Department of Energy
Office of Legacy Management

MAY 1 4 2009

Ms. Wendy Naugle
Colorado Department of Public Health and Environment
Remedial Programs Section
Hazardous Materials and Waste Management Division
4300 Cherry Creek Drive South
Denver, CO 80246-1530

Subject: Data Validation Package for Slick Rock, Colorado, Processing Site

Dear Ms. Naugle:

Enclosed is a copy of the Data Validation Package (DVP) for the Slick Rock, Colorado UMTRA sites. This DVP represents analyses of ground water and surface water samples that were collected in September 2008.

Monitoring wells 0303, 0305, 0307, 0309, 0310, 0311, and 0312, and surface locations 0692, 0696, and 0700 were sampled at the Slick Rock East (SRE) site. Monitoring wells 0317, 0318, 0319, 0320, 0508, 0510, and 0684, and surface water locations 0347, 0349, 0692, and 0694 were sampled at the Slick Rock West (SRW) site. These sample locations are consistent with those specified in the *Draft Ground Water Compliance Action Plan for the Slick Rock, Colorado, UMTRA Project Site*. Monitoring wells 0310 and 0312 (located downstream and across the Dolores River from the SRE site), and surface water location 0700 (located on the Dolores River south of the SRE site) were added to the sampling scheme in 2005 to determine what effects the alluvial ground water contaminant plume is having as it passes underneath, and interacts with, the Dolores River. The water level was measured at each sampled well.

The most notable increases in contaminant concentrations were observed at monitor well location 0318 at SRW, where selenium and molybdenum continued to increase. Manganese and uranium concentrations in 0318 remained at approximately the same levels as last year. Well 0318 and the surrounding area will be inspected in May 2009 to find if a cause for the increase can be determined.

MAY 1 4 2009

Please contact me at 970-248-6073 if you have any questions.

Sincerely,

Richard P. Bush
Site Manager

Enclosure

cc w/enclosure:
C. Crocker-Bedford
M. Fliegel, NRC
D. Schneck, San Miguel County
Naturita Public Library

cc w/o enclosure:
D. Traub, Stoller (e)
File: SRP 410.02 (Roberts)

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LMS/SRK/S00908

Data Validation Package

September 2008
Groundwater and Surface Water Sampling at the Slick Rock, Colorado Processing Sites

March 2009

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Contents

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Sampling Event Summary

Site: Slick Rock, Colorado, Processing Sites

Sampling Period: September 22–25, 2008

The Slick Rock, Colorado, Processing Sites are referred to as the Slick Rock East Processing Site and the Slick Rock West Processing Site. This annual event involved sampling a total of 14 monitor wells and 7 surface water locations at both sites as required by the *Draft Final Ground Water Compliance Action Plan for the Slick Rock, Colorado, Processing Sites*. Water levels were measured at all sampled wells; all sampled wells were inspected and found in good condition.

The proposed compliance strategy for the Slick Rock sites is natural flushing in conjunction with institutional controls and compliance monitoring. Contaminant concentrations at the Slick Rock sites are compared to their respective maximum concentration limit (MCL) to assess compliance with Title 40, *Code of Federal Regulations*, Part 192, with the exception of manganese and selenium. Manganese concentrations are compared to the maximum background concentration of 3.5 milligrams per liter (mg/L) to assess compliance because manganese does not have an MCL. A human-health risk-based alternate concentration limit of 0.18 mg/L has been proposed to assess compliance for selenium because groundwater modeling predicts that selenium concentrations at the Slick Rock West Processing Site will not be reduced to below the MCL within 100 years.

Wells with analyte concentrations that exceeded applicable groundwater standards are listed in Table 1.

Results from this sampling event demonstrated elevated concentrations for most contaminants at locations 0318, 0508, and 0510 as shown in the time-concentration graphs included in the Data Presentation section. Most notable is the increasing concentration of selenium in well 0318. The mobility of selenium is sensitive to changes in redox conditions in the groundwater and the redox potential has been generally increasing in well 0318 since 2004.

The radium-226 plus radium-228 concentration has decreased in well 0319 since 2006, and was slightly below the MCL of 5 picocuries per liter for this event.

Surface water results from Dolores River locations downstream of and adjacent to the processing sites were compared to statistical benchmark values derived using historical data from river locations 0693, which is located upstream of the West Processing Site and 0696, which is located upstream of the East Processing Site. As shown in Tables 2 and 3, no benchmark values were exceeded during this event, which indicates that the sites are having no measurable impact on river water quality.

Table 1. Slick Rock Wells with Samples that Exceeded EPA Standards in September 2008

Analyte	Standard	Location	Concentration (mg/L)
Manganese[a]	3.5	0508	4.9
		0510	5.3
Molybdenum	0.1	0317	0.2
		0318	4.8
		0508	1.2
		0510	0.88
Nitrate + Nitrite as Nitrogen	10	0318	240
		0508	330
		0510	390
Selenium[b]	0.18	0318	8
		0508	1.5
		0510	1.1
Uranium	0.044	0303	0.94
		0305	0.97
		0307	0.61
		0309	0.3
		0311	0.18
		0312	0.061
		0508	0.084
		0510	0.11

Standards are listed in 40 CFR 192.02 Table 1 to Subpart A; concentrations are in mg/L.
[a]Manganese standard is the Maximum Background Concentration.
[b]Selenium standard is the proposed Alternate Concentration Limit.

Table 2. Comparison of Slick Rock East Processing Site September 2008 Concentrations to Benchmarks

Analyte	Benchmark Value for 0696 (mg/L)	0692 Concentration (mg/L)	0700 Concentration (mg/L)
Uranium	0.0550	0.00079	0.00091

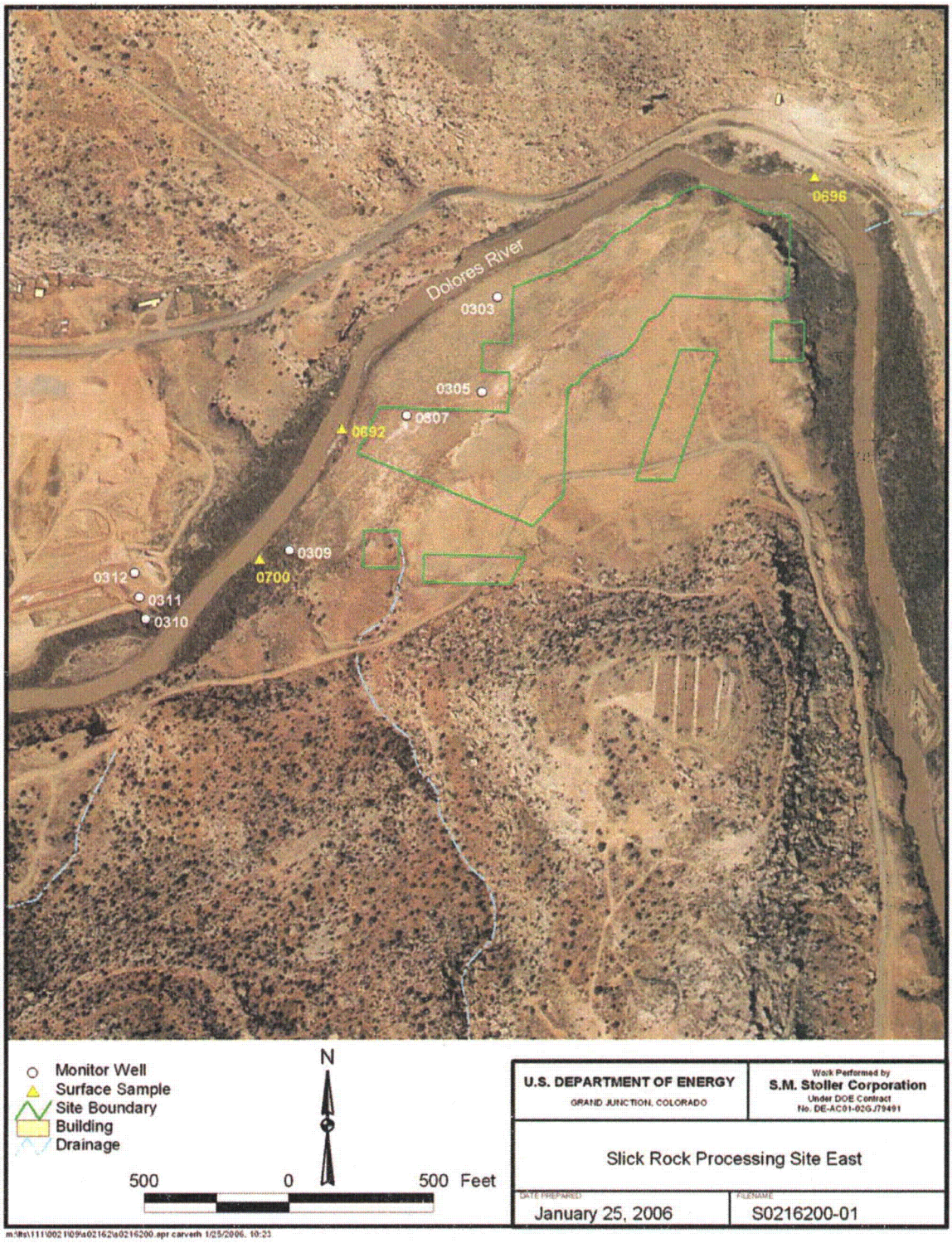
Table 3. Comparison of Slick Rock West Processing Site September 2008 Concentrations to Benchmarks

Analyte	Benchmark Value for 0693 (mg/L)	0347 Concentration (mg/L)	0349 Concentration (mg/L)	0694 Concentration (mg/L)
Manganese	0.0122	0.0010	0.0027	0.0057
Molybdenum	0.0048	0.0014	0.0016	0.0013
Nitrate + Nitrite as N	0.2400	0.017	0.16	0.036
Selenium	0.0047	0.00019	0.00072	0.00035
Uranium	0.0030	0.00075	0.00080	0.00072

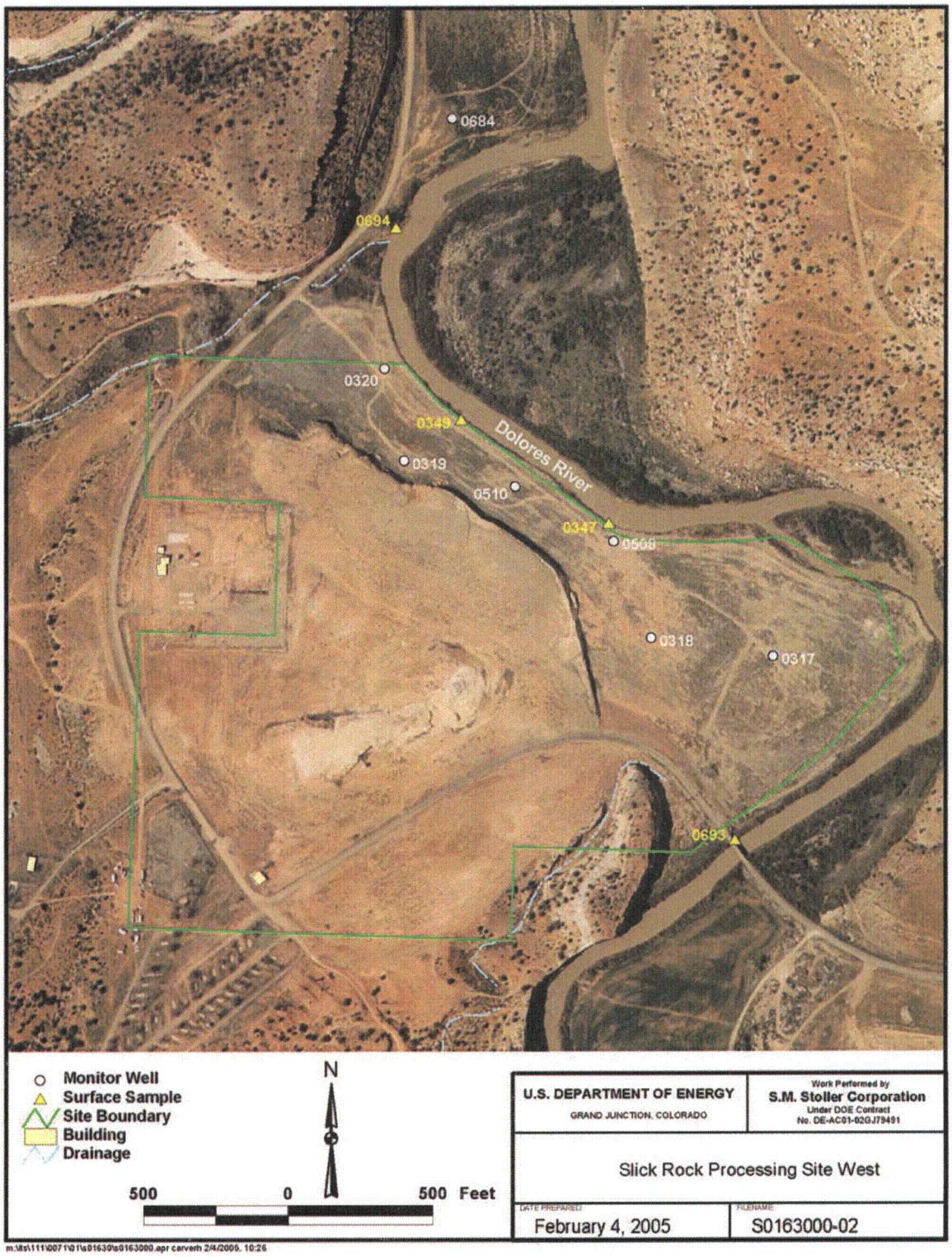
David Traub 4-7-09

David Traub
Site Lead, S.M. Stoller

Date



Slick Rock Processing Site East, Sample Location Map



Slick Rock Processing Site West, Sample Location Map

Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Slick Rock, Colorado	**Date(s) of Water Sampling**	September 22-25, 2008
Date(s) of Verification	November 5, 2008	**Name of Verifier**	Gretchen Baer

	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 August 18, 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 September 22, 2008.
4. Was an operational check of the field equipment conducted daily?	Yes	
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	With the exception that alkalinity measurements were NOT taken at any location, as per site lead instructions.
6. Was the category of the well documented?	Yes	
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	Yes	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	NA	

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	NA	
Was one pump/tubing volume removed prior to sampling?	NA	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	Duplicates were collected from wells 0319 and 0684.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	Yes	One equipment blank taken for surface water reel.
11. Were trip blanks prepared and included with each shipment of VOC samples?	Yes	One trip blank was collected.
12. Were QC samples assigned a fictitious site identification number?	Yes	
Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report?	Yes	Location IDs of 2404, 2498, 2500, and 2676 were used for QC samples.
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	All samples with turbidity readings above 10 were filtered. VOA samples were not filtered.
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 Completed" fields (FDCS)?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN):	08091835
Sample Event:	September 22-25, 2008
Site(s):	Slick Rock, Colorado; Processing Sites
Laboratory:	Paragon Analytics, Fort Collins, Colorado
Work Order No.:	0809210
Analysis:	Metals, Organics, Inorganics, and Radiochemistry
Validator:	Gretchen Baer
Review Date:	November 5, 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. 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 4.

Table 4. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Manganese	LMM-01	SW-846 3005A	SW-846 6010B
Molybdenum, Selenium, Uranium	LMM-02	SW-846 3005A	SW-846 6020A
Nitrite + Nitrate as N	WCH-A-022	MCAWW 353.2	MCAWW 353.2
Radium-226	ASP-A-016	PA SOP783R8	PA SOP783R8
Radium-228	GPC-A-020	SW-846 9320 (m)	PA SOP724R10
Volatile Organics	VOA-A-009	SW-846 5030C	SW-846 8260B

Data Qualifier Summary

Analytical results were qualified as listed in Table 5. Refer to the sections below for an explanation of the data qualifiers applied.

Table 5. Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
0809210-13	0347	Manganese	J	Intercept greater than 3 times MDL
0809210-13	0347	Molybdenum	U	Less than 5 times the method blank
0809210-14	0349	Manganese	J	Intercept greater than 3 times MDL
0809210-15	0693	Manganese	J	Intercept greater than 3 times MDL
0809210-15	0693	Molybdenum	U	Less than 5 times the method blank
0809210-16	0694	Molybdenum	U	Less than 5 times the method blank
0809210-25	2676 (Equip Blank)	Molybdenum	U	Less than 5 times the method blank
0809210-25	2676 (Equip Blank)	Uranium	U	Less than 5 times the method blank

Sample Shipping/Receiving

Paragon Analytics in Fort Collins, Colorado, received 25 water samples on September 26, 2008, under air bill numbers 8605 0099 4146 and 8605 0099 4157, 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 COC form was complete with no errors or omissions. The laboratory noted that a sample date was handwritten incorrectly on one bottle for sample GKR 106.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler at 1.4 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. Some volatile organics vials were received with visible headspace. The laboratory used vials with no headspace for analysis. No qualification of the data is necessary. 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 6010B

Calibration for manganese was performed on October 8 and 10, 2008, using three calibration standards. The calibration curve correlation coefficient values were greater than 0.995. The absolute values of the intercepts were less than 3 times the method detection limit (MDL) with one exception. The absolute value of the intercept for the October 10, 2008, calibration was slightly greater than 3 times the MDL. All associated detects less than 3 times the intercept are qualified with a "J" flag (estimated). 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 practical quantitation limit (PQL) and all results were within the acceptance range.

Method SW-846 6020

Calibration for selenium was performed on October 14, 2008, and for molybdenum and uranium on October 8 and 10, 2008, 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 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 for molybdenum and uranium and six for selenium. 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 8260B

The initial calibrations for benzene, ethylbenzene, toluene, and xylenes were performed using eight calibration standards on August 5, 2008. Calibration curves are established using linear regression, quadratic regression, or the average response factor approach. Calibrations using average response factors had relative standard deviations of less than 15 percent. Linear or higher order regression calibrations had correlation coefficient values greater than 0.99 and intercepts less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency. The verification checks met all acceptance criteria. The mass spectrometer calibration and resolution were checked at the beginning of each analytical run in accordance with the procedure. Internal standard recoveries were stable and within acceptance ranges. All surrogate recoveries were within the acceptance ranges.

Method MCAWW 353.2

Calibrations for nitrite + nitrate as N were performed using seven calibration standards on October 1, 2008. 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 12 verification checks. All calibration check results were within the acceptance criteria.

Radiochemical Analysis

All radiochemical results reported included the calculated two-sigma total propagated uncertainty and minimum detectable concentration (MDC).

Radium-226

Emanation cell plateau voltage determinations and cell efficiency calibrations were performed January 2008. Daily instrument checks performed on October 10, 2008, 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 November 2007. Daily instrument checks performed on October 13 and 14, 2008, met the acceptance criteria. The chemical recoveries met the acceptance criteria of 40 to 110 percent for all samples.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis.

Metals and Wet Chemistry

All method blank and calibration blank results associated with the samples were below the PQLs for all analytes. 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 associated manganese results were greater than 5 times the MDL, so no results are qualified.

Volatile Organics

The method blank results were below the PQLs and MDLs for all target compounds.

Radiochemistry

All radiochemical 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 Analysis

Matrix spike and matrix spike duplicate (MS/MSD) pairs were analyzed for metals and nitrate + nitrite as N as a measure of method performance in the sample matrix. The MS/MSD data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike concentration. The spike recoveries met the recovery and precision criteria for all analytes evaluated. The nitrate + nitrite as N spikes were performed on sample location 0318. The laboratory did not report the results for these spikes, but the spike recoveries could be calculated from the raw data.

Laboratory Replicate Analysis

Laboratory replicate sample results demonstrate acceptable laboratory precision. The relative percent difference values for the non-radiochemical sample replicates, laboratory control sample replicates, and matrix spike replicates were less than 20 percent for results that are greater than 5 times the PQL, indicating acceptable precision. The nitrate + nitrite as N replicate was performed on sample location 0318. The laboratory did not report the replicate results, but the relative percent difference could be calculated from the raw data.

The radiochemical relative error ratio (calculated using the one-sigma total propagated uncertainty) for the laboratory control sample replicates was less than three, indicating acceptable precision.

Laboratory Control Sample

Laboratory control samples were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. All control sample results were acceptable.

Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Serial dilution data are evaluated when the concentration of the undiluted sample is greater than 100 times the PQL for ICP-MS or greater than 50 times the PQL for ICP. All evaluated serial dilution data were acceptable.

Volatile Organics Internal Standard and Surrogate Recovery

Laboratory performance for individual samples is evaluated by means of surrogate spikes. All samples are spiked with surrogate compounds prior to sample preparation. Surrogate recoveries are used to monitor factors such as interference and high concentrations of analytes. Surrogate recoveries may also be influenced by the success in recoveries of the internal standards. Internal standard recoveries were stable and within acceptance ranges. All surrogate recoveries were within the acceptance ranges.

Chromatography Peak Integration

The integration of analyte peaks was reviewed for all volatile organics data. All peak integrations were satisfactory.

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 non-radiochemical analytes.

All radiochemical MDCs were calculated using the following equation as specified in *Quality Systems for Analytical Services.*

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

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. The analytical report included the MDL (MDC for radiochemistry) and PQL for all analytes and all required supporting documentation.

Electronic Data Deliverable (EDD) File

The EDD file arrived on October 28, 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.

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 08091835 **Lab Code:** PAR **Validator:** Gretchen Baer **Validation Date:** 11/3/2008

Project: Slick Rock **Analysis Type:** ☑ Metals ☑ General Chem ☑ Rad ☑ Organics

# of Samples: 25 **Matrix:** WATER **Requested Analysis Completed:** Yes

Chain of Custody

Present: OK **Signed:** OK **Dated:** OK

Sample

Integrity: OK **Preservation:** OK **Temperature:** OK

Select Quality Parameters

☑ Holding Times	All analyses were completed within the applicable holding times.
☑ Detection Limits	The reported detection limits are equal to or below contract requirements.
☑ Field/Trip Blanks	There were 2 trip/equipment blanks evaluated.
☑ Field Duplicates	There were 2 duplicates evaluated.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 08091835 **Lab Code:** PAR **Date Due:** 10/24/2008

Matrix: Water **Site Code:** SRK **Date Completed:** 10/29/2008

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	10/08/2008	0.0350	1.0000	OK	OK	OK	OK	OK	96.0	95.0	92.0	1.0	88.0	2.0	102.0
MANGANESE	10/08/2008											0.0	89.0		99.0
MANGANESE	10/10/2008	-0.9600	1.0000	OK	OK	OK	OK	OK	100.0	89.0	90.0	1.0	95.0	4.0	101.0
MANGANESE	10/10/2008											3.0	95.0		100.0
MOLYBDENUM	10/08/2008	0.0000	1.0000	OK	OK	OK	OK	OK	100.0	100.0	100.0	0.0	114.0		114.0
MOLYBDENUM	10/10/2008	-0.0010	1.0000	OK	OK	OK	OK	OK	100.0			0.0	111.0	8.0	122.0
MOLYBDENUM	10/10/2008											2.0			117.0
SELENIUM	10/14/2008	-0.0710	1.0000	OK	OK	OK	OK	OK	87.0			0.0	92.0	5.0	88.0
SELENIUM	10/14/2008											2.0			
URANIUM	10/08/2008	0.0000	1.0000	OK	OK	OK	OK	OK	103.0	100.0	101.0	1.0		8.0	104.0
URANIUM	10/08/2008											3.0			107.0
URANIUM	10/10/2008	0.0000	1.0000	OK	OK	OK	OK	OK	101.0	104.0	119.0	5.0	109.0	3.0	103.0
URANIUM	10/10/2008											3.0			111.0

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 08091835 **Lab Code:** PAR **Date Due:** 10/24/2008

Matrix: Water **Site Code:** SRK **Date Completed:** 10/29/2008

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB						
NITRATE/NITRITE AS N	10/01/2008	0.006	0.9999	OK	OK	OK	OK	OK	101.0	90.0	75.0	2.80	

SAMPLE MANAGEMENT SYSTEM
Organics Data Validation Summary

RIN: 08091835 **Project:** Slick Rock **Lab Code:** PAR **Validation Date:** 11/5/2008

LCS Recovery: All LCS recoveries were within the laboratory acceptance limits.

Method Blank(s): All method blanks results were below the method detection limit.

MS/MSD Recovery: N/A

Surrogate Recovery: All surrogate recoveries were within the laboratory acceptance limits.

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 08091835 **Lab Code:** PAR **Date Due:** 10/24/2008

Matrix: Water **Site Code:** SRK **Date Completed:** 10/29/2008

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
0319	Radium-226	10/10/2008			101.0			
2498	Radium-226	10/10/2008			98.7			
LCS	Radium-226	10/10/2008			97.5	86.8		
LCS_Duplicate	Radium-226	10/10/2008			97.9	94.5		0.48
Blank	Radium-226	10/10/2008	0.0598	U	93.8			
0319	Radium-228	10/13/2008			66.2			
2498	Radium-228	10/13/2008			60.2			
LCS	Radium-228	10/13/2008			68.0	88.2		
LCS_Duplicate	Radium-228	10/13/2008			67.4	98.8		0.53
Blank	Radium-228	10/13/2008	-0.1150	U	64.5			

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. All monitor wells met the Category I low-flow sampling criteria. Sample results for these wells were qualified with an "F" flag in the database, indicating the wells were purged and sampled using the low-flow sampling method.

Equipment Blank and Trip Blank Assessment

An equipment blank (field ID 2676) was collected after decontamination of the tubing reel used to collect surface water samples 0347, 0349, 0692, 0693, and 0700. Manganese was detected in the equipment blank. Sample results for manganese that are less than 5 times the equipment blank concentration are qualified with a "J" flag (estimated). Molybdenum and uranium were also detected in the blank by the laboratory, but these analytes have been qualified during data validation with a "U" flag as not detected. The equipment blank results indicate adequate decontamination of the sampling equipment.

A trip blank (field ID 2500) was prepared and analyzed for volatile organics to document contamination attributable to shipping and field handling procedures. There were no target analytes detected in the trip blank.

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 0319 and 0684 (field duplicate IDs 2498 and 2404). The non-radiochemical duplicate results were acceptable, meeting the Environmental Protection Agency recommended laboratory duplicate criteria of less than 20 percent relative difference for results that are greater than 5 times the PQL. The radiochemical duplicate results were acceptable with relative error ratios (calculated using the one-sigma total propagated uncertainty) of less than three.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Equipment/Trip Blanks

RIN: 08091835 **Lab Code:** PAR **Project:** Slick Rock **Validation Date:** 11/3/2008

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	0809210-25	SW6010	MANGANESE	0.64	B	0.2	UG/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
0809210-13	GKR 095	0347	1	1	B	J
0809210-14	GKR 096	0349	2.7	1	B	J
0809210-15	GKR 097	0693	2.5	1	B	J

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	0809210-25	SW6020	MOLYBDENUM	0.12	B	0.1	UG/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
0809210-13	GKR 095	0347	1.4	10		
0809210-14	GKR 096	0349	1.6	10		
0809210-15	GKR 097	0693	1.2	10		

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	0809210-25	SW6020	URANIUM	0.022	B	0.0045	UG/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
0809210-13	GKR 095	0347	0.75	10		
0809210-14	GKR 096	0349	0.8	10		
0809210-15	GKR 097	0693	0.78	10		
0809210-17	GKR 099	0692	0.79	10		
0809210-22	GKR 104	0700	0.91	10		

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 08091835 **Lab Code:** PAR **Project:** Slick Rock **Validation Date:** 11/3/2008

Duplicate: 2404 **Sample:** 0684

Analyte	Sample Result	Sample Flag	Sample Error	Duplicate Result	Duplicate Flag	Duplicate Error	RPD	RER	Units
MANGANESE	400			350			13.33		UG/L
MOLYBDENUM	5.3			4.9			7.84		UG/L
NITRATE/NITRITE AS N	0.033			0.035					MG/L
SELENIUM	0.35			0.33			5.88		UG/L
URANIUM	14			14			0		UG/L

Duplicate: 2498 **Sample:** 0319

Analyte	Sample Result	Sample Flag	Sample Error	Duplicate Result	Duplicate Flag	Duplicate Error	RPD	RER	Units
BENZENE	7400			7200			2.74		UG/L
Ethyl Benzene	240	J		260					UG/L
M+P-XYLENE	3800			3900			2.60		UG/L
O-XYLENE	750			770			2.63		UG/L
Radium-226	1.83		0.677	1.93		0.644		0.2	pCi/L
Radium-228	2.04		0.707	2.48		0.842		0.8	pCi/L
TOLUENE	6000			5800			3.39		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: 4-3-2009

Data Validation Lead: Gretchen Baer — Date: 4/3/09

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Attachment 1
Assessment of Anomalous Data

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Potential Outliers Report

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Potential Outliers Report

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

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

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

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

Two results were identified as potentially anomalous and are listed on the Anomalous Data Review Checksheet. The uranium result for location 0311 had a concentration higher than previously observed. Recent results for uranium indicate upward trending at this location. At 0349 (a surface water location), the molybdenum result was slightly lower than the historical minimum. 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: 08091835
Comparison: All Historical Data
Report Date: 2/26/2009

				Current			Historical Maximum			Historical Minimum			Number of Data Points		Normally Distributed	Statistical Outlier
					Qualifiers			Qualifiers			Qualifiers					
Site Code	Location Code	Sample Date	Analyte	Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect		
SRK01	0305	09/24/2008	Selenium	0.018		F	0.0457		F	0.019		F	13	0	Yes	No
SRK01	0311	09/22/2008	Uranium	0.18		F	0.15		F	0.0377			13	0	Yes (log)	Yes
SRK01	0318	09/23/2008	Manganese	0.1		F	12.8			0.26		F	17	0	Yes	No
SRK01	0318	09/23/2008	Molybdenum	4.8		F	4.4		F	0.459		F	17	0	Yes (log)	No
SRK01	0318	09/23/2008	Selenium	8		F	5.2		F	0.964		F	17	0	Yes (log)	No
SRK01	0347	09/23/2008	Manganese	0.001	B	J	0.058			0.0019	B		12	1	No	No
SRK01	0347	09/23/2008	Selenium	0.00019			0.0097			0.0003	U		12	3	No	No
SRK01	0349	09/23/2008	Molybdenum	0.0016			0.011			0.0017	U		11	4	Yes (log)	Yes
SRK01	0510	09/23/2008	Selenium	1.1		F	0.962			0.005	U		39	1	No	No
SRK01	0693	09/22/2008	Nitrate + Nitrite as Nitrogen	0.01	U		1	U	J	0.082			7	1	Yes (log)	No
SRK01	0694	09/22/2008	Nitrate + Nitrite as Nitrogen	0.036			1	U	J	0.061			7	1	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.	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.		

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.

Anomalous Data Review Checksheet

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Anomalous Data Review Checksheet

Site: Slick Rock, CO, Processing Sites **Sampling Data:** Groundwater and Surface Water

Reviewer:	Gretchen Baer Name (print)	Gretchen R Baer Signature	4/3/09 Date
Site Hydrologist:	David Traub Name (print)	David Traub Signature	4-3-09 Date

Date of Review: November 5, 2008

Loc. No.	Analyte	Type of Anomaly	Disposition
0311	Uranium	High	Apparent upward trend. Does not require further review.
0349	Molybdenum	Low	Surface water location. Compare to future results.

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Attachment 2
Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location (USEE100) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0303 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	09/24/2008	N001	4.3	-	14.3	-110		F	#		
pH	s.u.	09/24/2008	N001	4.3	-	14.3	7.08		F	#		
Specific Conductance	umhos /cm	09/24/2008	N001	4.3	-	14.3	3100		F	#		
Temperature	C	09/24/2008	N001	4.3	-	14.3	17.93		F	#		
Turbidity	NTU	09/24/2008	N001	4.3	-	14.3	8.4		F	#		
Uranium	mg/L	09/24/2008	N001	4.3	-	14.3	0.94		F	#	0.00009	

Groundwater Quality Data by Location (USEE100) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
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	09/24/2008	N001	8.7	-	18.7	47		F	#		
pH	s.u.	09/24/2008	N001	8.7	-	18.7	7.09		F	#		
Selenium	mg/L	09/24/2008	N001	8.7	-	18.7	0.018		F	#	0.000047	
Specific Conductance	umhos /cm	09/24/2008	N001	8.7	-	18.7	3662		F	#		
Temperature	C	09/24/2008	N001	8.7	-	18.7	15.86		F	#		
Turbidity	NTU	09/24/2008	N001	8.7	-	18.7	5.8		F	#		
Uranium	mg/L	09/24/2008	N001	8.7	-	18.7	0.97		F	#	0.00009	

Groundwater Quality Data by Location (USEE100) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0307 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	09/24/2008	N001	4.4	-	14.4	-51		F	#		
pH	s.u.	09/24/2008	N001	4.4	-	14.4	7.05		F	#		
Selenium	mg/L	09/24/2008	N001	4.4	-	14.4	0.00038		F	#	0.000024	
Specific Conductance	umhos /cm	09/24/2008	N001	4.4	-	14.4	5717		F	#		
Temperature	C	09/24/2008	N001	4.4	-	14.4	14.24		F	#		
Turbidity	NTU	09/24/2008	N001	4.4	-	14.4	6.9		F	#		
Uranium	mg/L	09/24/2008	N001	4.4	-	14.4	0.61		F	#	0.00009	

Groundwater Quality Data by Location (USEE100) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
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	09/23/2008	N001	10.2	-	20.2	22		F	#		
pH	s.u.	09/23/2008	N001	10.2	-	20.2	7.29		F	#		
Specific Conductance	umhos /cm	09/23/2008	N001	10.2	-	20.2	5077		F	#		
Temperature	C	09/23/2008	N001	10.2	-	20.2	14.95		F	#		
Turbidity	NTU	09/23/2008	N001	10.2	-	20.2	5.2		F	#		
Uranium	mg/L	09/23/2008	N001	10.2	-	20.2	0.3		F	#	0.000045	

Groundwater Quality Data by Location (USEE100) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0310 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Data	QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	09/22/2008	N001	14.7	-	19.7	-64		F	#		
pH	s.u.	09/22/2008	N001	14.7	-	19.7	6.74		F	#		
Specific Conductance	umhos /cm	09/22/2008	N001	14.7	-	19.7	1108		F	#		
Temperature	C	09/22/2008	N001	14.7	-	19.7	14.24		F	#		
Turbidity	NTU	09/22/2008	N001	14.7	-	19.7	2.35		F	#		
Uranium	mg/L	09/22/2008	N001	14.7	-	19.7	0.037		F	#	0.0000045	

Groundwater Quality Data by Location (USEE100) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0311 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	09/22/2008	N001	14.1	-	19.1	56		F	#		
pH	s.u.	09/22/2008	N001	14.1	-	19.1	6.57		F	#		
Specific Conductance	umhos /cm	09/22/2008	N001	14.1	-	19.1	3966		F	#		
Temperature	C	09/22/2008	N001	14.1	-	19.1	16.98		F	#		
Turbidity	NTU	09/22/2008	N001	14.1	-	19.1	1.07		F	#		
Uranium	mg/L	09/22/2008	N001	14.1	-	19.1	0.18		F	#	0.000022	

Groundwater Quality Data by Location (USEE100) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0312 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	09/22/2008	N001	14.5	-	19.5	74		F	#		
pH	s.u.	09/22/2008	N001	14.5	-	19.5	7.07		F	#		
Specific Conductance	umhos /cm	09/22/2008	N001	14.5	-	19.5	3083		F	#		
Temperature	C	09/22/2008	N001	14.5	-	19.5	17.79		F	#		
Turbidity	NTU	09/22/2008	N001	14.5	-	19.5	1.52		F	#		
Uranium	mg/L	09/22/2008	N001	14.5	-	19.5	0.061		F	#	0.0000045	

Groundwater Quality Data by Location (USEE100) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0317 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Molybdenum	mg/L	09/23/2008	N001	19.46	-	39.52	0.2		F	#	0.0005	
Oxidation Reduction Potential	mV	09/23/2008	N001	19.46	-	39.52	58		F	#		
pH	s.u.	09/23/2008	N001	19.46	-	39.52	7.12		F	#		
Specific Conductance	umhos /cm	09/23/2008	N001	19.46	-	39.52	2725		F	#		
Temperature	C	09/23/2008	N001	19.46	-	39.52	14.64		F	#		
Turbidity	NTU	09/23/2008	N001	19.46	-	39.52	9.4		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0318 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	09/23/2008	N001	4.99	-	15.02	0.1		F	#	0.0002	
Molybdenum	mg/L	09/23/2008	N001	4.99	-	15.02	4.8		F	#	0.01	
Nitrate + Nitrite as Nitrogen	mg/L	09/23/2008	N001	4.99	-	15.02	240		F	#	2	
Oxidation Reduction Potential	mV	09/23/2008	N001	4.99	-	15.02	177		F	#		
pH	s.u.	09/23/2008	N001	4.99	-	15.02	6.51		F	#		
Selenium	mg/L	09/23/2008	N001	4.99	-	15.02	8		F	#	0.024	
Specific Conductance	umhos /cm	09/23/2008	N001	4.99	-	15.02	3541		F	#		
Temperature	C	09/23/2008	N001	4.99	-	15.02	18.76		F	#		
Turbidity	NTU	09/23/2008	N001	4.99	-	15.02	5.9		F	#		
Uranium	mg/L	09/23/2008	N001	4.99	-	15.02	0.031		F	#	0.0000045	

Groundwater Quality Data by Location (USEE100) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0319 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Benzene	ug/L	09/23/2008	N001	4.55	-	14.58	7400		F	#	83	
Benzene	ug/L	09/23/2008	N002	4.55	-	14.58	7200		F	#	83	
Ethylbenzene	ug/L	09/23/2008	N001	4.55	-	14.58	240	J	F	#	83	
Ethylbenzene	ug/L	09/23/2008	N002	4.55	-	14.58	260		F	#	83	
m,p-Xylene	ug/L	09/23/2008	N001	4.55	-	14.58	3800		F	#	83	
m,p-Xylene	ug/L	09/23/2008	N002	4.55	-	14.58	3900		F	#	83	
o-Xylene	ug/L	09/23/2008	N001	4.55	-	14.58	750		F	#	83	
o-Xylene	ug/L	09/23/2008	N002	4.55	-	14.58	770		F	#	83	
Oxidation Reduction Potential	mV	09/23/2008	N001	4.55	-	14.58	-131		F	#		
pH	s.u.	09/23/2008	N001	4.55	-	14.58	6.64		F	#		
Radium-226	pCi/L	09/23/2008	N001	4.55	-	14.58	1.83		F	#	0.51	0.677
Radium-226	pCi/L	09/23/2008	N002	4.55	-	14.58	1.93		F	#	0.31	0.644
Radium-228	pCi/L	09/23/2008	N001	4.55	-	14.58	2.04		F	#	0.61	0.707
Radium-228	pCi/L	09/23/2008	N002	4.55	-	14.58	2.48		F	#	0.66	0.842
Specific Conductance	umhos /cm	09/23/2008	N001	4.55	-	14.58	6289		F	#		
Temperature	C	09/23/2008	N001	4.55	-	14.58	17.13		F	#		
Toluene	ug/L	09/23/2008	N001	4.55	-	14.58	6000		F	#	83	
Toluene	ug/L	09/23/2008	N002	4.55	-	14.58	5800		F	#	83	
Turbidity	NTU	09/23/2008	N001	4.55	-	14.58	4.72		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0320 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	09/23/2008	N001	4.92	-	9.96	0.54		F	#	0.0002	
Molybdenum	mg/L	09/23/2008	N001	4.92	-	9.96	0.0099		F	#	0.0001	
Nitrate + Nitrite as Nitrogen	mg/L	09/23/2008	N001	4.92	-	9.96	0.014		F	#	0.01	
Oxidation Reduction Potential	mV	09/23/2008	N001	4.92	-	9.96	-43		F	#		
pH	s.u.	09/23/2008	N001	4.92	-	9.96	6.88		F	#		
Selenium	mg/L	09/23/2008	N001	4.92	-	9.96	0.000042	B	F	#	0.000024	
Specific Conductance	umhos /cm	09/23/2008	N001	4.92	-	9.96	1056		F	#		
Temperature	C	09/23/2008	N001	4.92	-	9.96	16.11		F	#		
Turbidity	NTU	09/23/2008	N001	4.92	-	9.96	2.81		F	#		
Uranium	mg/L	09/23/2008	N001	4.92	-	9.96	0.016		F	#	0.0000045	

Groundwater Quality Data by Location (USEE100) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0508 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	09/23/2008	N001	1.01	-	11.01	4.9		F	#	0.0002	
Molybdenum	mg/L	09/23/2008	N001	1.01	-	11.01	1.2		F	#	0.002	
Nitrate + Nitrite as Nitrogen	mg/L	09/23/2008	N001	1.01	-	11.01	330		F	#	5	
Oxidation Reduction Potential	mV	09/23/2008	N001	1.01	-	11.01	81		F	#		
pH	s.u.	09/23/2008	N001	1.01	-	11.01	6.31		F	#		
Selenium	mg/L	09/23/2008	N001	1.01	-	11.01	1.5		F	#	0.0059	
Specific Conductance	umhos /cm	09/23/2008	N001	1.01	-	11.01	4395		F	#		
Temperature	C	09/23/2008	N001	1.01	-	11.01	18.58		F	#		
Turbidity	NTU	09/23/2008	N001	1.01	-	11.01	2.06		F	#		
Uranium	mg/L	09/23/2008	N001	1.01	-	11.01	0.084		F	#	0.00009	

Groundwater Quality Data by Location (USEE100) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0510 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	09/23/2008	N001	4.92	-	13.92	5.3		F	#	0.0002	
Molybdenum	mg/L	09/23/2008	N001	4.92	-	13.92	0.88		F	#	0.002	
Nitrate + Nitrite as Nitrogen	mg/L	09/23/2008	N001	4.92	-	13.92	390		F	#	5	
Oxidation Reduction Potential	mV	09/23/2008	N001	4.92	-	13.92	68		F	#		
pH	s.u.	09/23/2008	N001	4.92	-	13.92	6.41		F	#		
Selenium	mg/L	09/23/2008	N001	4.92	-	13.92	1.1		F	#	0.0059	
Specific Conductance	umhos /cm	09/23/2008	N001	4.92	-	13.92	5292		F	#		
Temperature	C	09/23/2008	N001	4.92	-	13.92	15.67		F	#		
Turbidity	NTU	09/23/2008	N001	4.92	-	13.92	1.88		F	#		
Uranium	mg/L	09/23/2008	N001	4.92	-	13.92	0.11		F	#	0.00009	

Groundwater Quality Data by Location (USEE100) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0684 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	09/23/2008	N001	11	-	21	0.4		F	#	0.0002	
Manganese	mg/L	09/23/2008	N002	11	-	21	0.35		F	#	0.0002	
Molybdenum	mg/L	09/23/2008	N001	11	-	21	0.0053		F	#	0.0001	
Molybdenum	mg/L	09/23/2008	N002	11	-	21	0.0049		F	#	0.0001	
Nitrate + Nitrite as Nitrogen	mg/L	09/23/2008	N001	11	-	21	0.033		F	#	0.01	
Nitrate + Nitrite as Nitrogen	mg/L	09/23/2008	N002	11	-	21	0.035		F	#	0.01	
Oxidation Reduction Potential	mV	09/23/2008	N001	11	-	21	85		F	#		
pH	s.u.	09/23/2008	N001	11	-	21	6.88		F	#		
Selenium	mg/L	09/23/2008	N001	11	-	21	0.00035		F	#	0.000024	
Selenium	mg/L	09/23/2008	N002	11	-	21	0.00033		F	#	0.000024	
Specific Conductance	umhos /cm	09/23/2008	N001	11	-	21	853		F	#		
Temperature	C	09/23/2008	N001	11	-	21	13.92		F	#		
Turbidity	NTU	09/23/2008	N001	11	-	21	5.26		F	#		
Uranium	mg/L	09/23/2008	N001	11	-	21	0.014		F	#	0.0000045	
Uranium	mg/L	09/23/2008	N002	11	-	21	0.014		F	#	0.0000045	

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

LAB QUALIFIERS:

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

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

DATA QUALIFIERS:

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

QA QUALIFIER:

#	Validated according to quality assurance guidelines.

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Surface Water Quality Data

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Surface Water Quality Data by Location (USEE102) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0347 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	09/23/2008	0001	0.001	B	J	#	0.0002	
Molybdenum	mg/L	09/23/2008	0001	0.0014		U	#	0.0001	
Nitrate + Nitrite as Nitrogen	mg/L	09/23/2008	0001	0.017			#	0.01	
Oxidation Reduction Potential	mV	09/23/2008	N001	64			#		
pH	s.u.	09/23/2008	N001	8			#		
Selenium	mg/L	09/23/2008	0001	0.00019			#	0.000024	
Specific Conductance	umhos/cm	09/23/2008	N001	408			#		
Temperature	C	09/23/2008	N001	17.9			#		
Turbidity	NTU	09/23/2008	N001	16.2			#		
Uranium	mg/L	09/23/2008	0001	0.00075			#	0.0000045	

Surface Water Quality Data by Location (USEE102) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0349 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	09/23/2008	0001	0.0027	B	J	#	0.0002	
Molybdenum	mg/L	09/23/2008	0001	0.0016			#	0.0001	
Nitrate + Nitrite as Nitrogen	mg/L	09/23/2008	0001	0.16			#	0.01	
Oxidation Reduction Potential	mV	09/23/2008	N001	-.6			#		
pH	s.u.	09/23/2008	N001	8.52			#		
Selenium	mg/L	09/23/2008	0001	0.00072			#	0.000024	
Specific Conductance	umhos/cm	09/23/2008	N001	430			#		
Temperature	C	09/23/2008	N001	16.54			#		
Turbidity	NTU	09/23/2008	N001	18.2			#		
Uranium	mg/L	09/23/2008	0001	0.0008			#	0.0000045	

Surface Water Quality Data by Location (USEE102) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0692 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	09/24/2008	N001	17			#		
pH	s.u.	09/24/2008	N001	8.39			#		
Specific Conductance	umhos/cm	09/24/2008	N001	385			#		
Temperature	C	09/24/2008	N001	14.61			#		
Turbidity	NTU	09/24/2008	N001	17.3			#		
Uranium	mg/L	09/24/2008	0001	0.00079			#	0.0000045	

Surface Water Quality Data by Location (USEE102) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0693 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	09/22/2008	0001	0.0025	B	J	#	0.0002	
Molybdenum	mg/L	09/22/2008	0001	0.0012		U	#	0.0001	
Nitrate + Nitrite as Nitrogen	mg/L	09/22/2008	0001	0.01	U		#	0.01	
Oxidation Reduction Potential	mV	09/22/2008	N001	79			#		
pH	s.u.	09/22/2008	N001	8.15			#		
Selenium	mg/L	09/22/2008	0001	0.00013			#	0.000024	
Specific Conductance	umhos/cm	09/22/2008	N001	411			#		
Temperature	C	09/22/2008	N001	24.3			#		
Turbidity	NTU	09/22/2008	N001	77.4			#		
Uranium	mg/L	09/22/2008	0001	0.00078			#	0.0000045	

Surface Water Quality Data by Location (USEE102) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0694 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	09/22/2008	0001	0.0057			#	0.0002	
Molybdenum	mg/L	09/22/2008	0001	0.0013		U	#	0.0001	
Nitrate + Nitrite as Nitrogen	mg/L	09/22/2008	0001	0.036			#	0.01	
Oxidation Reduction Potential	mV	09/22/2008	N001	84			#		
pH	s.u.	09/22/2008	N001	8.22			#		
Selenium	mg/L	09/22/2008	0001	0.00035			#	0.000024	
Specific Conductance	umhos/cm	09/22/2008	N001	432			#		
Temperature	C	09/22/2008	N001	18.65			#		
Turbidity	NTU	09/22/2008	N001	18.5			#		
Uranium	mg/L	09/22/2008	0001	0.00072			#	0.0000045	

Surface Water Quality Data by Location (USEE102) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0696 SURFACE LOCATION WQD, KNOWNS

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	09/22/2008	N001	79			#		
pH	s.u.	09/22/2008	N001	8.23			#		
Specific Conductance	umhos/cm	09/22/2008	N001	392			#		
Temperature	C	09/22/2008	N001	18.68			#		
Turbidity	NTU	09/22/2008	N001	21.1			#		
Uranium	mg/L	09/22/2008	0001	0.00064			#	0.0000045	

Surface Water Quality Data by Location (USEE102) FOR SITE SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009
Location: 0700 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	09/23/2008	N001	64			#		
pH	s.u.	09/23/2008	N001	8.55			#		
Specific Conductance	umhos/cm	09/23/2008	N001	394			#		
Temperature	C	09/23/2008	N001	23.34			#		
Turbidity	NTU	09/23/2008	N001	11.6			#		
Uranium	mg/L	09/23/2008	0001	0.00091			#	0.0000045	

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.

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Equipment Blank and Trip Blank Data

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BLANKS REPORT
LAB: PARAGON (Fort Collins, CO)
RIN: 08091835
Report Date: 2/26/2009

Parameter	Site Code	Location ID	Sample Date	ID	Units	Result	Qualifiers Lab	Qualifiers Data	Detection Limit	Uncertainty	Sample Type
Benzene	SRK01	0999	09/25/2008	N001	ug/L	1.7	U		1.7		TB
Ethylbenzene	SRK01	0999	09/25/2008	N001	ug/L	1.7	U		1.7		TB
m,p-Xylene	SRK01	0999	09/25/2008	N001	ug/L	1.7	U		1.7		TB
Manganese	SRK01	0999	09/25/2008	N002	mg/L	0.00064	B		0.0002		E
Molybdenum	SRK01	0999	09/25/2008	N002	mg/L	0.00012	B	U	0.0001		E
Nitrate + Nitrite as Nitrogen	SRK01	0999	09/25/2008	N002	mg/L	0.01	U		0.01		E
o-Xylene	SRK01	0999	09/25/2008	N001	ug/L	1.7	U		1.7		TB
Selenium	SRK01	0999	09/25/2008	N002	mg/L	0.000024	U		0.000024		E
Toluene	SRK01	0999	09/25/2008	N001	ug/L	1.7	U		1.7		TB
Uranium	SRK01	0999	09/25/2008	N002	mg/L	0.000022	B	U	0.0000045		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 SRK01, Slick Rock Processing Sites
REPORT DATE: 2/26/2009

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
0303	O	5446.91	09/24/2008		9.34	5437.57	
0305	O	5448.75	09/24/2008		11.52	5437.23	
0307	O	5447.1	09/24/2008		10.4	5436.7	
0309	O	5450.18	09/23/2008		15.22	5434.96	
0310	D	5450.56	09/22/2008		17.36	5433.2	
0311	D	5450.7	09/22/2008		17.5	5433.2	
0312	D	5451.06	09/22/2008		17.18	5433.88	
0317		5435.18	09/23/2008		10.65	5424.53	
0318	O	5435.22	09/23/2008		11.14	5424.08	
0319	O	5430.66	09/23/2008		8.8	5421.86	
0320	O	5427.4	09/23/2008		5.81	5421.59	
0508	O	5430.2	09/23/2008		6.77	5423.43	
0510	O	5427.87	09/23/2008		5.65	5422.22	
0684	D	5432.68	09/23/2008		15.88	5416.8	

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

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Hydrographs

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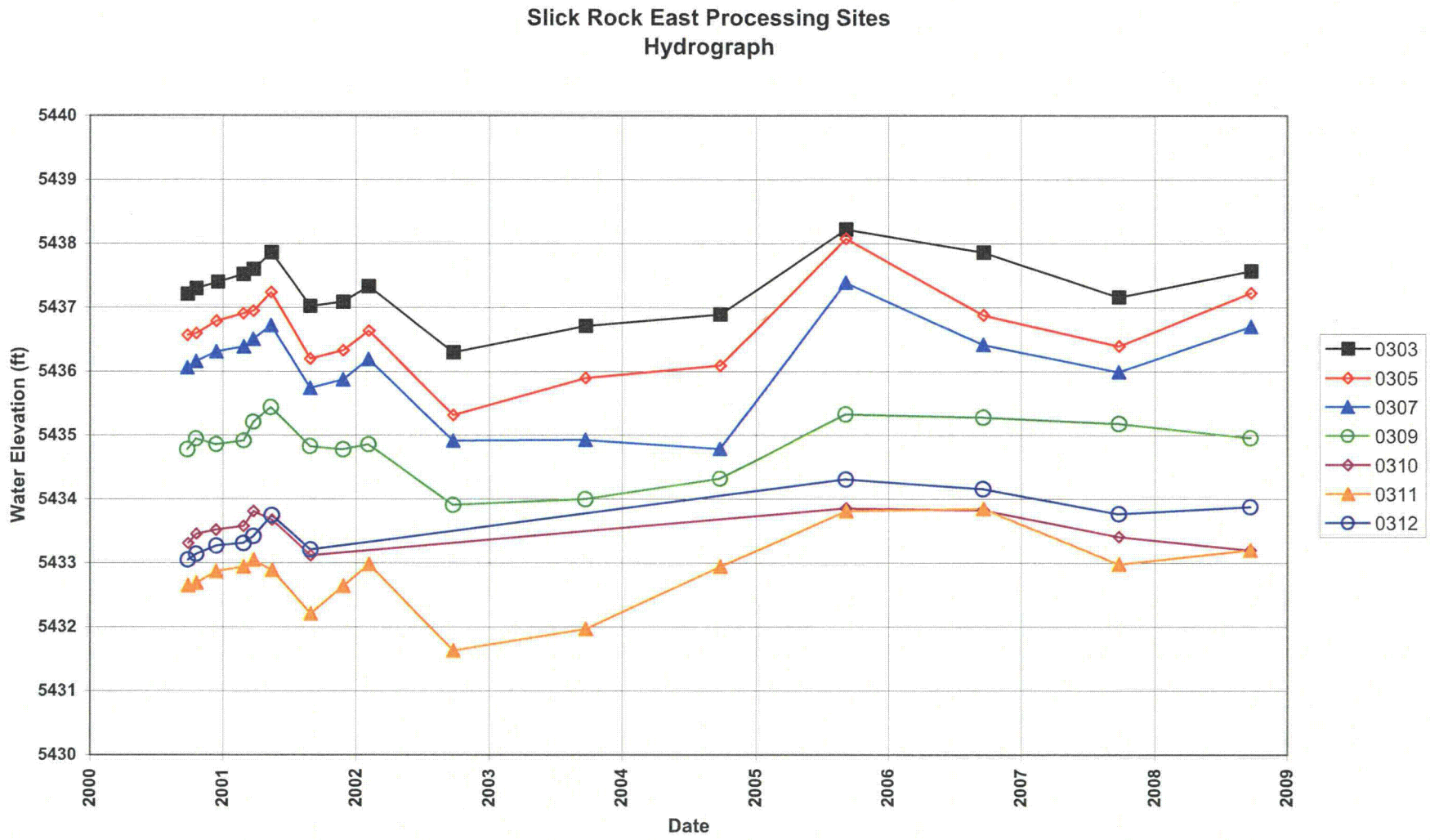
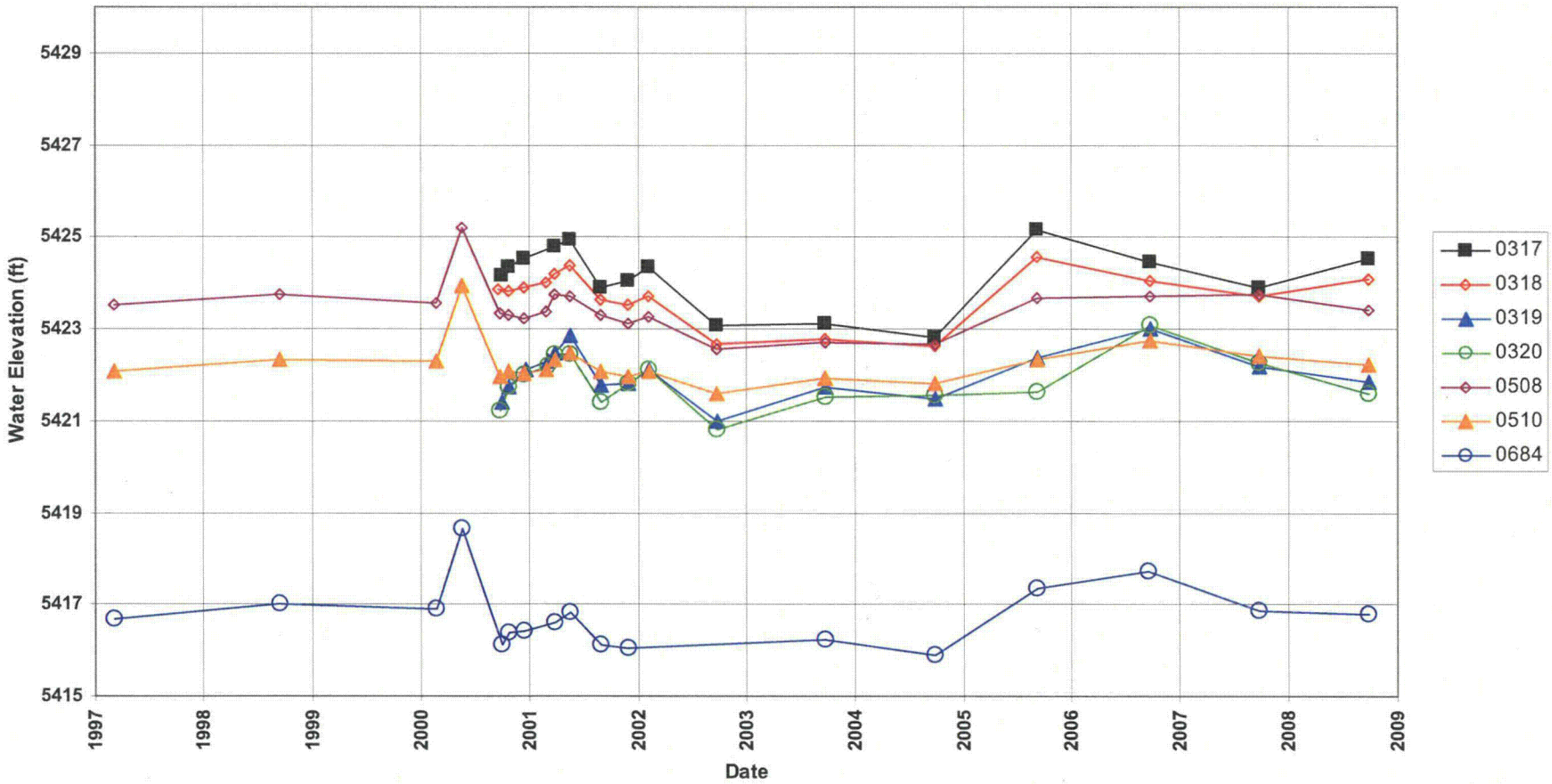

Slick Rock East Processing Sites
Hydrograph
Water Elevation (ft)
5440
5439
5438
5437
5436
5435
5434
5433
5432
5431
5430
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Date
0303
0305
0307
0309
0310
0311
0312

Slick Rock West Processing Sites
Hydrograph



Time-Concentration Graphs

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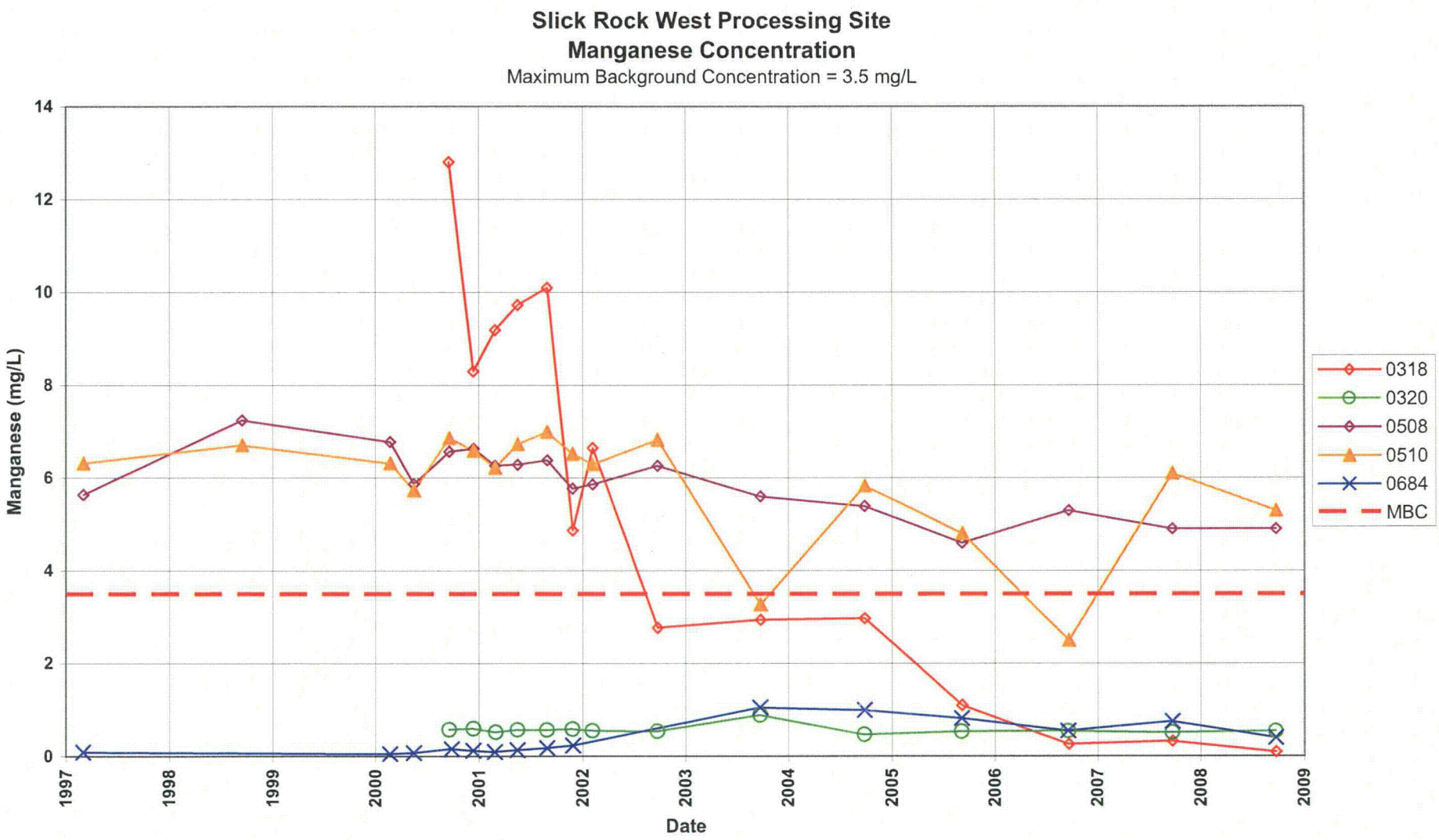
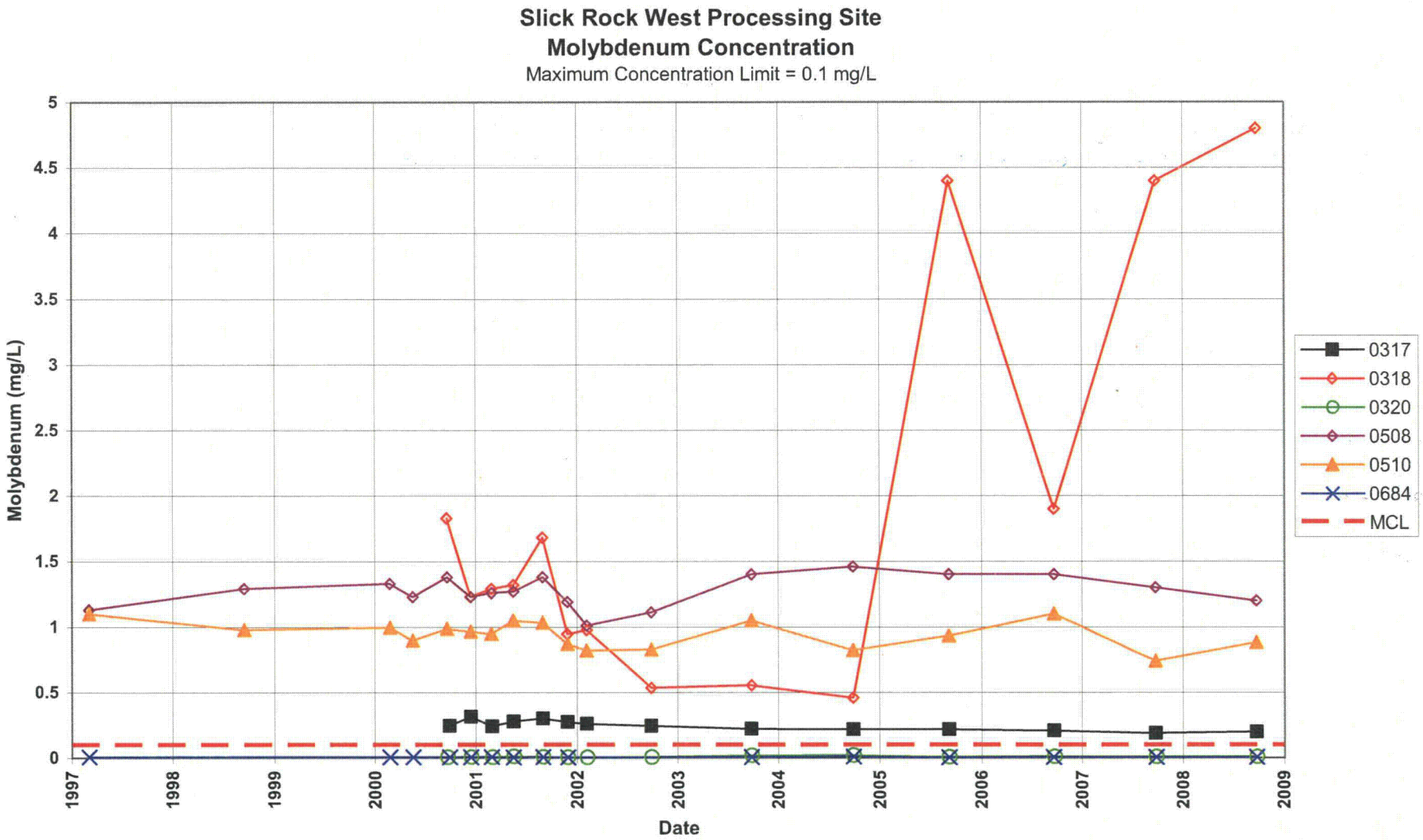
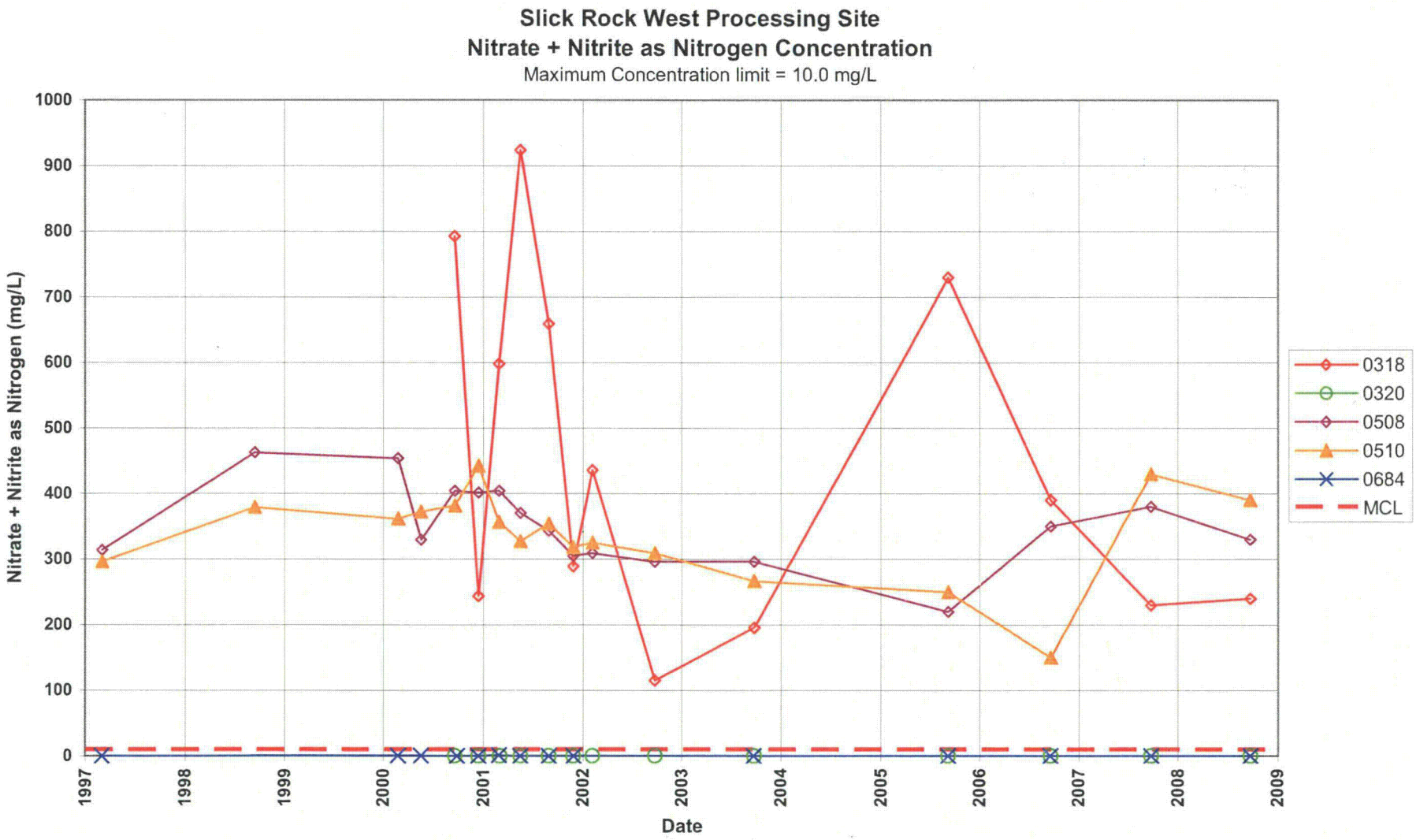
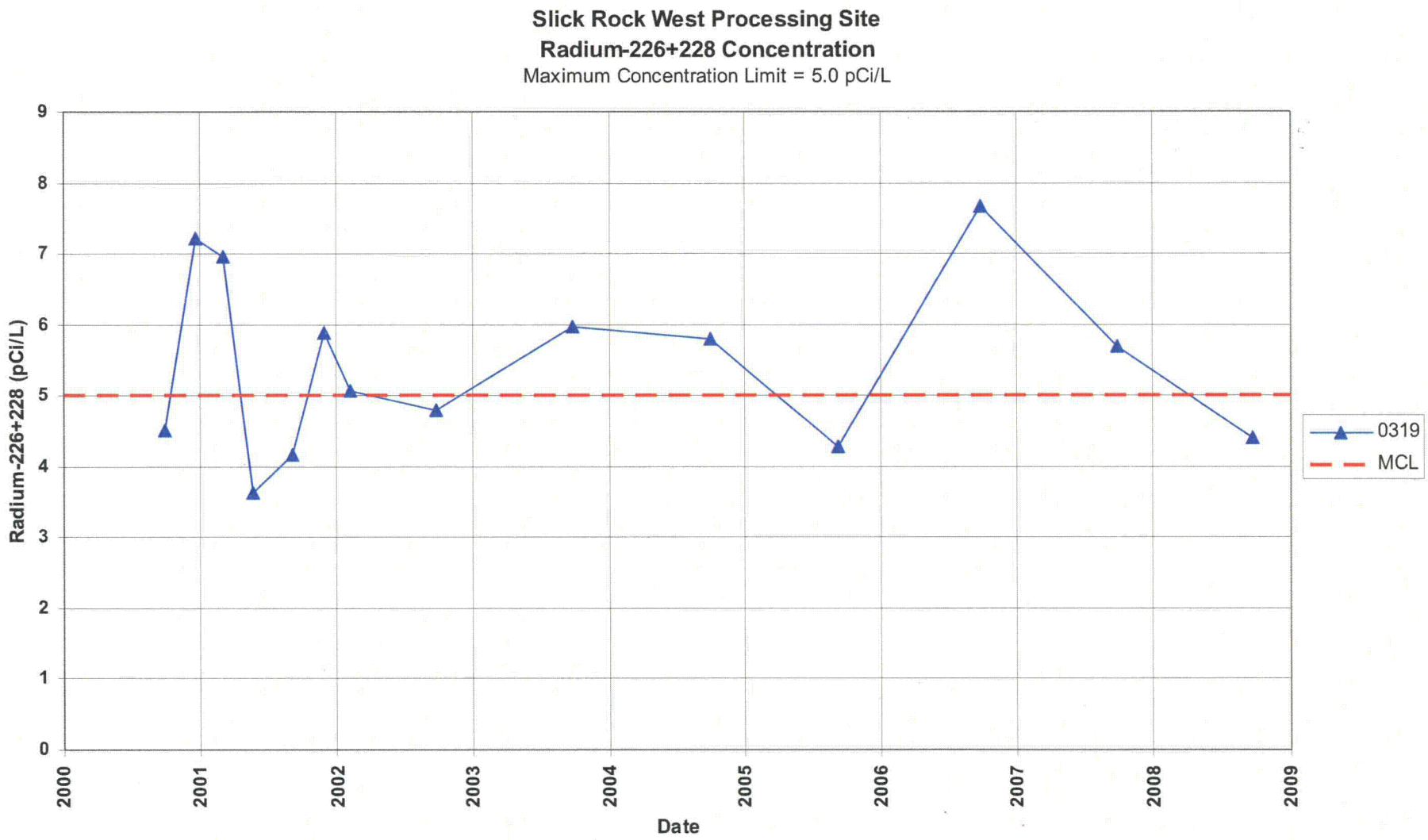
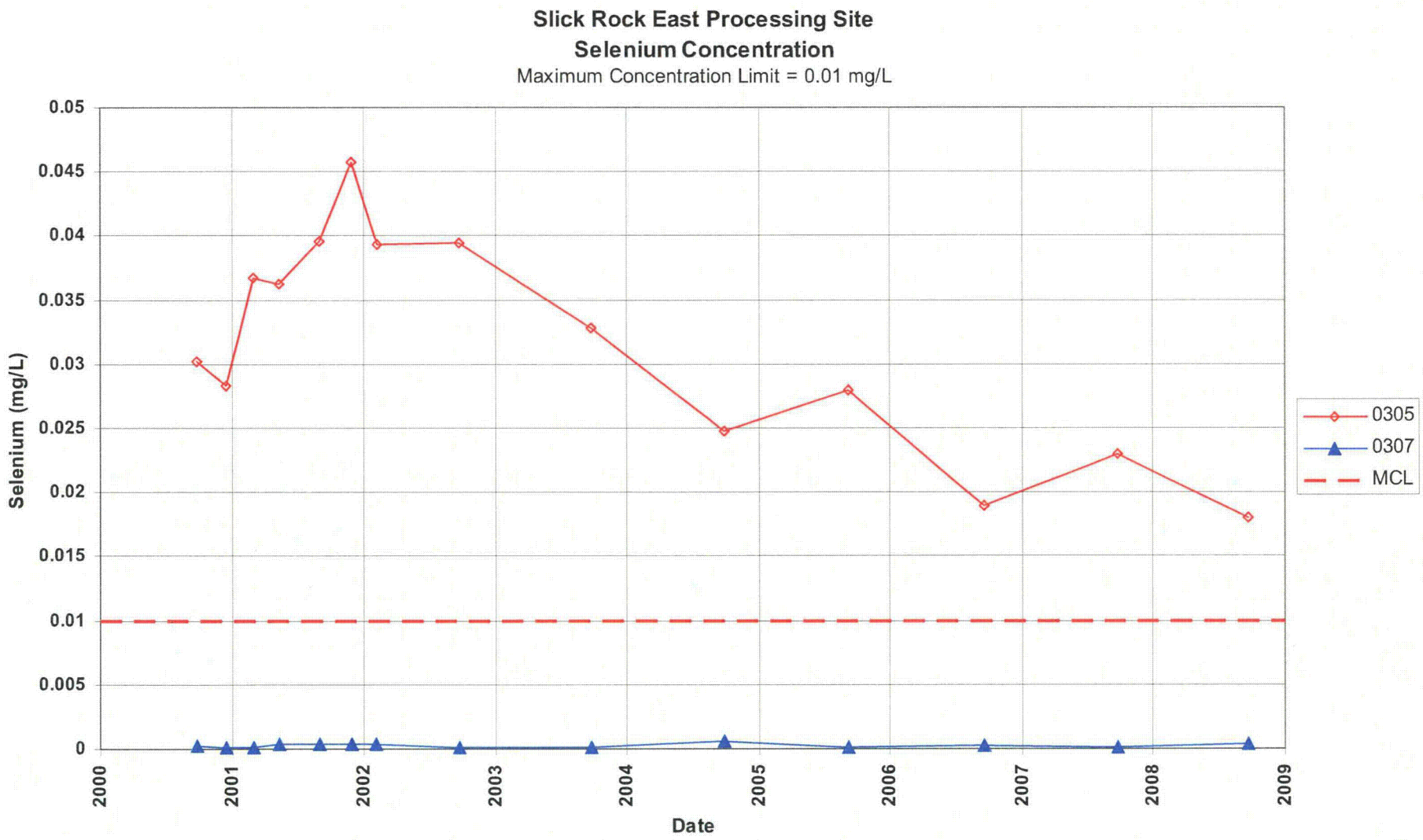
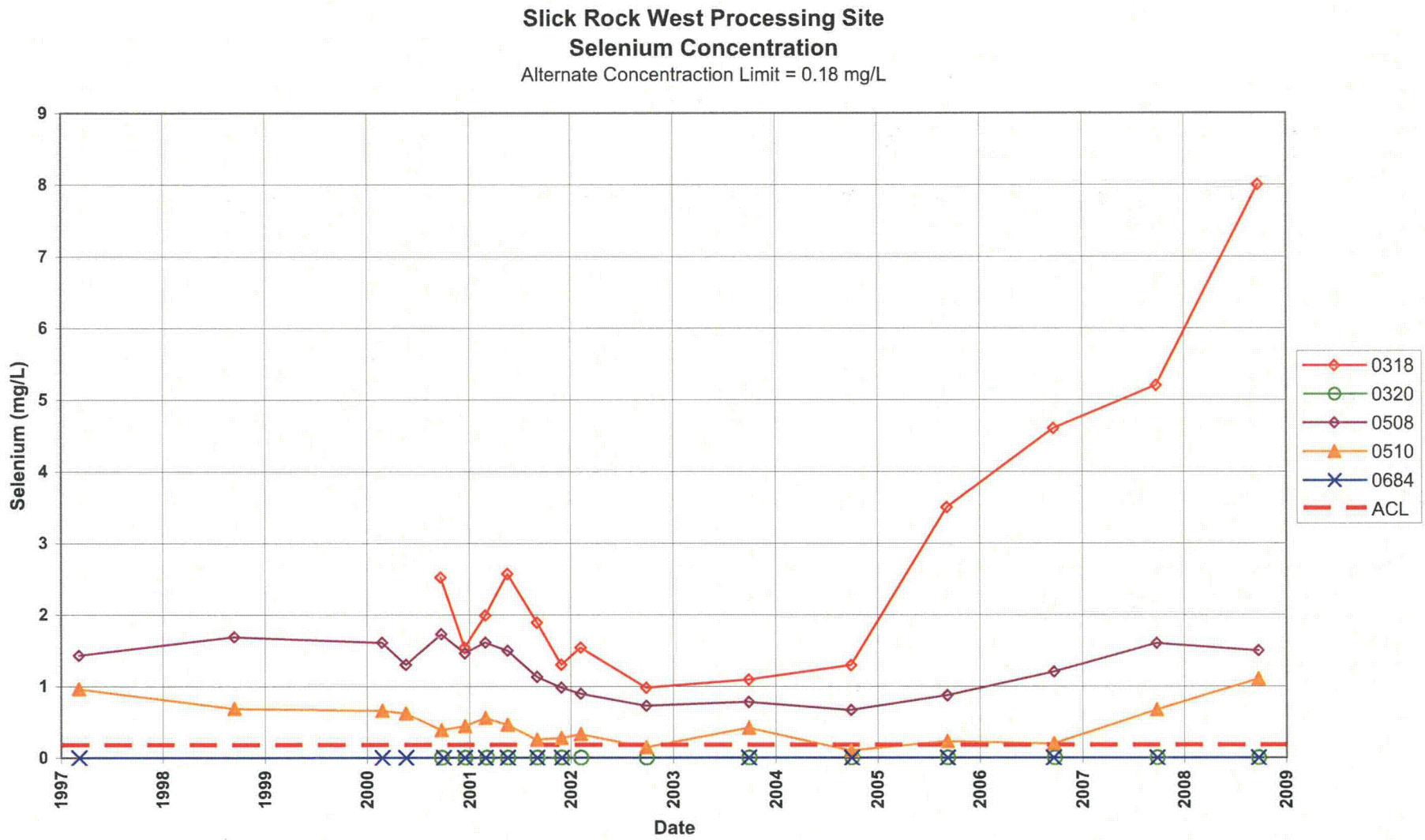

Slick Rock West Processing Site
Manganese Concentration
Maximum Background Concentration = 3.5 mg/L
Manganese (mg/L)
14
12
10
8
6
4
2
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Date
0318
0320
0508
0510
0684
MBC

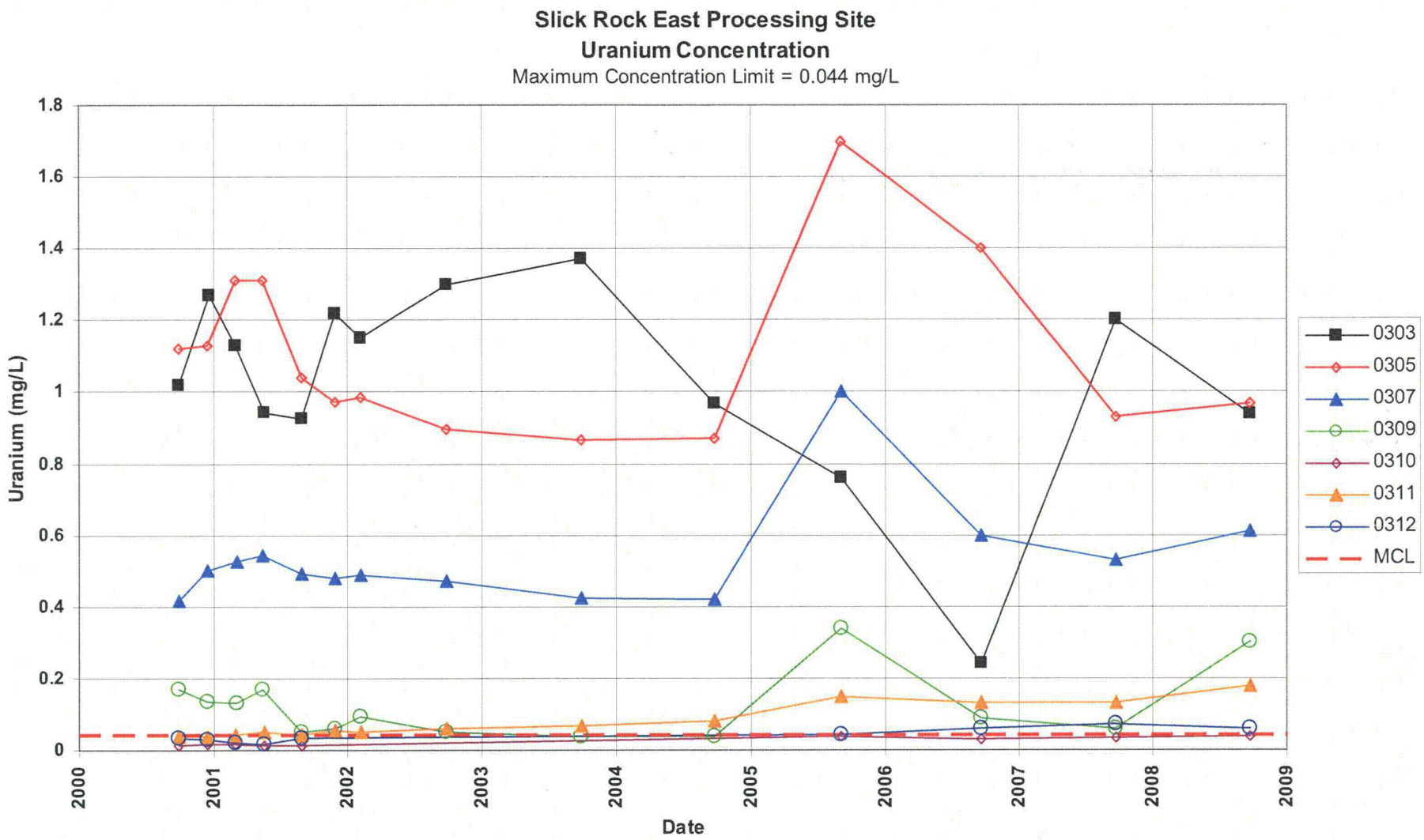

Slick Rock West Processing Site
Molybdenum Concentration
Maximum Concentration Limit = 0.1 mg/L
Molybdenum (mg/L)
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Date
0317
0318
0320
0508
0510
0684
MCL

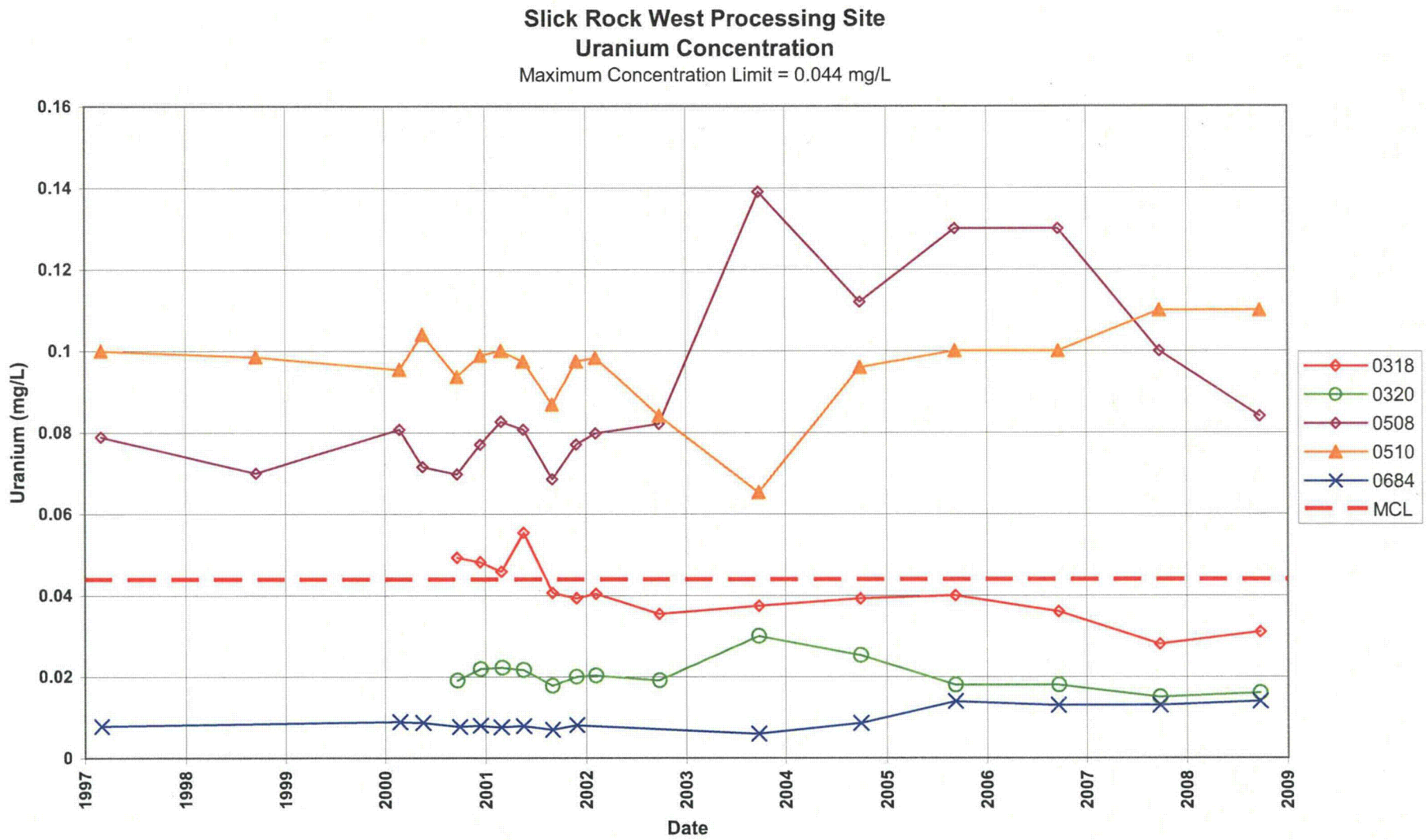

Slick Rock West Processing Site
Nitrate + Nitrite as Nitrogen Concentration
Maximum Concentration limit = 10.0 mg/L
Nitrate + Nitrite as Nitrogen (mg/L)
1000
900
800
700
600
500
400
300
200
100
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Date
0318
0320
0508
0510
0684
MCL

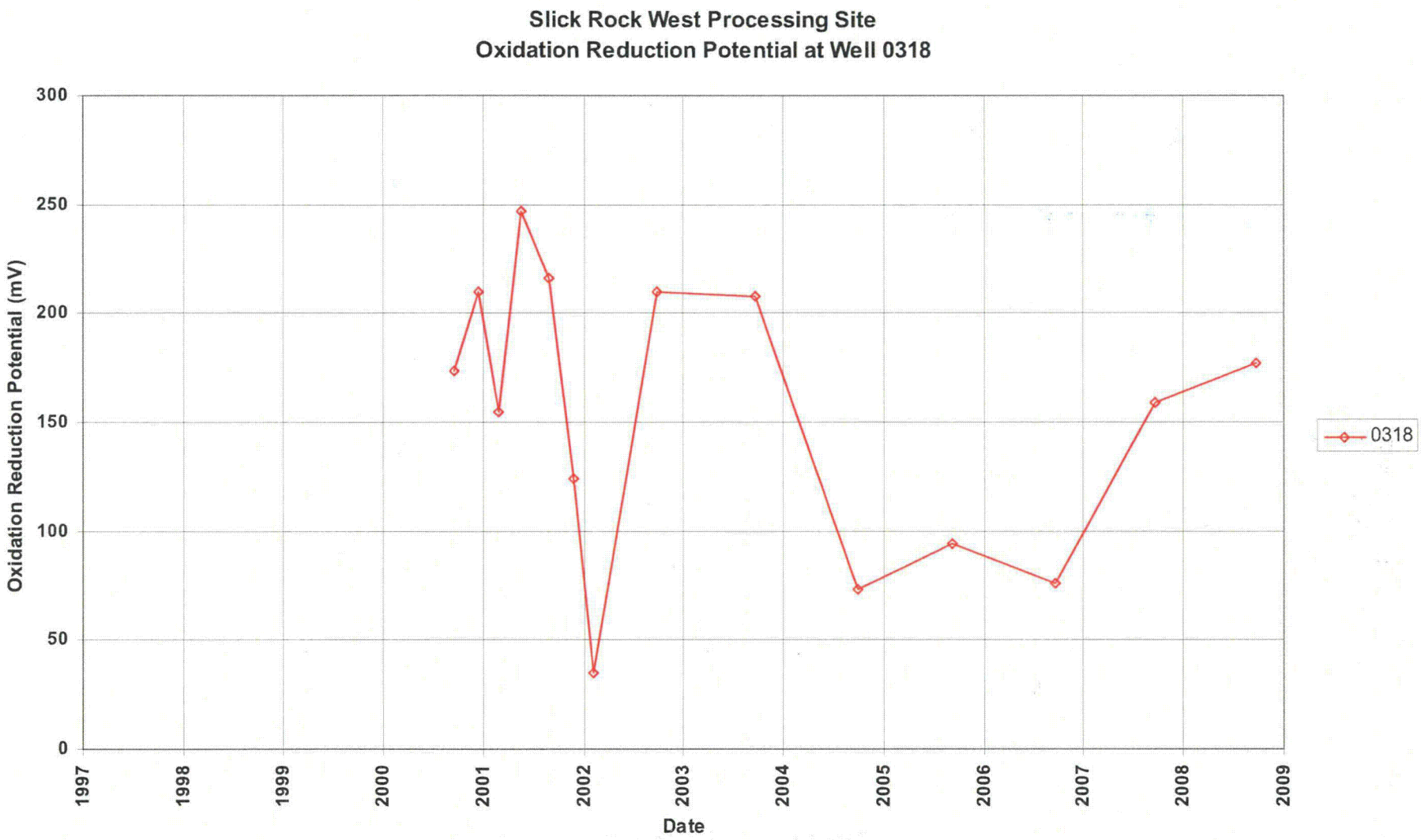

Slick Rock West Processing Site
Radium-226+228 Concentration
Maximum Concentration Limit = 5.0 pCi/L
Radium-226+228 (pCi/L)
0
1
2
3
4
5
6
7
8
9
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Date
0319
MCL


Slick Rock East Processing Site
Selenium Concentration
Maximum Concentration Limit = 0.01 mg/L
Selenium (mg/L)
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Date
0305
0307
MCL


Slick Rock West Processing Site
Selenium Concentration
Alternate Concentraction Limit = 0.18 mg/L
Selenium (mg/L)
0
1
2
3
4
5
6
7
8
9
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Date
0318
0320
0508
0510
0684
ACL


Slick Rock East Processing Site
Uranium Concentration
Maximum Concentration Limit = 0.044 mg/L
Uranium (mg/L)
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Date
0303
0305
0307
0309
0310
0311
0312
MCL


Slick Rock West Processing Site
Uranium Concentration
Maximum Concentration Limit = 0.044 mg/L
Uranium (mg/L)
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Date
0318
0320
0508
0510
0684
MCL


Slick Rock West Processing Site
Oxidation Reduction Potential at Well 0318
Oxidation Reduction Potential (mV)
300
250
200
150
100
50
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
Date
0318

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Attachment 3
Sampling and Analysis Work Order

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Stoller established 1959

Task Order LM00-501
Control Number 08-0652

August 18, 2008

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

SUBJECT: Contract No. DE-AM01-07LM00060, Stoller
September 2008 Environmental Sampling at Slick Rock, Colorado

Reference: Task Order LM00-501-02-120-402, Slick Rock, CO, Processing Sites

Dear Mr. Bush:

The purpose of this letter is to inform you of the upcoming sampling event at Slick Rock, Colorado. Enclosed are the map and tables specifying sample locations and analytes for routine monitoring at the Slick Rock Processing Sites. Water quality data will be collected at this site as part of the routine environmental sampling currently scheduled to begin the week of September 22, 2008.

The following lists show the monitor wells and surface locations scheduled for sampling during this event.

Monitor Wells*

West Site

317 Je	318 Al	319 Al	320 Al	508 Al	510 Al	684 Al

East Site

303 Al	305 Al	307 Al	309 Al	310 Al	311 Al	312 Al

*NOTE: Al = Alluvium; Je = Jurassic Entrada Sandstone

Surface Water

West Site

347	349	693	694

East Site

692	696	700

All samples will be collected as directed in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management*. Access agreements are covered under the cooperative agreement.

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

If you have any questions, please call me at extension 6056.

Sincerely,

Ed Cotter
Site Lead

EC/lcg/hc
Enclosures (3)

cc: (electronic)
Cheri Bahrke, Stoller
Ed Cotter, Stoller
Steve Donivan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
EDD Delivery

cc w/o enclosures:
(rc-grand.junction) Records SRE 410.02
(rc-grand.junction) Records SRW 410.02

Constituent Sampling Breakdown

Site	Slick Rock				
Analyte	Ground Water	Surface Water	Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Approx. No. Samples/yr	14	7			
Field Measurements					
Alkalinity	X	X			
Dissolved Oxygen					
Redox Potential	X	X			
pH	X	X			
Specific Conductance	X	X			
Turbidity	X	X			
Temperature	X	X			
Laboratory Measurements					
Aluminum					
Ammonia as N (NH3-N)					
Antimony					
Arsenic					
Calcium					
Chloride					
Chromium					
Cobalt					
Gross Alpha					
Gross Beta					
Iron					
Lead					
Magnesium					
Manganese	0318, 0320, 0508, 0510, 0684	0347, 0349, 0693, 0694	0.005	SW-846 6010	LMM-01
Molybdenum	0318, 0320, 0508, 0510, 0684	0347, 0349, 0693, 0694	0.003	SW-846 6020	LMM-02
Nickel					
Nitrate + Nitrite as N (NO3+NO2)-N	0318, 0320, 0508, 0510, 0684	0347, 0349, 0693, 0694	0.05	EPA 353.1	WCH-A-022
Potassium					
Radium-226	0319				GPC-A-018
Radium-228	0319				GPC-A-020
Selenium	0305, 0307, 0318, 0320, 0508, 0510, 0684	0347, 0349, 0693, 0694	0.0001	SW-846 6020	LMM-02
Sodium					
Strontium					
Sulfate					
Sulfide					
Total Dissolved Solids	✓				
Total Organic Carbon					
Tritium					
Uranium	0303, 0305, 0307, 0309, 0310, 0311, 0312, 0318, 0320, 0508, 0510, 0684	X	0.0001	SW-846 6020	LMM-02
Vanadium					
VOCs (BETX)	0319 only		0.005	SW-846 8260	VOA-A-009
Zinc					
Total No. of Analytes	8	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.

Sampling Frequencies for Locations at Slick Rock, Colorado

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitor Wells						
Union Carbide						
317			X			
318			X			
319			X			
320			X			
508			X			
510			X			
684			X			
North Continent						
303			X			
305			X			
307			X			
309			X			
310			X			
311			X			
312			X			
Surface Locations						
Union Carbide						
347			X			
349			X			
693			X			
694			X			
North Continent						
692			X			
696			X			
700			X			

Sampling conducted in September

Attachment 4
Trip Report

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Stoller
Grand Junction Office
established 1959

Memorandum

DATE: October 7, 2008

TO: Ed Cotter

FROM: Gretchen Baer

SUBJECT: Sampling Trip Report

Site: Slick Rock, Colorado — East and West sites

Dates of Sampling Event: September 22-24, 2008

Team Members: Gretchen Baer and Kent Moe

Number of Locations Sampled: 14 monitor wells and 7 surface locations.

Locations Not Sampled/Reason: All scheduled locations were sampled.

Location Specific Information:

Ticket Number	Location	Sample Date	Description	Notes
GKR 102	0310	9/22/08	Category I	
GKR 094	0311	9/22/08	Category I	
GKR 103	0312	9/22/08	Category I	
GKR 098	0694	9/22/08	Surface water	Filtered. Sampled by bailing with dedicated bottles.
GKR 097	0693	9/22/08	Surface water	Filtered. Sampled with hose reel.
GKR 100	0696	9/22/08	Surface water	Filtered. Sampled by bailing with dedicated bottles.
GKR 088	0684	9/23/08	Category I	--Sprayed for wasps on 9/22/08. --Field duplicate 2404 taken.
GKR 085	0320	9/23/08	Category I	
GKR 083	0319	9/23/08	Category I	--Water has a strong fuel odor. --Small bubbles appeared on the inside walls of the VOA vials when HCl was added. This will cause some headspace to form. --Field duplicate 2498 taken.
GKR 096	0349	9/23/08	Surface water	Filtered. Sampled with hose reel.
GKR 087	0510	9/23/08	Category I	
GKR 086	0508	9/23/08	Category I	
GKR 095	0347	9/23/08	Surface water	Filtered. Sampled with hose reel.
GKR 084	0318	9/23/08	Category I	
GKR 089	0317	9/23/08	Category I	

Ticket Number	Location	Sample Date	Description	Notes
GKR 093	0309	9/23/08	Category I	
GKR 104	0700	9/23/08	Surface water	Filtered. Sampled with hose reel.
GKR 091	0307	9/24/08	Category I	
GKR 099	0692	9/24/08	Surface water	Filtered. Sampled with hose reel.
GKR 090	0305	9/24/08	Category I	
GKR 092	0303	9/24/08	Category I	

Field Variance: As directed by the site lead, alkalinity measurements were not taken at any location.

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

False ID	True ID	Sample Type	Associated Matrix	Ticket Number	Notes
2404	0684	Duplicate	Groundwater	GKR 106	
2498	0319	Duplicate	Groundwater	GKR 101	
2500	----	Trip Blank	Groundwater	GKR 105	Created in Bldg 32 (GJO) on 9/25/08 using boiled Milli-Q water.
2676	----	Equipment Blank	Surface water	GKS 564	Rinse water from hose reel that was used to collect surface water samples 0347, 0349, 0693, 0692, 0700.

RIN Number Assigned: All samples were assigned to RIN 08091835.

Sample Shipment: Samples were shipped overnight by FedEx to Paragon Analytics, Inc., Fort Collins, CO, from Grand Junction, CO, on September 25, 2008.

Well Inspection Summary: Well inspections were conducted at all sampled wells. All wells were in good condition. Well 0684 had an active wasp nest inside the outer casing. The nest was sprayed with insecticide before sampling. Well 0319 emanates a strong fuel-like odor.

Equipment: The wells were sampled using the low-flow procedure with a peristaltic pump and the appropriate dedicated equipment.

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

Fences, Gates, Locks: All were in good condition.
Signs: No missing or vandalized signs were observed.
Trespassing/Site Disturbances: N/A

Site Issues: Because of very thick brush, most locations in the East Site and the eastern section of the West Site are difficult to reach by truck. It is highly recommended that ATVs be used to access these locations. Surface water locations 0692 and 0700 are particularly hard to reach. Currently, there is an animal path to the open bank at 0692. Eventually, brush may need to be cut back to reach 0700.

Disposal Cell/Drainage Structure Integrity: N/A
Vegetation/Noxious Weed Concerns: None
Maintenance Requirements: In future events, brush may need to be pruned back at some locations.

Corrective Action Taken/Required: None.

(GRB/lcg)

cc: (electronic)
Rich Bush, LM–50
Steve Donivan, Stoller
EDD Delivery

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