



Department of Energy
Office of Legacy Management

DEC 01 2008

Mr. Don Aragon, Executive Director
Wind River Environmental Quality Commission
P.O. Box 217
Ft. Washakie, WY 82514

Subject: Transmittal of the Data Validation Package for the Riverton, Wyoming, Site June 2008

Dear Mr. Aragon:

Enclosed is your copy of the data validation package presenting results of the validation and evaluation of the data collected during June 2008 sampling event conducted at the Riverton, Wyoming, processing site.

This sampling event consisted of sampling 20 monitor wells, five domestic wells, and nine surface water locations at the Riverton processing site as specified in the *Long-Term Management Plan for the Riverton, Wyoming, Processing Site*.

Although concentrations of molybdenum and uranium in samples collected from surficial aquifer wells continue to exceed their respective U. S. Environmental Protection Agency (EPA) ground water standard, concentrations continue to trend downward, indicating natural flushing is progressing. Concentration of molybdenum and uranium in samples collected from semi-confined aquifer monitor wells and confined aquifer domestic wells were below their respective EPA standard.

All data were checked against laboratory analytical quality control criteria, and data not meeting the criteria were qualified per the *Standard Practice for Validation of Laboratory Data*. All data in this package are considered validated and available for use.

Please contact me at (970) 248-6016 or Sam Campbell at (970) 248-6654 with any questions.

Sincerely,

Jalena Dayvault
Site Manager

Enclosure

2597 B 3/4 Road, Grand Junction, CO 81503	<input type="checkbox"/>	3600 Collins Ferry Road, Morgantown, WV 26505
1000 Independence Ave., S.W., Washington, DC 20585	<input type="checkbox"/>	11025 Dover St., Suite 1000, Westminster, CO 80021
10995 Hamilton-Cleves Highway, Harrison, OH 45030	<input type="checkbox"/>	955 Mound Road, Miamisburg, OH 45342
232 Energy Way, N. Las Vegas, NV 89030	<input type="checkbox"/>	

REPLY TO: Grand Junction Office

DEC 01 2008

cc w/enclosure:

J. Arum, Ziontz, Chestnut, Varnell, Berley, and Slonim

B. Crocker, Baldwin and Crocker

J. Erickson, Department of Environmental Quality/Wyoming

J. Redman, Northern Arapaho Utility

B. von Till, Nuclear Regulatory Commission

D. Wolf, Sonosky, Chambers, Sachse, Endreson, and Perry

Riverton Branch Library

File: RVT 410.02 (Roberts)

cc w/o enclosure:

S. Campbell, Stoller (e)

C. Carpenter, Stoller (e)

Sampling Events-DVPs\Riverton\DVP Riverton June 2008.doc

Data Validation Package

June 2008

**Groundwater and Surface Water
Sampling at the Riverton, WY,
Processing Site**

October 2008



**U.S. Department of Energy
Office of Legacy Management**

*Work Performed by the S.M. Stoller Corporation Under DOE Contract No. DE-AM01-07LM00060
for the U.S. Department of Energy Office of Legacy Management.
Approved for public release; distribution is unlimited.*

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Attachment 1—Assessment of Anomalous Data

Potential Outliers Report

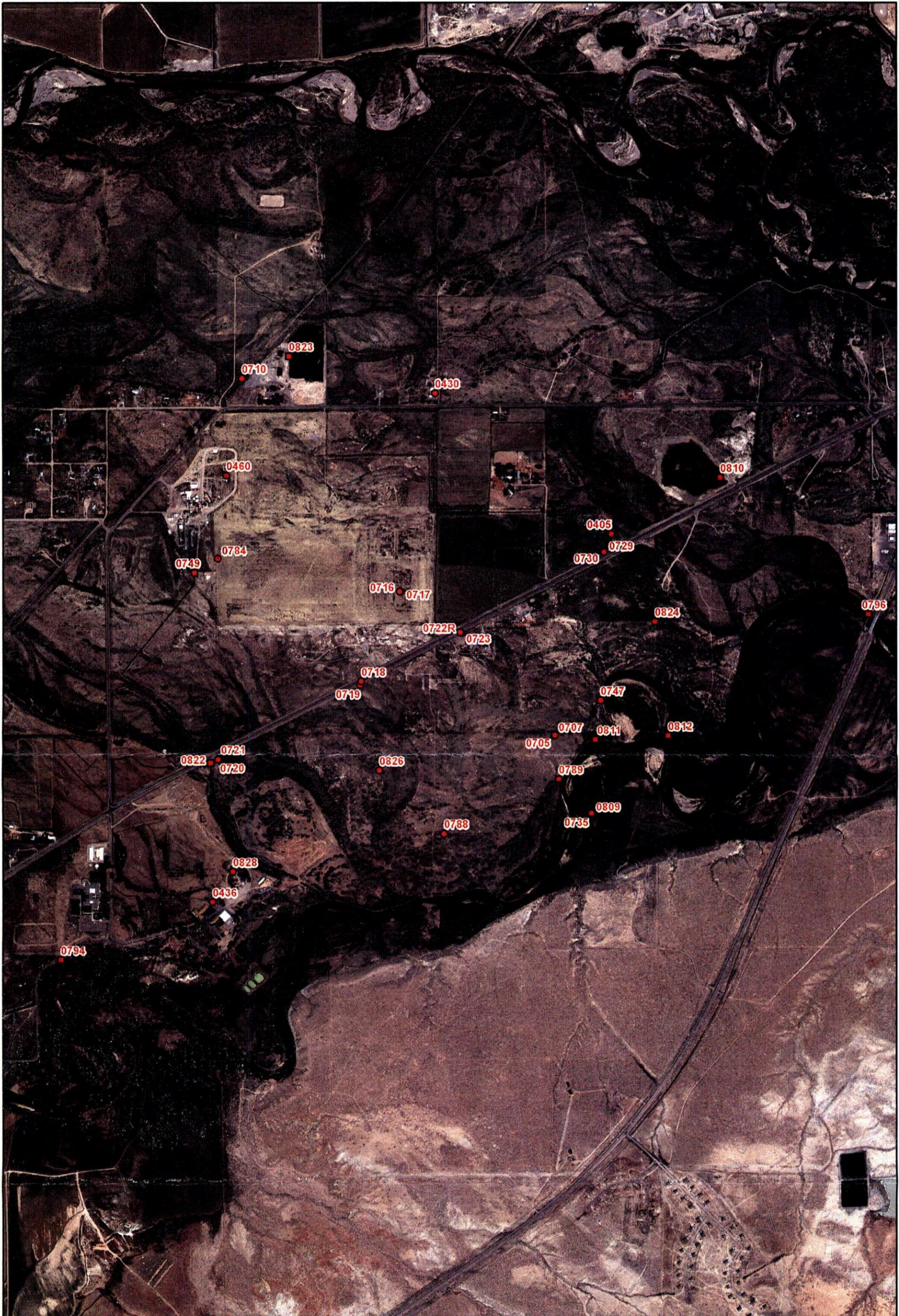
Attachment 2—Data Presentation

Groundwater Quality Data
Surface Water Quality Data
Equipment Blank Data
Static Water Level Data
Time-Concentration Graphs

Attachment 3—Sampling and Analysis Work Order

Attachment 4—Trip Report

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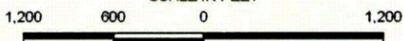


LEGEND

- Well to be Sampled
- Surface Location to be Sampled

N

SCALE IN FEET



U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION, COLORADO

Work Performed by
S.M. Stoller Corporation
Under DOE Contract
No. DE-AC01-07LM00080

Planned Sampling Map
Riverton, WY, Processing Site
June 2008

DATE PREPARED
November 13, 2008

FILENAME
S0469400

M:\LTS\111\0042\04\S04694\S0469400.mxd coatesc 11/13/2008 9:44:41 AM

Riverton, Wyoming, Processing Site, Sample Locations

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Sampling Event Summary

Site: Riverton, Wyoming, Processing Site

Sampling Period: June 11-12, 2008

The *Long-Term Management Plan (LTMP) for the Riverton, Wyoming, Processing Site* (in progress) requires semiannual monitoring to evaluate groundwater conditions and assess the progress of natural flushing of the upper most aquifer. This event involved sampling 20 monitor wells, nine surface water locations, and five domestic wells at the Riverton, Wyoming, Processing Site. Water levels were measured at all sampled monitor wells and 13 additional monitor wells that were not sampled. Sampling and analysis was conducted as specified in LTMP and the *Sampling and Analysis Plan for the U. S. Department of Energy Office of Legacy Management Sites*.

Results from this sampling event do not indicate any unexpected movement of contaminated groundwater. Concentrations of molybdenum and uranium in samples collected from semi-confined aquifer monitor wells were below the respective U.S. Environmental Protection Agency (EPA) (Title 40 *Code of Federal Regulations* [CFR] Part 192) groundwater standard. Although concentrations of molybdenum and uranium in the surficial aquifer currently exceed their respective EPA groundwater standard, concentrations continue to trend downward as shown in the time-concentration graphs, which are included in the Data Presentation section. Groundwater modeling predicts that natural flushing of the surficial aquifer will reduce concentrations below standards within 100 years. Progress of natural flushing will be assessed in the annual Verification Monitoring Report, which will include results from both 2008 sampling events (June and November). The EPA groundwater standards for molybdenum and uranium were exceeded in samples collected from surficial aquifer monitor wells listed in Table 1.

Table 1. Riverton Wells with Samples that Exceeded EPA Groundwater Standards in June 2008

Analyte	Standard ^a	Location	Concentration
Molybdenum	0.1	0707	0.66
		0716	0.17
		0789	0.51
Uranium	0.044	0707	0.76
		0716	0.22
		0718	0.19
		0722R	0.59
		0789	1.5

^aStandards are listed in 40 CFR 192.02 Table 1 to Subpart A; concentrations are in milligrams per liter (mg/L).

Results from domestic wells (locations 0405, 0430, 0436, 0460, and 0828) 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.

Surface water results were compared to the benchmark value for uranium (0.011 mg/L) derived from historical data at surface water location 0794, which is on the Little Wind River upstream of the site and represents background conditions (see sample location map). Uranium concentrations from Little Wind River locations 0796, 0811, and 0812 were below the benchmark value, which indicates minimal site-related impact on the water quality of the Little Wind River. In addition, the uranium concentration from surface water locations 0810 (constructed wetlands), 0822 (west side irrigation ditch), and 0823 (gravel pit pond) were below the benchmark value, which indicates minimal site-related impact to these surface water features. The uranium concentration (0.098 mg/L) in Oxbow Lake at location 0747 exceeded the benchmark value. Oxbow Lake receives discharge of contaminated groundwater and elevated concentrations are expected.

The sample collected at the ditch that discharges from the Chemtrade sulfuric acid plant (0749) continues to have elevated concentrations of sulfate (1,800 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 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. All radium concentrations were below detection limits, which indicates no impact to water quality in the ditch.



Sam Campbell
Site Lead, S.M. Stoller

11-13-08
Date

Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Riverton, Wyoming	Date(s) of Water Sampling	June 11-12, 2008
Date(s) of Verification	October 3, 2008	Name of Verifier	Gretchen Baer

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List other documents, SOP's, instructions.	Yes	Work Order Letter dated May 9, 2008
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 6, 2008.
4. Was an operational check of the field equipment conducted twice daily? Did the operational checks meet criteria?	Yes	With one exception: the ORP reading was not recorded for one of the op checks.
5. Were the number and types (alkalinity, temperature, Ec, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	Except that phenolphthalein alkalinity was not measured at 0460, 0810, 0823, and 0828.
6. Was the Category of the well documented?	No	Location 0460 should have been identified as Category IV.
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	Duplicates were collected at locations 0716 and 0810.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	Yes	
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number? Was the true identity of the samples recorded on the Quality Assurance Sample Log?	Yes	Location IDs 2644, 2645, & 2646 were used for QC samples.
	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	Filtered as specified in the SAP
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?	No	Location 0717 was missing one signature.
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	Presence of ice was not documented at location 0717.
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN): 08061652
 Sample Event: June 11-12, 2008
 Site(s): Riverton, Wyoming
 Laboratory: Paragon Analytics, Fort Collins, Colorado
 Work Order No.: 0806125
 Analysis: Metals, Wet Chemistry, and Radiochemistry
 Validator: Gretchen Baer
 Review Date: August 20, 2008

This validation was performed according to the *Environmental Procedures Catalog*, "Standard Practice for Validation of Laboratory Data," GT-9(P). 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 1.

Table 1. 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 2. Refer to the sections below for an explanation of the data qualifiers applied.

Table 2. Data Qualifier Summary

Sample Number	Location	Analyte(s)	Flag	Reason
0806125-1	0405	Uranium	U	Less than 5 times the calibration blank
0806125-2	0430	Uranium	U	Less than 5 times the method blank
0806125-4	0460	Uranium	U	Less than 5 times the method blank
0806125-13	0721	Uranium	U	Less than 5 times the calibration blank
0806125-15	0723	Molybdenum	U	Less than 5 times the method blank
0806125-15	0723	Uranium	U	Less than 5 times the calibration blank
0806125-24	0794	Molybdenum	U	Less than 5 times the calibration blank
0806125-34	0828	Uranium	U	Less than 5 times the calibration blank
0806125-37	Equipment Blank, 2646	Manganese	U	Less than 5 times the method blank
0806125-37	Equipment Blank, 2646	Uranium	U	Less than 5 times the method blank

Sample Shipping/Receiving

Paragon Analytics in Fort Collins, Colorado, received 37 water samples on June 17, 2008, 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 including the COC form and sample tickets had no errors or omissions, with the following exceptions. Incorrect sample times were written on the COC form for locations 0710 and 0729; the times should have been entered as 16:15 and 14:15, respectively. These errors were repeated by the laboratory throughout the data package. The laboratory incorrectly changed the filtration status for location 0460 to "filtered."

Preservation and Holding Times

The sample shipment was received cool and intact with the temperature within the iced cooler of 1.2 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses.

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.

Method SW-846 6010, Manganese

Calibrations for manganese were performed on June 26 and 27, 2008, using three 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). Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in 15 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 June 27, 2008, using seven 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. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in 14 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 five calibration standards on June 17, 2008. 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 calibration and calibration check standards were prepared from independent sources. 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

All radiochemical results reported included the calculated two-sigma total propagated uncertainty (TPU) and minimum detectable concentration (MDC). Radiochemical results are qualified with a "J" flag (estimated) when the result is greater than the MDC, but less than 3 times the MDC. Radiochemical results are qualified with a "U" flag (not detected) when the result is greater than the MDC but less than the two-sigma TPU.

Radium-226

Samples were screened for radium-226 by gas flow proportional counting. Plateau voltage determinations and detector efficiency calibrations were performed in September 2007. Daily instrument checks met the acceptance criteria. The chemical recoveries met the acceptance criteria of 40 to 110 percent for all samples.

Radium-228

Plateau voltage determinations and detector efficiency calibrations were performed in September 2007. 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. For manganese, some blank results were negative and the absolute values were greater than the MDL but less than the PQL. All manganese results were greater than 5 times the MDL, so no results are qualified.

Radiochemistry

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

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 (MS) Analysis

MS and matrix spike duplicate (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 MS 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 TPU) 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 evaluated serial dilution data were acceptable.

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 2.3.

$$MDC = \frac{4.65 \times \sqrt{\frac{b}{T}}}{K} + \frac{3}{K \times T}$$

Where:

b = background count rate (cpm)

K = Efficiency factor

T = Count time in minutes

The calculation of the MDCs using the equation above was verified. 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.

Chromatography Peak Integration

The integration of analyte peaks was reviewed for all ion chromatography data. There were no manual integrations performed and all peak integrations were satisfactory.

Electronic Data Deliverable (EDD) File

The EDD file arrived on July 16, 2008. The Sample Management System EDD validation module was used to verify that the EDD file was complete and in compliance with requirements. The module compares the contents of the file to the requested analyses to ensure all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package. The following errors were detected. Incorrect sample times were provided to the laboratory for locations 0710 and 0729; the times should have been entered as 16:15 and 14:15, respectively. The filtration status for location 0460 should be "not filtered" for all analyses. These errors in the EDD were corrected in the SEEPro database.

SAMPLE MANAGEMENT SYSTEM

EDD Non-Conformance Report

Report Date: 8/19/2008

EDD File: 08061652.xml

EDD Errors: No errors detected

Record	Table	Error Type	Field	Error Description

SAMPLE MANAGEMENT SYSTEM
General Data Validation Report

RIN: 08061652 Lab Code: PAR Validator: Gretchen Baer Validation Date: 8/20/2008

Project: Riverton Analysis Type: Metals General Chem Rad Organics

of Samples: 37 Matrix: WATER Requested Analysis Completed: Yes

Chain of Custody

Present: OK Signed: OK Dated: OK

Sample

Integrity: OK Preservation: OK Temperature: OK

Select Quality Parameters

- | | |
|---|--|
| <input checked="" type="checkbox"/> Holding Times | All analyses were completed within the applicable holding times. |
| <input checked="" type="checkbox"/> Detection Limits | The reported detection limits are equal to or below contract requirements. |
| <input checked="" type="checkbox"/> Field/Trip Blanks | There was 1 trip/equipment blank evaluated. |
| <input checked="" type="checkbox"/> Field Duplicates | There were 2 duplicates evaluated. |

SAMPLE MANAGEMENT SYSTEM
Metals Data Validation Worksheet

RIN: 08061652 Lab Code: PAR Date Due: 7/15/2008
 Matrix: Water Site Code: RVT Date Completed: 7/21/2008

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	06/26/2008											92.0		99.0	
Manganese	06/27/2008										0.0	98.0		107.0	
Manganese	06/27/2008											98.0		107.0	
MANGANESE	06/26/2008	-0.3700	1.0000	OK	OK	OK	OK	OK	101.0	98.0	98.0	1.0	92.0	99.0	
MANGANESE	06/27/2008	0.2820	1.0000	OK	OK	OK	OK	OK	108.0	97.0	97.0	0.0	98.0	8.0	
Molybdenum	06/27/2008										1.0				
MOLYBDENUM	06/27/2008	-0.0040	1.0000	OK	OK	OK	OK	OK	106.0	111.0	111.0	0.0	115.0	122.0	
MOLYBDENUM	06/27/2008							OK	105.0	117.0	112.0	2.0	0.0		
Uranium	06/27/2008										2.0				
URANIUM	06/27/2008	0.0000	1.0000	OK	OK	OK	OK	OK	104.0	112.0	110.0	2.0	107.0	96.0	
URANIUM	06/27/2008							OK	103.0	115.0	111.0	3.0	8.0		

SAMPLE MANAGEMENT SYSTEM
Wet Chemistry Data Validation Worksheet

RIN: 08061652 Lab Code: PAR Date Due: 7/15/2008
 Matrix: Water Site Code: RVT Date Completed: 7/21/2008

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	06/18/2008	0.234	1.0000	OK	OK	OK	OK	96.0	100.0	96.0	1.00		
SULFATE	06/18/2008						OK	94.0	99.0	101.0	1.00		

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

Page 1 of 1

RIN: 08061652

Lab Code: PAR

Date Due: 7/15/2008

Matrix: Water

Site Code: RVT

Date Completed: 7/21/2008

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
LCS	Radium-226	07/07/2008			103	101		
LCS_Duplicate	Radium-226	07/07/2008			99.2	102		0.1
0822	Radium-226	07/09/2008			95.3			
Blank	Radium-226	07/09/2008	0.0194	U	102			
0822	Radium-228	07/03/2008			61.5			
LCS	Radium-228	07/03/2008			62.7	118		
LCS_Duplicate	Radium-228	07/03/2008			63.4	94.3		1.06
Blank	Radium-228	07/03/2008	0.3390	U	62.4			

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. Monitor wells were sampled using a peristaltic pump and dedicated tubing. Domestic wells were sampled by filling bottles at the discharge point.

Sample results for all monitor 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 and 0719 were classified as Category II. The sample results for these two wells were qualified with a "Q" flag, indicating the data are qualitative because of the sampling technique.

Equipment Blank Assessment

An equipment blank (field ID 2646) was collected after decontamination of the non-dedicated tubing reel used to collect some surface water samples. Manganese and uranium were detected in the blank by the laboratory, but these analytes were qualified during data validation with a "U" flag as not detected. The equipment blank results indicate adequate decontamination of the sampling equipment.

Field Duplicate Assessment

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates, which measure only laboratory performance. Duplicate samples were collected from locations 0716 and 0810 (field duplicate IDs 2645 and 2644). 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

Page 1 of 1

RIN: 08061652 Lab Code: PAR Project: Riverton Validation Date: 8/20/2008

Duplicate: 2644

Sample: 0810

Analyte	Sample			Duplicate			RPD	RER	Units
	Result	Flag	Error	Result	Flag	Error			
MANGANESE	24			28			15.38		UG/L
MOLYBDENUM	1.1			1.2					UG/L
SULFATE	240			250			4.08		MG/L
URANIUM	4.9			4.9			0		UG/L

Duplicate: 2645

Sample: 0716

Analyte	Sample			Duplicate			RPD	RER	Units
	Result	Flag	Error	Result	Flag	Error			
MANGANESE	200			210			4.88		UG/L
MOLYBDENUM	170			170			0		UG/L
SULFATE	330			320			3.08		MG/L
URANIUM	220			210			4.65		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 10-22-2008
Steve Donivan Date

Data Validation Lead: Gretchen Baer 10/22/08
Gretchen Baer Date

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Attachment 1
Assessment of Anomalous Data

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Potential Outliers Report

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Potential Outliers Report

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

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

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

1. Identify extreme values that may be potential outliers by generating the Outliers Report using the Sample Management System from data in the SEEPro database. The application compares the new data set with historical data and lists all new data that fall outside the historical data range. Data listed in the report are highlighted if the concentration detected is not within 50 percent of historical minimum or maximum values. A determination is also made if the data are normally distributed using the Studentized Range 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.

Four results were identified as potentially anomalous. Both uranium results for location 0716 had concentrations lower than previously observed. Historical results for uranium, manganese, molybdenum, and sulfate indicate downward trending at this location. The manganese results for locations 0729 and 0811 were identified as anomalously high. The data associated with this result were further reviewed. There were no errors noted and the data for this RIN are acceptable as qualified.

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Data Validation Outliers Report - No Field Parameters

Laboratory: PARAGON (Fort Collins, CO)

RIN: 08061652

Comparison: All Historical Data

Report Date: 10/3/2008

Site Code	Location Code	Sample Date	Analyte	Current Result	Current Qualifiers		Historical Maximum			Historical Minimum			Number of Data Points		Normally Distributed	Statistical Outlier
					Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect		
RVT01	0405	06/11/2008	Manganese	0.0021	B		0.01	U	G	0.0023	B		19	11	No	No
RVT01	0716	06/12/2008	Manganese	0.2		F	0.773			0.25		F	21	0	Yes	No
RVT01	0716	06/12/2008	Manganese	0.21		F	0.773			0.25		F	21	0	Yes	No
RVT01	0716	06/12/2008	Sulfate	330		F	850			370		F	20	0	Yes (log)	No
RVT01	0716	06/12/2008	Sulfate	320		F	850			370		F	20	0	Yes (log)	No
RVT01	0716	06/12/2008	Uranium	0.22		F	0.718			0.23		F	21	0	Yes (log)	Yes
RVT01	0716	06/12/2008	Uranium	0.21		F	0.718			0.23		F	21	0	Yes (log)	Yes
RVT01	0717	06/12/2008	Manganese	0.017		FQ	0.24		F	0.089		F	19	0	No	Yes
RVT01	0718	06/12/2008	Manganese	0.93		F	3.28			0.97		F	20	0	Yes	No
RVT01	0718	06/12/2008	Molybdenum	0.084		F	0.15			0.0885		F	20	0	Yes	No
RVT01	0720	06/11/2008	Sulfate	760		F	600		F	100		F	15	0	Yes	No
RVT01	0729	06/11/2008	Manganese	0.071		F	0.033		F	0.00029	B	UF	14	5	Yes (log)	Yes
RVT01	0788	06/12/2008	Molybdenum	0.02		F	0.037		F	0.024		F	11	0	Yes	No
RVT01	0789	06/12/2008	Manganese	0.15		F	0.82		F	0.34		F	5	0	Yes	No
RVT01	0789	06/12/2008	Molybdenum	0.51		F	0.5		F	0.38		F	5	0	Yes	No
RVT01	0789	06/12/2008	Sulfate	4000		F	3900		F	3500		F	5	0	Yes	No
RVT01	0810	06/11/2008	Molybdenum	0.0011			0.0021	B		0.0012			6	3	Yes	No
RVT01	0810	06/11/2008	Sulfate	250			390			290			8	0	Yes	No
RVT01	0810	06/11/2008	Sulfate	240			390			290			8	0	Yes	No
RVT01	0810	06/11/2008	Uranium	0.0049			0.01			0.0051			8	0	Yes	No

Data Validation Outliers Report - No Field Parameters

Laboratory: PARAGON (Fort Collins, CO)

RIN: 08061652

Comparison: All Historical Data

Report Date: 10/3/2008

Site Code	Location Code	Sample Date	Analyte	Current			Historical Maximum			Historical Minimum			Number of Data Points		Normally Distributed	Statistical Outlier
				Result	Qualifiers Lab Data		Result	Qualifiers Lab Data		Result	Qualifiers Lab Data		N	N Below Detect		
RVT01	0811	06/12/2008	Manganese	0.2			0.0531			0.0043	B		6	0	Yes	Yes
RVT01	0823	06/11/2008	Manganese	0.063			0.0342			0.0019	B		5	1	Yes	No
RVT01	0823	06/11/2008	Uranium	0.0043			0.013			0.0044			7	0	Yes	No

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

STATISTICAL TESTS:

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

Attachment 2
Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0405 WELL

Parameter	Units	Sample		Depth Range (Ft.BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	-	136			#		
Manganese	mg/L	06/11/2008	N001	-	0.0021	B		#	0.00013	
Molybdenum	mg/L	06/11/2008	N001	-	0.0029	E		#	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	-	119			#		
pH	s.u.	06/11/2008	N001	-	8.87			#		
Specific Conductance	umhos /cm	06/11/2008	N001	-	899			#		
Sulfate	mg/L	06/11/2008	N001	-	280			#	2.5	
Temperature	C	06/11/2008	N001	-	12.27			#		
Turbidity	NTU	06/11/2008	N001	-	1.07			#		
Uranium	mg/L	06/11/2008	N001	-	0.000085	B	U	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0430 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	-	164			#		
Manganese	mg/L	06/11/2008	N001	-	0.0086			#	0.00013	
Molybdenum	mg/L	06/11/2008	N001	-	0.0025			#	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	-	76			#		
pH	s.u.	06/11/2008	N001	-	8.99			#		
Specific Conductance	umhos /cm	06/11/2008	N001	-	748			#		
Sulfate	mg/L	06/11/2008	N001	-	180			#	2.5	
Temperature	C	06/11/2008	N001	-	11.38			#		
Turbidity	NTU	06/11/2008	N001	-	3.93			#		
Uranium	mg/L	06/11/2008	N001	-	0.000065	B	U	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0436 WELL

Parameter	Units	Date	Sample ID	Depth Range (Ft/BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	-	156		#		
Manganese	mg/L	06/11/2008	N001	-	0.012		#	0.00013	
Molybdenum	mg/L	06/11/2008	N001	-	0.004		#	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	-	76		#		
pH	s.u.	06/11/2008	N001	-	8.77		#		
Specific Conductance	umhos/cm	06/11/2008	N001	-	857		#		
Sulfate	mg/L	06/11/2008	N001	-	230		#	2.5	
Temperature	C	06/11/2008	N001	-	27.49		#		
Turbidity	NTU	06/11/2008	N001	-	1.9		#		
Uranium	mg/L	06/11/2008	N001	-	0.00014		#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0460 WELL Koch Sulfuric Acid Plant

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
						Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	-	169			#		
Manganese	mg/L	06/11/2008	N001	-	0.0015	B		#	0.00013	
Molybdenum	mg/L	06/11/2008	N001	-	0.003			#	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	-	69.6			#		
pH	s.u.	06/11/2008	N001	-	8.07			#		
Specific Conductance	umhos/cm	06/11/2008	N001	-	701			#		
Sulfate	mg/L	06/11/2008	N001	-	160			#	2.5	
Temperature	C	06/11/2008	N001	-	17.79			#		
Turbidity	NTU	06/11/2008	N001	-	2.34			#		
Uranium	mg/L	06/11/2008	N001	-	0.000064	B	U	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0705 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/12/2008	N001	37.3 - 61.8	77		FQ #		
Manganese	mg/L	06/12/2008	N001	37.3 - 61.8	0.0062		FQ #	0.00013	
Molybdenum	mg/L	06/12/2008	N001	37.3 - 61.8	0.0028		FQ #	0.001	
Oxidation Reduction Potential	mV	06/12/2008	N001	37.3 - 61.8	30		FQ #		
pH	s.u.	06/12/2008	N001	37.3 - 61.8	8.39		FQ #		
Specific Conductance	umhos/cm	06/12/2008	N001	37.3 - 61.8	1199		FQ #		
Sulfate	mg/L	06/12/2008	N001	37.3 - 61.8	440		FQ #	5	
Temperature	C	06/12/2008	N001	37.3 - 61.8	11.08		FQ #		
Turbidity	NTU	06/12/2008	N001	37.3 - 61.8	2.59		FQ #		
Uranium	mg/L	06/12/2008	N001	37.3 - 61.8	0.00021		FQ #	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0707 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/12/2008	N001	9.1 - 23.3	305		F #		
Manganese	mg/L	06/12/2008	N001	9.1 - 23.3	0.95		F #	0.00013	
Molybdenum	mg/L	06/12/2008	N001	9.1 - 23.3	0.66		F #	0.02	
Oxidation Reduction Potential	mV	06/12/2008	N001	9.1 - 23.3	40		F #		
pH	s.u.	06/12/2008	N001	9.1 - 23.3	7.05		F #		
Specific Conductance	umhos/cm	06/12/2008	N001	9.1 - 23.3	3231		F #		
Sulfate	mg/L	06/12/2008	N001	9.1 - 23.3	1800		F #	10	
Temperature	C	06/12/2008	N001	9.1 - 23.3	10.06		F #		
Turbidity	NTU	06/12/2008	N001	9.1 - 23.3	1.93		F #		
Uranium	mg/L	06/12/2008	N001	9.1 - 23.3	0.76		F #	0.002	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0710 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab.	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	9.8 - 26.8	200		F #		
Manganese	mg/L	06/11/2008	N001	9.8 - 26.8	0.018		F #	0.00013	
Molybdenum	mg/L	06/11/2008	N001	9.8 - 26.8	0.0019		F #	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	9.8 - 26.8	76		F #		
pH	s.u.	06/11/2008	N001	9.8 - 26.8	7.58		F #		
Specific Conductance	umhos/cm	06/11/2008	N001	9.8 - 26.8	594		F #		
Sulfate	mg/L	06/11/2008	N001	9.8 - 26.8	100		F #	2.5	
Temperature	C	06/11/2008	N001	9.8 - 26.8	8.87		F #		
Turbidity	NTU	06/11/2008	N001	9.8 - 26.8	2.67		F #		
Uranium	mg/L	06/11/2008	N001	9.8 - 26.8	0.004		F #	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0716 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/12/2008	N001	9.78 - 14.78	281		F #		
Manganese	mg/L	06/12/2008	N001	9.78 - 14.78	0.2		F #	0.00013	
Manganese	mg/L	06/12/2008	N002	9.78 - 14.78	0.21		F #	0.00013	
Molybdenum	mg/L	06/12/2008	N001	9.78 - 14.78	0.17		F #	0.01	
Molybdenum	mg/L	06/12/2008	N002	9.78 - 14.78	0.17		F #	0.01	
Oxidation Reduction Potential	mV	06/12/2008	N001	9.78 - 14.78	64		F #		
pH	s.u.	06/12/2008	N001	9.78 - 14.78	7.25		F #		
Specific Conductance	umhos/cm	06/12/2008	N001	9.78 - 14.78	1151		F #		
Sulfate	mg/L	06/12/2008	N001	9.78 - 14.78	330		F #	5	
Sulfate	mg/L	06/12/2008	N002	9.78 - 14.78	320		F #	5	
Temperature	C	06/12/2008	N001	9.78 - 14.78	10.07		F #		
Turbidity	NTU	06/12/2008	N001	9.78 - 14.78	1.36		F #		
Uranium	mg/L	06/12/2008	N001	9.78 - 14.78	0.22		F #	0.001	
Uranium	mg/L	06/12/2008	N002	9.78 - 14.78	0.21		F #	0.001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0717 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/12/2008	N001	45.1 - 55.1	239		F #		
Manganese	mg/L	06/12/2008	N001	45.1 - 55.1	0.017		F #	0.00013	
Molybdenum	mg/L	06/12/2008	N001	45.1 - 55.1	0.0081		F #	0.001	
Oxidation Reduction Potential	mV	06/12/2008	N001	45.1 - 55.1	64		F #		
pH	s.u.	06/12/2008	N001	45.1 - 55.1	7.68		F #		
Specific Conductance	umhos/cm	06/12/2008	N001	45.1 - 55.1	1874		F #		
Sulfate	mg/L	06/12/2008	N001	45.1 - 55.1	710		F #	10	
Temperature	C	06/12/2008	N001	45.1 - 55.1	10.38		F #		
Turbidity	NTU	06/12/2008	N001	45.1 - 55.1	1.95		F #		
Uranium	mg/L	06/12/2008	N001	45.1 - 55.1	0.00018		F #	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0718 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	06/12/2008	N001	18.24 - 23.24	384		F	#		
Manganese	mg/L	06/12/2008	N001	18.24 - 23.24	0.93		F	#	0.00013	
Molybdenum	mg/L	06/12/2008	N001	18.24 - 23.24	0.084		F	#	0.005	
Oxidation Reduction Potential	mV	06/12/2008	N001	18.24 - 23.24	21		F	#		
pH	s.u.	06/12/2008	N001	18.24 - 23.24	7.18		F	#		
Specific Conductance	umhos /cm	06/12/2008	N001	18.24 - 23.24	3344		F	#		
Sulfate	mg/L	06/12/2008	N001	18.24 - 23.24	1600		F	#	10	
Temperature	C	06/12/2008	N001	18.24 - 23.24	10.49		F	#		
Turbidity	NTU	06/12/2008	N001	18.24 - 23.24	2.86		F	#		
Uranium	mg/L	06/12/2008	N001	18.24 - 23.24	0.19		F	#	0.0005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0719 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft:BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/12/2008	N001	38.47 - 48.47	94		FQ #		
Manganese	mg/L	06/12/2008	N001	38.47 - 48.47	0.017		FQ #	0.00013	
Molybdenum	mg/L	06/12/2008	N001	38.47 - 48.47	0.014		FQ #	0.001	
Oxidation Reduction Potential	mV	06/12/2008	N001	38.47 - 48.47	-8		FQ #		
pH	s.u.	06/12/2008	N001	38.47 - 48.47	7.82		FQ #		
Specific Conductance	umhos/cm	06/12/2008	N001	38.47 - 48.47	1144		FQ #		
Sulfate	mg/L	06/12/2008	N001	38.47 - 48.47	420		FQ #	5	
Temperature	C	06/12/2008	N001	38.47 - 48.47	11.25		FQ #		
Turbidity	NTU	06/12/2008	N001	38.47 - 48.47	8.41		FQ #		
Uranium	mg/L	06/12/2008	N001	38.47 - 48.47	0.00057		FQ #	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0720 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	7.94	- 12.94	231		F	#		
Manganese	mg/L	06/11/2008	N001	7.94	- 12.94	0.13		F	#	0.00013	
Molybdenum	mg/L	06/11/2008	N001	7.94	- 12.94	0.0016		F	#	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	7.94	- 12.94	58		F	#		
pH	s.u.	06/11/2008	N001	7.94	- 12.94	7.29		F	#		
Specific Conductance	umhos/cm	06/11/2008	N001	7.94	- 12.94	1719		F	#		
Sulfate	mg/L	06/11/2008	N001	7.94	- 12.94	760		F	#	5	
Temperature	C	06/11/2008	N001	7.94	- 12.94	8.75		F	#		
Turbidity	NTU	06/11/2008	N001	7.94	- 12.94	2.12		F	#		
Uranium	mg/L	06/11/2008	N001	7.94	- 12.94	0.0097		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0721 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	44.43 - 54.43	93		F #		
Manganese	mg/L	06/11/2008	N001	44.43 - 54.43	0.0052		F #	0.00013	
Molybdenum	mg/L	06/11/2008	N001	44.43 - 54.43	0.0028		F #	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	44.43 - 54.43	35		F #		
pH	s.u.	06/11/2008	N001	44.43 - 54.43	8.89		F #		
Specific Conductance	umhos/cm	06/11/2008	N001	44.43 - 54.43	874		F #		
Sulfate	mg/L	06/11/2008	N001	44.43 - 54.43	290		F #	2.5	
Temperature	C	06/11/2008	N001	44.43 - 54.43	10.28		F #		
Turbidity	NTU	06/11/2008	N001	44.43 - 54.43	2.44		F #		
Uranium	mg/L	06/11/2008	N001	44.43 - 54.43	0.00011		UF #	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0722R WELL Replacement well for destroyed well 0722.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/12/2008	N001	11.1 - 16.1	310		F #		
Manganese	mg/L	06/12/2008	N001	11.1 - 16.1	0.0051		F #	0.00013	
Molybdenum	mg/L	06/12/2008	N001	11.1 - 16.1	0.078		F #	0.02	
Oxidation Reduction Potential	mV	06/12/2008	N001	11.1 - 16.1	25		F #		
pH	s.u.	06/12/2008	N001	11.1 - 16.1	6.95		F #		
Specific Conductance	umhos/cm	06/12/2008	N001	11.1 - 16.1	1821		F #		
Sulfate	mg/L	06/12/2008	N001	11.1 - 16.1	810		F #	5	
Temperature	C	06/12/2008	N001	11.1 - 16.1	11.09		F #		
Turbidity	NTU	06/12/2008	N001	11.1 - 16.1	1.01		F #		
Uranium	mg/L	06/12/2008	N001	11.1 - 16.1	0.59		F #	0.002	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0723 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	06/12/2008	N001	45.99 - 55.99	388		F	#		
Manganese	mg/L	06/12/2008	N001	45.99 - 55.99	0.52		F	#	0.00013	
Molybdenum	mg/L	06/12/2008	N001	45.99 - 55.99	0.00018	B	UF	#	0.001	
Oxidation Reduction Potential	mV	06/12/2008	N001	45.99 - 55.99	-16		F	#		
pH	s.u.	06/12/2008	N001	45.99 - 55.99	7.11		F	#		
Specific Conductance	umhos /cm	06/12/2008	N001	45.99 - 55.99	3830		F	#		
Sulfate	mg/L	06/12/2008	N001	45.99 - 55.99	1900		F	#	10	
Temperature	C	06/12/2008	N001	45.99 - 55.99	11.93		F	#		
Turbidity	NTU	06/12/2008	N001	45.99 - 55.99	1.18		F	#		
Uranium	mg/L	06/12/2008	N001	45.99 - 55.99	0.000083	B	UF	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0729 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	14.71 - 19.71	357		F #		
Manganese	mg/L	06/11/2008	N001	14.71 - 19.71	0.071		F #	0.00013	
Molybdenum	mg/L	06/11/2008	N001	14.71 - 19.71	0.0032		F #	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	14.71 - 19.71	123		F #		
pH	s.u.	06/11/2008	N001	14.71 - 19.71	7.29		F #		
Specific Conductance	umhos/cm	06/11/2008	N001	14.71 - 19.71	901		F #		
Sulfate	mg/L	06/11/2008	N001	14.71 - 19.71	140		F #	2.5	
Temperature	C	06/11/2008	N001	14.71 - 19.71	10.38		F #		
Turbidity	NTU	06/11/2008	N001	14.71 - 19.71	6.22		F #		
Uranium	mg/L	06/11/2008	N001	14.71 - 19.71	0.015		F #	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0730 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	38.62 - 48.62	345		F #		
Manganese	mg/L	06/11/2008	N001	38.62 - 48.62	0.12		F #	0.00013	
Molybdenum	mg/L	06/11/2008	N001	38.62 - 48.62	0.0045		F #	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	38.62 - 48.62	20		F #		
pH	s.u.	06/11/2008	N001	38.62 - 48.62	7.6		F #		
Specific Conductance	umhos/cm	06/11/2008	N001	38.62 - 48.62	982		F #		
Sulfate	mg/L	06/11/2008	N001	38.62 - 48.62	190		F #	5	
Temperature	C	06/11/2008	N001	38.62 - 48.62	11.51		F #		
Turbidity	NTU	06/11/2008	N001	38.62 - 48.62	5.96		F #		
Uranium	mg/L	06/11/2008	N001	38.62 - 48.62	0.0032		F #	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0735 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Data QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	4906.6 - 4891.6 6 6	156	F	#		
Manganese	mg/L	06/11/2008	N001	4906.6 - 4891.6 6 6	0.022	F	#	0.00013	
Molybdenum	mg/L	06/11/2008	N001	4906.6 - 4891.6 6 6	0.0015	F	#	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	4906.6 - 4891.6 6 6	104	F	#		
pH	s.u.	06/11/2008	N001	4906.6 - 4891.6 6 6	7.7	F	#		
Specific Conductance	umhos/cm	06/11/2008	N001	4906.6 - 4891.6 6 6	1418	F	#		
Sulfate	mg/L	06/11/2008	N001	4906.6 - 4891.6 6 6	550	F	#	5	
Temperature	C	06/11/2008	N001	4906.6 - 4891.6 6 6	9.75	F	#		
Turbidity	NTU	06/11/2008	N001	4906.6 - 4891.6 6 6	3.06	F	#		
Uranium	mg/L	06/11/2008	N001	4906.6 - 4891.6 6 6	0.00028	F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0784 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/12/2008	N001	1.65 - 6.65	242		F #		
Manganese	mg/L	06/12/2008	N001	1.65 - 6.65	0.54		F #	0.00013	
Molybdenum	mg/L	06/12/2008	N001	1.65 - 6.65	0.023		F #	0.001	
Oxidation Reduction Potential	mV	06/12/2008	N001	1.65 - 6.65	6		F #		
pH	s.u.	06/12/2008	N001	1.65 - 6.65	8.09		F #		
Specific Conductance	umhos/cm	06/12/2008	N001	1.65 - 6.65	4983		F #		
Sulfate	mg/L	06/12/2008	N001	1.65 - 6.65	2400		F #	25	
Temperature	C	06/12/2008	N001	1.65 - 6.65	11.72		F #		
Turbidity	NTU	06/12/2008	N001	1.65 - 6.65	7.5		F #		
Uranium	mg/L	06/12/2008	N001	1.65 - 6.65	0.0055		F #	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0788 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/12/2008	N001	1.41 - 13.41	404		F #		
Manganese	mg/L	06/12/2008	N001	1.41 - 13.41	0.015		F #	0.00013	
Molybdenum	mg/L	06/12/2008	N001	1.41 - 13.41	0.02		F #	0.001	
Oxidation Reduction Potential	mV	06/12/2008	N001	1.41 - 13.41	48		F #		
pH	s.u.	06/12/2008	N001	1.41 - 13.41	7.38		F #		
Specific Conductance	umhos/cm	06/12/2008	N001	1.41 - 13.41	2228		F #		
Sulfate	mg/L	06/12/2008	N001	1.41 - 13.41	880		F #	10	
Temperature	C	06/12/2008	N001	1.41 - 13.41	9.38		F #		
Turbidity	NTU	06/12/2008	N001	1.41 - 13.41	2.15		F #		
Uranium	mg/L	06/12/2008	N001	1.41 - 13.41	0.034		F #	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0789 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	06/12/2008	N001	6.2 - 18.2	313		F	#		
Manganese	mg/L	06/12/2008	N001	6.2 - 18.2	0.15		F	#	0.00013	
Molybdenum	mg/L	06/12/2008	N001	6.2 - 18.2	0.51		F	#	0.01	
Oxidation Reduction Potential	mV	06/12/2008	N001	6.2 - 18.2	65		F	#		
pH	s.u.	06/12/2008	N001	6.2 - 18.2	7.2		F	#		
Specific Conductance	umhos/cm	06/12/2008	N001	6.2 - 18.2	6570		F	#		
Sulfate	mg/L	06/12/2008	N001	6.2 - 18.2	4000		F	#	25	
Temperature	C	06/12/2008	N001	6.2 - 18.2	9.69		F	#		
Turbidity	NTU	06/12/2008	N001	6.2 - 18.2	3.02		F	#		
Uranium	mg/L	06/12/2008	N001	6.2 - 18.2	1.5		F	#	0.005	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0809 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
						Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	10.5 - 19.4	113		F	#		
Manganese	mg/L	06/11/2008	N001	10.5 - 19.4	0.81		F	#	0.00013	
Molybdenum	mg/L	06/11/2008	N001	10.5 - 19.4	0.0016		F	#	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	10.5 - 19.4	42		F	#		
pH	s.u.	06/11/2008	N001	10.5 - 19.4	7.64		F	#		
Specific Conductance	umhos/cm	06/11/2008	N001	10.5 - 19.4	626		F	#		
Sulfate	mg/L	06/11/2008	N001	10.5 - 19.4	210		F	#	2.5	
Temperature	C	06/11/2008	N001	10.5 - 19.4	9.52		F	#		
Turbidity	NTU	06/11/2008	N001	10.5 - 19.4	0.33		F	#		
Uranium	mg/L	06/11/2008	N001	10.5 - 19.4	0.002		F	#	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0824 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	9.5 - 14.5	340		F #		
Manganese	mg/L	06/11/2008	N001	9.5 - 14.5	0.007		F #	0.00013	
Molybdenum	mg/L	06/11/2008	N001	9.5 - 14.5	0.0041		F #	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	9.5 - 14.5	88		F #		
pH	s.u.	06/11/2008	N001	9.5 - 14.5	7.31		F #		
Specific Conductance	umhos/cm	06/11/2008	N001	9.5 - 14.5	862		F #		
Sulfate	mg/L	06/11/2008	N001	9.5 - 14.5	140		F #	2.5	
Temperature	C	06/11/2008	N001	9.5 - 14.5	9.45		F #		
Turbidity	NTU	06/11/2008	N001	9.5 - 14.5	3.66		F #		
Uranium	mg/L	06/11/2008	N001	9.5 - 14.5	0.02		F #	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0826 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/12/2008	N001	6.6 - 11.6	349		F #		
Manganese	mg/L	06/12/2008	N001	6.6 - 11.6	0.53		F #	0.00013	
Molybdenum	mg/L	06/12/2008	N001	6.6 - 11.6	0.022		F #	0.001	
Oxidation Reduction Potential	mV	06/12/2008	N001	6.6 - 11.6	-3		F #		
pH	s.u.	06/12/2008	N001	6.6 - 11.6	7.48		F #		
Specific Conductance	umhos/cm	06/12/2008	N001	6.6 - 11.6	1298		F #		
Sulfate	mg/L	06/12/2008	N001	6.6 - 11.6	340		F #	5	
Temperature	C	06/12/2008	N001	6.6 - 11.6	8.97		F #		
Turbidity	NTU	06/12/2008	N001	6.6 - 11.6	1.65		F #		
Uranium	mg/L	06/12/2008	N001	6.6 - 11.6	0.029		F #	0.0001	

Groundwater Quality Data by Location (USEE100) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0828 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
						Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	-	164		#		
Manganese	mg/L	06/11/2008	N001	-	0.0044	B	#	0.00013	
Molybdenum	mg/L	06/11/2008	N001	-	0.0038		#	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	-	68		#		
pH	s.u.	06/11/2008	N001	-	8.88		#		
Specific Conductance	umhos/cm	06/11/2008	N001	-	840		#		
Sulfate	mg/L	06/11/2008	N001	-	230		#	2.5	
Temperature	C	06/11/2008	N001	-	13.98		#		
Turbidity	NTU	06/11/2008	N001	-	3.17		#		
Uranium	mg/L	06/11/2008	N001	-	0.00022	U	#	0.0001	

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: 10/3/2008

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		Detection Limit	Uncertainty
					Lab.	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/12/2008	0001	240		#		
Manganese	mg/L	06/12/2008	0001	0.24		#	0.00013	
Molybdenum	mg/L	06/12/2008	0001	0.01		#	0.002	
Oxidation Reduction Potential	mV	06/12/2008	N001	7.7		#		
pH	s.u.	06/12/2008	N001	7.39		#		
Specific Conductance	umhos/cm	06/12/2008	N001	894		#		
Sulfate	mg/L	06/12/2008	0001	230		#	2.5	
Temperature	C	06/12/2008	N001	16.34		#		
Turbidity	NTU	06/12/2008	N001	60.7		#		
Uranium	mg/L	06/12/2008	0001	0.098		#	0.0002	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0749 SURFACE LOCATION 8/26/97 State plane east changed from 589532.71 to an estimation close to river

Parameter	Units	Sample		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID		Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/12/2008	0001	183		#		
Manganese	mg/L	06/12/2008	0001	0.036		#	0.00013	
Molybdenum	mg/L	06/12/2008	0001	0.0072		#	0.001	
Oxidation Reduction Potential	mV	06/12/2008	N001	166		#		
pH	s.u.	06/12/2008	N001	7.34		#		
Specific Conductance	umhos/cm	06/12/2008	N001	3528		#		
Sulfate	mg/L	06/12/2008	0001	1800		#	10	
Temperature	C	06/12/2008	N001	20.75		#		
Turbidity	NTU	06/12/2008	N001	15.7		#		
Uranium	mg/L	06/12/2008	0001	0.00062		#	0.0001	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

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			Detection Limit	Uncertainty
					Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	0001	85			#		
Manganese	mg/L	06/11/2008	0001	0.011			#	0.00013	
Molybdenum	mg/L	06/11/2008	0001	0.00068	B	U	#	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	58			#		
pH	s.u.	06/11/2008	N001	8.14			#		
Specific Conductance	umhos/cm	06/11/2008	N001	321			#		
Sulfate	mg/L	06/11/2008	0001	78			#	0.5	
Temperature	C	06/11/2008	N001	11.11			#		
Turbidity	NTU	06/11/2008	N001	68.3			#		
Uranium	mg/L	06/11/2008	0001	0.002			#	0.0001	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0796 SURFACE LOCATION Was possibly historically sampled -900 ft E from current location

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	0001	114			#		
Manganese	mg/L	06/11/2008	0001	0.016			#	0.00013	
Molybdenum	mg/L	06/11/2008	0001	0.00076	B		#	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	91			#		
pH	s.u.	06/11/2008	N001	7.71			#		
Specific Conductance	umhos/cm	06/11/2008	N001	318			#		
Sulfate	mg/L	06/11/2008	0001	74			#	0.5	
Temperature	C	06/11/2008	N001	10.94			#		
Turbidity	NTU	06/11/2008	N001	82.8			#		
Uranium	mg/L	06/11/2008	0001	0.0018			#	0.0001	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0810 SURFACE LOCATION Gravel Pit Pond

Parameter	Units	Sample Date	Sample ID	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	383			#		
Manganese	mg/L	06/11/2008	N001	0.024			#	0.00013	
Manganese	mg/L	06/11/2008	N002	0.028			#	0.00013	
Molybdenum	mg/L	06/11/2008	N001	0.0011			#	0.001	
Molybdenum	mg/L	06/11/2008	N002	0.0012			#	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	136			#		
pH	s.u.	06/11/2008	N001	8.96			#		
Specific Conductance	umhos/cm	06/11/2008	N001	1117			#		
Sulfate	mg/L	06/11/2008	N001	240			#	5	
Sulfate	mg/L	06/11/2008	N002	250			#	5	
Temperature	C	06/11/2008	N001	15.38			#		
Turbidity	NTU	06/11/2008	N001	1.23			#		
Uranium	mg/L	06/11/2008	N001	0.0049			#	0.0001	
Uranium	mg/L	06/11/2008	N002	0.0049			#	0.0001	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0811 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID		Lab	Data QA		
Alkalinity, Total (As CaCO3)	mg/L	06/12/2008	0001	94		#		
Manganese	mg/L	06/12/2008	0001	0.2		#	0.00013	
Molybdenum	mg/L	06/12/2008	0001	0.0011		#	0.001	
Oxidation Reduction Potential	mV	06/12/2008	N001	23		#		
pH	s.u.	06/12/2008	N001	7.86		#		
Specific Conductance	umhos/cm	06/12/2008	N001	334		#		
Sulfate	mg/L	06/12/2008	0001	71		#	0.5	
Temperature	C	06/12/2008	N001	14.76		#		
Turbidity	NTU	06/12/2008	N001	111		#		
Uranium	mg/L	06/12/2008	0001	0.002		#	0.0001	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0812 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers			Detection Limit	Uncertainty
					Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	0001	82			#		
Manganese	mg/L	06/11/2008	0001	0.0097			#	0.00013	
Molybdenum	mg/L	06/11/2008	0001	0.00067	B		#	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	78			#		
pH	s.u.	06/11/2008	N001	8.16			#		
Specific Conductance	umhos/cm	06/11/2008	N001	298			#		
Sulfate	mg/L	06/11/2008	0001	69			#	0.5	
Temperature	C	06/11/2008	N001	13.28			#		
Turbidity	NTU	06/11/2008	N001	60.7			#		
Uranium	mg/L	06/11/2008	0001	0.0017			#	0.0001	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0822 SURFACE LOCATION west-side irrigation ditch

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	218			#		
Manganese	mg/L	06/11/2008	N001	0.014			#	0.00013	
Molybdenum	mg/L	06/11/2008	N001	0.0037			#	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	57			#		
pH	s.u.	06/11/2008	N001	8.47			#		
Radium-226	pCi/L	06/11/2008	N001	0.19	U		#	0.19	-0.116
Radium-228	pCi/L	06/11/2008	N001	0.77	U		#	0.77	0.413
Specific Conductance	umhos/cm	06/11/2008	N001	2131			#		
Sulfate	mg/L	06/11/2008	N001	960			#	10	
Temperature	C	06/11/2008	N001	13.42			#		
Turbidity	NTU	06/11/2008	N001	2			#		
Uranium	mg/L	06/11/2008	N001	0.0074			#	0.0001	

Surface Water Quality Data by Location (USEE102) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/3/2008

Location: 0823 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Alkalinity, Total (As CaCO3)	mg/L	06/11/2008	N001	134			#		
Manganese	mg/L	06/11/2008	N001	0.063			#	0.00013	
Molybdenum	mg/L	06/11/2008	N001	0.0026			#	0.001	
Oxidation Reduction Potential	mV	06/11/2008	N001	77			#		
pH	s.u.	06/11/2008	N001	9.1			#		
Specific Conductance	umhos/cm	06/11/2008	N001	1139			#		
Sulfate	mg/L	06/11/2008	N001	370			#	5	
Temperature	C	06/11/2008	N001	15.95			#		
Turbidity	NTU	06/11/2008	N001	4.47			#		
Uranium	mg/L	06/11/2008	N001	0.0043			#	0.0001	

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 (Fort Collins, CO)

RIN: 08061652

Report Date: 10/3/2008

Parameter	Site Code	Location ID	Sample Date	ID	Units	Result	Qualifiers Lab	Data	Detection Limit	Uncertainty	Sample Type
Manganese	RVT01	0999	06/12/2008	N001	mg/L	0.0011	B	U	0.00013		E
Molybdenum	RVT01	0999	06/12/2008	N001	mg/L	0.001	U		0.001		E
Sulfate	RVT01	0999	06/12/2008	N001	mg/L	0.5	U		0.5		E
Uranium	RVT01	0999	06/12/2008	N001	mg/L	0.000015	B	U	0.0001		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.

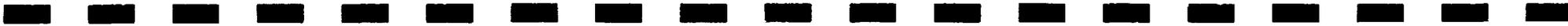
DATA QUALIFIERS:

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

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: 10/3/2008

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	06/12/2008	10:01:00	10.52	4936.06	
0110	O	4946.44	06/13/2008	09:33:00	9.07	4937.37	
0111	O	4946.87	06/12/2008	10:00:00	9.45	4937.42	
0700	U	4951.38	06/11/2008	14:52:00	5.33	4946.05	
0705	D	4930.8	06/12/2008		5.38	4925.42	
0707	D	4931	06/12/2008		4.58	4926.42	
0710	U	4947.9	06/11/2008		5.32	4942.58	
0716	O	4939.12	06/12/2008		8.93	4930.19	
0717	O	4938.8	06/12/2008		8.69	4930.11	
0718	D	4937.6	06/12/2008		7.42	4930.18	
0719	D	4937.55	06/12/2008		7.2	4930.35	
0720	C	4940.46	06/11/2008		4.98	4935.48	
0721	C	4940.47	06/11/2008		7.1	4933.37	
0722R		4937.06	06/12/2008		9.04	4928.02	
0723	D	4936.01	06/12/2008		7.9	4928.11	
0724	U	4941.36	06/11/2008	17:17:00	7.32	4934.04	
0725	U	4941.66	06/11/2008	17:18:00	7.56	4934.1	
0726	U	4942	06/11/2008	17:19:00	5.96	4936.04	
0727	U	4951.69	06/11/2008	15:55:00	8.69	4943	
0728	U	4946.01	06/12/2008	08:29:00	6.7	4939.31	
0729	D	4932.75	06/11/2008		6.95	4925.8	
0730	D	4933.08	06/11/2008		7.65	4925.43	
0732	U	4945.07	06/12/2008	09:52:00	8.08	4936.99	
0733	U	4946.76	06/11/2008	10:36:00	6.22	4940.54	
0734	U	4946.08	06/11/2008	10:38:00	7.24	4938.84	
0735	D	4934.16	06/11/2008		8.3	4925.86	
0736	U	4946	06/11/2008	16:38:00	7.16	4938.84	
0784	U	4945.45	06/12/2008		6.75	4938.7	

STATIC WATER LEVELS (USEE700) FOR SITE RVT01, Riverton Processing Site
REPORT DATE: 10/3/2008

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0788	C	4935.09	06/12/2008		7.5	4927.59	
0789	D	4933.66	06/12/2008		7.7	4925.96	
0809		4932.09	06/11/2008		6.1	4925.99	
0824		4928.27	06/11/2008		5.46	4922.81	
0826		4936.98	06/12/2008		6.61	4930.37	

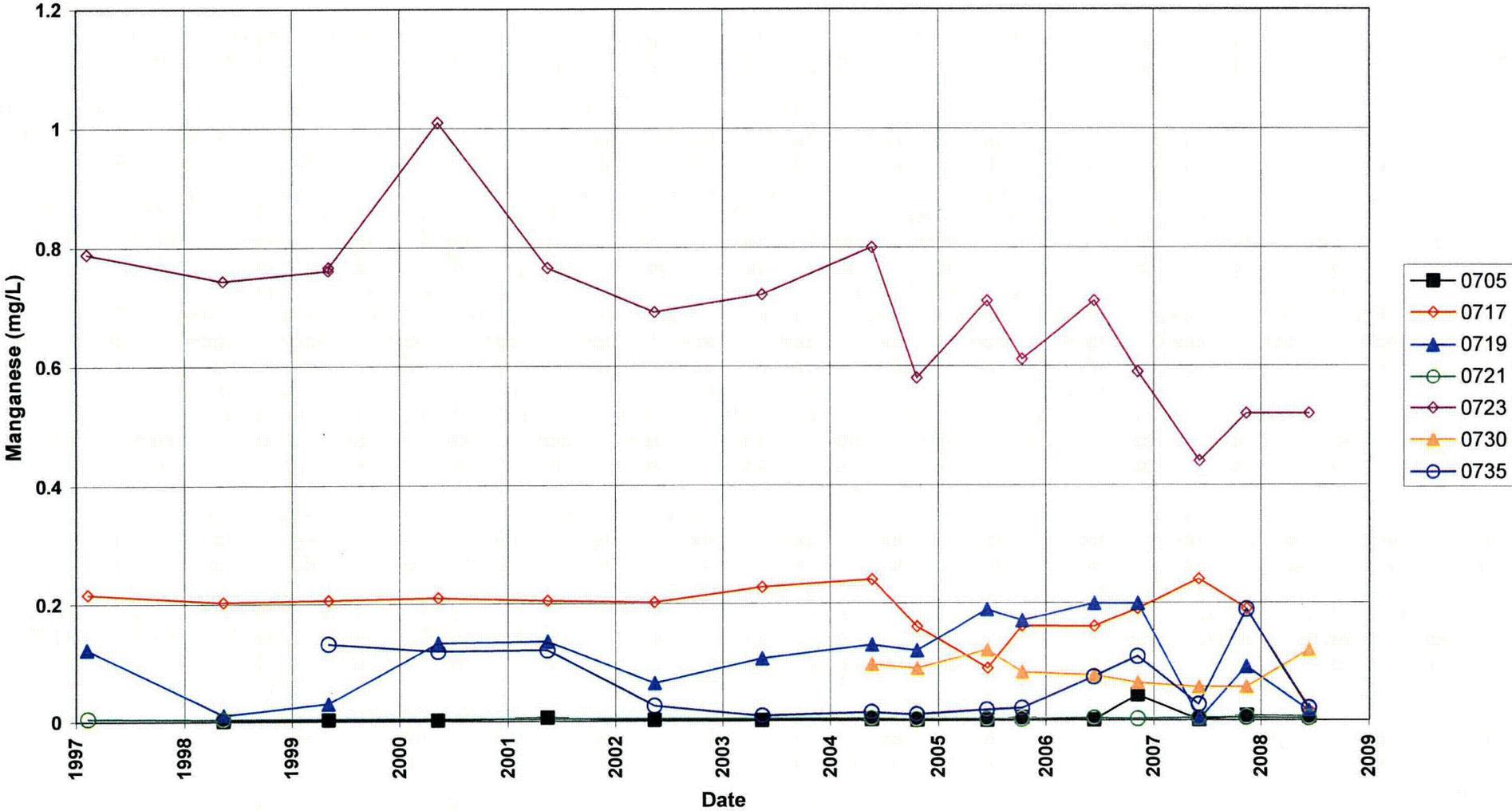
FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWN GRADIENT F OFF SITE
 N UNKNOWN O ON SITE U UPGRADIENT

WATER LEVEL FLAGS: D Dry F FLOWING

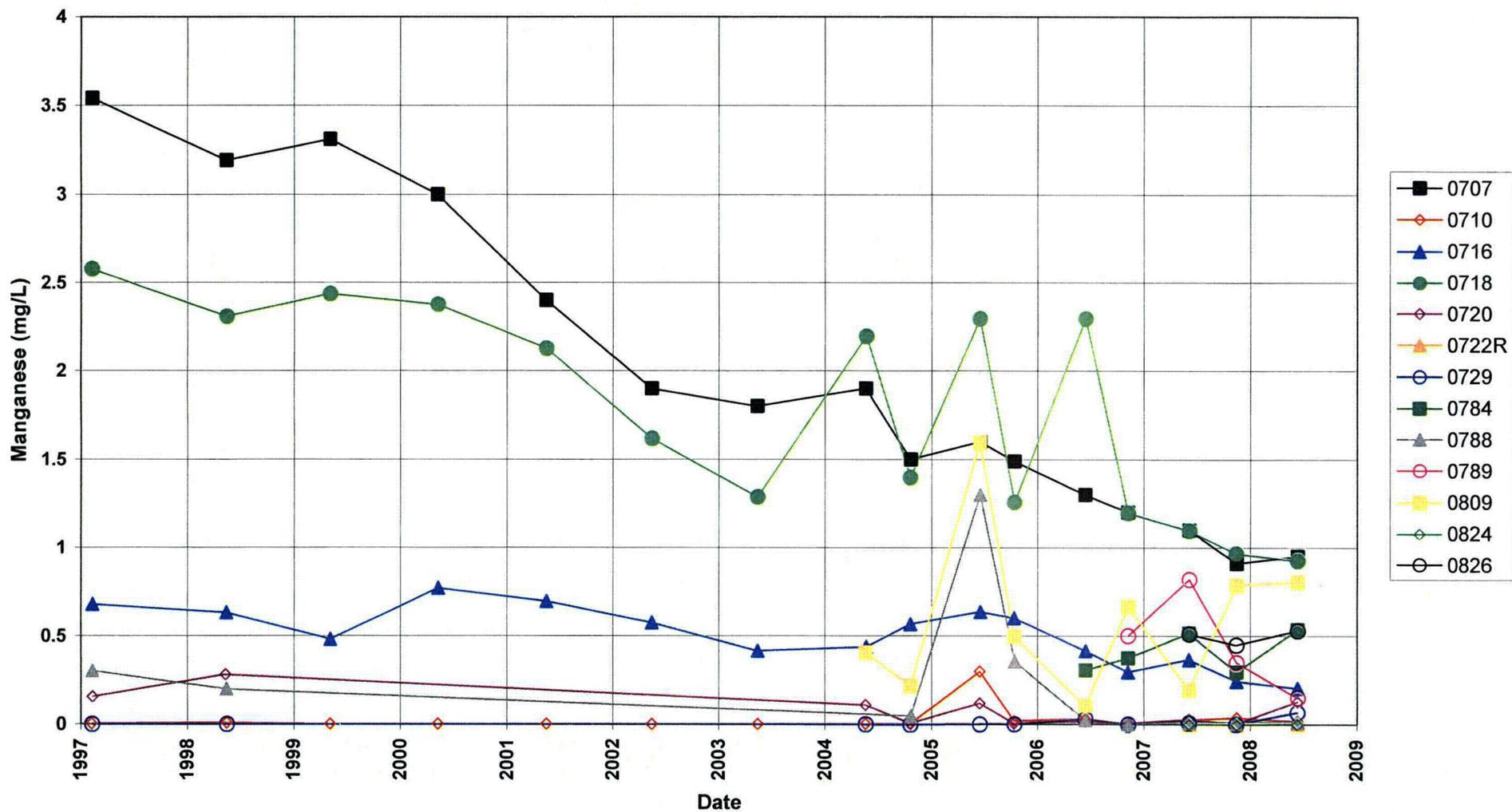
Time-Concentration Graphs

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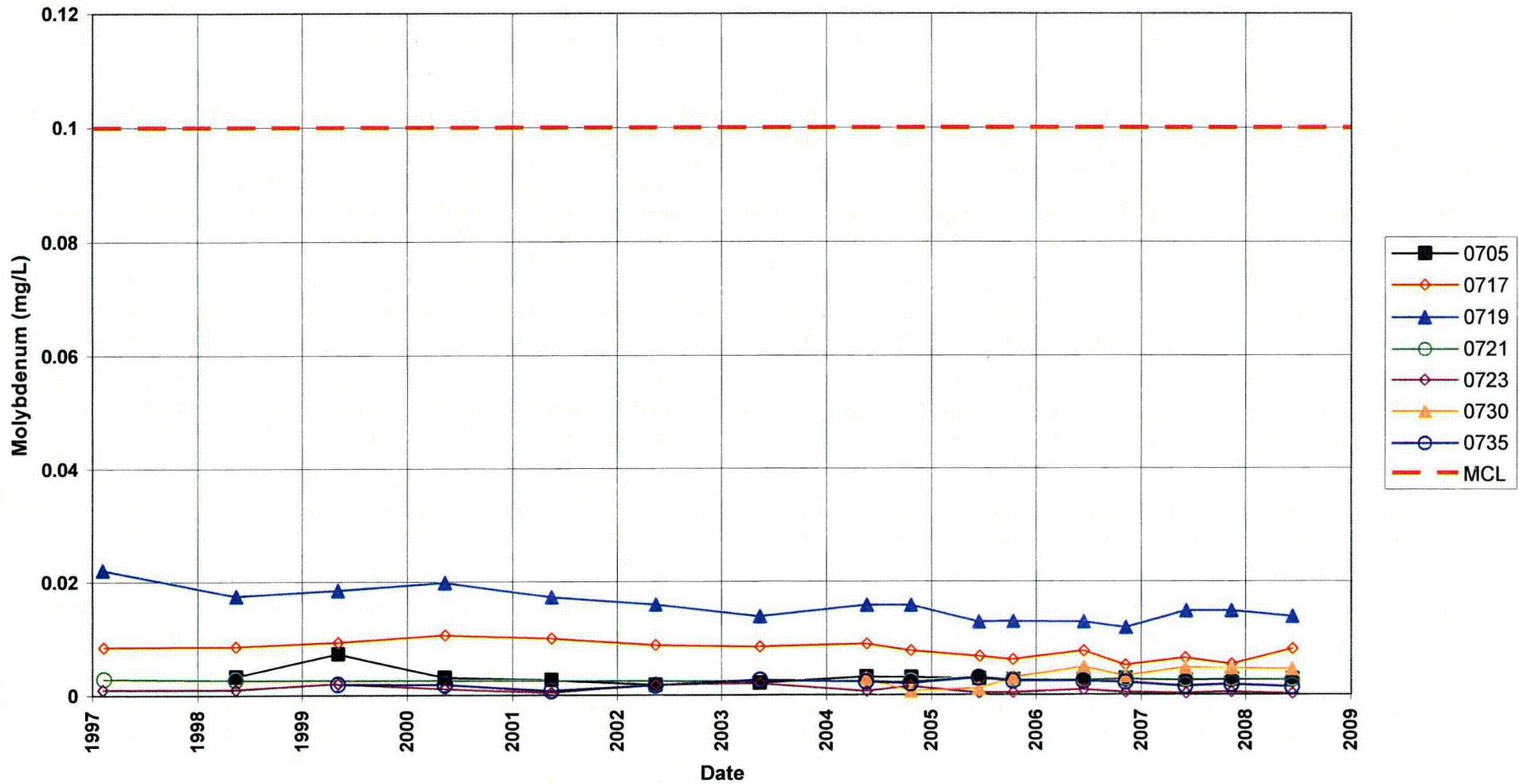
Riverton Processing Site
Semi-Confined Aquifer Locations
Manganese Concentration



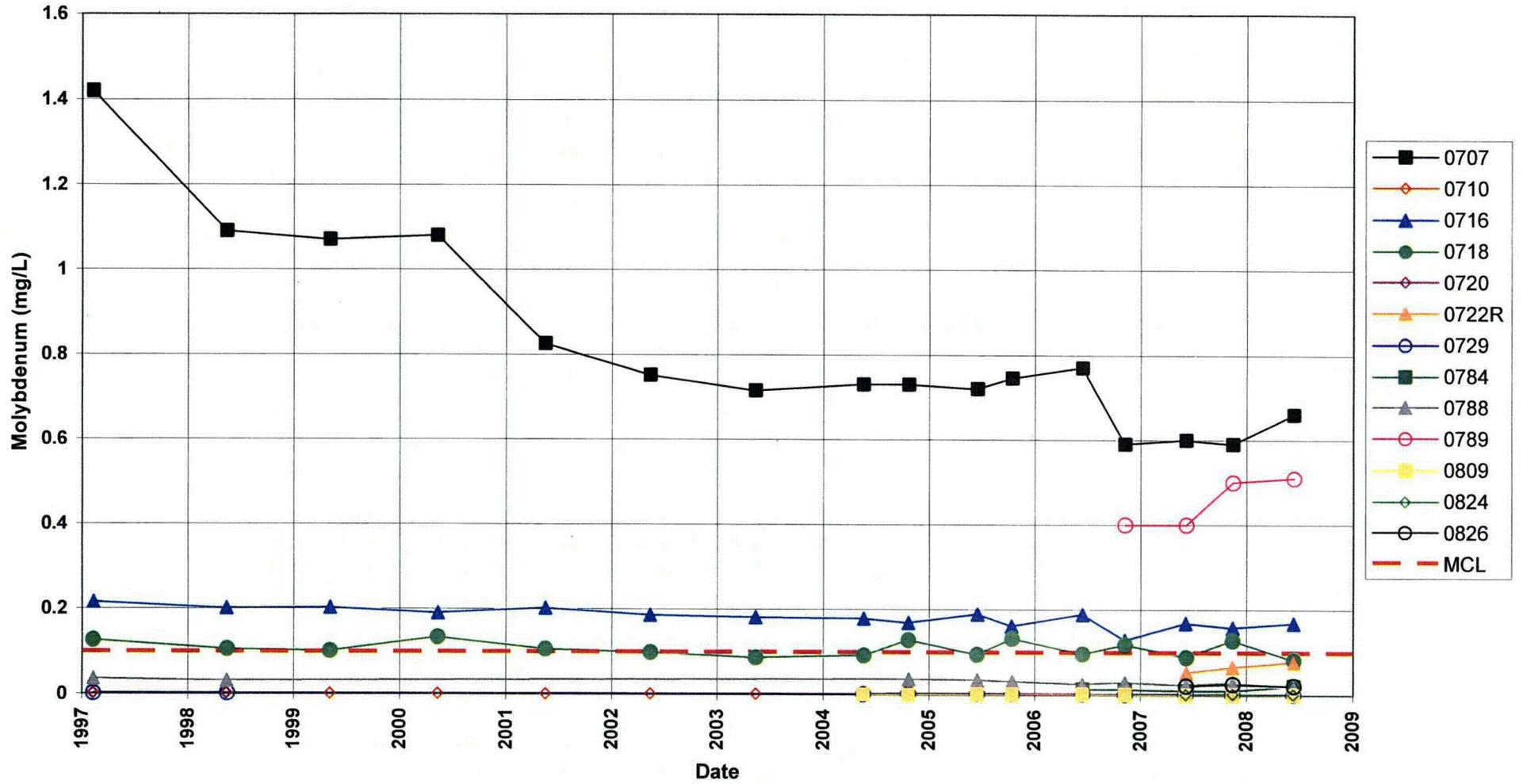
**Riverton Processing Site
Surficial Aquifer Locations
Manganese Concentration**



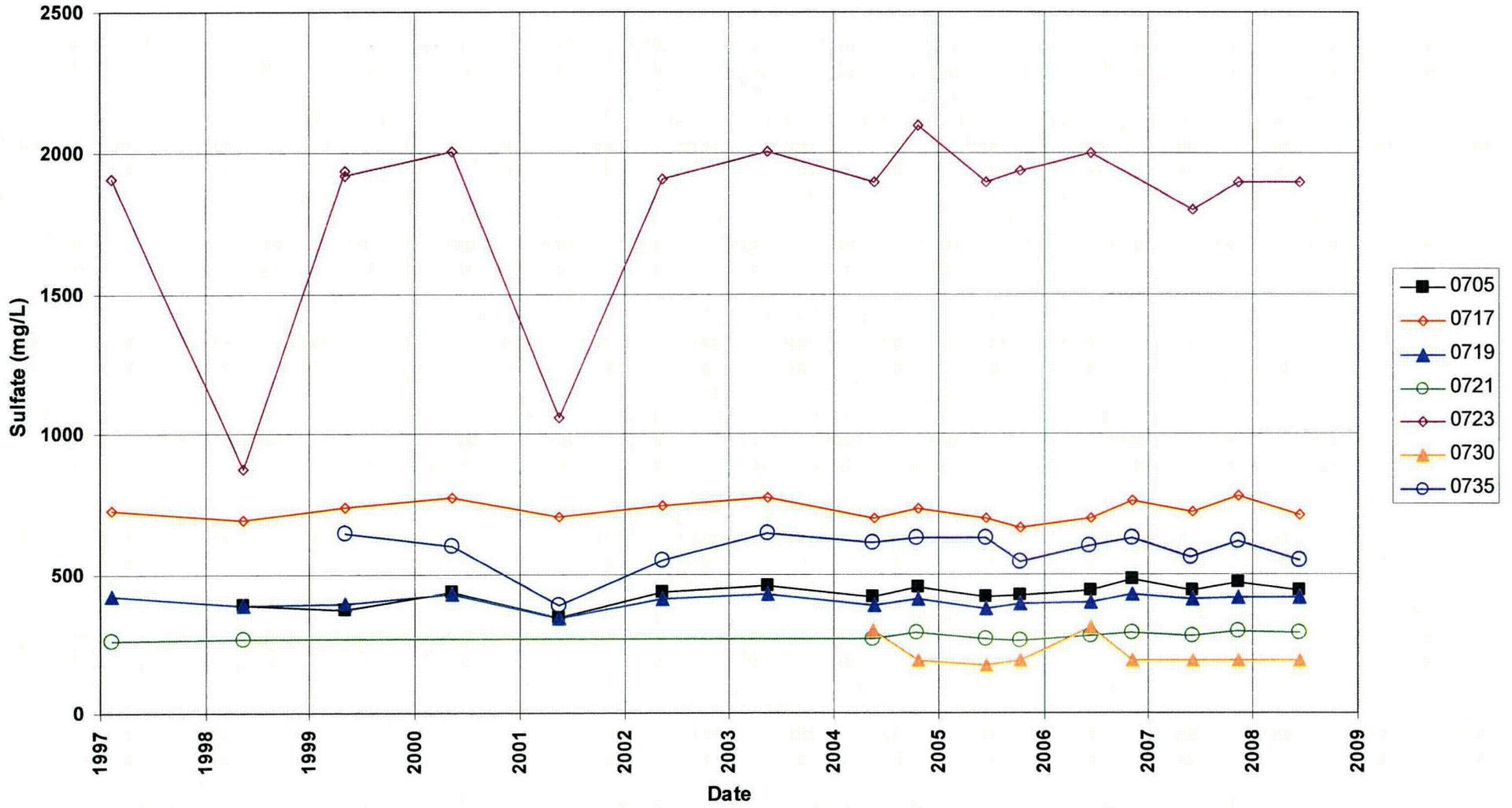
Riverton Processing Site
Semi-Confined Aquifer Locations
Molybdenum Concentration
Maximum Contaminant Level = 0.1 mg/L



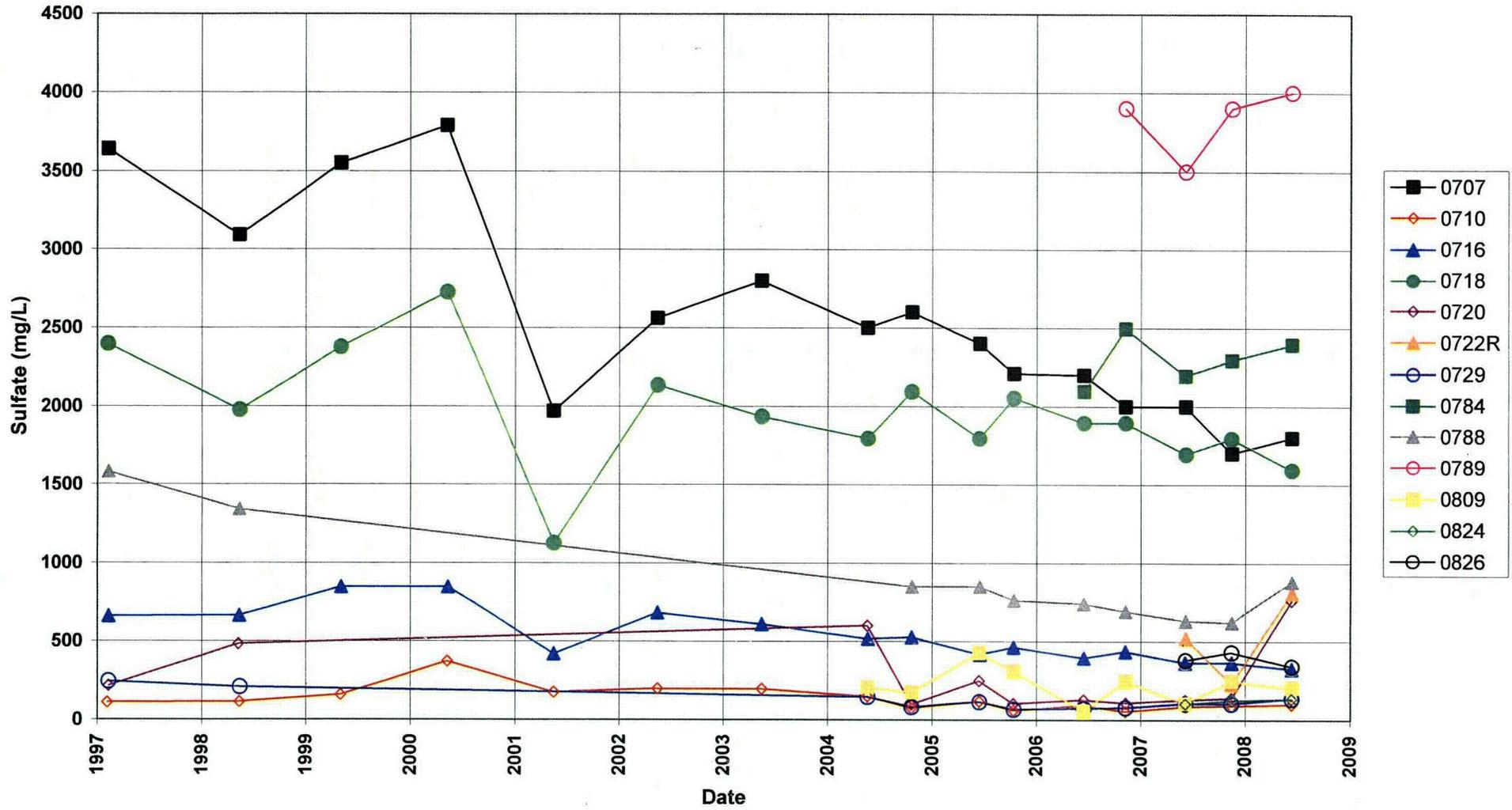
**Riverton Processing Site
Surficial Aquifer Locations
Molybdenum Concentration**
Maximum Contaminant Level = 0.1 mg/L



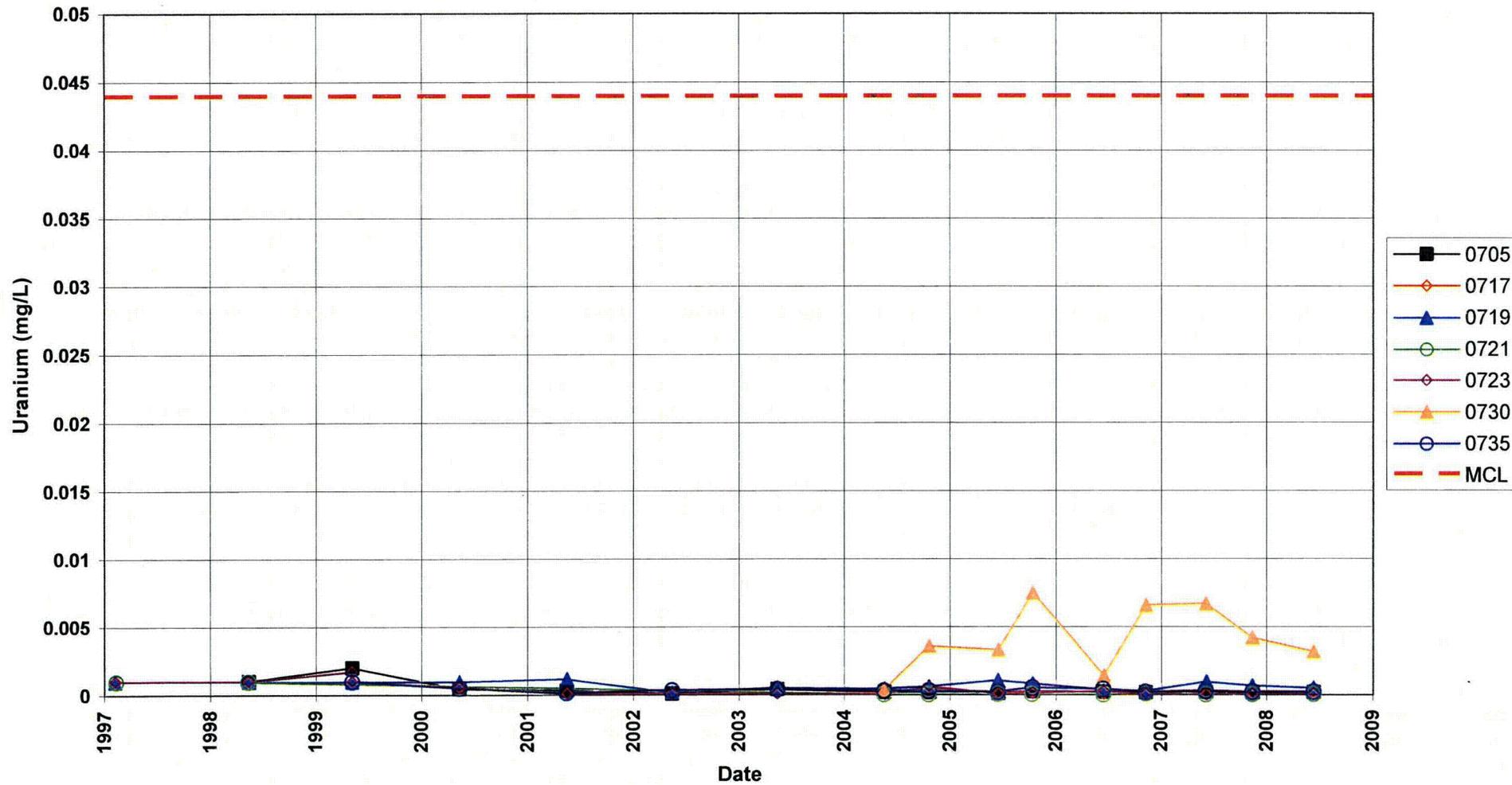
**Riverton Processing Site
Semi-Confined Aquifer Locations
Sulfate Concentration**



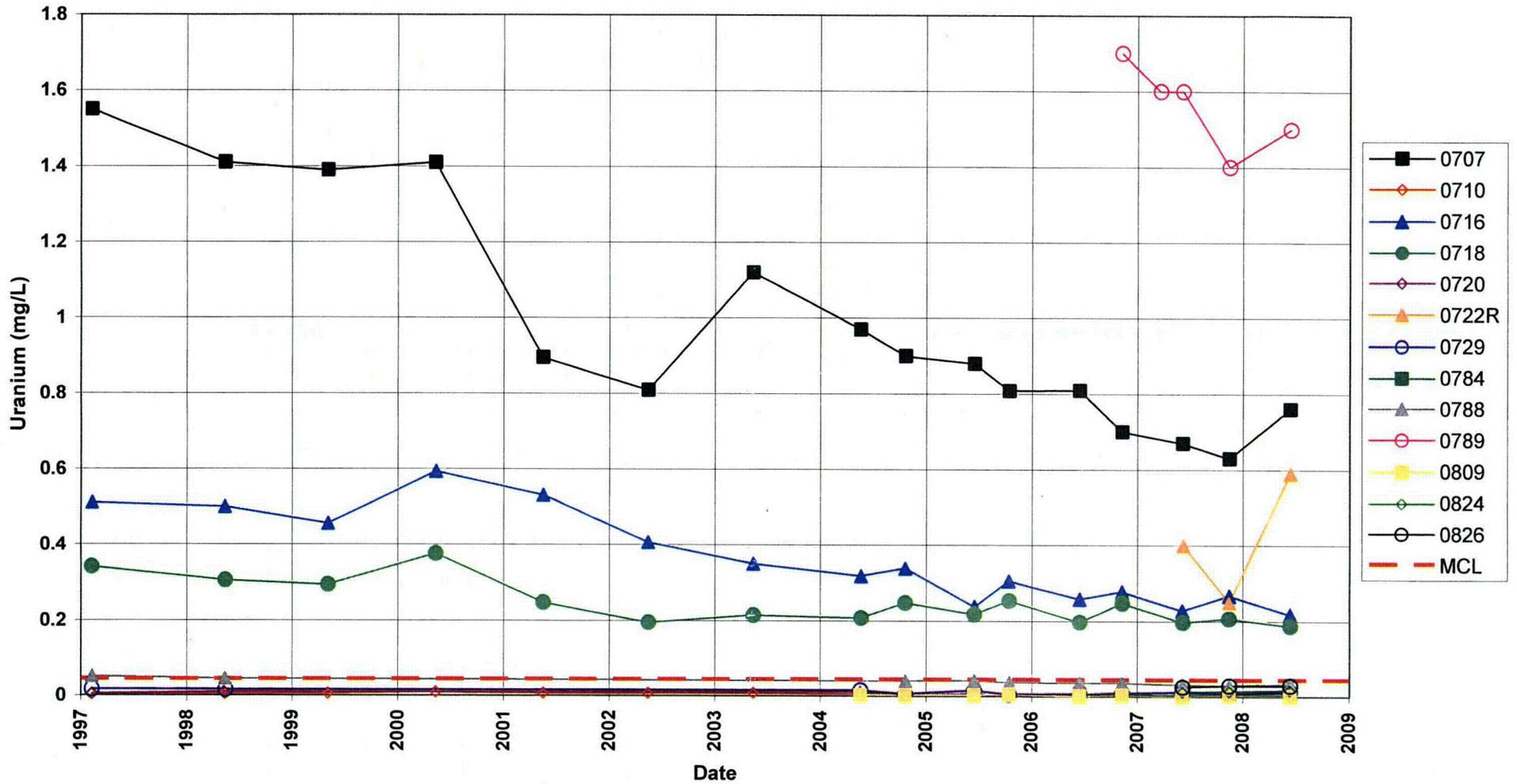
**Riverton Processing Site
Surficial Aquifer Locations
Sulfate Concentration**



Riverton Processing Site
Semi-Confined Aquifer Locations
Uranium Concentration
Maximum Contaminant Level = 0.044 mg/L



**Riverton Processing Site
Surficial Aquifer Locations
Uranium Concentration**
Maximum Contaminant Level = 0.044 mg/L



Attachment 3
Sampling and Analysis Work Order

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May 9, 2008

U.S. Department of Energy
Office of Legacy Management
ATTN: Jalena Maestas
Site Manager
2597 B ¼ Road
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AM01-07LM00060, Stoller
June 2008 Environmental Sampling at Riverton, Wyoming

Reference: LM00-501-02-117-402, Riverton, WY, Processing Site

Dear Ms. Maestas:

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 monitor wells, domestic wells, and surface locations at this site as part of the routine environmental sampling currently scheduled to begin the week of June 9, 2008.

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

Monitor Wells*

705 Se	716 Sf	719 Se	722R Sf	730 Se	788 Sf	824
707 Sf	717 Se	720 Sf	723 Se	735 Se	789 Sf	826
710 Sf	718 Sf	721 Se	729 Sf	784 Sf	809 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		
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Jalena Maestas
Control Number 08-0269
Page 2

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.

If you have any questions, please call me at extension 6654.

Sincerely,



Sam Campbell
Site Lead

SC/lcg/hc

Enclosures (3)

cc: Cheri Bahrke, Stoller
Sam Campbell, Stoller (e)
Steve Donovan, Stoller (e)
Bev Gallagher, Stoller (e)
Lauren Goodknight, Stoller (e)
EDD Delivery (e)

cc w/o enclosures:

Correspondence Control File (Thru Dee Dee Crawford/Christi Weston)
File RVT 410.02 (rc-grand.junction)

\\Condor\home\L40048\My Documents\Ground Water\RVT\0806rvt-ltr.doc

Constituent Sampling Breakdown

Site Analyte	Riverton					
	Groundwater	Surface Water	Water System	Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Approx. No. Samples/yr	52	18	11			
<i>Field Measurements</i>						
Alkalinity	X	X	X			
Dissolved Oxygen			X			
Redox Potential	X	X	X			
Residual Chlorine			X			
pH	X	X	X			
Specific Conductance	X	X	X			
Turbidity	X	X	X			
Temperature	X	X	X			
<i>Laboratory Measurements</i>						
Aluminum						
Ammonia as N (NH3-N)						
Antimony						
Arsenic						
Cadmium						
Calcium						
Chloride						
Gamma Spec						
Gross Alpha			X	2 pCi/L	EPA 900.0	GPC-A-001
Gross Beta			X	4 pCi/L	EPA 900.0	GPC-A-001
Iron						
Lead						
Magnesium						
Manganese	X	X		0.005	SW-846 6010	LMM-01
Molybdenum	X	X		0.003	SW-846 6020	LMM-02
Nitrate + Nitrite as N						
PCBs						
Potassium						
Radium-226		0822 only	X	1 pCi/L	Gas Proportional Counter	GPC-A-018
Radium-228		0822 only	X	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						
Tin						
Total Dissolved Solids						
Uranium	X	X	X	0.0001	SW-846 6020	LMM-02
Vanadium						
Zinc						
Total No. of Analytes	4	6	5			

Note: All analyte samples are considered unfiltered unless stated otherwise. All private well samples are to be unfiltered. The total number of analytes does not include field parameters.

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Attachment 4
Trip Report

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Memorandum

Control Number N/A

DATE: June 19, 2008
TO: Distribution
FROM: Sam E. Campbell
SUBJECT: Trip Report

Site: Riverton, Wyoming, Processing Site.

Dates of Sampling Event: June 10 to June 13, 2008.

Team Members: Sam Campbell and Dan Sellers.

Number of Locations Sampled: 20 monitor wells, 9 surface water locations, and 5 domestic wells.

Locations Not Sampled/Reason: None.

Location Specific Information: Monitor wells 0705 and 0719 were purged and sampled using Category II criteria; all other monitor wells were purged and sampled using Category I criteria.

Samples collected from surface water locations 0747, 0749, 0794, 0796, 0811, 0812 were filtered because the measured turbidity was greater than 10 NTUs; samples from all other locations were collected without filtering.

At the time of sampling, water was flowing from the Oxbow Lake to the Little Wind River in response to recent high flows in the Little Wind River

Monitor well 0110 was repaired. The surface casing had been hit and broke at a weld, which snapped the inner PVC casing. The new elevation is 2.09 feet lower than the former elevation.

A snapshot of the Little Wind River elevation was measured. The elevation of the river was 10.84 feet below the casing elevation at monitor well 0809.

The data logger from the stilling well (0827) was removed because it was no longer functioning.

The Little Wind River continues to erode the bank toward monitor well 0735; the bank is now 8 feet from the well.

Field Variance: None.

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	0810	Duplicate	NFD-396
2645	0716	Duplicate	NFD-440
2646	Equipment Blank	Equipment Blank	NFK-976

Requisition Numbers Assigned: All samples were assigned to report identification number (RIN) 08061652 and were shipped to Paragon Analytics on June 16, 2008.

Water Level Measurements: Water levels were measured at all sampled monitor wells and 13 additional monitor wells.

Well Inspection Summary: Concrete pads at monitor wells 0725 and 0726 have deteriorated; all other wells were in good shape.

Equipment: All equipment functioned properly.

Regulatory: The Wind River Environmental Quality Commission (WREQC) split samples at monitor wells 0707 and 0718. David Ferris of WREQC liked the updated base map that we had in the field and requested a copy. Steve Babits of WREQC delivered a copy of the Tribal Ordinance restricting well installations within the IC boundary.

Institutional Controls

Fences, Gates, Locks: No issues identified.

Signs: Warning signs installed around the Oxbow Lake were intact.

Trespassing/Site Disturbances: None.

Site Issues: None.

Disposal Cell/Drainage Structure Integrity: Not applicable.

Vegetation/Noxious Weed Concerns: Not applicable.

Maintenance Requirements: None.

Access Issues: None.

Corrective Action Required/Taken: The database needs to be updated with a new elevation for monitor well 0110. New concrete pads are needed around monitor wells 0725 and 0726. Obtain permission and send the Riverton base map to WREQC.

(SEC/lcg)

cc: Jalena Maestas, DOE (e)
Cheri Bahrke, Stoller (e)
Steve Donovan, Stoller (e)
EDD Delivery (e)

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