Data Validation Package

November 2009 Groundwater and Surface Water Sampling at the Rifle (Old), Colorado, Processing Site

January 2010

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Rifle, Colorado, Processing Site (Old)

Sampling Period: November 23–24, 2009

This event includes sampling groundwater and surface water at the Old Rifle, Colorado, Processing Site. Sampling and analysis was conducted as specified in the *Sampling and Analysis Plan for the U.S. Department of Energy Office of Legacy Management Sites* (LMS/PLN/S05341, continually updated). Duplicate samples were collected from location 0656.

Samples were collected at the Old Rifle site from eight monitor wells and four surface locations as specified in the 2001 *Ground Water Compliance Action Plan for the Old Rifle, Colorado, UMTRA Project Site*. Water levels were measured at each sampled well. Wells with sample concentrations that exceeded U.S. Environmental Protection Agency groundwater standards are listed in Table 1.

Table 1. Old Rifle Locations that Exceed Standards

Analyte	Standard[a]	ACL[b]	Location	Concentration
Selenium	0.01	0.05	0305	0.026
			0655	0.027
Uranium	0.044	NA	0304	0.052
			0305	0.088
			0310	0.200
			0655	0.110
			0656	0.140
Vanadium	NA	1.0	NA	NA

[a] Standards are listed in 40 CFR 192.02 Table 1 to Subpart A; units are in milligrams per liter (mg/L).
[b] Alternate Concentration Limit proposed in *Ground Water Compliance Action Plan for the Old Rifle, Colorado, UMTRA Project Site*; units are in mg/L.

Time-concentration graphs from the wells sampled are included with the analytical data. Data analysis indicates that the concentrations of the contaminants of concern are generally stable with fluctuations that may be partially attributable to a seasonal effect, particularly for wells at the low end of the concentration range. There is no indication of unexpected plume movement from this sampling event.

Analytical results for surface locations 0396 and 0741 that are adjacent to and downgradient of the site along the Colorado River are below the alternate concentration limits at generally stable concentrations.

Richard Dayvault

Richard Dayvault

3/15/10

Date

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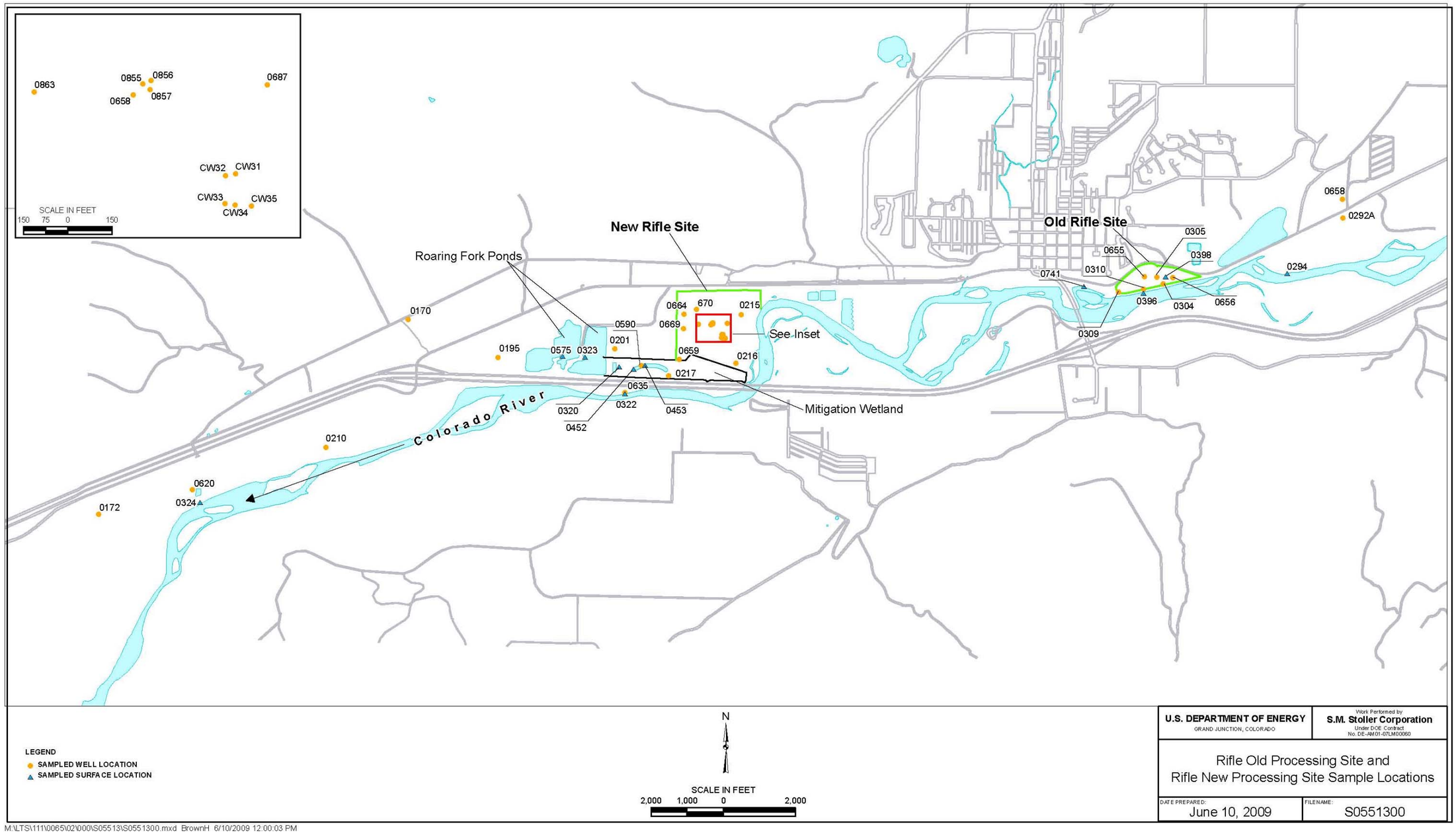

Old and New Rifle, Colorado, Processing Sites Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Rifle, Colorado	**Date(s) of Water Sampling**	November 23−24, 2009
Date(s) of Verification	January 6, 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 13, 2009.
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 October 23, 2009.
4. Was an operational check of the field equipment conducted daily?	Yes	Operation checks were performed on November 23−24, 2009.
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:	NA	All wells were Category I.
Was the flow rate less than 500 mL/min?		
Was one pump/tubing volume removed prior to sampling?		
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	A duplicate sample was collected from location 0656.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	NA	An equipment blank was not required.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number?	Yes	
Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report?		Location ID 2833 was used for the duplicate sample.
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?	NA	Sample cooling was not required.
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN):	09112697
Sample Event:	November 23−24, 2009
Site(s):	Rifle, Old, Processing Site
Laboratory:	ALS Laboratory Group, Fort Collins, Colorado
Work Order No.:	0911256
Analysis:	Metals
Validator:	Steve Donivan
Review Date:	January 6, 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. See attached Data Validation Worksheets for supporting documentation on the data review and validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 2.

Table 2. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Selenium, Uranium , Vanadium	LMM-02	SW-846 3005A	SW-846 6020

Data Qualifier Summary

Analytical results were qualified as listed in Table 3. Refer to the sections below for an explanation of the data qualifiers applied.

Table 3. Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
0911256-5	0309	Selenium	U	Less than 5 times the method blank

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 13 water samples on November 25, 2009, accompanied by a Chain of Custody (COC) form. The receiving documentation included copies of the shipping labels listing the air waybill numbers. The COC form was checked to confirm that all of the samples were listed on the form with sample collection dates and times, and that signature and dates were present indicating sample relinquishment and receipt. The COC form was complete with no errors or omissions.

Preservation and Holding Times

The sample shipments were received cool and intact at ambient temperature which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

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 6020
Calibrations for selenium, uranium, and vanadium were performed on December 3, 2009, using eight 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. Calibration and laboratory spike standards were prepared from independent sources. Initial and continuing calibration verification checks were made at the required frequency resulting in five calibration 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. 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 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
All method, initial calibration, and continuing calibration blank results associated with the samples were below the PQLs for all analytes. In cases where a blank concentration exceeds the method detection limit, the associated sample results are qualified with a "U" flag (not detected) when the sample result is greater than the method detection limit but less than 5 times the blank 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 results met the acceptance criteria.

Laboratory Replicate Analysis

Laboratory replicate analyses are used to determine laboratory precision for each sample matrix. The relative percent difference for replicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than the PQL, the range should be no greater than the PQL. The replicate results met these criteria demonstrating acceptable laboratory precision.

Laboratory Control Sample

Laboratory control samples (LCS) were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. The LCS results were acceptable for all analytes.

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. All evaluated serial dilution data were acceptable.

Detection Limits/Dilutions

Samples were diluted in a consistent and acceptable manner when required. The required detection limits were met for all analytes.

Completeness

Results were reported in the correct units for all analytes requested using contract-required laboratory qualifiers.

Electronic Data Deliverable (EDD) File

The EDD file arrived on December 12, 2009. The Sample Management System EDD validation module was used to verify that the EDD file was complete and in compliance with requirements. The module compares the contents of the file to the requested analyses to ensure all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package.

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 09112697 **Lab Code:** PAR **Validator:** Steve Donivan **Validation Date:** 1/6/2010

Project: Rifle Disposal/Processing Site (old/new) **Analysis Type:** ☑ Metals ☐ General Chem ☐ Rad ☐ Organics

# of Samples: 13 **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 was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 09112697 **Lab Code:** PAR **Date Due:** 12/23/2009

Matrix: Water **Site Code:** RFL **Date Completed:** 12/14/2009

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								
SELENIUM	12/03/2009	0.0000	1.0000	OK	OK	OK	OK	OK	99.0	82.0	82.0	0.0	97.0		70.0
SELENIUM	12/03/2009											4.0			
URANIUM	12/03/2009	0.0000	1.0000	OK	OK	OK	OK	OK	100.0	105.0	109.0	3.0	105.0	10.0	123.0
URANIUM	12/03/2009											2.0			
VANADIUM	12/03/2009	0.0000	1.0000	OK	OK	OK	OK	OK	98.0	104.0	103.0	1.0	101.0		98.0

Sampling Quality Control Assessment

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

Sampling Protocol

Surface water samples were collected by container immersion. All wells met the Category I criteria and were sampled with dedicated tubing using the low-flow purge procedure. Sample results were qualified with an "F" flag in the database, indicating the wells were purged and sampled using the low-flow sampling method.

Equipment Blank Assessment

An equipment blank was not required because dedicated tubing and containers were used.

Field Duplicate Assessment

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates, which measure only laboratory performance. The relative percent difference for duplicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than the PQL, the range should be no greater than the PQL. A duplicate sample was collected from location 0656 (field duplicate ID 2833). The duplicate results met these criteria demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 09112697 **Lab Code:** PAR **Project:** Rifle Disposal/Processing Site (old/new) **Validation Date:** 1/6/2010

Duplicate: 2833 **Sample:** 0656

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
SELENIUM	1.4			1	1.4			1	0		UG/L
URANIUM	140			50	140			50	0		UG/L
VANADIUM	31			10	31			10	0		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: 1-15-2010

Data Validation Lead: Steve Donivan — Date: 1-15-2010

Attachment 1
Assessment of Anomalous Data

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Potential Outliers Report

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Potential Outliers Report

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

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

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

1. Identify extreme values that may be potential outliers by generating the Outliers Report using the Sample Management System from data in the SEEPro database. The application compares the new data set with historical data and lists the new data that fall outside the historical data range. A determination is also made if the data are normally distributed using the Shapiro-Wilk Test.
2. Apply the appropriate statistical test. Dixon's Extreme Value test is used to test for statistical outliers when the sample size is less than or equal to 25. This test considers both extreme values that are much smaller than the rest of the data (case 1) and extreme values that are much larger than the rest of the data (case 2). This test is valid only if the data without the suspected outlier are normally distributed. Rosner's Test is a parametric test that is used to detect outliers for sample sizes of 25 or more. This test also assumes that the data without the suspected outliers are normally distributed.
3. Scientifically review statistical outliers and decide on their disposition.

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

Data Validation Outliers Report - No Field Parameters
Laboratory: ALS Laboratory Group
RIN: 09112697
Comparison: All Historical Data
Report Date: 1/6/2010

				Current			Historical Maximum			Historical Minimum			Number of Data Points		Normally Distributed	Statistical Outlier
					Qualifiers			Qualifiers			Qualifiers					
Site Code	Location Code	Sample Date	Analyte (filtered)	Result	*Lab*	*Data*	Result	*Lab*	*Data*	Result	*Lab*	*Data*	N	N Below Detect		
RFO01	0658	11/23/2009	Uranium (n)	0.018		F	0.067		FJ	0.022		F	14	0	Yes	No

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

Attachment 2
Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 1/6/2010
Location: 0292A WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	11/23/2009	N001	10.5	-	20.5	59.7		F	#		
pH	s.u.	11/23/2009	N001	10.5	-	20.5	7.07		F	#		
Selenium	mg/L	11/23/2009	N001	10.5	-	20.5	0.00024		F	#	0.000027	
Specific Conductance	umhos /cm	11/23/2009	N001	10.5	-	20.5	2356		F	#		
Temperature	C	11/23/2009	N001	10.5	-	20.5	13.27		F	#		
Turbidity	NTU	11/23/2009	N001	10.5	-	20.5	8.81		F	#		
Uranium	mg/L	11/23/2009	N001	10.5	-	20.5	0.03		F	#	0.0000024	
Vanadium	mg/L	11/23/2009	N001	10.5	-	20.5	0.00054		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 1/6/2010
Location: 0304 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	11/23/2009	N001	13.2	-	18.2	10.2		F	#		
pH	s.u.	11/23/2009	N001	13.2	-	18.2	7.28		F	#		
Selenium	mg/L	11/23/2009	N001	13.2	-	18.2	0.0025		F	#	0.000027	
Specific Conductance	umhos /cm	11/23/2009	N001	13.2	-	18.2	1877		F	#		
Temperature	C	11/23/2009	N001	13.2	-	18.2	12.98		F	#		
Turbidity	NTU	11/23/2009	N001	13.2	-	18.2	9.72		F	#		
Uranium	mg/L	11/23/2009	N001	13.2	-	18.2	0.052		F	#	0.0000024	
Vanadium	mg/L	11/23/2009	N001	13.2	-	18.2	0.037		F	#	0.00025	

Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 1/6/2010
Location: 0305 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	11/24/2009	N001	13.76	-	18.76	213.3		F	#		
pH	s.u.	11/24/2009	N001	13.76	-	18.76	7.29		F	#		
Selenium	mg/L	11/24/2009	N001	13.76	-	18.76	0.026		F	#	0.00013	
Specific Conductance	umhos /cm	11/24/2009	N001	13.76	-	18.76	1902		F	#		
Temperature	C	11/24/2009	N001	13.76	-	18.76	13.23		F	#		
Turbidity	NTU	11/24/2009	N001	13.76	-	18.76	7.24		F	#		
Uranium	mg/L	11/24/2009	N001	13.76	-	18.76	0.088		F	#	0.000012	
Vanadium	mg/L	11/24/2009	N001	13.76	-	18.76	0.58		F	#	0.0025	

Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 1/6/2010
Location: 0309 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	11/24/2009	N001	16.93	-	21.93	-17.4		F	#		
pH	s.u.	11/24/2009	N001	16.93	-	21.93	7.09		F	#		
Selenium	mg/L	11/24/2009	N001	16.93	-	21.93	0.00011		UF	#	0.000027	
Specific Conductance	umhos /cm	11/24/2009	N001	16.93	-	21.93	2297		F	#		
Temperature	C	11/24/2009	N001	16.93	-	21.93	14.39		F	#		
Turbidity	NTU	11/24/2009	N001	16.93	-	21.93	5.58		F	#		
Uranium	mg/L	11/24/2009	N001	16.93	-	21.93	0.017		F	#	0.0000024	
Vanadium	mg/L	11/24/2009	N001	16.93	-	21.93	0.00019	B	F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 1/6/2010
Location: 0310 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
pH	s.u.	11/24/2009	N001	17.93	-	22.93	7.17		F	#		
Selenium	mg/L	11/24/2009	N001	17.93	-	22.93	0.00037		F	#	0.000027	
Specific Conductance	umhos /cm	11/24/2009	N001	17.93	-	22.93	2895		F	#		
Temperature	C	11/24/2009	N001	17.93	-	22.93	13.67		F	#		
Turbidity	NTU	11/24/2009	N001	17.93	-	22.93	7.35		F	#		
Uranium	mg/L	11/24/2009	N001	17.93	-	22.93	0.2		F	#	0.000012	
Vanadium	mg/L	11/24/2009	N001	17.93	-	22.93	0.012		F	#	0.000075	

Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 1/6/2010
Location: 0655 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	11/24/2009	N001	13.6	-	23.6	61.9		F	#		
pH	s.u.	11/24/2009	N001	13.6	-	23.6	7		F	#		
Selenium	mg/L	11/24/2009	N001	13.6	-	23.6	0.027		F	#	0.00013	
Specific Conductance	umhos /cm	11/24/2009	N001	13.6	-	23.6	2479		F	#		
Temperature	C	11/24/2009	N001	13.6	-	23.6	13.63		F	#		
Turbidity	NTU	11/24/2009	N001	13.6	-	23.6	2.4		F	#		
Uranium	mg/L	11/24/2009	N001	13.6	-	23.6	0.11		F	#	0.000012	
Vanadium	mg/L	11/24/2009	N001	13.6	-	23.6	0.34		F	#	0.0025	

Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 1/6/2010
Location: 0656 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	11/23/2009	N001	6.35	-	21.35	123.8		F	#		
pH	s.u.	11/23/2009	N001	6.35	-	21.35	7.12		F	#		
Selenium	mg/L	11/23/2009	N001	6.35	-	21.35	0.0014		F	#	0.000027	
Selenium	mg/L	11/23/2009	N002	6.35	-	21.35	0.0014		F	#	0.000027	
Specific Conductance	umhos /cm	11/23/2009	N001	6.35	-	21.35	1908		F	#		
Temperature	C	11/23/2009	N001	6.35	-	21.35	15.38		F	#		
Turbidity	NTU	11/23/2009	N001	6.35	-	21.35	2.8		F	#		
Uranium	mg/L	11/23/2009	N001	6.35	-	21.35	0.14		F	#	0.000012	
Uranium	mg/L	11/23/2009	N002	6.35	-	21.35	0.14		F	#	0.000012	
Vanadium	mg/L	11/23/2009	N001	6.35	-	21.35	0.031		F	#	0.00025	
Vanadium	mg/L	11/23/2009	N002	6.35	-	21.35	0.031		F	#	0.00025	

Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 1/6/2010
Location: 0658 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	11/23/2009	N001	2.3	-	17.3	161.9		F	#		
pH	s.u.	11/23/2009	N001	2.3	-	17.3	6.99		F	#		
Selenium	mg/L	11/23/2009	N001	2.3	-	17.3	0.0019		F	#	0.000027	
Specific Conductance	umhos /cm	11/23/2009	N001	2.3	-	17.3	1682		F	#		
Temperature	C	11/23/2009	N001	2.3	-	17.3	9.65		F	#		
Turbidity	NTU	11/23/2009	N001	2.3	-	17.3	4.61		F	#		
Uranium	mg/L	11/23/2009	N001	2.3	-	17.3	0.018		F	#	0.0000024	
Vanadium	mg/L	11/23/2009	N001	2.3	-	17.3	0.00098		F	#	0.000075	

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.

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 RFO01, Rifle Old Processing Site
REPORT DATE: 1/6/2010
Location: 0294 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	11/23/2009	N001	175.3			#		
pH	s.u.	11/23/2009	N001	8.3			#		
Selenium	mg/L	11/23/2009	N001	0.00058			#	0.000027	
Specific Conductance	umhos/cm	11/23/2009	N001	1060			#		
Temperature	C	11/23/2009	N001	3.35			#		
Turbidity	NTU	11/23/2009	N001	3.31			#		
Uranium	mg/L	11/23/2009	N001	0.0027			#	0.0000024	
Vanadium	mg/L	11/23/2009	N001	0.0006			#	0.000075	

Surface Water Quality Data by Location (USEE102) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 1/6/2010
Location: 0396 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	11/23/2009	N001	54.6			#		
pH	s.u.	11/23/2009	N001	8.65			#		
Selenium	mg/L	11/23/2009	N001	0.00059			#	0.000027	
Specific Conductance	umhos/cm	11/23/2009	N001	1083			#		
Temperature	C	11/23/2009	N001	3.42			#		
Turbidity	NTU	11/23/2009	N001	4.81			#		
Uranium	mg/L	11/23/2009	N001	0.0026			#	0.0000024	
Vanadium	mg/L	11/23/2009	N001	0.001			#	0.000075	

Surface Water Quality Data by Location (USEE102) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 1/6/2010
Location: 0398 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	11/23/2009	N001	95.3			#		
pH	s.u.	11/23/2009	N001	8.19			#		
Selenium	mg/L	11/23/2009	N001	0.0045			#	0.000027	
Specific Conductance	umhos/cm	11/23/2009	N001	1688			#		
Temperature	C	11/23/2009	N001	8.23			#		
Turbidity	NTU	11/23/2009	N001	5.21			#		
Uranium	mg/L	11/23/2009	N001	0.023			#	0.0000024	
Vanadium	mg/L	11/23/2009	N001	0.0045			#	0.000075	

Surface Water Quality Data by Location (USEE102) FOR SITE RFO01, Rifle Old Processing Site
REPORT DATE: 1/6/2010
Location: 0741 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	11/23/2009	N001	95.2			#		
pH	s.u.	11/23/2009	N001	8.45			#		
Selenium	mg/L	11/23/2009	N001	0.00059			#	0.000027	
Specific Conductance	umhos/cm	11/23/2009	N001	1053			#		
Temperature	C	11/23/2009	N001	3.12			#		
Turbidity	NTU	11/23/2009	N001	4.25			#		
Uranium	mg/L	11/23/2009	N001	0.0025			#	0.0000024	
Vanadium	mg/L	11/23/2009	N001	0.00069			#	0.000075	

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.

QA QUALIFIER:
- # Validated according to quality assurance guidelines.

Static Water Level Data

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Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0292A		5323.08	11/23/2009	13:40:56	12.02	5311.06
0304	O	5310.63	11/23/2009	14:40:25	11.61	5299.02
0305	O	5312.08	11/24/2009	11:30:25	12.65	5299.43
0309	O	5313.37	11/24/2009	12:20:43	15.84	5297.53
0310	O	5311.64	11/24/2009	11:55:15	13.7	5297.94
0655	O	5312.87	11/24/2009	12:40:04	13.71	5299.16
0656	O	5313.28	11/23/2009	14:15:31	13.65	5299.63
0658	U	5323.07	11/23/2009	12:35:47	7.71	5315.36

FLOW CODES: O ON SITE U UPGRADIENT

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Time-Concentration Graphs

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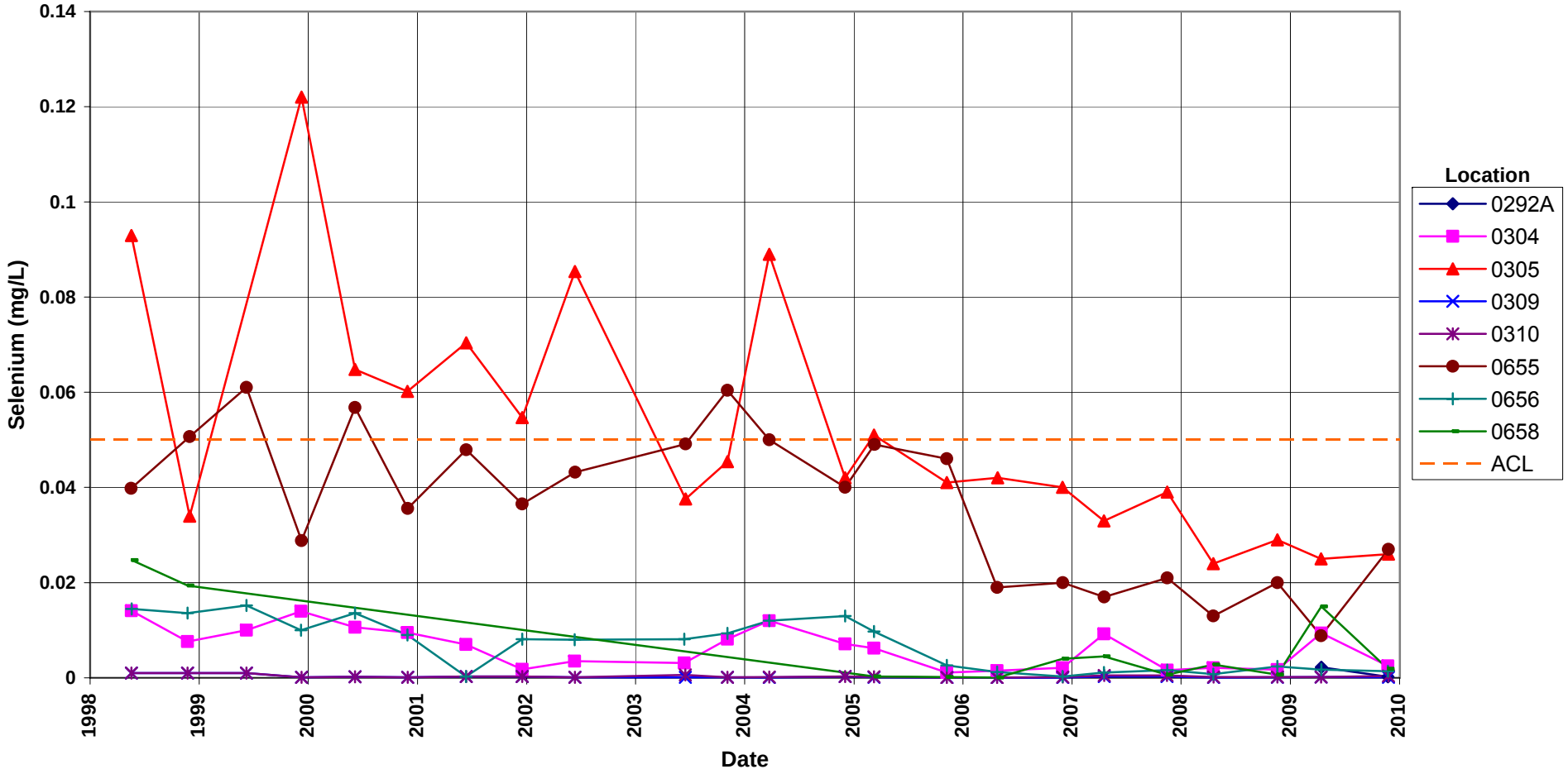
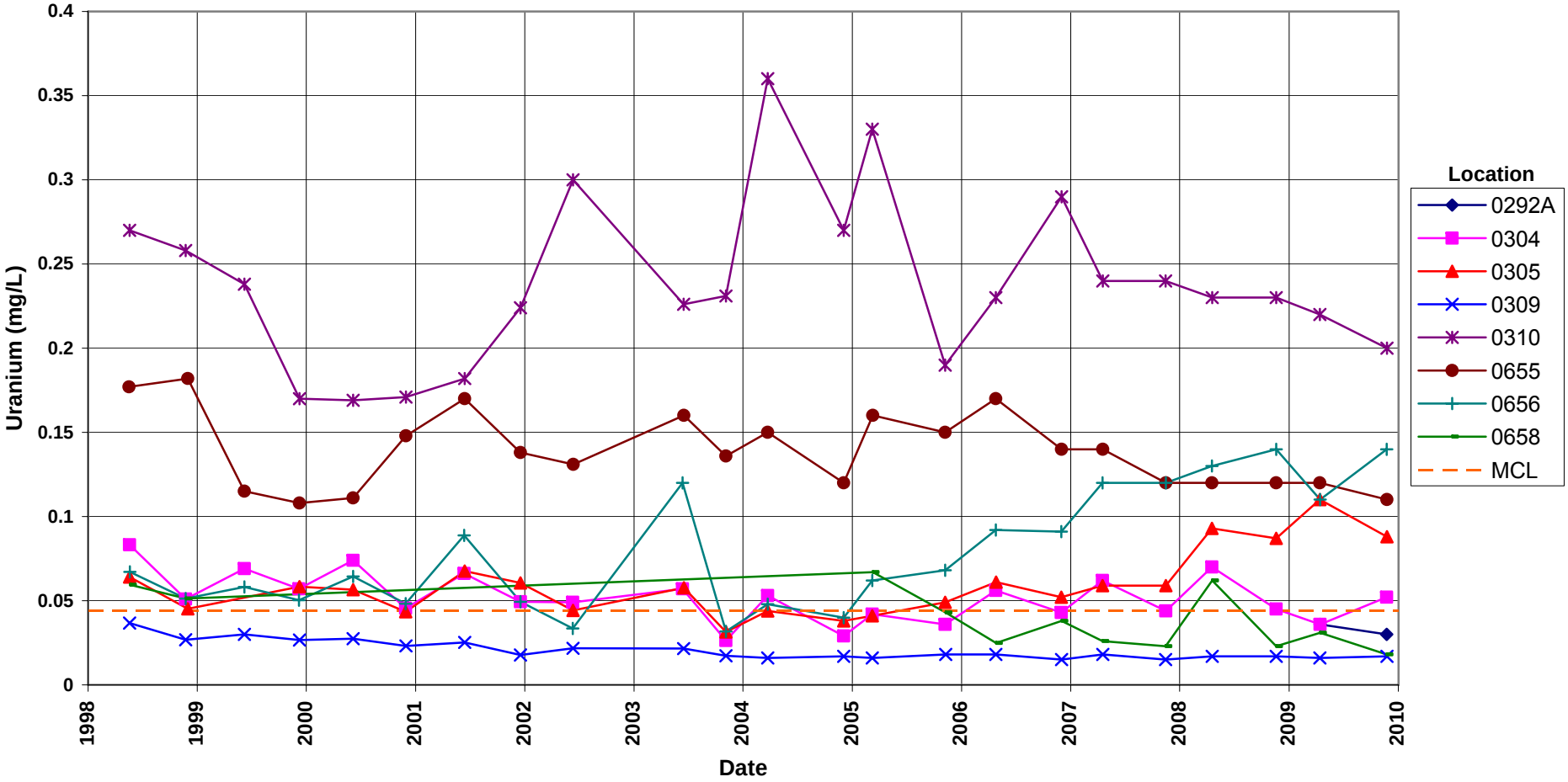
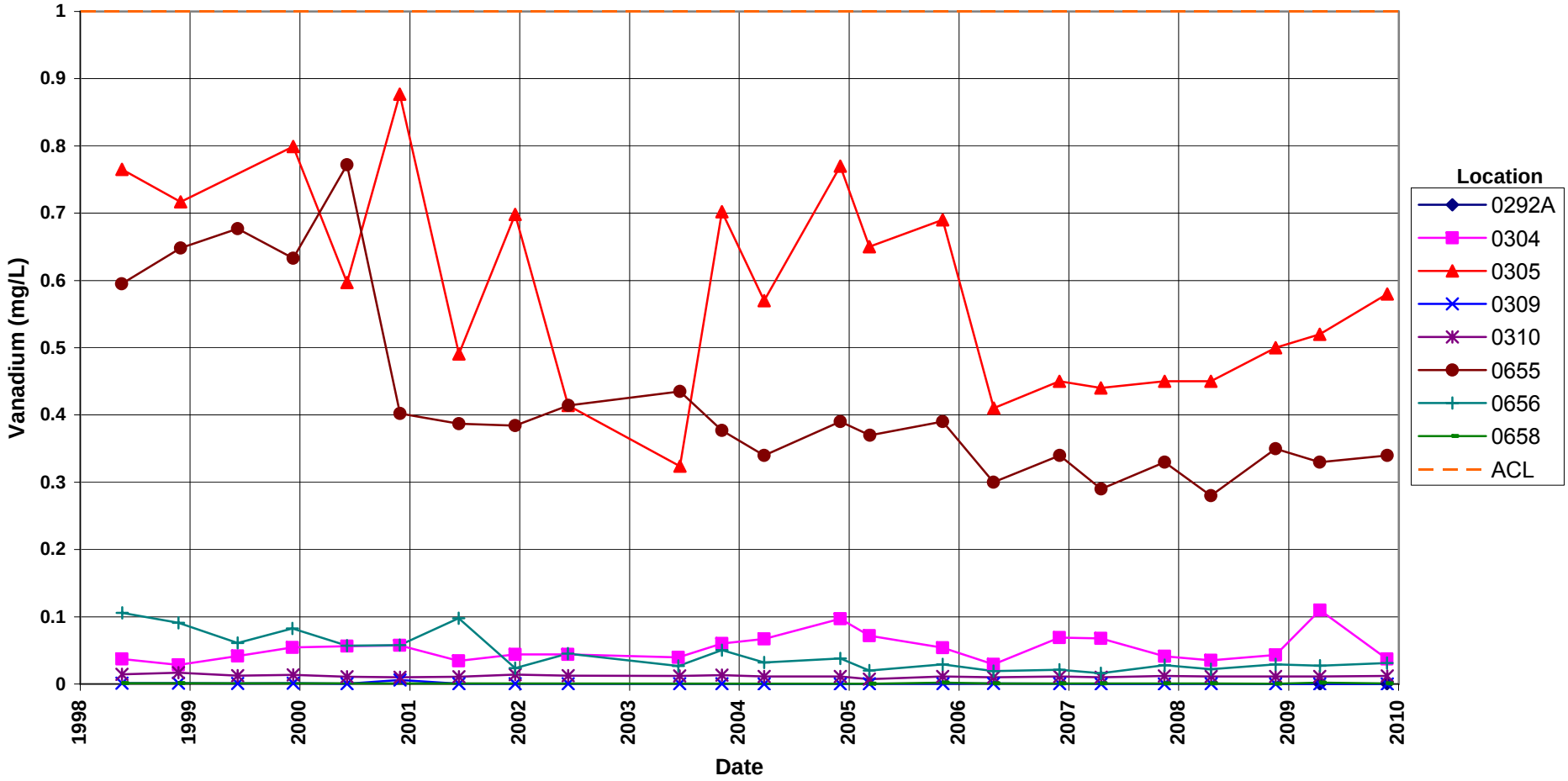
Rifle Old Processing Site
Selenium Concentration
Alternate Concentration Limit (ACL) = 0.05 mg/L



Rifle Old Processing Site
Uranium Concentration
Maximum Concentration Limit (MCL) = 0.044 mg/L



Rifle Old Processing Site
Vanadium Concentration
Alternate Concentration Limit (ACL) = 1.0 mg/L



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Attachment 3
Sampling and Analysis Work Order

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Stoller established 1959

Task Order LM00-501
Control Number 10-0027

October 13, 2009

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

SUBJECT: Contract No. DE-AM01-07LM00060, Stoller
November 2009 Environmental Sampling at Rifle, Colorado

REFERENCE: Task Order LM00-501-02-116-402, Rifle-Old, CO, Processing Site

Dear Mr. Bush:

The purpose of this letter is to inform you of the upcoming sampling event at Rifle, Colorado. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Rifle Old processing site. Water quality data will be collected at this site as part of the routine environmental sampling currently scheduled to begin the week of November 16, 2009.

The following lists show the monitor well and surface water locations scheduled to be sampled during this event.

Monitor Wells*

Old Rifle

292A Al	305 Al	309 Al	310 Al	655 Al	656 Al	658 Al
304 Al						

*NOTE: Al = alluvium; Nr = no recovery of data for classifying

Surface Locations

Old Rifle

294	396	398	741

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.

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

Please contact me at (970) 248-6375 if you have any questions.

Sincerely,

Richard Dayvault
Site Lead

RD/lcg/lb

Enclosures (3)

cc: (electronic)
Cheri Bahrke, Stoller
Richard Dayvault, Stoller
Steve Donivan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
EDD Delivery
rc-grand.junction

Constituent Sampling Breakdown

Site	Rifle							
Analyte	Groundwater		Surface Water			Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Approx. No. Samples/yr	35		15					
Field Measurements								
Alkalinity								
Dissolved Oxygen								
Redox Potential	X		X					
pH	X		X					
Specific Conductance	X		X					
Turbidity	X							
Temperature	X		X					
Laboratory Measurements	**RFO*	**RFN*	*RFO*	*RFN*	*RFL*			
Aluminum								
Ammonia as N (NH3-N)		X		X		0.1	EPA 350.1	WCH-A-005
Arsenic								
Calcium								
Chloride								
Chromium								
Iron								
Lead								
Magnesium								
Manganese								
Molybdenum		X		X		0.003	SW-846 6020	LMM-02
Nickel								
Nickel-63								
Nitrate + Nitrite as N (NO3+NO2)-N		X		X		0.05	EPA 353.1	WCH-A-022
Potassium								
Radium-226								
Radium-228								
Selenium	X		X			0.0001	SW-846 6020	LMM-02
Silica								
Sodium								
Total Dissolved Solids								
Total Organic Carbon								
Uranium	X	X	X	X	X	0.0001	SW-846 6020	LMM-02
Vanadium	X	0215, 0216, 0217, 0590, 0658, 0659, 0664, 0669, 0670, and 0855 only	X	X	X	0.0003	SW-846 6020	LMM-02
Zinc								
Total No. of Analytes	3	5	3	5	2			

*RFN = New Rifle; *RFO = Old Rifle

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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Stoller established 1959
Grand Junction Office

Memorandum

Control Number N/A

DATE: December 15, 2009

TO: Richard Dayvault

FROM: Dan Sellers

SUBJECT: Trip Report (Routine environmental sampling)

Site: Old Rifle Site, CO

Dates of Sampling Event: November 23, 2009 and November 24, 2009

Team Members: Joe Trevino and Dan Sellers

Number of Locations Sampled: 8 monitor wells, 4 surface locations.

Locations Not Sampled/Reason: None.

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

False Id	True Id	Sample Type	Associated Matrix	Ticket Number
2833	0656	Duplicate	Groundwater	HMX 226

RIN Number Assigned: RIN 09112697.

Sample Shipment: Samples were shipped to ALS Laboratory Group on November 24, 2009.

Sampling/Analysis: Samples were analyzed for selenium, uranium, and vanadium.

Site Specific Information: All wells were developed prior to sampling. Well 0658 is bent and needs to be straightened. Well development for this well consisted of pumping 10 gallons of water after surging with tubing.

(DLS/lcg)

cc: (electronic)
Richard Bush, LM–50
Steve Donivan, Stoller
EDD Delivery
Cheri Bahrke, Stoller

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