Data Validation Package

June 2012
Groundwater Sampling at the Durango, Colorado, Processing and Disposal Sites

August 2012

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Durango, Colorado, Disposal and Processing Sites

Sampling Period: June 25–27, 2012

Annual groundwater sampling was conducted at the Durango, Colorado, Disposal and Processing sites as specified is the applicable site documents. Sampling and analysis was conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PLN/S04351, continually updated). Water levels were measured at each sampled well.

The 2011 *Long-Term Surveillance Plan for the Durango Disposal Site, Durango, Colorado* (LTSP), requires annual monitoring to verify the performance of the disposal cell. Point-of-compliance wells 0607, 0612, and 0621, and monitoring wells 0605, 0608, 0618, and 0623 were sampled as specified in the plan. The concentrations of the indicator parameters (molybdenum, selenium, and uranium) in the point of compliance wells were below their respective 2011 LTSP approved concentration limits of 0.22 milligram per liter (mg/L), 0.42 mg/L, and 0.077 mg/L. The uranium concentration in monitoring well 0618 has been generally increasing since 2005 and is now 0.131 mg/L, however, well 0618 is not a point of compliance well and is monitored as a best management practice only.

The 2003 *Preliminary Final Ground Water Compliance Action Plan for the Durango, Colorado, UMTRA Project Site* requires annual monitoring of groundwater and surface water from the Mill Tailings area to determine progress of the natural flushing process in meeting compliance standards. Surface water sampling required in the plan was not included this event and will be performed in September 2012. Surface water sampling has been changed to a September date to coincide with low–flow conditions in the Animas River, and this change is planned to continue in future years. Groundwater samples were also collected at the Raffinate Pond area as a best management practice to monitor selenium and uranium concentrations.

EPA groundwater standards for cadmium, selenium, and uranium were exceeded in samples collected from processing site monitoring wells as shown in Table 1 on the following page. In reviewing the time-concentration graphs included in this report, the results from this sampling event are generally consistent with contaminant concentrations previously observed.

Table 1. Durango Processing Site Wells Exceeding EPA Standards in June 2012

Analyte	Standard[a]	Cleanup Goal[b]	Site Code[c]	Location	Concentration (mg/L)
Cadmium	0.01	Not applicable	DUR01	0612	0.057
Selenium	0.01	0.05	DUR01	0630	0.017
Selenium	0.01	0.05	DUR02	0594	0.016
				0598	0.27
				0607	0.35
				0879	0.038
				0884	0.62
Uranium	0.044	Not applicable	DUR01	0612	1.3
				0617	0.18
				0630	0.29
				0631	0.075
				0633	0.74
Uranium	0.044	Not applicable	DUR02	0594	0.054
				0598	0.10
				0879	0.086
				0884	0.14

[a] Standards are listed in 40 CFR 192.02 Table 1 to Subpart A; concentrations are in mg/L.
[b] Cleanup goal for selenium from the 2003 *Preliminary Final Ground Water Compliance Action Plan for the Durango, Colorado, UMTRA Project Site*. Concentrations are in mg/L.
[c] DUR01 = Mill Tailings Area; DUR02 = Raffinate Ponds Area.

David Miller
Site Lead, S.M. Stoller Corporation

9/12/12
Date

Durango, Colorado, Disposal Site, Sample Location Map

Durango, Colorado, Processing Site, Sample Location Map

Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Durango, Colorado	**Date(s) of Water Sampling**	June 25–27, 2012
Date(s) of Verification	August 2, 2012	**Name of Verifier**	Steve Donivan

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List other documents, SOPs, instructions.		Work Order letter dated May 24, 2012.
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Was a pre-trip calibration conducted as specified in the above-named documents?	Yes	Pre-trip calibration was performed on June 22, 2012.
4. Was an operational check of the field equipment conducted daily?	Yes	
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
6. Was the category of the well documented?	Yes	
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	Yes	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	NA	

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	Yes	
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	Duplicate samples were collected from wells DUR01-0863, DUR03-0612, and DUR03-0621.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated 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?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members (hardcopies) or are dates present for the “Date Signed” fields (FDCS)?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN):	12064648
Sample Event:	June 26–27, 2012
Site(s):	Durango, Colorado
Laboratory:	ALS Laboratory Group
Work Order No.:	1206415
Analysis:	Metals and Wet Chemistry
Validator:	Steve Donivan
Review Date:	August 1, 2012

This validation was performed according to the *Environmental Procedures Catalog* (LMS/PRO/S04325, continually updated), "Standard Practice for Validation of Laboratory Data." The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation of 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
Chloride	MIS-A-045	SW-846 9056	SW-846 9056
Metals: Ca, Fe, K, Mg, Mn, Na	LMM-01	SW-846 3005A	SW-846 6010B
Metals: Cd, Mo, Se, U	LMM-02	SW-846 3005A	SW-846 6020A
Sulfate	MIS-A-045	SW-846 9056	SW-846 9056
Total Dissolved Solids	WCH-B-033	EPA 160.1	EPA 160.1

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(s)	Flag	Reason
1206415-15	0605	Iron	U	Less than 5 times the method blank
1206415-16	0607	Iron	U	Less than 5 times the method blank
1206415-17	0612	Iron	U	Less than 5 times the method blank
1206415-18	0612 Duplicate	Iron	U	Less than 5 times the method blank

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 18 water samples on June 29, 2012, accompanied by a Chain of Custody (COC) form. The receiving documentation included copies of the shipping labels listing the air waybill numbers. The 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 form had no errors or omissions.

Preservation and Holding Times

The sample shipment was received cool and intact with temperatures within the iced cooler at 0.8 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

Detection and Quantitation Limits

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

Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure that the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods. All calibration and laboratory spike standards were prepared from independent sources.

Method SW-846 6010B
Calibrations for calcium, iron, magnesium, manganese, potassium, and sodium were performed on July 18, 2012, using four (three for manganese) 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 MDLs. Initial and continuing calibration verification checks were made at the required frequency resulting in 29 verification checks. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results were within the acceptance range.

Method SW-846 6020A
Calibrations for cadmium, molybdenum, selenium, and uranium were performed on July 18, 2012 using four calibration standards. The calibration curve correlation coefficient

values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDLs. Initial and continuing calibration verification checks were made at the required frequency resulting in 15 verification checks. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results were within the acceptance range with the exception of cadmium. The associated sample cadmium results were either below the MDL or greater than 5 times the PQL, not requiring qualification. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

Method SW-846 9056
Initial calibrations were performed for chloride and sulfate using five calibration standards on June 12, 2012. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in nine verification checks. All calibration check results were within the acceptance criteria.

Method EPA 160.1
There are no calibration requirements associated with the determination of total dissolved solids.

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. All method blank and calibration blank results associated with the samples were below the PQLs for all analytes with the exception of three sulfate calibration blanks. Sample results associated with these blanks were greater than 10 times the blank concentration. 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 results were greater than 5 times the MDL and required no qualification.

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

ICP interference check samples ICSA and ICSAB were analyzed at the required frequency to verify the instrumental interelement and background correction factors. All check sample results met the acceptance criteria.

Matrix Spike Analysis

Matrix spike and matrix spike duplicate (MS/MSD) samples are used to measure method performance in the sample matrix. The MS/MSD data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike concentration. The spikes met the recovery and precision criteria for all analytes evaluated. Matrix spikes are not required for

sodium, potassium, magnesium, and calcium; these results were evaluated only for acceptable precision.

Laboratory Replicate Analysis

Laboratory replicate sample results demonstrate acceptable laboratory precision. The relative percent difference values for the sample replicates and matrix spike replicates were less than 20 percent for results that are greater than 5 times the PQL, indicating acceptable precision for all analytes.

Laboratory Control Sample

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

Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Serial dilution data are evaluated when the concentration of the undiluted sample is greater than 50 times the MDL. The serial dilution data met the acceptance criteria for all data evaluated.

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.

Chromatography Peak Integration

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

Electronic Data Deliverable (EDD) File

The EDD file received arrived on July 25, 2012. 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: 12064648 **Lab Code:** PAR **Validator:** Steve Donivan **Validation Date:** 7/31/2012

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

# of Samples: 18 **Matrix:** WATER **Requested Analysis Completed:** Yes

Chain of Custody

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

Sample

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

Select Quality Parameters

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

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 12064648 **Lab Code:** PAR **Date Due:** 7/27/2012

Matrix: Water **Site Code:** DUR **Date Completed:** 7/26/2012

Analyte	Method Type	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R^2	ICV	CCV	ICB	CCB								
Cadmium	ICP/MS	07/18/2012	0.0000	1.0000	OK	OK	OK	OK	OK	108.0	93.0	95.0	1.0	103.0	5.0	147.0
Calcium	ICP/ES	07/18/2012	0.0000	1.0000	OK	OK	OK	OK	OK	100.0	103.0	99.0	1.0	106.0	1.0	106.0
Iron	ICP/ES	07/18/2012	0.0000	1.0000	OK	OK	OK	OK	OK	103.0	95.0	95.0	0.0	106.0		127.0
Magnesium	ICP/ES	07/18/2012	0.0000	1.0000	OK	OK	OK	OK	OK	101.0	105.0	101.0	1.0	106.0	1.0	106.0
Manganese	ICP/ES	07/18/2012	0.0000	1.0000	OK	OK	OK	OK	OK	97.0	96.0	95.0	1.0	95.0	7.0	104.0
Manganese	ICP/ES	07/18/2012	0.0000	1.0000	OK	OK	OK	OK	OK				0.0		5.0	
Molybdenum	ICP/MS	07/18/2012	0.0000	1.0000	OK	OK	OK	OK	OK	102.0	99.0	106.0	7.0	97.0	5.0	100.0
Molybdenum	ICP/MS	07/18/2012									101.0	101.0	0.0			
Potassium	ICP/ES	07/18/2012	0.0000	1.0000	OK	OK	OK	OK	OK	95.0	128.0	127.0	1.0		9.0	87.0
Selenium	ICP/MS	07/18/2012	0.0000	1.0000	OK	OK	OK	OK	OK	99.0				102.0		106.0
Selenium	ICP/MS	07/19/2012	0.0000	1.0000	OK	OK	OK	OK			98.0	96.0	2.0	100.0		99.0
Selenium	ICP/MS	07/19/2012									107.0	108.0	1.0			80.0
Sodium	ICP/ES	07/18/2012	0.0000	1.0000	OK	OK	OK	OK	OK	100.0			1.0		10.0	86.0
Uranium	ICP/MS	07/18/2012			OK	OK	OK	OK	OK	106.0	103.0	109.0	5.0	104.0	3.0	110.0
Uranium	ICP/MS	07/18/2012											0.0			

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 12064648 **Lab Code:** PAR **Date Due:** 7/27/2012

Matrix: Water **Site Code:** DUR **Date Completed:** 7/26/2012

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB						
CHLORIDE	07/03/2012	0.000	1.0000	OK	OK	OK	OK	OK	96.00	102.0	102.0	0	
SULFATE	07/03/2012	0.000	1.0000	OK	OK	OK	OK	OK	98.00	108.0	108.0	0	
SULFATE	07/03/2012									104.0			
TOTAL DISSOLVED SOLIDS	07/03/2012							OK	107.00			1.00	

General Information

Report Number (RIN):	12064650
Sample Event:	June 25, 2012
Site(s):	Durango Treatment System
Laboratory:	GEL Laboratories
Work Order No.:	306703
Analysis:	Metals, Wet Chemistry, Radiochemistry
Validator:	Steve Donivan
Review Date:	August 1, 2012

This validation was performed according to the *Environmental Procedures Catalog* (LMS/PRO/S04325, continually updated), "Standard Practice for Validation of Laboratory Data." The procedure was applied at Level 2, Data Verification. 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
Calcium, Chromium, Iron, Potassium, Magnesium, Manganese, Sodium, Vanadium	LMM-01	SW-846 3005A	SW-846 6010B
Arsenic, Barium, Cadmium, Molybdenum, Selenium, Uranium, Vanadium	LMM-02	SW-846 3005A	SW-846 6020A
Radon-222	ASP-A-012	SM 7500 Rn B	SM 7500 Rn B
Uranium Isotopes	LMR-02	U-02-RC Modified	U-02-RC Modified
Chloride	MIS-A-045	SW-856 9056	SW-856 9056
Sulfate	MIS-A-045	SW-856 9056	SW-856 9056
Alkalinity, Total	WCH-A-002	SM 2320B	SM 2320B
Nitrate + Nitrite as N	WCH-A-022	EPA 353.2	EPA 353.2
Total Dissolved Solids	WCH-A-033	SM 2540C	SM 2540C

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
306703001	0608	Molybdenum	U	Less than 5 times the method blank
306703001	0608	Uranium-235	J	Less than the Determination Limit
306703003	0621	Uranium-235	U	Less than the Decision Level Concentration
306703003	0621	Uranium-238	J	Less than the Determination Limit
306703005	0623	Radon-222	J	Less than the Determination Limit
306703006	0621 Duplicate	Radon-222	J	Less than the Determination Limit
306703006	0621 Duplicate	Uranium-234	J	Less than the Determination Limit
306703006	0621 Duplicate	Uranium-238	U	Less than the Decision Level Concentration

Sample Shipping/Receiving

GEL Laboratories in Charleston, South Carolina, received six water samples on June 27, 2012, accompanied by a 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 with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The COC form had no errors or omissions.

Preservation and Holding Times

The sample shipments were received intact with the temperatures inside the iced cooler at 4.0 °C, 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.

Detection and Quantitation Limits

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

For radiochemical analytes (those measured by radiometric counting) the MDL and PQL are not applicable, and these results are evaluated using the minimum detectable concentration (MDC), Decision Level Concentration (DLC), and Determination Limit (DL). The MDC is a measure of radiochemical method performance and was calculated and reported as specified in *Quality Systems for Analytical Services*. The DLC is the minimum concentration of an analyte that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, and is estimated as 3 times the one-sigma total propagated uncertainty. Results that are greater than the MDC, but less than the DLC are qualified with a "U" flag (not detected). The DL for radiochemical results is the lowest concentration that can be reliably measured, and is defined as 3 times the MDC. Results not previously "U" qualified that are less than the DL are qualified with a "J" flag as estimated values.

The reported MDLs for all metal, organic, and wet chemical analytes, and MDCs for radiochemical analytes demonstrate compliance with contractual requirements.

Laboratory Instrument Calibration

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for all analytes. Initial calibration demonstrates that the instrument is capable of acceptable performance in the beginning of the analytical run and of producing a linear curve. Compliance requirements for continuing calibration checks are established to ensure that the instrument continues to be capable of producing acceptable qualitative and quantitative data. All laboratory instrument calibrations were performed correctly in accordance with the cited methods.

Radiochemical Analysis

Alpha Spectrometry
Alpha spectrometry calibrations and instrument backgrounds were performed within a month prior to sample analysis. Calibration standards were counted to obtain a minimum of 10,000 counts per peak. Daily instrument checks met the acceptance criteria. The tracer recoveries met the acceptance criteria of 30 to 110 percent for all samples. All internal standard peak width values were below 100 kiloelectron volts demonstrating acceptable resolution. All internal standard peaks were within 50 kiloelectron volts of the expected position. The regions of interest for analyte peaks were reviewed. All regions of interest were satisfactory and all integrations were performed correctly.

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. All method blank and calibration blank results associated with the samples were below the MDL.

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

MS/MSD samples are used to measure 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 spikes met the recovery and precision criteria for all analytes evaluated.

Laboratory Replicate Analysis

Laboratory replicate sample results demonstrate acceptable laboratory precision. The relative percent difference values for the sample replicates and matrix spike replicates were less than 20 percent for results that are greater than 5 times the PQL, indicating acceptable precision.

Laboratory Control Sample

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

Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Serial dilution data are evaluated when the concentration of the undiluted sample is greater than 50 times the MDL. The serial dilution results met the acceptance criteria for all analytes evaluated.

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 samples.

Completeness

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

Anion/Cation Balance

The anion/cation balance is used to determine if major ion concentrations have been quantified correctly. The total anions should balance with (be equal to) the total cations when expressed in milliequivalents per liter. Table 6 shows the total anion and cation results in groundwater samples from this event and the charge balance, which is a relative percent difference calculation. Typically, a charge balance difference of 10 percent is considered acceptable.

Table 6. Comparison of Major Anions and Cations in Water Samples

Site Code	Location	Cations (meq/L)	Anions (meq/L)	Charge Balance (%)
DUR03	0608	17.88	18.59	2.0
DUR03	0618	28.80	31.47	4.4
DUR03	0621	57.42	69.55	9.6
DUR03	0623	43.50	43.03	0.5

The charge balance values met the acceptance criteria, indicating acceptable analytical performance.

EDD File

The EDD file was received on July 30, 2012. 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: 12064650 **Lab Code:** GEN **Validator:** Steve Donivan **Validation Date:** 8/1/2012

Project: Durango Treatment System **Analysis Type:** ☑ Metals ☑ General Chem ☑ Rad ☐ Organics

# of Samples: 5 **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	There are 0 detection limit failures.
☐ Field/Trip Blanks	
☑ Field Duplicates	There was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 12064650 **Lab Code:** GEN **Date Due:** 7/25/2012

Matrix: Water **Site Code:** DUR02 **Date Completed:** 7/25/2012

Analyte	Method Type	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R^2	ICV	CCV	ICB	CCB								
Arsenic	ICP/MS	07/13/2012			OK	OK	OK	OK	OK	107.0	104.0			107.0		97.0
Barium	ICP/MS	07/13/2012			OK	OK	OK	OK	OK	105.0	101.0		1.0	100.0		102.0
Cadmium	ICP/MS	07/13/2012			OK	OK	OK	OK	OK	106.0	99.7			104.0		107.0
Calcium	ICP/ES	07/04/2012			OK	OK	OK	OK	OK				1.0	97.0	0.6	104.0
Chromium	ICP/ES	07/04/2012			OK	OK	OK	OK	OK	99.9	93.3			101.0		99.0
Iron	ICP/ES	07/04/2012			OK	OK	OK	OK	OK	104.0	99.7		1.0	92.0	3.1	108.0
Magnesium	ICP/ES	07/04/2012			OK	OK	OK	OK	OK				1.0	95.0	0.6	105.0
Manganese	ICP/ES	07/04/2012			OK	OK	OK	OK	OK	100.0	96.2			101.0		104.0
Molybdenum	ICP/MS	07/13/2012			OK	OK	OK	OK	OK	105.0	103.0		2.0	94.0		105.0
Potassium	ICP/ES	07/04/2012			OK	OK	OK	OK	OK	105.0	109.0		1.0	111.0	2.5	101.0
Selenium	ICP/MS	07/13/2012			OK	OK	OK	OK	OK	105.0	100.0			103.0		103.0
Sodium	ICP/ES	07/04/2012			OK	OK	OK	OK	OK				0.0	108.0	0.2	101.0
Uranium	ICP/MS	07/13/2012			OK	OK	OK	OK	OK				7.0	115.0	0.6	118.0
Vanadium	ICP/ES	07/04/2012			OK	OK	OK	OK	OK	103.0	104.0			107.0		102.0

SAMPLE MANAGEMENT SYSTEM
Radiochemistry Data Validation Worksheet

RIN: 12064650 **Lab Code:** GEN **Date Due:** 7/25/2012

Matrix: Water **Site Code:** DUR02 **Date Completed:** 7/25/2012

Sample	Analyte	Date Analyzed	Result	Flag	Tracer %R	LCS %R	MS %R	Duplicate
0608	Radon-222	06/28/2012						0.37
Blank	Radon-222	07/02/2012	12.2000	U				
0608	Radon-222	07/02/2012					110.0	
Blank_Spike	Radon-222	07/02/2012				112.00		
0618	Uranium-233+234	07/09/2012			62.0			
0621	Uranium-233+234	07/09/2012			85.0			
0623	Uranium-233+234	07/09/2012			80.0			
2257	Uranium-233+234	07/09/2012			72.0			
0623	Uranium-233+234	07/09/2012			78.0			0.98
0623	Uranium-233+234	07/09/2012			77.0			
Blank	Uranium-233+234	07/09/2012	0.0110	U	79.0			
0608	Uranium-233+234	07/17/2012			52.0			
Blank	Uranium-235	07/09/2012	0.0040	U				
0623	Uranium-235/236	07/09/2012						0.40
0623	Uranium-235/236	07/09/2012						
0623	Uranium-238	07/09/2012						0.25
Blank_Spike	Uranium-238	07/09/2012				99.50		
0623	Uranium-238	07/09/2012					96.7	
Blank	Uranium-238	07/09/2012	0	U				

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 12064650 **Lab Code:** GEN **Date Due:** 7/25/2012

Matrix: Water **Site Code:** DUR02 **Date Completed:** 7/25/2012

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB						
ALKALINITY, Total as CaCO3	06/29/2012							OK	103.00	107.0		0	
ALKALINITY, Total as CaCO3	06/29/2012							OK	107.00				
Chloride	07/04/2012			OK	OK	OK	OK	OK	100.00				
Chloride	07/05/2012									118.0		0	
NO2+NO3 as N	06/29/2012			OK	OK	OK	OK	OK	102.00	85.0		0	
Sulfate	07/04/2012			OK	OK	OK	OK	OK	101.00	116.0		0	
Total Dissolved Solids	06/28/2012							OK	95.70			2.00	

Sampling Quality Control Assessment

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

Sampling Protocol

Well DUR01 0879 was sampled per Program Directive DUP-2012-02. The well was purged and sampled using high flow purging protocol.

All other monitoring wells were sampled using the low flow protocol and met the Category I or II low-flow sampling criteria. The 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. Well DUR03-0623 did not meet the Category I water level stability criteria, and wells DUR01-0634, DUR02-0607, DUR03-0605, and DUR03-0612 were classified as Category II due to water level drawdown. The sample results for these five wells were qualified with a "Q" flag, indicating the data are qualitative because of the sampling technique.

Equipment Blank Assessment

An equipment blank was not required. All monitoring wells were sampled using a peristaltic pump and dedicated tubing, or a dedicated bladder pump.

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 less than 5 times the PQL, the range should be no greater than the PQL. For radiochemical results, the relative error ratio should be less than 3. Duplicate samples were collected from wells DUR01-0863, DUR03-0612, and DUR03-0621. The duplicate results met the acceptance criteria demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 12064648 **Lab Code:** PAR **Project:** Durango **Validation Date:** 7/31/2012

Duplicate: 2171 **Sample:** 0863

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Cadmium	0.12	U		10	0.12	U		10			UG/L
Manganese	120			1	120			1	0		UG/L
Molybdenum	0.73	B		10	0.59	B		10			UG/L
Selenium	0.037	B		1	0.04	B		1			UG/L
SULFATE	680			20	680			20	0		MG/L
Uranium	0.18			10	0.16			10	11.76		UG/L

Duplicate: 2173 **Sample:** 0612

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Calcium	6500			1	6300			1	3.13		UG/L
CHLORIDE	58			5	57			5	1.74		MG/L
Iron	120			1	130			1	8.00		UG/L
Magnesium	4200			1	4100			1	2.41		UG/L
Manganese	5.8			1	5.5			1	5.31		UG/L
Molybdenum	0.32	U		10	0.32	U		10			UG/L
Potassium	9900			1	9900			1	0		UG/L
Selenium	0.069	B		1	0.049	B		1			UG/L
Sodium	1000000			50	1000000			50	0		UG/L
SULFATE	8.5			5	16			5			MG/L
TOTAL DISSOLVED SOLIDS	2800			1	2900			1	3.51		MG/L
Uranium	0.11			10	0.11			10			UG/L

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 12064650 **Lab Code:** GEN **Project:** Durango Treatment System **Validation Date:** 8/1/2012

Duplicate: 2257 **Sample:** 0621

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
ALKALINITY, Total as CaCO3	5.47			1.00	5.47			1.00	0		mg/L
Arsenic	1.70	U		1.00	1.70	U		1.00			ug/L
Barium	5.94	B		1.00	6.26	B		1.00	5.25		ug/L
Cadmium	0.223	B		1.00	0.23	B		1.00			ug/L
Calcium	413000			1.00	414000			1.00	0.24		ug/L
Chloride	11.5			1.00	11.6			1.00	0.87		mg/L
Chromium	1.00	U		1.00	1.00	U		1.00			ug/L
Iron	130000			1.00	130000			1.00	0		ug/L
Magnesium	336000			1.00	335000			1.00	0.30		ug/L
Manganese	2830			1.00	2830			1.00	0		ug/L
Molybdenum	0.165	U		1.00	0.165	U		1.00			ug/L
NO2+NO3 as N	0.085	U		5.00	0.017	U		1.00			mg/L
Potassium	11400			1.00	11400			1.00	0		ug/L
Radon-222	40.5	U	32.3	1.00	51.8		33.8	1.00		0.5	pCi/L
Selenium	1.50	U		1.00	1.50	U		1.00			ug/L
Sodium	204000			1.00	203000			1.00	0.49		ug/L
Sulfate	3320			200.00	3310			200.00	0.30		mg/L
Total Dissolved Solids	4370			1.00	4470			1.00	2.26		mg/L
Uranium	0.185	BN		1.00	0.125	BN		1.00			ug/L
Uranium-233+234	0.141		0.0508	1.00	0.128		0.0502	1.00		0.4	pCi/L
Uranium-235/236	0.0167		0.0165	1.00	0.00	U	0.00941	1.00		1.7	pCi/L
Uranium-238	0.0777		0.0358	1.00	0.0426		0.0279	1.00		1.5	pCi/L
Vanadium	1.00	U		1.00	1.00	U		1.00			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: 8-16-2012

Data Validation Lead: Steve Donivan — Date: 8-16-2012

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
Comparison: All Historical Data
Laboratory: ALS Laboratory Group
RIN: 12064648
Report Date: 8/3/2012

					Current			Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
						Qualifiers			Qualifiers			Qualifiers				
Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
DUR01	0617	N001	06/26/2012	Selenium	0.00083		F	0.16			0.0015		F	42	0	No
DUR01	0631	N001	06/26/2012	Uranium	0.075		F	0.63			0.11		F	25	0	No
DUR01	0635	N001	06/26/2012	Uranium	0.017		F	0.016		F	0.0044		L	25	0	No
DUR02	0884	N001	06/27/2012	Selenium	0.62		F	2.99		F	0.74		F	17	0	No
DUR03	0605	N001	06/27/2012	Uranium	0.00003	B	FQ	0.003	U		0.00004		FQ	42	30	No
DUR03	0612	N001	06/27/2012	Sulfate	8.5		FQ	925			13.2		L	29	0	No
DUR03	0608	N001	06/25/2012	Magnesium	89.3		F	250		F	100		F	65	0	No
DUR03	0608	N001	06/25/2012	Total Dissolved Solids	1090		F	2330			1180			60	0	No
DUR03	0618	N001	06/25/2012	Selenium	0.00398	B	F	0.03	U		0.0054			22	2	No
DUR03	0621	N001	06/25/2012	Sodium	204		F	200	E	FQJ	89		F	30	0	No
DUR03	0621	N002	06/25/2012	Sodium	203		F	200	E	FQJ	89		F	30	0	No
DUR03	0623	0001	06/25/2012	Chromium	0.001	U	FQ	0.01	U		0.00111	B		17	15	No
DUR03	0623	0001	06/25/2012	Sodium	197		FQ	176			79		FQ	37	0	No
DUR03	0623	0001	06/25/2012	Sulfate	1530		FQ	1520		QF	730		FQ	35	0	No

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

Attachment 2
Data Presentation

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Groundwater Quality Data
Durango Disposal Site

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Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/3/2012
Location: 0605 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/27/2012	N001	36	-	56	810		FQ	#		
Calcium	mg/L	06/27/2012	N001	36	-	56	130		FQ	#	0.012	
Chloride	mg/L	06/27/2012	N001	36	-	56	30		FQ	#	4	
Iron	mg/L	06/27/2012	N001	36	-	56	0.081	B	UFQ	#	0.0049	
Magnesium	mg/L	06/27/2012	N001	36	-	56	110		FQ	#	0.013	
Manganese	mg/L	06/27/2012	N001	36	-	56	0.029		FQ	#	0.00011	
Molybdenum	mg/L	06/27/2012	N001	36	-	56	0.00032	U	FQ	#	0.00032	
Oxidation Reduction Potential	mV	06/27/2012	N001	36	-	56	-161.2		FQ	#		
pH	s.u.	06/27/2012	N001	36	-	56	6.88		FQ	#		
Potassium	mg/L	06/27/2012	N001	36	-	56	8.8	N	FQ	#	0.11	
Selenium	mg/L	06/27/2012	N001	36	-	56	0.000039	B	FQ	#	0.000032	
Sodium	mg/L	06/27/2012	N001	36	-	56	300		FQ	#	0.033	
Specific Conductance	umhos /cm	06/27/2012	N001	36	-	56	2372		FQ	#		
Sulfate	mg/L	06/27/2012	N001	36	-	56	670		FQ	#	10	
Temperature	C	06/27/2012	N001	36	-	56	13.19		FQ	#		
Total Dissolved Solids	mg/L	06/27/2012	N001	36	-	56	1800		FQ	#	40	
Turbidity	NTU	06/27/2012	N001	36	-	56	3.41		FQ	#		
Uranium	mg/L	06/27/2012	N001	36	-	56	0.00003	B	FQ	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/3/2012
Location: 0607 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/27/2012	N001	36.7	-	56.7	426		F	#		
Calcium	mg/L	06/27/2012	N001	36.7	-	56.7	290		F	#	0.012	
Chloride	mg/L	06/27/2012	N001	36.7	-	56.7	13		F	#	1	
Iron	mg/L	06/27/2012	N001	36.7	-	56.7	0.12		UF	#	0.0049	
Magnesium	mg/L	06/27/2012	N001	36.7	-	56.7	200		F	#	0.013	
Manganese	mg/L	06/27/2012	N001	36.7	-	56.7	0.077		F	#	0.00011	
Molybdenum	mg/L	06/27/2012	N001	36.7	-	56.7	0.00032	U	F	#	0.00032	
Oxidation Reduction Potential	mV	06/27/2012	N001	36.7	-	56.7	-249		F	#		
pH	s.u.	06/27/2012	N001	36.7	-	56.7	6.79		F	#		
Potassium	mg/L	06/27/2012	N001	36.7	-	56.7	9		F	#	0.11	
Selenium	mg/L	06/27/2012	N001	36.7	-	56.7	0.000066	B	F	#	0.000032	
Sodium	mg/L	06/27/2012	N001	36.7	-	56.7	330		F	#	0.066	
Specific Conductance	umhos /cm	06/27/2012	N001	36.7	-	56.7	3358		F	#		
Sulfate	mg/L	06/27/2012	N001	36.7	-	56.7	1700		F	#	25	
Temperature	C	06/27/2012	N001	36.7	-	56.7	11.87		F	#		
Total Dissolved Solids	mg/L	06/27/2012	N001	36.7	-	56.7	3100		F	#	80	
Turbidity	NTU	06/27/2012	N001	36.7	-	56.7	4.83		F	#		
Uranium	mg/L	06/27/2012	N001	36.7	-	56.7	0.00027		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/3/2012
Location: 0608 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/25/2012	N001	29	-	39	330		F	#	0.725	
Alkalinity, Total (as $CaCO_3$)	mg/L	06/25/2012	N001	29	-	39	330		F	#		
Arsenic	mg/L	06/25/2012	N001	29	-	39	0.0017	U	F	#	0.0017	
Barium	mg/L	06/25/2012	N001	29	-	39	0.0289		F	#	0.0006	
Cadmium	mg/L	06/25/2012	N001	29	-	39	0.000164	B	F	#	0.00011	
Calcium	mg/L	06/25/2012	N001	29	-	39	150		F	#	0.05	
Chloride	mg/L	06/25/2012	N001	29	-	39	15.1		F	#	0.067	
Chromium	mg/L	06/25/2012	N001	29	-	39	0.001	U	F	#	0.001	
Iron	mg/L	06/25/2012	N001	29	-	39	0.276		F	#	0.03	
Magnesium	mg/L	06/25/2012	N001	29	-	39	89.3		F	#	0.11	
Manganese	mg/L	06/25/2012	N001	29	-	39	0.00261	B	F	#	0.002	
Molybdenum	mg/L	06/25/2012	N001	29	-	39	0.00132	B	UF	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	06/25/2012	N001	29	-	39	1.44		F	#	0.017	
Oxidation Reduction Potential	mV	06/25/2012	N001	29	-	39	127.2		F	#		
pH	s.u.	06/25/2012	N001	29	-	39	7.02		F	#		
Potassium	mg/L	06/25/2012	N001	29	-	39	4.91	B	F	#	0.05	
Radon-222	pCi/L	06/25/2012	N001	29	-	39	420		F	#	51	102
Selenium	mg/L	06/25/2012	N001	29	-	39	0.00269	B	F	#	0.0015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/3/2012
Location: 0608 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Sodium	mg/L	06/25/2012	N001	29	-	39	67.1		F	#	0.1	
Specific Conductance	umhos /cm	06/25/2012	N001	29	-	39	1496		F	#		
Sulfate	mg/L	06/25/2012	N001	29	-	39	551		F	#	2.66	
Temperature	C	06/25/2012	N001	29	-	39	12.59		F	#		
Total Dissolved Solids	mg/L	06/25/2012	N001	29	-	39	1090		F	#	3.4	
Turbidity	NTU	06/25/2012	N001	29	-	39	8.73		F	#		
Uranium	mg/L	06/25/2012	N001	29	-	39	0.0167	N	F	#	0.000067	
Uranium-234	pCi/L	06/25/2012	N001	29	-	39	5.78		F	#	0.0393	0.803
Uranium-235/236	pCi/L	06/25/2012	N001	29	-	39	0.168		FJ	#	0.0561	0.0658
Uranium-238	pCi/L	06/25/2012	N001	29	-	39	4.65		F	#	0.0393	0.657
Vanadium	mg/L	06/25/2012	N001	29	-	39	0.001	U	F	#	0.001	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/3/2012
Location: 0612 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/27/2012	N001	98.09 - 108.09	2285		FQ	#		
Calcium	mg/L	06/27/2012	N001	98.09 - 108.09	6.5		FQ	#	0.012	
Calcium	mg/L	06/27/2012	N002	98.09 - 108.09	6.3		FQ	#	0.012	
Chloride	mg/L	06/27/2012	N001	98.09 - 108.09	58		FQ	#	1	
Chloride	mg/L	06/27/2012	N002	98.09 - 108.09	57		FQ	#	1	
Iron	mg/L	06/27/2012	N001	98.09 - 108.09	0.12		UFQ	#	0.0049	
Iron	mg/L	06/27/2012	N002	98.09 - 108.09	0.13		UFQ	#	0.0049	
Magnesium	mg/L	06/27/2012	N001	98.09 - 108.09	4.2		FQ	#	0.013	
Magnesium	mg/L	06/27/2012	N002	98.09 - 108.09	4.1		FQ	#	0.013	
Manganese	mg/L	06/27/2012	N001	98.09 - 108.09	0.0058		FQ	#	0.00011	
Manganese	mg/L	06/27/2012	N002	98.09 - 108.09	0.0055		FQ	#	0.00011	
Molybdenum	mg/L	06/27/2012	N001	98.09 - 108.09	0.00032	U	FQ	#	0.00032	
Molybdenum	mg/L	06/27/2012	N002	98.09 - 108.09	0.00032	U	FQ	#	0.00032	
Oxidation Reduction Potential	mV	06/27/2012	N001	98.09 - 108.09	-278.8		FQ	#		
pH	s.u.	06/27/2012	N001	98.09 - 108.09	7.69		FQ	#		
Potassium	mg/L	06/27/2012	N001	98.09 - 108.09	9.9		FQ	#	0.11	
Potassium	mg/L	06/27/2012	N002	98.09 - 108.09	9.9		FQ	#	0.11	
Selenium	mg/L	06/27/2012	N001	98.09 - 108.09	0.000069	B	FQ	#	0.000032	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/3/2012
Location: 0612 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Selenium	mg/L	06/27/2012	N002	98.09 - 108.09	0.000049	B	FQ	#	0.000032	
Sodium	mg/L	06/27/2012	N001	98.09 - 108.09	1000		FQ	#	0.33	
Sodium	mg/L	06/27/2012	N002	98.09 - 108.09	1000		FQ	#	0.33	
Specific Conductance	umhos /cm	06/27/2012	N001	98.09 - 108.09	4106		FQ	#		
Sulfate	mg/L	06/27/2012	N001	98.09 - 108.09	8.5		FQ	#	2.5	
Sulfate	mg/L	06/27/2012	N002	98.09 - 108.09	16		FQ	#	2.5	
Temperature	C	06/27/2012	N001	98.09 - 108.09	14.87		FQ	#		
Total Dissolved Solids	mg/L	06/27/2012	N001	98.09 - 108.09	2800		FQ	#	80	
Total Dissolved Solids	mg/L	06/27/2012	N002	98.09 - 108.09	2900		FQ	#	80	
Turbidity	NTU	06/27/2012	N001	98.09 - 108.09	7.48		FQ	#		
Uranium	mg/L	06/27/2012	N001	98.09 - 108.09	0.00011		FQ	#	0.000029	
Uranium	mg/L	06/27/2012	N002	98.09 - 108.09	0.00011		FQ	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/3/2012
Location: 0618 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/25/2012	N001	29.77 - 49.77	372		F	#		
Alkalinity, Total (as $CaCO_3$)	mg/L	06/25/2012	N001	29.77 - 49.77	400		F	#	0.725	
Arsenic	mg/L	06/25/2012	N001	29.77 - 49.77	0.00337	B	F	#	0.0017	
Barium	mg/L	06/25/2012	N001	29.77 - 49.77	0.0167	B	F	#	0.0006	
Cadmium	mg/L	06/25/2012	N001	29.77 - 49.77	0.00011	U	F	#	0.00011	
Calcium	mg/L	06/25/2012	N001	29.77 - 49.77	239		F	#	0.05	
Chloride	mg/L	06/25/2012	N001	29.77 - 49.77	32.2		F	#	1.34	
Chromium	mg/L	06/25/2012	N001	29.77 - 49.77	0.001	U	F	#	0.001	
Iron	mg/L	06/25/2012	N001	29.77 - 49.77	0.03	U	F	#	0.03	
Magnesium	mg/L	06/25/2012	N001	29.77 - 49.77	142		F	#	0.11	
Manganese	mg/L	06/25/2012	N001	29.77 - 49.77	0.002	U	F	#	0.002	
Molybdenum	mg/L	06/25/2012	N001	29.77 - 49.77	0.000614	B	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	06/25/2012	N001	29.77 - 49.77	1.13		F	#	0.085	
Oxidation Reduction Potential	mV	06/25/2012	N001	29.77 - 49.77	48.8		F	#		
pH	s.u.	06/25/2012	N001	29.77 - 49.77	6.91		F	#		
Potassium	mg/L	06/25/2012	N001	29.77 - 49.77	2.14	B	F	#	0.05	
Radon-222	pCi/L	06/25/2012	N001	29.77 - 49.77	507		F	#	50.8	120
Selenium	mg/L	06/25/2012	N001	29.77 - 49.77	0.00398	B	F	#	0.0015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/3/2012
Location: 0618 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Sodium	mg/L	06/25/2012	N001	29.77	-	49.77	118		F	#	0.1	
Specific Conductance	umhos /cm	06/25/2012	N001	29.77	-	49.77	2319		F	#		
Sulfate	mg/L	06/25/2012	N001	29.77	-	49.77	1080		F	#	5.32	
Temperature	C	06/25/2012	N001	29.77	-	49.77	11.38		F	#		
Total Dissolved Solids	mg/L	06/25/2012	N001	29.77	-	49.77	1900		F	#	3.4	
Turbidity	NTU	06/25/2012	N001	29.77	-	49.77	3.19		F	#		
Uranium	mg/L	06/25/2012	N001	29.77	-	49.77	0.131	N	F	#	0.000335	
Uranium-234	pCi/L	06/25/2012	N001	29.77	-	49.77	39.8		F	#	0.079	5.32
Uranium-235/236	pCi/L	06/25/2012	N001	29.77	-	49.77	1.83		F	#	0.0668	0.319
Uranium-238	pCi/L	06/25/2012	N001	29.77	-	49.77	36.2		F	#	0.0468	4.85
Vanadium	mg/L	06/25/2012	N001	29.77	-	49.77	0.001	U	F	#	0.001	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/3/2012
Location: 0621 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/25/2012	N001	78.46 - 88.46	5.47		F	#	0.725	
Alkalinity, Total (as $CaCO_3$)	mg/L	06/25/2012	N001	78.46 - 88.46	33		F	#		
Alkalinity, Total (as $CaCO_3$)	mg/L	06/25/2012	N002	78.46 - 88.46	5.47		F	#	0.725	
Arsenic	mg/L	06/25/2012	N001	78.46 - 88.46	0.0017	U	F	#	0.0017	
Arsenic	mg/L	06/25/2012	N002	78.46 - 88.46	0.0017	U	F	#	0.0017	
Barium	mg/L	06/25/2012	N001	78.46 - 88.46	0.00594	B	F	#	0.0006	
Barium	mg/L	06/25/2012	N002	78.46 - 88.46	0.00626	B	F	#	0.0006	
Cadmium	mg/L	06/25/2012	N001	78.46 - 88.46	0.000223	B	F	#	0.00011	
Cadmium	mg/L	06/25/2012	N002	78.46 - 88.46	0.00023	B	F	#	0.00011	
Calcium	mg/L	06/25/2012	N001	78.46 - 88.46	413		F	#	0.05	
Calcium	mg/L	06/25/2012	N002	78.46 - 88.46	414		F	#	0.05	
Chloride	mg/L	06/25/2012	N001	78.46 - 88.46	11.5		F	#	0.067	
Chloride	mg/L	06/25/2012	N002	78.46 - 88.46	11.6		F	#	0.067	
Chromium	mg/L	06/25/2012	N001	78.46 - 88.46	0.001	U	F	#	0.001	
Chromium	mg/L	06/25/2012	N002	78.46 - 88.46	0.001	U	F	#	0.001	
Iron	mg/L	06/25/2012	N001	78.46 - 88.46	130		F	#	0.03	
Iron	mg/L	06/25/2012	N002	78.46 - 88.46	130		F	#	0.03	
Magnesium	mg/L	06/25/2012	N001	78.46 - 88.46	336		F	#	0.11	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/3/2012
Location: 0621 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Magnesium	mg/L	06/25/2012	N002	78.46	-	88.46	335		F	#	0.11	
Manganese	mg/L	06/25/2012	N001	78.46	-	88.46	2.83		F	#	0.002	
Manganese	mg/L	06/25/2012	N002	78.46	-	88.46	2.83		F	#	0.002	
Molybdenum	mg/L	06/25/2012	N001	78.46	-	88.46	0.000165	U	F	#	0.000165	
Molybdenum	mg/L	06/25/2012	N002	78.46	-	88.46	0.000165	U	F	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	06/25/2012	N001	78.46	-	88.46	0.085	U	F	#	0.085	
Nitrate + Nitrite as Nitrogen	mg/L	06/25/2012	N002	78.46	-	88.46	0.017	U	F	#	0.017	
Oxidation Reduction Potential	mV	06/25/2012	N001	78.46	-	88.46	173.5		F	#		
pH	s.u.	06/25/2012	N001	78.46	-	88.46	4.9		F	#		
Potassium	mg/L	06/25/2012	N001	78.46	-	88.46	11.4		F	#	0.05	
Potassium	mg/L	06/25/2012	N002	78.46	-	88.46	11.4		F	#	0.05	
Radon-222	pCi/L	06/25/2012	N001	78.46	-	88.46	51.1	U	F	#	51.1	32.3
Radon-222	pCi/L	06/25/2012	N002	78.46	-	88.46	51.8		FJ	#	51.8	33.8
Selenium	mg/L	06/25/2012	N001	78.46	-	88.46	0.0015	U	F	#	0.0015	
Selenium	mg/L	06/25/2012	N002	78.46	-	88.46	0.0015	U	F	#	0.0015	
Sodium	mg/L	06/25/2012	N001	78.46	-	88.46	204		F	#	0.1	
Sodium	mg/L	06/25/2012	N002	78.46	-	88.46	203		F	#	0.1	
Specific Conductance	umhos /cm	06/25/2012	N001	78.46	-	88.46	4270		F	#		

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/3/2012
Location: 0621 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Sulfate	mg/L	06/25/2012	N001	78.46	-	88.46	3320		F	#	26.6	
Sulfate	mg/L	06/25/2012	N002	78.46	-	88.46	3310		F	#	26.6	
Temperature	C	06/25/2012	N001	78.46	-	88.46	11.54		F	#		
Total Dissolved Solids	mg/L	06/25/2012	N001	78.46	-	88.46	4370		F	#	3.4	
Total Dissolved Solids	mg/L	06/25/2012	N002	78.46	-	88.46	4470		F	#	3.4	
Turbidity	NTU	06/25/2012	N001	78.46	-	88.46	4.79		F	#		
Uranium	mg/L	06/25/2012	N001	78.46	-	88.46	0.000185	BN	F	#	0.000067	
Uranium	mg/L	06/25/2012	N002	78.46	-	88.46	0.000125	BN	F	#	0.000067	
Uranium-234	pCi/L	06/25/2012	N001	78.46	-	88.46	0.141		F	#	0.0453	0.0508
Uranium-234	pCi/L	06/25/2012	N002	78.46	-	88.46	0.128		FJ	#	0.0429	0.0502
Uranium-235/236	pCi/L	06/25/2012	N001	78.46	-	88.46	0.0167		UF	#	0.0125	0.0165
Uranium-235/236	pCi/L	06/25/2012	N002	78.46	-	88.46	0.0144	U	F	#	0.0144	0.00941
Uranium-238	pCi/L	06/25/2012	N001	78.46	-	88.46	0.0777		FJ	#	0.0324	0.0358
Uranium-238	pCi/L	06/25/2012	N002	78.46	-	88.46	0.0426		UF	#	0.0297	0.0279
Vanadium	mg/L	06/25/2012	N001	78.46	-	88.46	0.001	U	F	#	0.001	
Vanadium	mg/L	06/25/2012	N002	78.46	-	88.46	0.001	U	F	#	0.001	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/3/2012
Location: 0623 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/25/2012	0001	19.35 - 39.35	502		FQ	#	0.725	
Alkalinity, Total (as $CaCO_3$)	mg/L	06/25/2012	N001	19.35 - 39.35	231		FQ	#		
Arsenic	mg/L	06/25/2012	0001	19.35 - 39.35	0.00192	B	FQ	#	0.0017	
Barium	mg/L	06/25/2012	0001	19.35 - 39.35	0.0247		FQ	#	0.0006	
Cadmium	mg/L	06/25/2012	0001	19.35 - 39.35	0.00011	U	FQ	#	0.00011	
Calcium	mg/L	06/25/2012	0001	19.35 - 39.35	280		FQ	#	0.05	
Chloride	mg/L	06/25/2012	0001	19.35 - 39.35	40.5		FQ	#	1.34	
Chromium	mg/L	06/25/2012	0001	19.35 - 39.35	0.001	U	FQ	#	0.001	
Iron	mg/L	06/25/2012	0001	19.35 - 39.35	0.186		FQ	#	0.03	
Magnesium	mg/L	06/25/2012	0001	19.35 - 39.35	254		FQ	#	0.11	
Manganese	mg/L	06/25/2012	0001	19.35 - 39.35	0.246		FQ	#	0.002	
Molybdenum	mg/L	06/25/2012	0001	19.35 - 39.35	0.00148	B	FQ	#	0.000165	
Nitrate + Nitrite as Nitrogen	mg/L	06/25/2012	0001	19.35 - 39.35	0.097	J	FQ	#	0.085	
Oxidation Reduction Potential	mV	06/25/2012	N001	19.35 - 39.35	-.5		FQ	#		
pH	s.u.	06/25/2012	N001	19.35 - 39.35	7.08		FQ	#		
Potassium	mg/L	06/25/2012	0001	19.35 - 39.35	2.58	B	FQ	#	0.05	
Radon-222	pCi/L	06/25/2012	N001	19.35 - 39.35	87		FQJ	#	50.9	38
Selenium	mg/L	06/25/2012	0001	19.35 - 39.35	0.0015	U	FQ	#	0.0015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/3/2012
Location: 0623 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Sodium	mg/L	06/25/2012	0001	19.35	-	39.35	197		FQ	#	0.1	
Specific Conductance	umhos /cm	06/25/2012	N001	19.35	-	39.35	3130		FQ	#		
Sulfate	mg/L	06/25/2012	0001	19.35	-	39.35	1530		FQ	#	13.3	
Temperature	C	06/25/2012	N001	19.35	-	39.35	10.93		FQ	#		
Total Dissolved Solids	mg/L	06/25/2012	0001	19.35	-	39.35	2680		FQ	#	3.4	
Turbidity	NTU	06/25/2012	N001	19.35	-	39.35	187		FQ	#		
Uranium	mg/L	06/25/2012	0001	19.35	-	39.35	0.00128	N	FQ	#	0.000067	
Uranium-234	pCi/L	06/25/2012	0001	19.35	-	39.35	0.84		FQ	#	0.041	0.17
Uranium-235/236	pCi/L	06/25/2012	0001	19.35	-	39.35	0.0507	U	FQ	#	0.0507	0.0225
Uranium-238	pCi/L	06/25/2012	0001	19.35	-	39.35	0.353		FQ	#	0.041	0.0974
Vanadium	mg/L	06/25/2012	0001	19.35	-	39.35	0.001	U	FQ	#	0.001	

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.

Groundwater Quality Data
Durango Processing Site

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Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/3/2012
Location: 0612 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/26/2012	N001	37.41	-	57.41	479		F	#		
Cadmium	mg/L	06/26/2012	N001	37.41	-	57.41	0.057		F	#	0.00012	
Manganese	mg/L	06/26/2012	N001	37.41	-	57.41	6.1		F	#	0.00011	
Molybdenum	mg/L	06/26/2012	N001	37.41	-	57.41	0.094		F	#	0.00032	
Oxidation Reduction Potential	mV	06/26/2012	N001	37.41	-	57.41	41.9		F	#		
pH	s.u.	06/26/2012	N001	37.41	-	57.41	6.58		F	#		
Selenium	mg/L	06/26/2012	N001	37.41	-	57.41	0.00084		F	#	0.000032	
Specific Conductance	umhos /cm	06/26/2012	N001	37.41	-	57.41	4091		F	#		
Sulfate	mg/L	06/26/2012	N001	37.41	-	57.41	1700		F	#	50	
Temperature	C	06/26/2012	N001	37.41	-	57.41	13.42		F	#		
Turbidity	NTU	06/26/2012	N001	37.41	-	57.41	5.6		F	#		
Uranium	mg/L	06/26/2012	N001	37.41	-	57.41	1.3		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/3/2012
Location: 0617 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/26/2012	N001	14	-	29	410		F	#		
Manganese	mg/L	06/26/2012	N001	14	-	29	0.49		F	#	0.00011	
Molybdenum	mg/L	06/26/2012	N001	14	-	29	0.0011		F	#	0.00032	
Oxidation Reduction Potential	mV	06/26/2012	N001	14	-	29	-106.9		F	#		
pH	s.u.	06/26/2012	N001	14	-	29	6.91		F	#		
Selenium	mg/L	06/26/2012	N001	14	-	29	0.00083		F	#	0.000032	
Specific Conductance	umhos /cm	06/26/2012	N001	14	-	29	3367		F	#		
Sulfate	mg/L	06/26/2012	N001	14	-	29	1800		F	#	25	
Temperature	C	06/26/2012	N001	14	-	29	13.82		F	#		
Turbidity	NTU	06/26/2012	N001	14	-	29	7.16		F	#		
Uranium	mg/L	06/26/2012	N001	14	-	29	0.18		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/3/2012
Location: 0630 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/26/2012	N001	28.3	-	38.3	325		F	#		
Manganese	mg/L	06/26/2012	N001	28.3	-	38.3	0.41		F	#	0.00011	
Molybdenum	mg/L	06/26/2012	N001	28.3	-	38.3	0.0032		F	#	0.00032	
Oxidation Reduction Potential	mV	06/26/2012	N001	28.3	-	38.3	-4.3		F	#		
pH	s.u.	06/26/2012	N001	28.3	-	38.3	6.8		F	#		
Selenium	mg/L	06/26/2012	N001	28.3	-	38.3	0.017		F	#	0.00032	
Specific Conductance	umhos /cm	06/26/2012	N001	28.3	-	38.3	3343		F	#		
Sulfate	mg/L	06/26/2012	N001	28.3	-	38.3	1700		F	#	25	
Temperature	C	06/26/2012	N001	28.3	-	38.3	14.95		F	#		
Turbidity	NTU	06/26/2012	N001	28.3	-	38.3	6.14		F	#		
Uranium	mg/L	06/26/2012	N001	28.3	-	38.3	0.29		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/3/2012
Location: 0631 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/26/2012	N001	6	-	16	404		F	#		
Manganese	mg/L	06/26/2012	N001	6	-	16	0.47		F	#	0.00011	
Molybdenum	mg/L	06/26/2012	N001	6	-	16	0.0063		F	#	0.00032	
Oxidation Reduction Potential	mV	06/26/2012	N001	6	-	16	-73.8		F	#		
pH	s.u.	06/26/2012	N001	6	-	16	7.15		F	#		
Selenium	mg/L	06/26/2012	N001	6	-	16	0.00015		F	#	0.000032	
Specific Conductance	umhos /cm	06/26/2012	N001	6	-	16	1263		F	#		
Sulfate	mg/L	06/26/2012	N001	6	-	16	170		F	#	2.5	
Temperature	C	06/26/2012	N001	6	-	16	14.53		F	#		
Turbidity	NTU	06/26/2012	N001	6	-	16	8.3		F	#		
Uranium	mg/L	06/26/2012	N001	6	-	16	0.075		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/3/2012
Location: 0633 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/26/2012	N001	4	-	14	808		F	#		
Manganese	mg/L	06/26/2012	N001	4	-	14	0.16		F	#	0.00011	
Molybdenum	mg/L	06/26/2012	N001	4	-	14	0.0012		F	#	0.00032	
Oxidation Reduction Potential	mV	06/26/2012	N001	4	-	14	-70.8		F	#		
pH	s.u.	06/26/2012	N001	4	-	14	6.64		F	#		
Selenium	mg/L	06/26/2012	N001	4	-	14	0.0088		F	#	0.00032	
Specific Conductance	umhos /cm	06/26/2012	N001	4	-	14	6464		F	#		
Sulfate	mg/L	06/26/2012	N001	4	-	14	3600		F	#	50	
Temperature	C	06/26/2012	N001	4	-	14	15.56		F	#		
Turbidity	NTU	06/26/2012	N001	4	-	14	5.92		F	#		
Uranium	mg/L	06/26/2012	N001	4	-	14	0.74		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/3/2012
Location: 0634 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/26/2012	N001	8	-	18	466		FQ	#		
Manganese	mg/L	06/26/2012	N001	8	-	18	0.17		FQ	#	0.00011	
Molybdenum	mg/L	06/26/2012	N001	8	-	18	0.00089	B	FQ	#	0.00032	
Oxidation Reduction Potential	mV	06/26/2012	N001	8	-	18	47.8		FQ	#		
pH	s.u.	06/26/2012	N001	8	-	18	6.99		FQ	#		
Selenium	mg/L	06/26/2012	N001	8	-	18	0.00012		FQ	#	0.000032	
Specific Conductance	umhos /cm	06/26/2012	N001	8	-	18	4673		FQ	#		
Sulfate	mg/L	06/26/2012	N001	8	-	18	2400		FQ	#	25	
Temperature	C	06/26/2012	N001	8	-	18	17.37		FQ	#		
Turbidity	NTU	06/26/2012	N001	8	-	18	2.97		FQ	#		
Uranium	mg/L	06/26/2012	N001	8	-	18	0.024		FQ	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/3/2012
Location: 0635 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/26/2012	N001	5.5	-	15.5	536		F	#		
Manganese	mg/L	06/26/2012	N001	5.5	-	15.5	0.11		F	#	0.00011	
Molybdenum	mg/L	06/26/2012	N001	5.5	-	15.5	0.0031		F	#	0.00032	
Oxidation Reduction Potential	mV	06/26/2012	N001	5.5	-	15.5	-36.3		F	#		
pH	s.u.	06/26/2012	N001	5.5	-	15.5	6.78		F	#		
Selenium	mg/L	06/26/2012	N001	5.5	-	15.5	0.0006		F	#	0.000032	
Specific Conductance	umhos /cm	06/26/2012	N001	5.5	-	15.5	2662		F	#		
Sulfate	mg/L	06/26/2012	N001	5.5	-	15.5	1100		F	#	25	
Temperature	C	06/26/2012	N001	5.5	-	15.5	13.61		F	#		
Turbidity	NTU	06/26/2012	N001	5.5	-	15.5	5.64		F	#		
Uranium	mg/L	06/26/2012	N001	5.5	-	15.5	0.017		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/3/2012
Location: 0863 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/26/2012	N001	58	-	67.5	517		F	#		
Cadmium	mg/L	06/26/2012	N001	58	-	67.5	0.00012	U	F	#	0.00012	
Cadmium	mg/L	06/26/2012	N002	58	-	67.5	0.00012	U	F	#	0.00012	
Manganese	mg/L	06/26/2012	N001	58	-	67.5	0.12		F	#	0.00011	
Manganese	mg/L	06/26/2012	N002	58	-	67.5	0.12		F	#	0.00011	
Molybdenum	mg/L	06/26/2012	N001	58	-	67.5	0.00073	B	F	#	0.00032	
Molybdenum	mg/L	06/26/2012	N002	58	-	67.5	0.00059	B	F	#	0.00032	
Oxidation Reduction Potential	mV	06/26/2012	N001	58	-	67.5	-45.6		F	#		
pH	s.u.	06/26/2012	N001	58	-	67.5	6.9		F	#		
Selenium	mg/L	06/26/2012	N001	58	-	67.5	0.000037	B	F	#	0.000032	
Selenium	mg/L	06/26/2012	N002	58	-	67.5	0.00004	B	F	#	0.000032	
Specific Conductance	umhos /cm	06/26/2012	N001	58	-	67.5	2283		F	#		
Sulfate	mg/L	06/26/2012	N001	58	-	67.5	680		F	#	10	
Sulfate	mg/L	06/26/2012	N002	58	-	67.5	680		F	#	10	
Temperature	C	06/26/2012	N001	58	-	67.5	13.44		F	#		
Turbidity	NTU	06/26/2012	N001	58	-	67.5	5.72		F	#		
Uranium	mg/L	06/26/2012	N001	58	-	67.5	0.00018		F	#	0.000029	
Uranium	mg/L	06/26/2012	N002	58	-	67.5	0.00016		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/3/2012
Location: 0594 WELL Original location DH-116.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/27/2012	N001	8.5	-	38.5	418		F	#		
Oxidation Reduction Potential	mV	06/27/2012	N001	8.5	-	38.5	-17.6		F	#		
pH	s.u.	06/27/2012	N001	8.5	-	38.5	6.8		F	#		
Selenium	mg/L	06/27/2012	N001	8.5	-	38.5	0.016		F	#	0.00032	
Specific Conductance	umhos /cm	06/27/2012	N001	8.5	-	38.5	4657		F	#		
Temperature	C	06/27/2012	N001	8.5	-	38.5	14.33		F	#		
Turbidity	NTU	06/27/2012	N001	8.5	-	38.5	9.8		F	#		
Uranium	mg/L	06/27/2012	N001	8.5	-	38.5	0.054		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/3/2012
Location: 0598 WELL Original location Bureau of Rec well DH-110.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/27/2012	N001	66.2 - 96.2	508		F	#		
Oxidation Reduction Potential	mV	06/27/2012	N001	66.2 - 96.2	-6.3		F	#		
pH	s.u.	06/27/2012	N001	66.2 - 96.2	6.89		F	#		
Selenium	mg/L	06/27/2012	N001	66.2 - 96.2	0.27		F	#	0.00032	
Specific Conductance	umhos /cm	06/27/2012	N001	66.2 - 96.2	7847		F	#		
Temperature	C	06/27/2012	N001	66.2 - 96.2	13.98		F	#		
Turbidity	NTU	06/27/2012	N001	66.2 - 96.2	9.94		F	#		
Uranium	mg/L	06/27/2012	N001	66.2 - 96.2	0.1		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/3/2012
Location: 0607 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/27/2012	0001	35	-	55	371		FQ	#		
Oxidation Reduction Potential	mV	06/27/2012	N001	35	-	55	57.3		FQ	#		
pH	s.u.	06/27/2012	N001	35	-	55	7.41		FQ	#		
Selenium	mg/L	06/27/2012	0001	35	-	55	0.35		FQ	#	0.00032	
Specific Conductance	umhos /cm	06/27/2012	N001	35	-	55	2492		FQ	#		
Temperature	C	06/27/2012	N001	35	-	55	17.59		FQ	#		
Turbidity	NTU	06/27/2012	N001	35	-	55	13.8		FQ	#		
Uranium	mg/L	06/27/2012	0001	35	-	55	0.0025		FQ	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/3/2012
Location: 0879 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/27/2012	N001	27	-	36.9	429			#		
Oxidation Reduction Potential	mV	06/27/2012	N001	27	-	36.9	-37.8			#		
pH	s.u.	06/27/2012	N001	27	-	36.9	6.78			#		
Selenium	mg/L	06/27/2012	N001	27	-	36.9	0.038			#	0.00032	
Specific Conductance	umhos /cm	06/27/2012	N001	27	-	36.9	8386			#		
Temperature	C	06/27/2012	N001	27	-	36.9	12.99			#		
Turbidity	NTU	06/27/2012	N001	27	-	36.9	6.09			#		
Uranium	mg/L	06/27/2012	N001	27	-	36.9	0.086			#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/3/2012
Location: 0884 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/27/2012	N001	36.5	-	46.5	411		F	#		
Oxidation Reduction Potential	mV	06/27/2012	N001	36.5	-	46.5	188.8		F	#		
pH	s.u.	06/27/2012	N001	36.5	-	46.5	6.92		F	#		
Selenium	mg/L	06/27/2012	N001	36.5	-	46.5	0.62		F	#	0.00032	
Specific Conductance	umhos /cm	06/27/2012	N001	36.5	-	46.5	4408		F	#		
Temperature	C	06/27/2012	N001	36.5	-	46.5	14.22		F	#		
Turbidity	NTU	06/27/2012	N001	36.5	-	46.5	2.2		F	#		
Uranium	mg/L	06/27/2012	N001	36.5	-	46.5	0.14		F	#	0.000029	

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

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

DATA QUALIFIERS:
- F Low flow sampling method used.
- 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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Static Water Level Data

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STATIC WATER LEVELS (USEE700) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/2/2012

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0612	D	6500.94	06/26/2012	15:20:01	41.71	6459.23
0617	D	6498.11	06/26/2012	10:35:10	31	6467.11
0630	D	6494.44	06/26/2012	11:10:40	33.6	6460.84
0631	D	6477.91	06/26/2012	10:00:28	10	6467.91
0633	D	6481.81	06/26/2012	09:15:42	10.51	6471.3
0634	D	6491.75	06/26/2012	16:15:58	14.06	6477.69
0635	D	6497.68	06/26/2012	15:55:24	14.21	6483.47
0863		6513.32	06/26/2012	14:45:53	58.41	6454.91

STATIC WATER LEVELS (USEE700) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/2/2012

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0594	O	6472.49	06/27/2012	09:55:11	20.95	6451.54
0598	O	6479.09	06/27/2012	12:10:50	21.2	6457.89
0607	U	6527.95	06/27/2012	13:30:25	51.31	6476.64
0879		6473.91	06/27/2012	11:15:21	21.25	6452.66
0884		6476.37	06/27/2012	09:10:56	17	6459.37

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

STATIC WATER LEVELS (USEE700) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/3/2012

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0605	U	7189.6	06/27/2012	15:15:21	38.6	7151
0607	D	7099.1	06/27/2012	14:55:55	44.25	7054.85
0608	D	7035	06/25/2012	18:35:32	37.91	6997.09
0612	D	7109.8	06/27/2012	14:20:29	80.99	7028.81
0618	D	7036.41	06/25/2012	19:40:17	39.98	6996.43
0621	U	7035.77	06/25/2012	19:20:20	52.75	6983.02
0623	U	7048.67	06/25/2012	20:25:10	35.92	7012.75

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

WATER LEVEL FLAGS: D Dry F Flowing B Below top of pump

Time-Concentration Graphs
Durango Disposal Site

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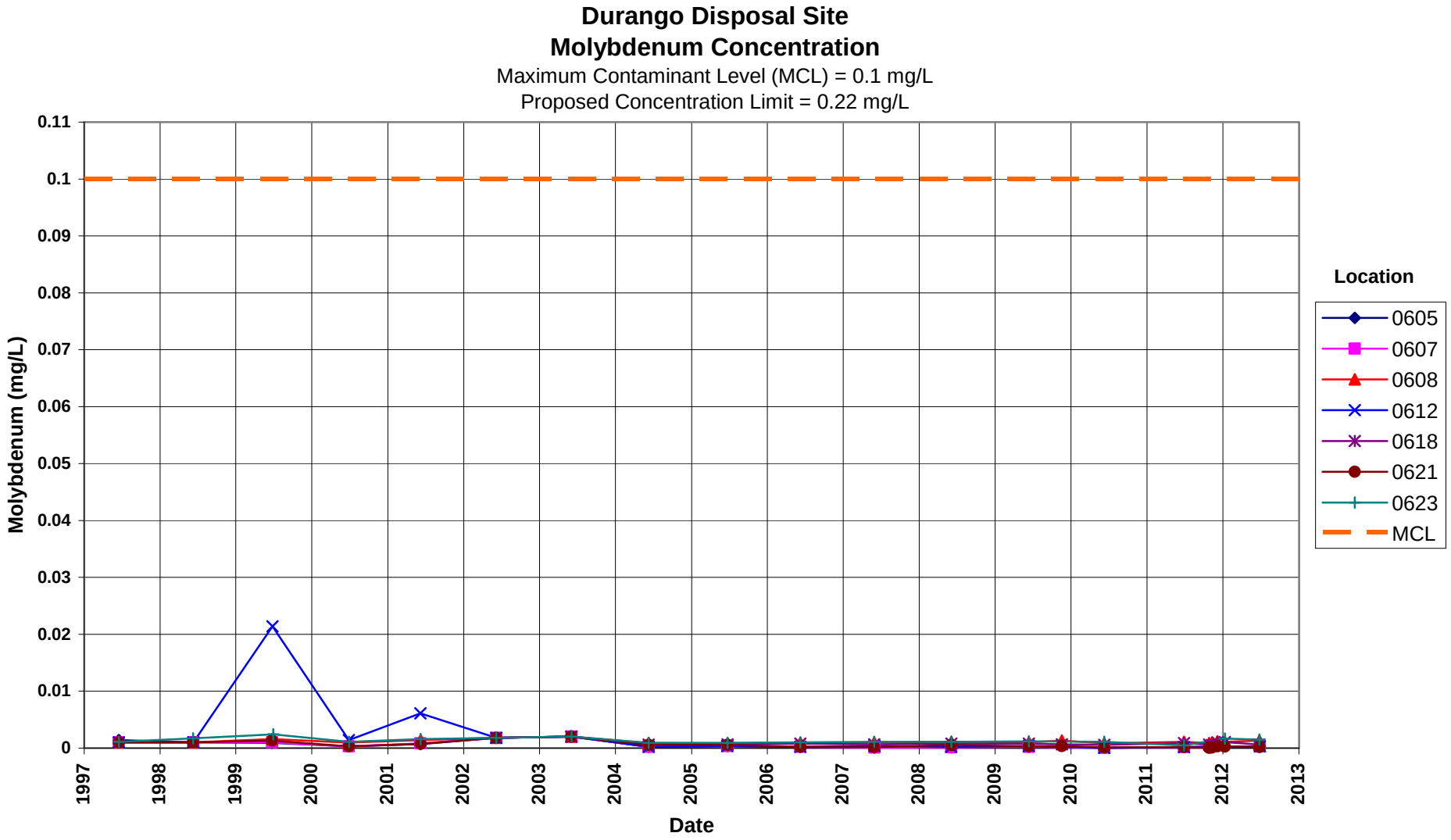
Durango Disposal Site
Molybdenum Concentration
Maximum Contaminant Level (MCL) = 0.1 mg/L
Proposed Concentration Limit = 0.22 mg/L
Molybdenum (mg/L)
0.11
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
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Location
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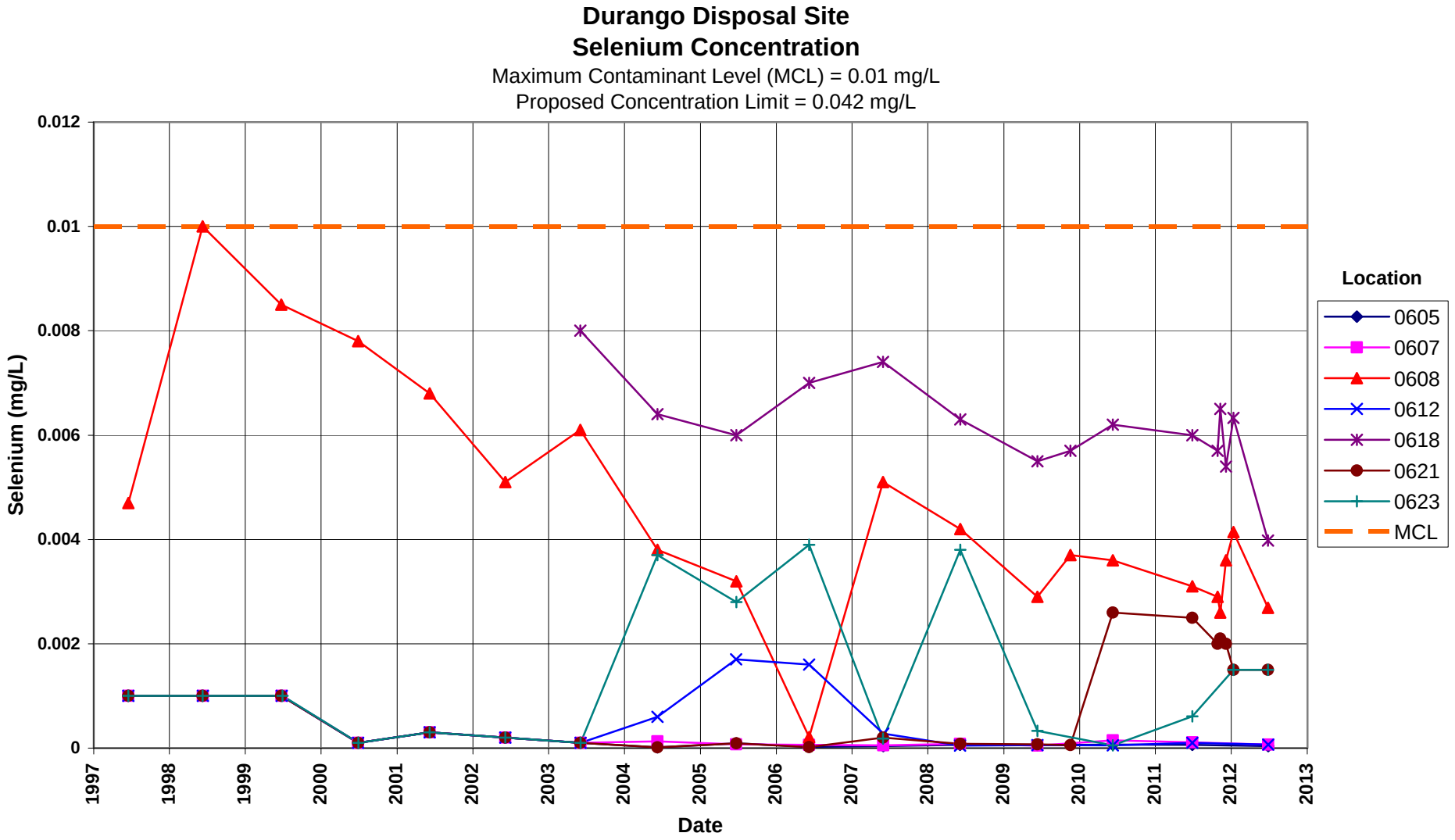
0607
0608
0612
0618
0621
0623
MCL


Durango Disposal Site
Selenium Concentration
Maximum Contaminant Level (MCL) = 0.01 mg/L
Proposed Concentration Limit = 0.042 mg/L
Selenium (mg/L)
0.012
0.01
0.008
0.006
0.004
0.002
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
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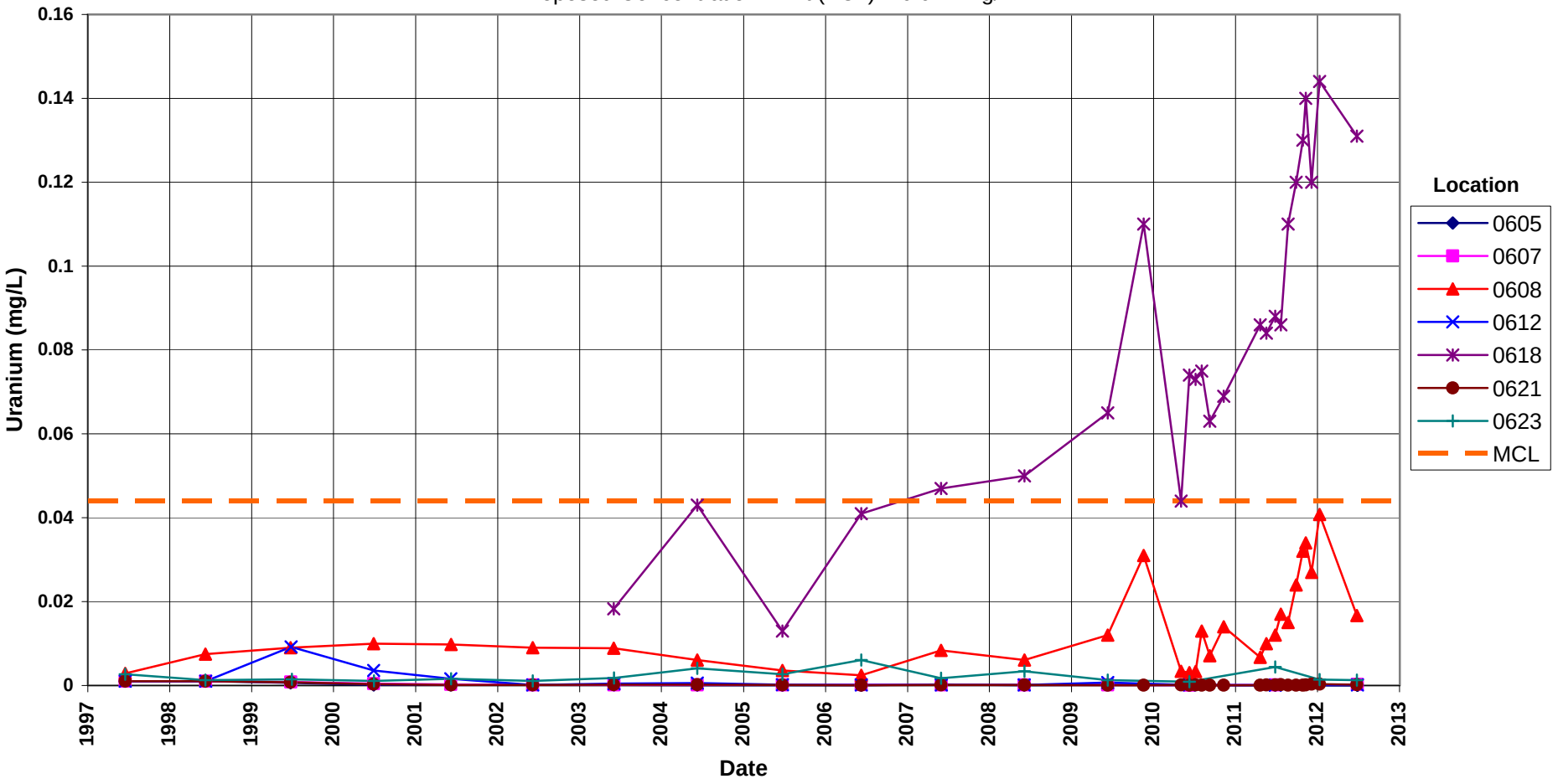
0607
0608
0612
0618
0621
0623
MCL


Durango Disposal Site
Uranium Concentration
Maximum Contaminant Level (MCL) = 0.044 mg/L
Proposed Concentration Limit (PCL) = 0.077 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
2010
2011
2012
2013
Date
Location
0605
0607
0608
0612
0618
0621
0623
MCL

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Time-Concentration Graphs
Durango Processing Site

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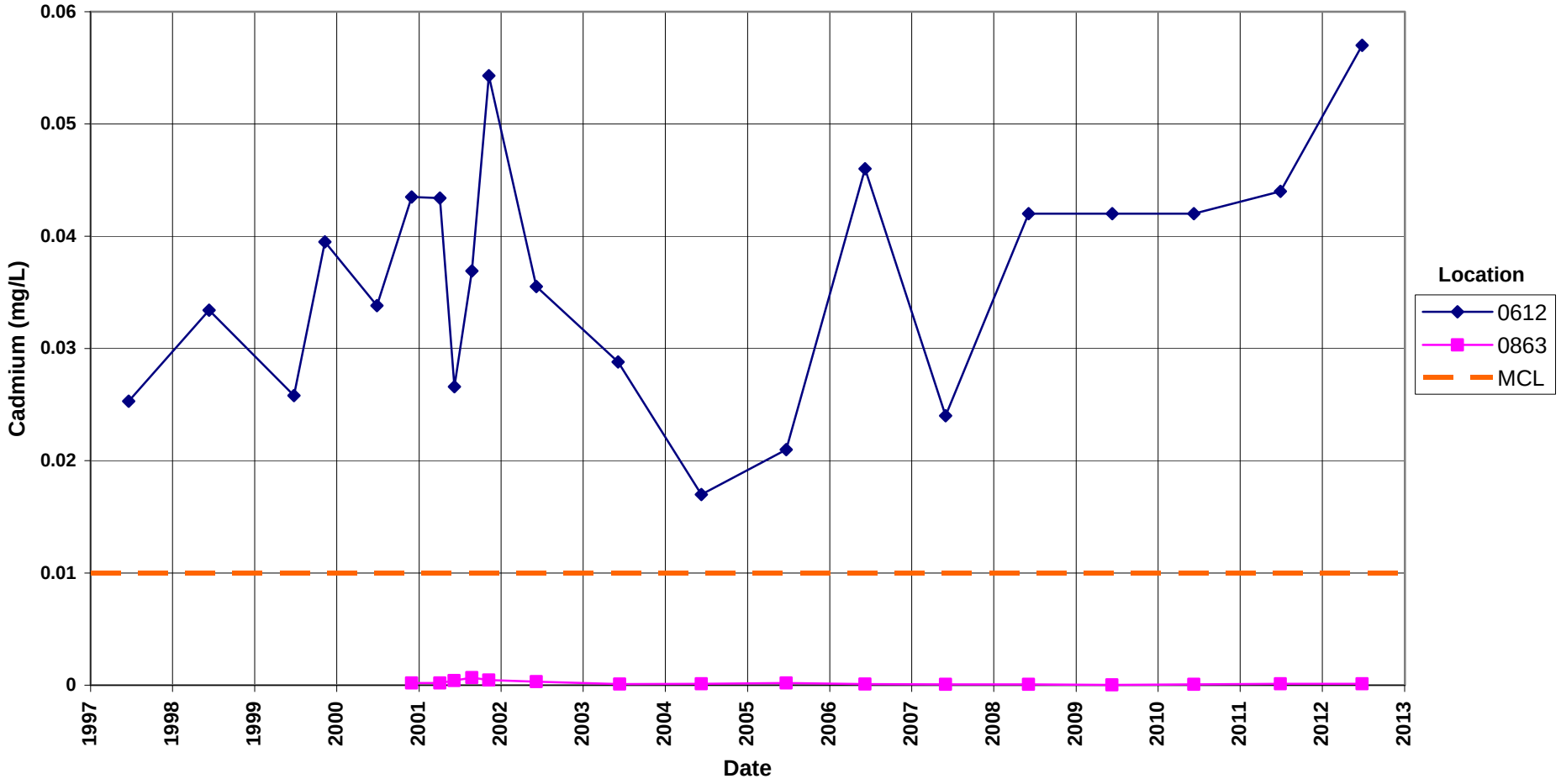
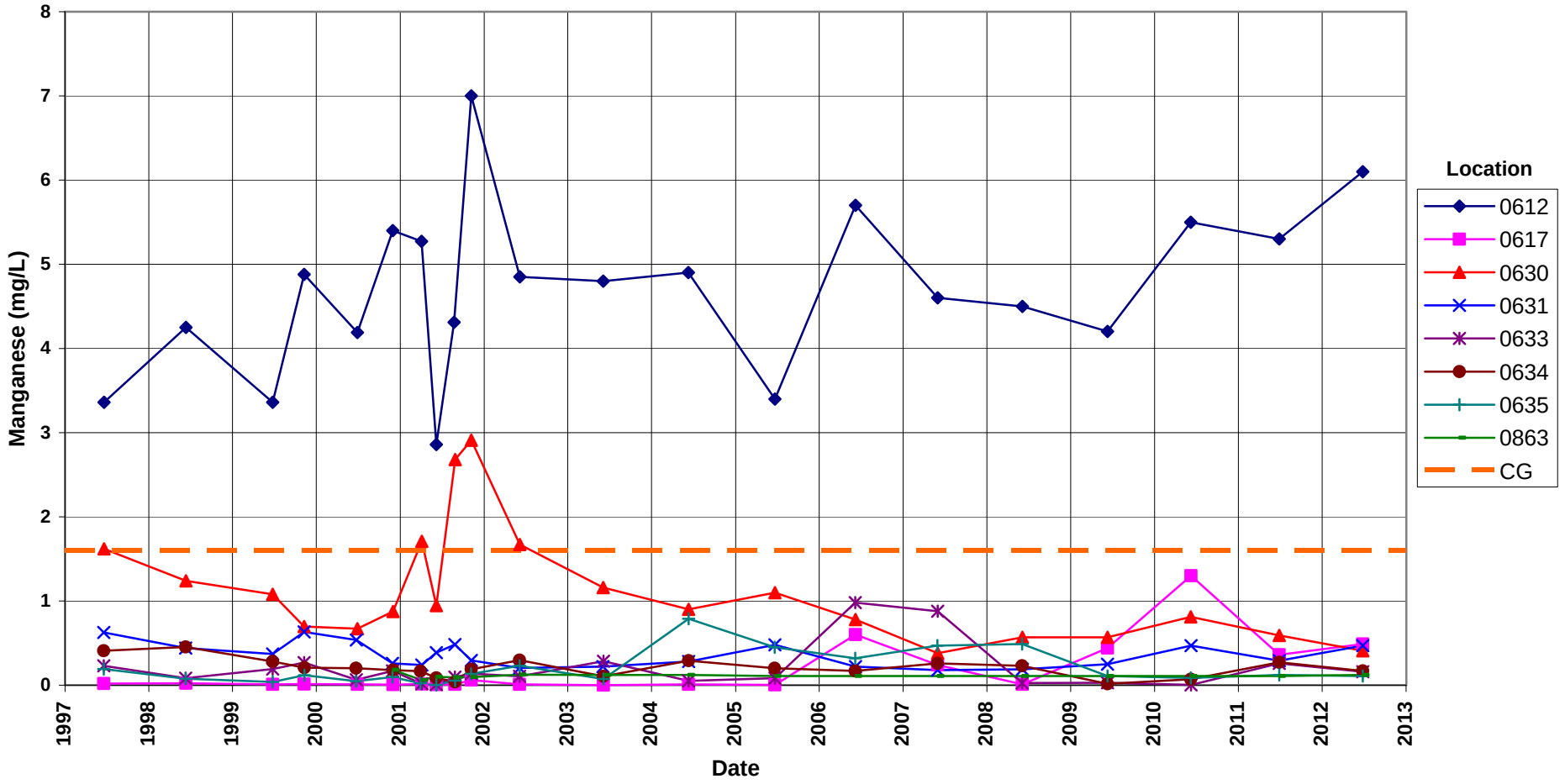
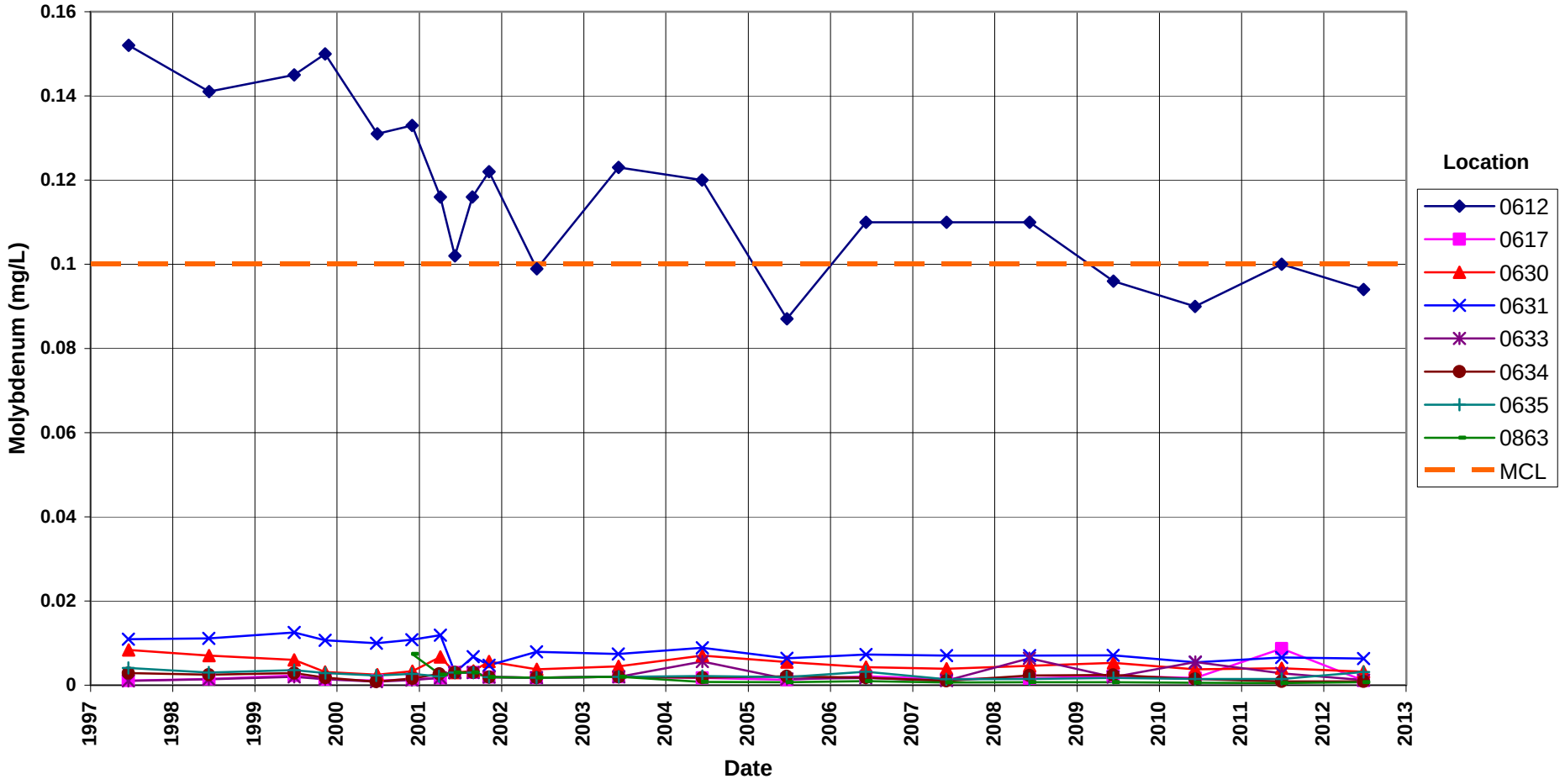
Durango Mill Tailings Process Site
Cadmium Concentration
Maximum Contaminant Level (MCL) = 0.01 mg/L



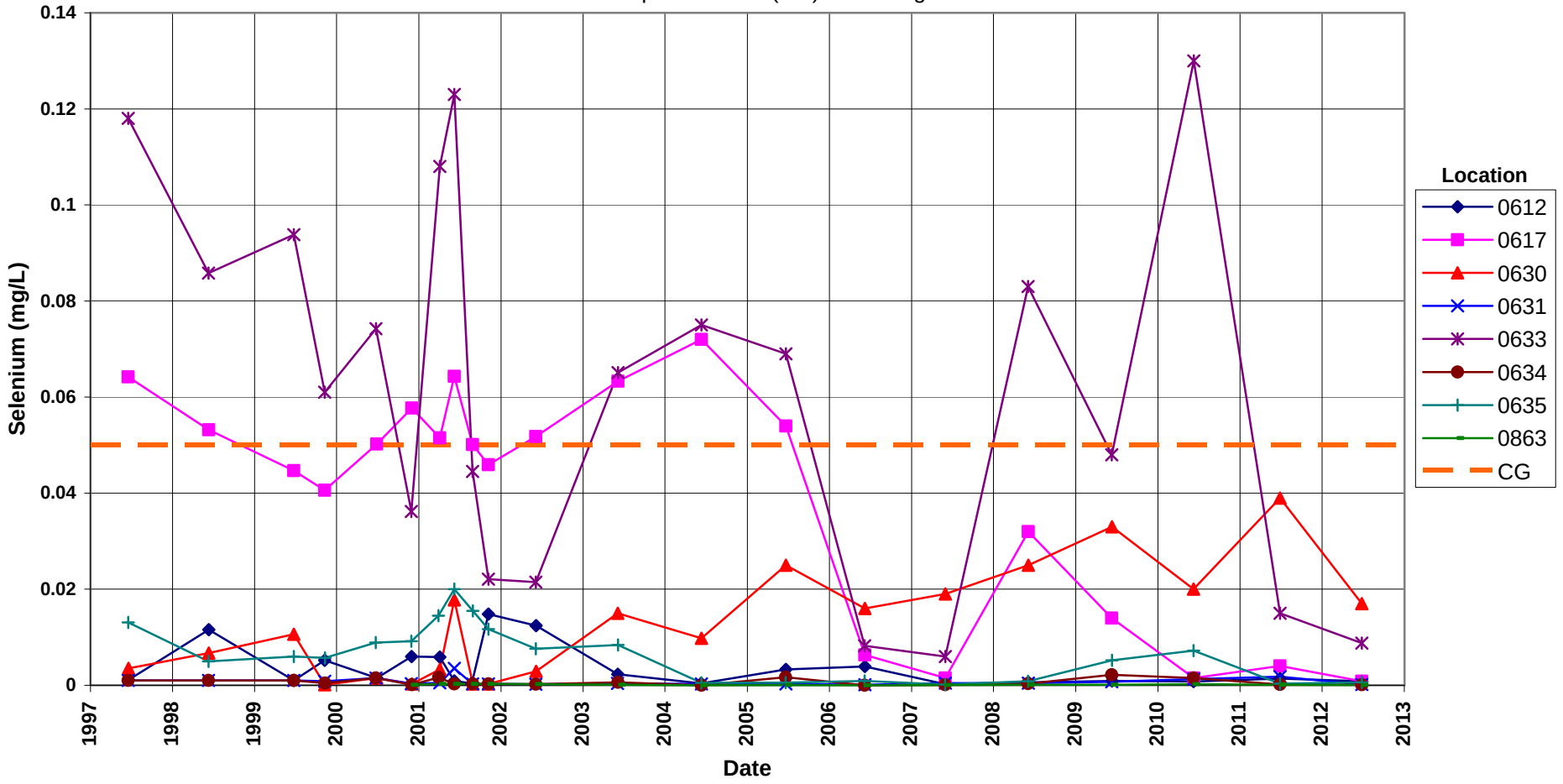
Durango Mill Tailings Process Site
Manganese Concentration
Compliance Goal (CG) = 1.6 mg/L



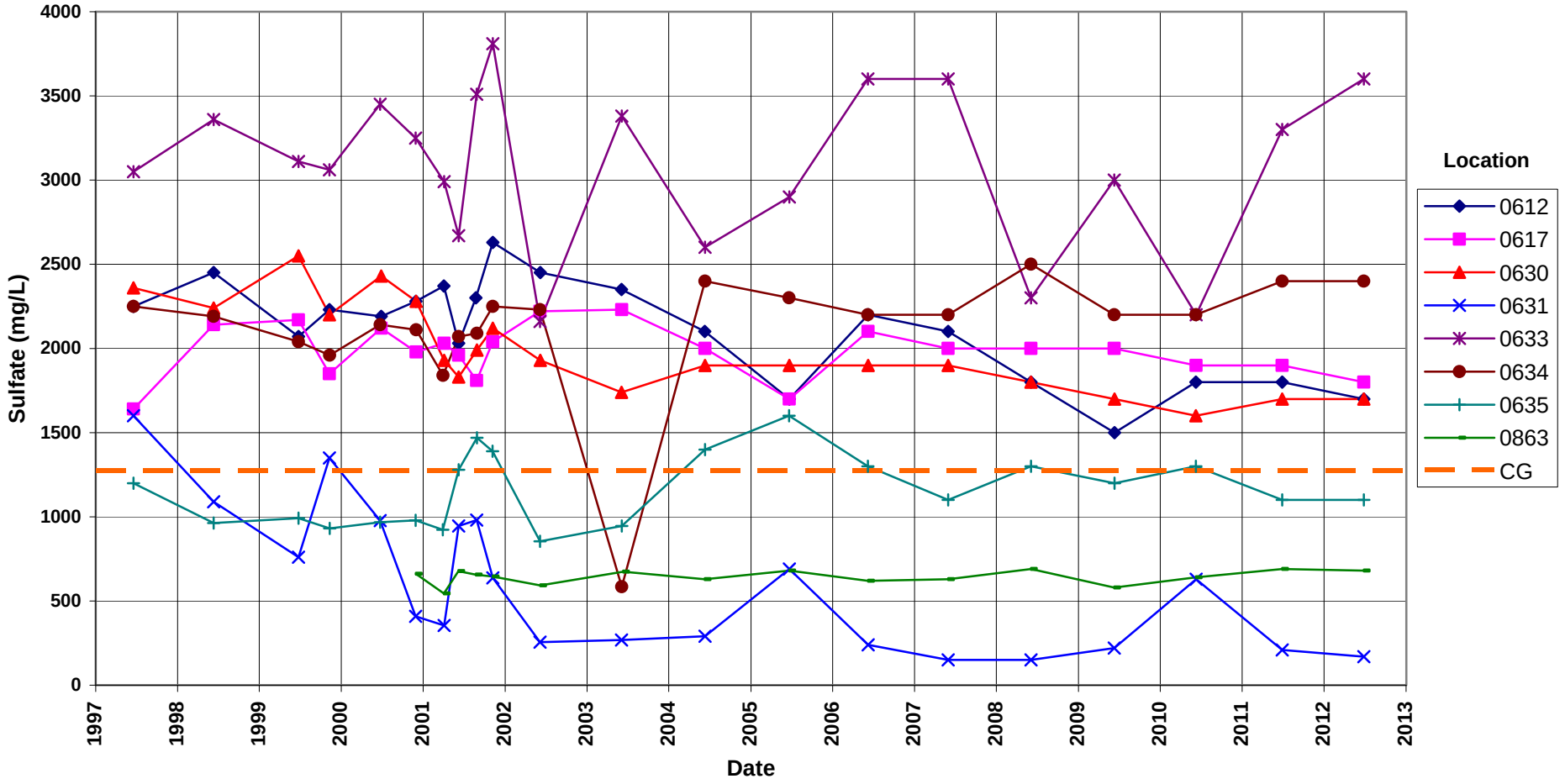
Durango Mill Tailings Process Site
Molybdenum Concentration
Maximum Contaminant Level (MCL) = 0.1 mg/L



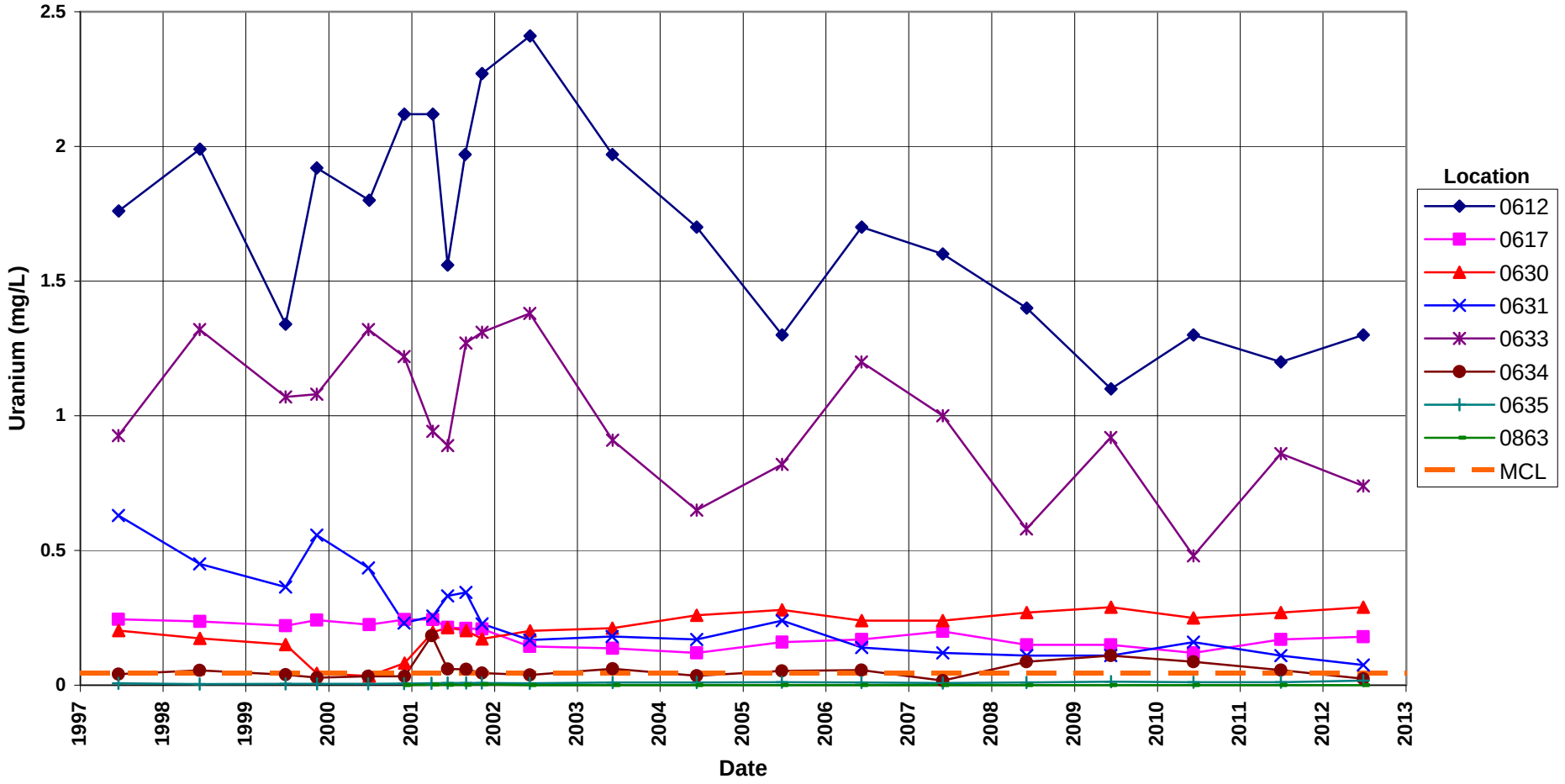
Durango Mill Tailings Process Site
Selenium Concentration
Maximum Contaminant Level (MCL) = 0.01 mg/L
Compliance Goal (CG) = 0.05 mg/L

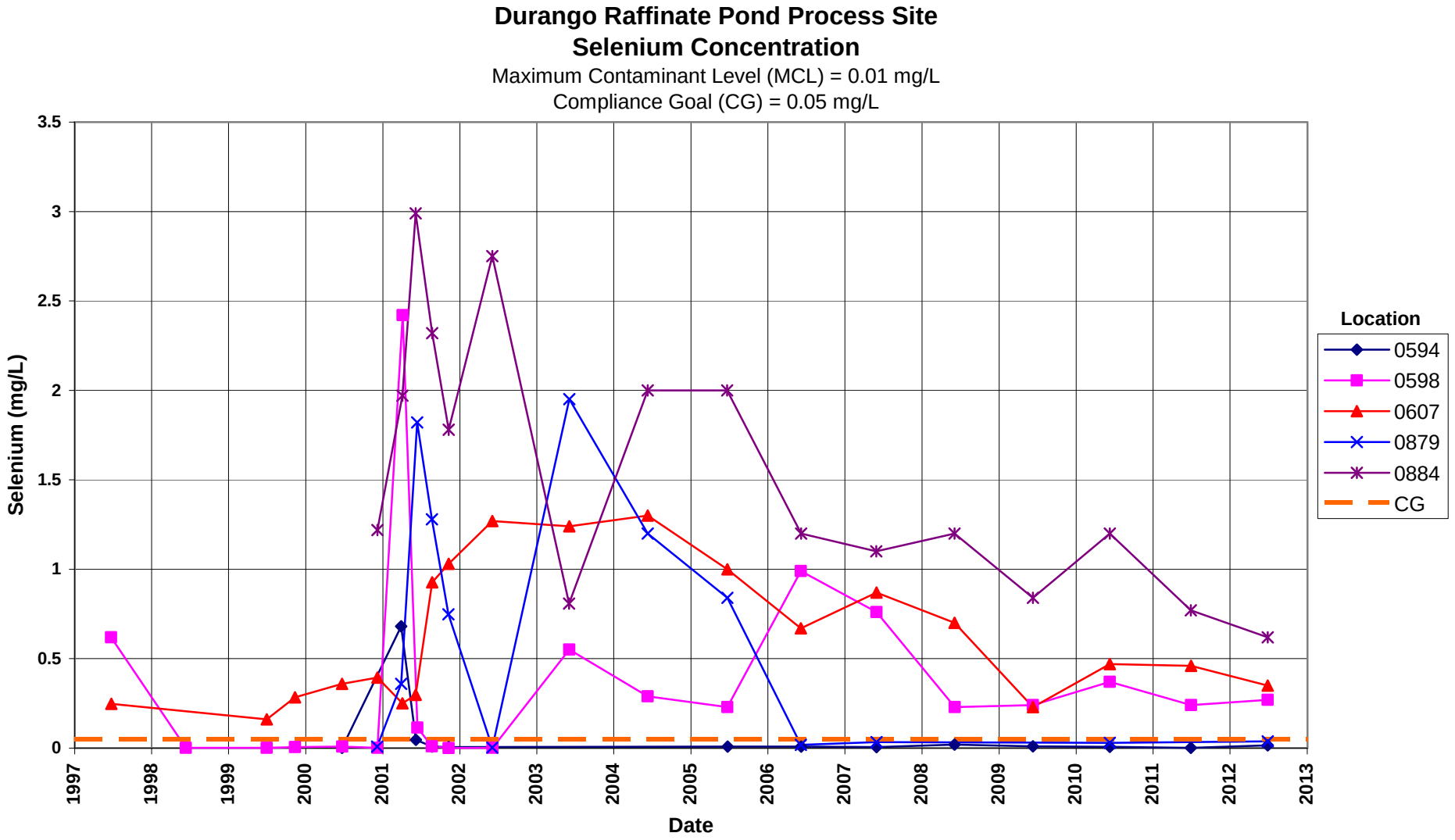


Durango Mill Tailings Process Site
Sulfate Concentration
Compliance Goal (CG) = 1276 mg/L

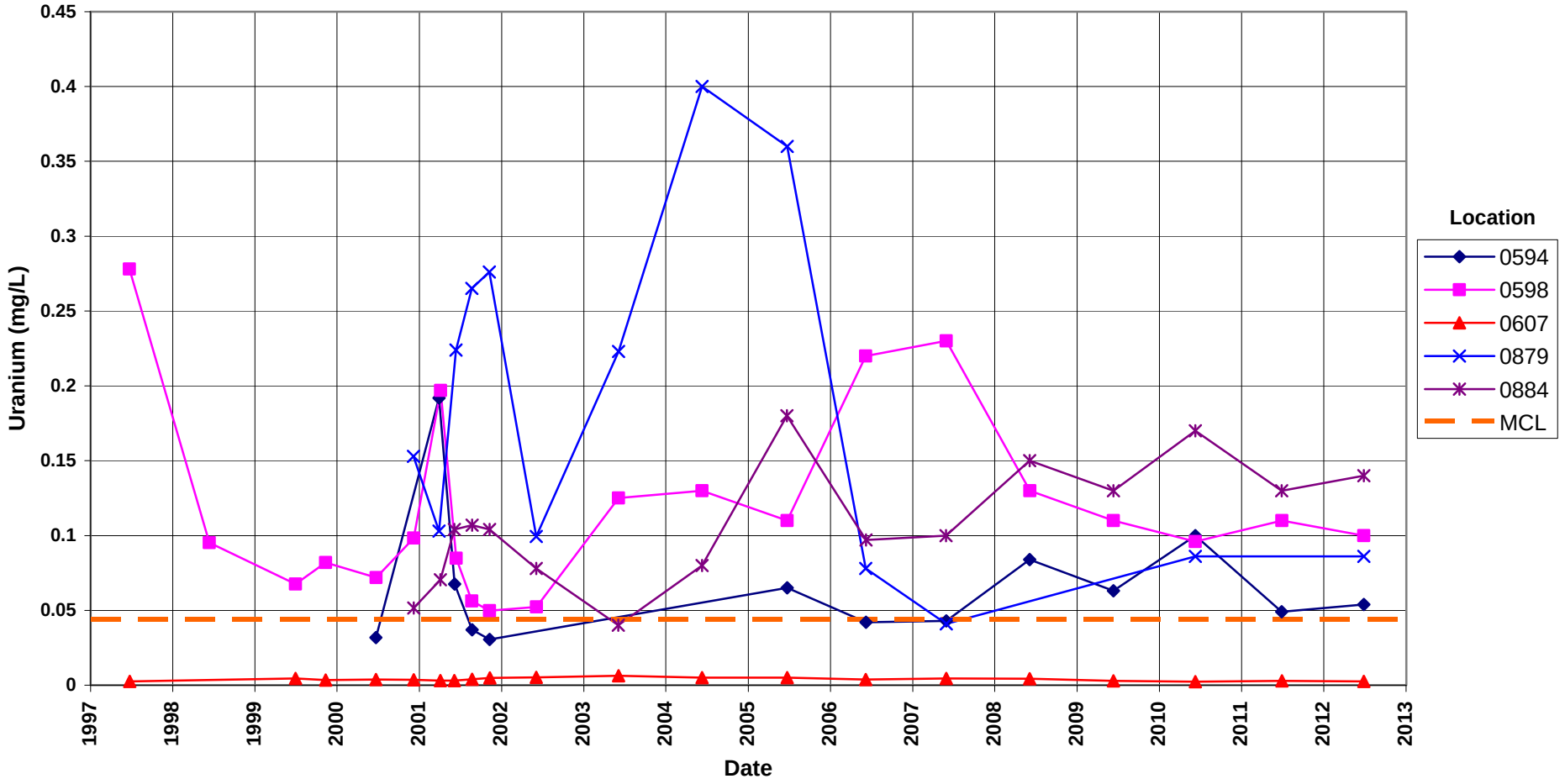


Durango Mill Tailings Process Site
Uranium Concentration
Maximum Contaminant Level (MCL) = 0.044 mg/L




Durango Raffinate Pond Process Site
Selenium Concentration
Maximum Contaminant Level (MCL) = 0.01 mg/L
Compliance Goal (CG) = 0.05 mg/L
Selenium (mg/L)
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
2010
2011
2012
2013
Date
Location
0594
0598
0607
0879
0884
CG

Durango Raffinate Pond Process Site
Uranium Concentration
Maximum Contaminant Level = 0.044 mg/L



Attachment 3
Sampling and Analysis Work Order

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Task Order LM00-501
Control Number 12-0651

May 24, 2012

U.S. Department of Energy
Office of Legacy Management
ATTN: Jalena Dayvault
Site Manager
2597 Legacy Way
Grand Junction, CO 81503

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller)
June 2012 Environmental Sampling at the Durango, Colorado, Disposal and Processing Sites

REFERENCE: Task Order LM-501-02-104-402, Durango, Colorado, Processing and Disposal Sites

Dear Ms. Dayvault:

The purpose of this letter is to inform you of the upcoming sampling at Durango, Colorado. Enclosed are the maps and tables specifying sample locations and analytes for monitoring at the Durango sites. Water quality data will be collected from monitoring wells at these sites as part of the routine environmental sampling currently scheduled to begin the week of June 25, 2012. Surface water sampling will be conducted in September.

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

Monitoring Wells*

DUR01 Mill Site

612 Al/Km	630 Al/Km	631 Al/Km	633 Km	634 Km	635 Km	863 Al
617 Al						

DUR02 Raffinate Pond

594 Mf	598 Mf/Pl	607 Al	879 Mf	884 Al		

DUR03 Bodo Canyon

605 Cf	607 Cf	608 Al	612 Km	618 Al	621 Cf	623 Al

*NOTE: Al = Alluvium; Cf = Cliff House Formation; Km = Mancos Shale; Mf = Menefee Formation; Pl = Point Lookout Formation

The S.M. Stoller Corporation 2597 Legacy Way Grand Junction, CO 81503 (970) 248-6000 Fax (970) 248-6040

All samples will be collected as directed in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*. Access agreements are being reviewed and are expected to be complete by the beginning of fieldwork.

Please contact me at (970) 248-6652 if you have any questions.

Sincerely,

David Miller
Site Lead

DM/lcg/lb

Enclosures (3)

cc: (electronic)
Karl Stoeckle, DOE
Steve Donivan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
David Miller, Stoller
EDD Delivery
rc-grand.junction
File: DUP410.02 (A)
DUD410.02 (A)

Sampling Frequencies for Locations at Durango, Colorado

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitoring Wells						
DUR01 Mill Tailings						
612			X			
617			X			
630			X			
631			X			Download datalogger
633			X			Download datalogger
634			X			
635			X			
859					X	Download datalogger
863			X			Download datalogger
DUR02 Raffinate Pond						
594			X			Se and U ONLY
596					X	Download datalogger
598			X			Se and U ONLY
607			X			Se and U ONLY
879			X			Se and U ONLY
884			X			Se and U ONLY
888					X	Download datalogger
889					X	Download datalogger
890					X	Download datalogger
DUR03 Bodo Canyon						
605			X			
607			X			POC WELL
608			X			"
612			X			"
618			X			"; supplements 608
621			X			"
623			X			BACKGROUND
MW-1					X	Download datalogger
NVP					X	Download datalogger
P7					X	Download datalogger
Groundwater sampling conducted in June; surface water sampling conducted in September.						

Constituent Sampling Breakdown

Site	Durango				
Analyte	**Groundwater**	**Surface Water**	**Required Detection Limit (mg/L)**	**Analytical Method**	**Line Item Code**
Approx. No. Samples/yr	20	7			
Field Measurements					
Alkalinity	X	X			
Dissolved Oxygen					
Redox Potential	X	X			
pH	X	X			
Specific Conductance	X	X			
Turbidity	X				
Temperature	X	X			
Laboratory Measurements					
Aluminum					
Ammonia as N (NH3-N)					
Cadmium	0612 & 0863 only	X	0.001	SW-846 6020	LMM-02
Calcium	DUR03 only		5	SW-846 6010	LMM-01
Chloride	DUR03 only		0.5	SW-846 9056	MIS-A-039
Chromium					
Gross Alpha					
Gross Beta					
Iron	DUR03 only		0.1	SW-846 6020	LMM-01
Lead					
Magnesium	DUR03 only		5	SW-846 6010	LMM-01
Manganese	All Mill Tailings Areas and Bodo Canyon locations		0.005	SW-846 6010	LMM-01
Molybdenum	All Mill Tailings Areas and Bodo Canyon locations	X	0.003	SW-846 6020	LMM-02
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO_3+NO_2)-N					
Potassium	DUR03 only		1	SW-846 6010	LMM-01
Radium-226					
Radium-228					
Selenium	X	X	0.0001	SW-846 6020	LMM-02
Silica					
Sodium	DUR03 only		1	SW-846 6010	LMM-01
Strontium					
Sulfate	All Mill Tailings Areas and Bodo Canyon locations		0.5	SW-846 9056	MIS-A-044
Sulfide					
Total Dissolved Solids	DUR03 only		10	SM2540 C	WCH-A-033
Uranium	X	X	0.0001	SW-846 6020	LMM-02
Vanadium					
Zinc					
Total No. of Analytes	13	4			

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

Attachment 4
Trip Report

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Memorandum

DATE: July 9, 2012

TO: David Miller

FROM: Daniel Sellers

SUBJECT: Trip Report

Site: Durango, Colorado, Processing (DUR01), Raffinate Pond (DUR02) and Disposal (DUR03) Sites Sampling.

Dates of Sampling Event: June 25-28, 2012

Team Members: Dan Sellers and Dave Atkinson. Present on June 26 to observe sampling at the Processing site: Jalena Dayvault (DOE).

Number of Locations Sampled: Samples were collected from 20 locations identified on the sampling notification letter as follows:

	Locations Sampled	Planned Locations
Mill Tailings Site, DUR01	8 wells	8 wells
Raffinate Pond Site, DUR02	5 wells	5 wells
Bodo Canyon Site, DUR03	7 wells	7 wells

Splits for uranium analysis were collected at the Treatment System (DUR03 locations 0608, 0618, 0621, 0623) for the Environmental Sciences Laboratory (ESL). These split samples were created by collecting metals samples in 500mL-liter bottles, acidifying, and then transferring ~100mL in to 125mL bottles.

Locations Not Sampled/Reason: None

Location Specific Information:

Site	Location IDs	Comments
DUR01	0631	Dark clumps early in purge.
DUR01	0635	Rusty clumps early in purge.
DUR01	0634	Cat II

Site	Location IDs	Comments
DUR02	0594 0607	
DUR03	0605 0612	
DUR02	0879	Per Program Directive DUP-2012-02, well was purged and sampled using high flow purging protocol.
DUR03	0605 0607 0612	Sulfur odor. 0612 has a very high alkalinity value.
DUR03	0621	pH slow to stabilize; settles out at < 5.
DUR03	0623	Cat II. Filtered. Turbidity was>10NTUs.

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

False ID	True ID	Ticket Number	Sample Type	Associated Matrix
2171	DUR01 0863	KHZ 006	Duplicate	Groundwater
2173	DUR03 0612	KHZ 008	Duplicate	Groundwater
2242	DUR03 0621	KHZ 024	ESL Duplicate	Groundwater
2257	DUR03 0621	KHZ 015	Duplicate	Groundwater

Report Identification Number (RIN) Assigned: RIN 12064648 was assigned to samples collected at all three sites (DUR01, DUR02, and DUR03) that were shipped to ALS Laboratory; RIN 012064650 was assigned for treatment system wells 0608, 0618, 0621 and 0623 that were shipped to GEL Laboratories; RIN 12064651 was assigned to the treatment system samples collected for the ESL. Field data sheets can be found in \\Condor\sms\12064648 in the Field Data folder.

Sample Shipment: RIN 12064650 samples were shipped from Durango, Colorado, to GEL Laboratories on June 26, 2012. RIN 12064648 samples were shipped from Durango, Colorado, to ALS Laboratory Group on June 28, 2012. RIN 12064651 samples were hand-delivered to the ESL on June 28, 2012.

Water Level Measurements: Water level measurements were collected at all sampled wells.

Well Inspection Summary: All wells were in good condition with two exceptions:
Well DUR02 0607 is bent and is too high above the current surface level.

Field Variance: Well DUR01 0879 was sampled per Program Directive DUP-2012-02 (Well was purged and sampled using high flow purging protocol) Due to construction activities that had altered the well the bladder pump is now wedged in place and does not work and cannot be removed.

Equipment: All equipment functioned properly. All wells were sampled using the low-flow procedure. Wells were sampled with a peristaltic pump and dedicated tubing, a dedicated bladder pump, or a disposable bailer. All other equipment was dedicated or disposable.

Institutional Controls

Fences, Gates, Locks: All gates were appropriately closed and locked during the sampling event. The standard LMS key worked in a lock that is "daisy-chained" on the gate for the dog park. A Bureau of Reclamation key is used for well DUR02 0598.
Signs: No issues observed.
Trespassing/Site Disturbances: None observed.

Site Issues:

Disposal Cell/Drainage Structure Integrity: No issues observed.
Vegetation/Noxious Weed Concerns: No issues observed.
Maintenance Requirements: Well DUR02 0607 needs to be straightened and modified to the current surface level.
Safety Issues: None identified.
Access Issues:

- Samplers called Durango police dispatch prior to arriving at the Durango Processing site (DUR01, aka "the dog park") to let them know about sampling activities.
- Bureau of Reclamation personnel are available in an office trailer just below well DUR02 0607 if help is needed accessing wells 0598 or 0879.

Corrective Action Required/Taken: None.

(DLS/lcg)

cc: (electronic)
Jalena Dayvault, DOE
Steve Donivan, Stoller
David Miller, Stoller
EDD Delivery

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