

Data Validation Package

June and September 2013
Groundwater and Surface Water
Sampling at the
Durango, Colorado, Disposal and
Processing Sites

March 2014



U.S. DEPARTMENT OF
ENERGY

Legacy
Management

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Sampling Event Summary

Site: Durango, Colorado, Disposal and Processing Sites

Sampling Period: June 3–5, 2013 and September 4, 2013

Annual groundwater and surface sampling was conducted at the Durango, Colorado, Disposal and Processing sites as specified in the applicable site documents. Sampling and analyses were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PRO/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 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 was performed in September to coincide with low-flow conditions in the Animas River. Groundwater samples also were collected at the Raffinate Pond area as a best management practice to monitor selenium and uranium concentrations.

U.S. Environmental Protection Agency (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.

Table 1. Durango Processing Site Wells Exceeding EPA Standards in June 2013

Analyte	Standard ^a	Cleanup Goal ^b	Site Code ^c	Location	Concentration (mg/L)
Cadmium	0.01	Not applicable	DUR01	0612	0.043
Selenium	0.01	0.05	DUR01	0630	0.012
				0633	0.045
				0598	0.230
			DUR02	0607	0.410
				0879	0.012
				0884	0.550
Uranium	0.044	Not applicable	DUR01	0612	1.40
				0617	0.160
				0630	0.230
				0631	0.100
				0633	0.700
Uranium	0.044	Not applicable	DUR02	0598	0.096
				0879	0.083
				0884	0.100

^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.

Surface water results from Animas River locations adjacent to and downstream of the processing site are compared to results from the upstream location (0652) in Table 2.

Table 2. Comparison of Animas River Concentrations to Benchmarks

Analyte	Benchmark ^a	0652	0584	0586	0654	0678	0691
Cadmium	0.0020	0.0002	0.0001	0.0002	0.0001	0.0001	0.0001
Molybdenum	0.010	0.0013	0.0012	0.0012	0.0013	0.0012	0.0012
Selenium	0.005	ND	ND	ND	ND	ND	ND
Uranium	0.0018	0.0011	0.0010	0.0011	0.0011	0.0010	0.0010

^a Benchmark values were derived using historical data from upstream location 0652.

Concentrations are in milligrams per liter (mg/L).

ND: Not Detected



Cassie Gauthier
Site Lead, S.M. Stoller Corporation

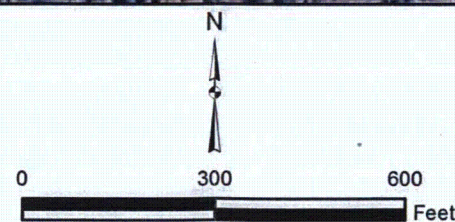
3/17/14

Date



LEGEND

- WELL TO BE SAMPLED
- - - SITE BOUNDARY



U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION, COLORADO

Work Performed by
S.M. Stoller Corporation
Under DOE Contract
No. DE-AM01-07LM00060

Planned Sampling Map
Durango, CO, Disposal Site
June 2013

DATE PREPARED:
May 7, 2013

FILENAME:
S1019600

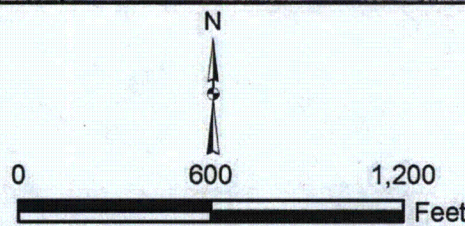
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Durango, Colorado, Disposal Site Sample Location Map—June 2013



LEGEND

- WELL TO BE SAMPLED
- - - SITE BOUNDARY



U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION, COLORADO

Work Performed by
S.M. Stoller Corporation
Under DOE Contract
No. DE-AM01-07LM00060

Planned Sampling Map Durango, CO, Processing Sites June 2013

DATE PREPARED:
May 7, 2013

FILENAME:
S1019700

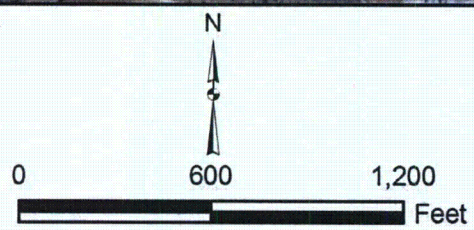
M:\LTS\111\0001\16\000\S10197\S1019700-11x17.mxd smithw 05/07/2013 11:01:44 AM

Durango, Colorado, Processing Sites Sample Location Map—June 2013



LEGEND

- SURFACE LOCATION TO BE SAMPLED
- - - SITE BOUNDARY



U.S. DEPARTMENT OF ENERGY
GRAND JUNCTION, COLORADO

Work Performed by
S.M. Stoller Corporation
Under DOE Contract
No. DE-AM01-07LM00080

Planned Sampling Map
Durango, CO, Processing Sites
September 2013

DATE PREPARED:
March 12, 2014

FILENAME:
S1051800

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Durango, Colorado, Processing Sites Sample Location Map—September 2013

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Durango, Colorado	Date(s) of Water Sampling	June 3–5 and September 4, 2013
Date(s) of Verification	October 16, 2013	Name of Verifier	Stephen Donivan

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List any Program Directives or other documents, SOPs, instructions.	Yes	Work Order letters dated May 10, and August 6, 2013, Program Directive DUP-2012-02.
2. Were the sampling locations specified in the planning documents sampled?	No	Surface location 0588 was dry and not sampled. Location 0678 was sampled instead of 0656.
3. Were calibrations conducted as specified in the above-named documents?	Yes	Initial calibrations were performed on June 3 and September 3, 2013.
4. Was an operational check of the field equipment conducted daily? Did the operational checks meet criteria?	Yes	Operational checks were performed June 3,4,5, and September 4, 2013.
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	No	Alkalinity was not measured at location DUR02-0598.
6. Were wells categorized correctly?	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 meet criteria prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	Yes	

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 at locations DUR01-0863, DUR03-0618, and DUR01-0586.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	Yes	One equipment blank was collected.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were the true identities of the QC samples documented?	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. Was all pertinent information documented on the field data sheets?	No	Sampling equipment was not identified at many groundwater locations.
18. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
19. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN): 13055370
Sample Event: June 3–5, 2013
Site(s): Durango, Colorado
Laboratory: ALS Laboratory Group
Work Order No.: 1306104
Analysis: Metals and Wet Chemistry
Validator: Stephen Donovan
Review Date: August 8, 2013

This validation was performed according to the *Environmental Procedures Catalog* (LMS/POL/S04325, continually updated), “Standard Practice for Validation of Environmental 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 3.

Table 3. 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 4. Refer to the sections below for an explanation of the data qualifiers applied.

Table 4. Data Qualifier Summary

Sample Number	Location	Analyte(s)	Flag	Reason
1306104-1	0612	Selenium	J	PQL check result
1306104-6	0634	Selenium	J	PQL check result
1306104-7	0635	Selenium	J	PQL check result
1306104-08	0863	Uranium	J	Laboratory replicate result
1306104-17	0608	Iron	U	Less than 5 times the calibration blank
1306104-17	0608	Manganese	U	Less than 5 times the calibration blank
1306104-17	0608	Potassium	J	Serial dilution result
1306104-17	0608	Selenium	J	Serial dilution result
1306104-17	0608	Sodium	J	Serial dilution result
1306104-18	0612	Selenium	J	PQL check result
1306104-19	0618	Manganese	U	Less than 5 times the method blank
1306104-22	0618 Duplicate	Iron	U	Less than 5 times the calibration blank

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 22 water samples on June 7, 2013, 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 of 5 °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 June 10 and 11, 2013, 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 with all calibration checks meeting 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 June 11, 2013, 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 with all calibration checks meeting 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 selenium. The associated sample selenium results that are greater than the MDL but less than 5 times the PQL are qualified with a "J" flag as estimated values. 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 April 3, 2013. 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 with all calibration check results within the acceptance range.

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 practical quantitation limits 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 practical quantitation limit. 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 practical quantitation limit, indicating acceptable precision for all analytes, with the following exception. The duplicate prepared from sample 0863 did not meet the acceptance criteria for uranium. The associated sample uranium result is qualified with a “J” flag as an estimated value.

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 with the following exceptions. The serial dilution prepared from sample 0608 did not meet the acceptance criteria for potassium, selenium, and sodium. The associated sample results for these analytes are qualified with a “J” flag as estimated values.

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 26, 2013. 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: 13055370 Lab Code: PAR Validator: Stephen Donivan Validation Date: 08/06/2013
Project: Durango Analysis Type: ☒ Metals ☒ General Chem ☐ Rad ☐ Organics
of Samples: 22 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
- ☒ Detection Limits
- ☐ Field/Trip Blanks
- ☒ Field Duplicates

All analyses were completed within the applicable holding times.

The reported detection limits are equal to or below contract requirements.

There were 2 duplicates evaluated.

SAMPLE MANAGEMENT SYSTEM

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Metals Data Validation Worksheet

RIN: 13055370

Lab Code: PAR

Date Due: 07/05/2013

Matrix: Water

Site Code: DUR01

Date Completed: 06/27/2013

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	CCV	CCB								
Cadmium	ICP/MS	06/11/2013	0.0000	1.0000	OK	OK	OK	99.0	105.0	102.0	3.0	100.0		110.0
Calcium	ICP/ES	06/10/2013	0.0000	1.0000	OK	OK	OK	104.0				105.0	0.0	103.0
Calcium	ICP/ES	06/11/2013	0.0000	1.0000	OK	OK	OK	103.0	105.0	101.0	1.0	103.0		98.0
Iron	ICP/ES	06/10/2013	0.0000	1.0000	OK	OK	OK	94.0				107.0		94.0
Iron	ICP/ES	06/11/2013	0.0000	1.0000	OK	OK	OK	96.0	92.0	92.0	0.0	105.0		95.0
Magnesium	ICP/ES	06/10/2013	0.0000	1.0000	OK	OK	OK	99.0				106.0	1.0	102.0
Magnesium	ICP/ES	06/11/2013	0.0000	1.0000	OK	OK	OK	103.0	104.0	102.0	1.0	104.0		99.0
Manganese	ICP/ES	06/10/2013	0.0000	1.0000	OK	OK	OK	102.0	95.0	94.0	1.0	90.0	1.0	102.0
Manganese	ICP/ES	06/11/2013	0.0000	1.0000	OK	OK	OK	100.0	95.0	94.0	0.0	95.0		102.0
Molybdenum	ICP/MS	06/11/2013	0.0000	1.0000	OK	OK	OK	99.0	109.0	102.0	6.0	102.0		91.0
Molybdenum	ICP/MS	06/11/2013						102.0	106.0	105.0	1.0			
Potassium	ICP/ES	06/10/2013	0.0000	1.0000	OK	OK	OK	105.0					13.0	84.0
Potassium	ICP/ES	06/11/2013	0.0000	1.0000	OK	OK	OK	109.0	128.0	128.0	0.0			84.0
Selenium	ICP/MS	06/11/2013	0.0000	1.0000	OK	OK	OK	95.0	106.0	105.0	1.0	96.0	17.0	64.0
Selenium	ICP/MS	06/11/2013						97.0	106.0	107.0	1.0			
Sodium	ICP/ES	06/10/2013	0.0000	1.0000	OK	OK	OK	99.0					14.0	85.0
Sodium	ICP/ES	06/11/2013	0.0000	1.0000	OK	OK	OK	101.0	108.0	107.0	1.0			85.0
Uranium	ICP/MS	06/11/2013	0.0000	1.0000	OK	OK	OK	105.0	123.0	99.0	9.0	105.0	5.0	80.0

SAMPLE MANAGEMENT SYSTEM
Metals Data Validation Worksheet

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RIN: 13055370 Lab Code: PAR Date Due: 07/05/2013
 Matrix: Water Site Code: DUR01 Date Completed: 06/27/2013

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	CCV	CCB								
Uranium	ICP/MS	06/11/2013						106.0	113.0	111.0	2.0			
Vanadium	ICP/MS	06/11/2013	0.0000	1.0000	OK	OK	OK	101.0	112.0	107.0	5.0	105.0		99.0
Vanadium	ICP/MS	06/11/2013						104.0						

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 13055370

Lab Code: PARDate Due: 07/05/2013Matrix: WaterSite Code: DUR01Date Completed: 06/27/2013

Analyte	Date Analyzed	CALIBRATION					Method	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	CCV	CCB	Blank						
CHLORIDE	06/14/2013	0.000	1.0000	OK	OK	OK	98.00	98.0	97.0	0		
SULFATE	06/14/2013	0.000	0.9998	OK	OK	OK	95.00	91.0	87.0	1.00		
TOTAL DISSOLVED SOLIDS	06/13/2013					OK	105.00			0		

General Information

Requisition No. (RIN): 13085577
Sample Event: September 4, 2013
Site(s): Durango, Colorado
Laboratory: GEL Laboratories
Work Order No.: 332985
Analysis: Metals
Validator: Stephen Donivan
Review Date: October 16, 2013

This validation was performed according to the *Environmental Procedures Catalog* (LMS/POL/S04325, continually updated), "Standard Practice for Validation of Environmental 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 5.

Table 5. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Metals, Cd, Mo, Se, U	LMM-02	SW-846 3005A	SW-846 6020A

Data Qualifier Summary

None of the analytical results required qualification.

Sample Shipping/Receiving

GEL Laboratories in Charleston, South Carolina, received eight water samples on September 6, 2013, accompanied by a 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 intact at ambient temperature which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

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.

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 6020A

Calibrations for cadmium, molybdenum, selenium, and uranium were performed on October 1, 2013, using two calibration standards. Initial and continuing calibration verification checks were made at the required frequency with all calibration checks meeting 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 and all results were within the acceptance range. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. All method blank and calibration blank results associated with the samples were below MDLs for all analytes.

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 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.

Dilutions

Samples dilutions were not required.

Completeness

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

Electronic Data Deliverable (EDD) File

The EDD file arrived on October 7, 2013. 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: 13085577 Lab Code: GEN Validator: Stephen Donovan Validation Date: 10/16/2013

Project: Durango Analysis Type: ☒ Metals ☐ General Chem ☐ Rad ☐ Organics

of Samples: 8 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

There was 1 trip/equipment blank evaluated.

☒ Field Duplicates

There was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM
Metals Data Validation Worksheet

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RIN: 13085577 Lab Code: GEN Date Due: 10/04/2013
 Matrix: Water Site Code: DUR01 Date Completed: 10/04/2013

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	CCV	CCB								
Cadmium	ICP/MS	10/01/2013			OK	OK	OK	109.0	106.0			97.0		101.0
Molybdenum	ICP/MS	10/01/2013			OK	OK	OK	107.0	104.0		0.0	107.0		102.0
Selenium	ICP/MS	10/01/2013			OK	OK	OK	106.0	106.0			96.0		105.0
Uranium	ICP/MS	10/01/2013			OK	OK	OK	105.0	101.0		4.0	103.0		102.0

Sampling Quality Control Assessment

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

Sampling Protocol

All monitoring wells were sampled using a peristaltic pump and dedicated tubing, or a dedicated bladder pump, meeting Category I or II low-flow sampling criteria with the following exception: well DUR01-0879 was sampled per Program Directive DUP-2012-02 (well was purged and sampled using high flow purging protocol). Sample results for monitoring wells meeting the Category I or II criteria were qualified with an "F" flag in the database, indicating the wells were purged and sampled using the low-flow sampling method.

Wells DUR01-0633, DUR01-0634, DUR02-0607, DUR03-0605, DUR03-0612, and DUR03-0623 were classified as Category II due to water level drawdown. The sample results for these six wells were qualified with a "Q" flag, indicating the data are qualitative because of the sampling technique.

Equipment Blank Assessment

Equipment blanks are prepared and analyzed to document contamination attributable to the sample collection process. One equipment blank was submitted with these samples. There were no analytes detected in this 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. 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. Duplicate samples were collected from wells DUR01-0863 and DUR03-0618 and surface location DUR01-0586. The duplicate results met the acceptance criteria demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM

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Validation Report: Field Duplicates

RIN: 13055370 Lab Code: PAR Project: Durango Validation Date: 08/06/2013

Duplicate: 2171

Sample: 0863

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Cadmium	0.021	B		1	0.014	B		1			UG/L
Manganese	110			1	110			1	0		UG/L
Molybdenum	0.61			1	0.64			1	4.80		UG/L
Selenium	0.032	U		1	0.032	U		1			UG/L
SULFATE	650			20	650			20	0		MG/L
Uranium	0.13	*		1	0.1			1	NA		UG/L

Duplicate: 2173

Sample: 0618

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Calcium	240000			1	240000			1	0		UG/L
CHLORIDE	32			20	31			20	3.17		MG/L
Iron	19	B		1	7.4	B		1	NA		UG/L
Magnesium	130000			1	140000			1	7.41		UG/L
Manganese	0.97	B		1	0.35	B		1			UG/L
Molybdenum	0.48	B		10	0.61			1			UG/L
Potassium	3200			1	3300			1	3.08		UG/L
Selenium	5.5			1	5.3			1	3.70		UG/L
Sodium	100000			1	100000			1	0		UG/L
SULFATE	880			20	890			20	1.13		MG/L
TOTAL DISSOLVED SOLIDS	1800			1	1800			1	0		MG/L
Uranium	100			10	100			1	0		UG/L

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

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RIN: 13085577 Lab Code: GEN Project: Durango Validation Date: 10/16/2013

Duplicate: 2517

Sample: 0586

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Cadmium	0.189	B		1.00	0.168	B		1.00			ug/L
Molybdenum	1.19	B		1.00	1.23	B		1.00	3.31		ug/L
Selenium	1.50	U		1.00	1.50	U		1.00			ug/L
Uranium	1.06			1.00	1.09			1.00	2.79		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: Stephen Donovan
Stephen Donovan

3-13-2014
Date

Data Validation Lead: Stephen Donovan
Stephen Donovan

3-13-2014
Date

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 environmental database. The application compares the new data set (in standard environmental database units) 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. The review should include an evaluation of any notable trends in the data that may indicate the outliers represent true extreme values.

The specific conductance value from location DUR02-0594 was identified as a potential outlier. The recorded value was 50 micromhos per centimeter ($\mu\text{mhos/cm}$) with historical values ranging from 3,082 to 4,739 $\mu\text{mhos/cm}$. This value appears to be a result of a measurement error and the value is qualified with an "R" flag as rejected.

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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: 10/29/2013

Location: 0605 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/05/2013	N001	36	-	56	703		FQ	#		
Calcium	mg/L	06/05/2013	N001	36	-	56	130		FQ	#	0.012	
Chloride	mg/L	06/05/2013	N001	36	-	56	32		FQ	#	4	
Iron	mg/L	06/05/2013	N001	36	-	56	0.0049	U	FQ	#	0.0049	
Magnesium	mg/L	06/05/2013	N001	36	-	56	100		FQ	#	0.013	
Manganese	mg/L	06/05/2013	N001	36	-	56	0.029		FQ	#	0.00011	
Molybdenum	mg/L	06/05/2013	N001	36	-	56	0.000032	U	FQ	#	0.000032	
Oxidation Reduction Potential	mV	06/05/2013	N001	36	-	56	-95.5		FQ	#		
pH	s.u.	06/05/2013	N001	36	-	56	6.95		FQ	#		
Potassium	mg/L	06/05/2013	N001	36	-	56	11		FQ	#	0.11	
Selenium	mg/L	06/05/2013	N001	36	-	56	0.000032	U	FQ	#	0.000032	
Sodium	mg/L	06/05/2013	N001	36	-	56	260		FQ	#	0.066	
Specific Conductance	umhos/cm	06/05/2013	N001	36	-	56	2273		FQ	#		
Sulfate	mg/L	06/05/2013	N001	36	-	56	660		FQ	#	10	
Temperature	C	06/05/2013	N001	36	-	56	14.55		FQ	#		
Total Dissolved Solids	mg/L	06/05/2013	N001	36	-	56	1800		FQ	#	40	
Turbidity	NTU	06/05/2013	N001	36	-	56	1.88		FQ	#		
Uranium	mg/L	06/05/2013	N001	36	-	56	0.000037		FQ	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 10/29/2013
Location: 0607 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/05/2013	N001	36.7	- 56.7	408		F	#		
Calcium	mg/L	06/05/2013	N001	36.7	- 56.7	300		F	#	0.012	
Chloride	mg/L	06/05/2013	N001	36.7	- 56.7	13		F	#	1	
Iron	mg/L	06/05/2013	N001	36.7	- 56.7	0.053	B	F	#	0.0049	
Magnesium	mg/L	06/05/2013	N001	36.7	- 56.7	180		F	#	0.013	
Manganese	mg/L	06/05/2013	N001	36.7	- 56.7	0.072		F	#	0.00011	
Molybdenum	mg/L	06/05/2013	N001	36.7	- 56.7	0.000032	U	F	#	0.000032	
Oxidation Reduction Potential	mV	06/05/2013	N001	36.7	- 56.7	-214.9		F	#		
pH	s.u.	06/05/2013	N001	36.7	- 56.7	6.95		F	#		
Potassium	mg/L	06/05/2013	N001	36.7	- 56.7	11		F	#	0.11	
Selenium	mg/L	06/05/2013	N001	36.7	- 56.7	0.000032	U	F	#	0.000032	
Sodium	mg/L	06/05/2013	N001	36.7	- 56.7	300		F	#	0.066	
Specific Conductance	umhos /cm	06/05/2013	N001	36.7	- 56.7	3232		F	#		
Sulfate	mg/L	06/05/2013	N001	36.7	- 56.7	1600		F	#	25	
Temperature	C	06/05/2013	N001	36.7	- 56.7	13.73		F	#		
Total Dissolved Solids	mg/L	06/05/2013	N001	36.7	- 56.7	3200		F	#	80	
Turbidity	NTU	06/05/2013	N001	36.7	- 56.7	2.76		F	#		
Uranium	mg/L	06/05/2013	N001	36.7	- 56.7	0.00012		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site

REPORT DATE: 10/29/2013

Location: 0608 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/05/2013	N001	29	-	39	306		F	#		
Calcium	mg/L	06/05/2013	N001	29	-	39	150		F	#	0.012	
Chloride	mg/L	06/05/2013	N001	29	-	39	15		F	#	2	
Iron	mg/L	06/05/2013	N001	29	-	39	0.013	B	UF	#	0.0049	
Magnesium	mg/L	06/05/2013	N001	29	-	39	85		F	#	0.013	
Manganese	mg/L	06/05/2013	N001	29	-	39	0.0018	B	UF	#	0.00011	
Molybdenum	mg/L	06/05/2013	N001	29	-	39	0.0013		F	#	0.000032	
Oxidation Reduction Potential	mV	06/05/2013	N001	29	-	39	68.3		F	#		
pH	s.u.	06/05/2013	N001	29	-	39	7.06		F	#		
Potassium	mg/L	06/05/2013	N001	29	-	39	6.4	EN	FJ	#	0.11	
Selenium	mg/L	06/05/2013	N001	29	-	39	0.0033	E	FJ	#	0.000032	
Sodium	mg/L	06/05/2013	N001	29	-	39	63	E	FJ	#	0.0066	
Specific Conductance	umhos /cm	06/05/2013	N001	29	-	39	1362		F	#		
Sulfate	mg/L	06/05/2013	N001	29	-	39	490		F	#	5	
Temperature	C	06/05/2013	N001	29	-	39	12.03		F	#		
Total Dissolved Solids	mg/L	06/05/2013	N001	29	-	39	1100		F	#	40	
Turbidity	NTU	06/05/2013	N001	29	-	39	2.77		F	#		
Uranium	mg/L	06/05/2013	N001	29	-	39	0.016		F	#	0.0000029	
Uranium	mg/L	06/05/2013	N002	29	-	39	0.0155			0	0.0002	
Vanadium	mg/L	06/05/2013	N001	29	-	39	0.00028	B	F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 10/29/2013
Location: 0612 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/05/2013	N001	98.09	- 108.09	2358		FQ	#		
Calcium	mg/L	06/05/2013	0001	98.09	- 108.09	6.7		FQ	#	0.012	
Chloride	mg/L	06/05/2013	0001	98.09	- 108.09	56		FQ	#	10	
Iron	mg/L	06/05/2013	0001	98.09	- 108.09	0.014	B	FQ	#	0.0049	
Magnesium	mg/L	06/05/2013	0001	98.09	- 108.09	3.7		FQ	#	0.013	
Manganese	mg/L	06/05/2013	0001	98.09	- 108.09	0.0074		FQ	#	0.00011	
Molybdenum	mg/L	06/05/2013	0001	98.09	- 108.09	0.000032	U	FQ	#	0.000032	
Oxidation Reduction Potential	mV	06/05/2013	N001	98.09	- 108.09	-370		FQ	#		
pH	s.u.	06/05/2013	N001	98.09	- 108.09	7.68		FQ	#		
Potassium	mg/L	06/05/2013	0001	98.09	- 108.09	12		FQ	#	0.11	
Selenium	mg/L	06/05/2013	0001	98.09	- 108.09	0.000041	B	FQJ	#	0.000032	
Sodium	mg/L	06/05/2013	0001	98.09	- 108.09	840		FQ	#	0.33	
Specific Conductance	umhos /cm	06/05/2013	N001	98.09	- 108.09	3824		FQ	#		
Sulfate	mg/L	06/05/2013	0001	98.09	- 108.09	13		FQ	#	0.5	
Temperature	C	06/05/2013	N001	98.09	- 108.09	17.34		FQ	#		
Total Dissolved Solids	mg/L	06/05/2013	0001	98.09	- 108.09	2700		FQ	#	80	
Turbidity	NTU	06/05/2013	N001	98.09	- 108.09	16.1		FQ	#		
Uranium	mg/L	06/05/2013	0001	98.09	- 108.09	0.000071		FQ	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site

REPORT DATE: 10/29/2013

Location: 0618 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/05/2013	N001	29.77 - 49.77	382		F	#		
Calcium	mg/L	06/05/2013	N001	29.77 - 49.77	240		F	#	0.012	
Calcium	mg/L	06/05/2013	N002	29.77 - 49.77	240		F	#	0.012	
Chloride	mg/L	06/05/2013	N001	29.77 - 49.77	32		F	#	4	
Chloride	mg/L	06/05/2013	N002	29.77 - 49.77	31		F	#	4	
Iron	mg/L	06/05/2013	N001	29.77 - 49.77	0.019	B	F	#	0.0049	
Iron	mg/L	06/05/2013	N002	29.77 - 49.77	0.0074	B	UF	#	0.0049	
Magnesium	mg/L	06/05/2013	N001	29.77 - 49.77	130		F	#	0.013	
Magnesium	mg/L	06/05/2013	N002	29.77 - 49.77	140		F	#	0.013	
Manganese	mg/L	06/05/2013	N001	29.77 - 49.77	0.00097	B	UF	#	0.00011	
Manganese	mg/L	06/05/2013	N002	29.77 - 49.77	0.00035	B	F	#	0.00011	
Molybdenum	mg/L	06/05/2013	N001	29.77 - 49.77	0.00048	B	F	#	0.00032	
Molybdenum	mg/L	06/05/2013	N002	29.77 - 49.77	0.00061		F	#	0.00032	
Oxidation Reduction Potential	mV	06/05/2013	N001	29.77 - 49.77	100.2		F	#		
pH	s.u.	06/05/2013	N001	29.77 - 49.77	6.9		F	#		
Potassium	mg/L	06/05/2013	N001	29.77 - 49.77	3.2		F	#	0.11	
Potassium	mg/L	06/05/2013	N002	29.77 - 49.77	3.3		F	#	0.11	
Selenium	mg/L	06/05/2013	N001	29.77 - 49.77	0.0055		F	#	0.000032	
Selenium	mg/L	06/05/2013	N002	29.77 - 49.77	0.0053		F	#	0.000032	
Sodium	mg/L	06/05/2013	N001	29.77 - 49.77	100		F	#	0.0066	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 10/29/2013
Location: 0618 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Sodium	mg/L	06/05/2013	N002	29.77 - 49.77	100		F	#	0.0066	
Specific Conductance	umhos /cm	06/05/2013	N001	29.77 - 49.77	2021		F	#		
Sulfate	mg/L	06/05/2013	N001	29.77 - 49.77	880		F	#	10	
Sulfate	mg/L	06/05/2013	N002	29.77 - 49.77	890		F	#	10	
Temperature	C	06/05/2013	N001	29.77 - 49.77	12.12		F	#		
Total Dissolved Solids	mg/L	06/05/2013	N001	29.77 - 49.77	1800		F	#	40	
Total Dissolved Solids	mg/L	06/05/2013	N002	29.77 - 49.77	1800		F	#	40	
Turbidity	NTU	06/05/2013	N001	29.77 - 49.77	1.17		F	#		
Uranium	mg/L	06/05/2013	N001	29.77 - 49.77	0.1		F	#	0.000029	
Uranium	mg/L	06/05/2013	N002	29.77 - 49.77	0.1		F	#	0.0000029	
Uranium	mg/L	06/05/2013	N003	29.77 - 49.77	0.1008			0	0.0002	
Uranium	mg/L	06/05/2013	N004	29.77 - 49.77	0.1009			0	0.0002	
Vanadium	mg/L	06/05/2013	N001	29.77 - 49.77	0.0002	B	F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site

REPORT DATE: 10/29/2013

Location: 0621 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/05/2013	N001	78.46	- 88.46	0		F	#		
Calcium	mg/L	06/05/2013	N001	78.46	- 88.46	450		F	#	0.12	
Chloride	mg/L	06/05/2013	N001	78.46	- 88.46	15		F	#	4	
Iron	mg/L	06/05/2013	N001	78.46	- 88.46	160		F	#	0.0049	
Magnesium	mg/L	06/05/2013	N001	78.46	- 88.46	380		F	#	0.013	
Manganese	mg/L	06/05/2013	N001	78.46	- 88.46	3.1		F	#	0.00011	
Molybdenum	mg/L	06/05/2013	N001	78.46	- 88.46	0.000057	B	F	#	0.000032	
Oxidation Reduction Potential	mV	06/05/2013	N001	78.46	- 88.46	150.9		F	#		
pH	s.u.	06/05/2013	N001	78.46	- 88.46	5.25		F	#		
Potassium	mg/L	06/05/2013	N001	78.46	- 88.46	17		F	#	0.11	
Selenium	mg/L	06/05/2013	N001	78.46	- 88.46	0.0048		F	#	0.000032	
Sodium	mg/L	06/05/2013	N001	78.46	- 88.46	160		F	#	0.066	
Specific Conductance	umhos /cm	06/05/2013	N001	78.46	- 88.46	3942		F	#		
Sulfate	mg/L	06/05/2013	N001	78.46	- 88.46	3100		F	#	25	
Temperature	C	06/05/2013	N001	78.46	- 88.46	13.96		F	#		
Total Dissolved Solids	mg/L	06/05/2013	N001	78.46	- 88.46	4600		F	#	80	
Turbidity	NTU	06/05/2013	N001	78.46	- 88.46	9.98		F	#		
Uranium	mg/L	06/05/2013	N001	78.46	- 88.46	0.00013		F	#	0.0000029	
Uranium	mg/L	06/05/2013	N002	78.46	- 88.46	0.004	U		0	0.0002	
Vanadium	mg/L	06/05/2013	N001	78.46	- 88.46	0.00057		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site

REPORT DATE: 10/29/2013

Location: 0623 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/05/2013	0001	19.35 - 39.35	536		FQ	#		
Calcium	mg/L	06/05/2013	0001	19.35 - 39.35	300		FQ	#	0.012	
Chloride	mg/L	06/05/2013	0001	19.35 - 39.35	46		FQ	#	10	
Iron	mg/L	06/05/2013	0001	19.35 - 39.35	7.1		FQ	#	0.0049	
Magnesium	mg/L	06/05/2013	0001	19.35 - 39.35	260		FQ	#	0.013	
Manganese	mg/L	06/05/2013	0001	19.35 - 39.35	0.45		FQ	#	0.00011	
Molybdenum	mg/L	06/05/2013	0001	19.35 - 39.35	0.0011		FQ	#	0.000032	
Oxidation Reduction Potential	mV	06/05/2013	N001	19.35 - 39.35	-55.4		FQ	#		
pH	s.u.	06/05/2013	N001	19.35 - 39.35	6.92		FQ	#		
Potassium	mg/L	06/05/2013	0001	19.35 - 39.35	4		FQ	#	0.11	
Selenium	mg/L	06/05/2013	0001	19.35 - 39.35	0.000032	U	FQ	#	0.000032	
Sodium	mg/L	06/05/2013	0001	19.35 - 39.35	150		FQ	#	0.066	
Specific Conductance	umhos /cm	06/05/2013	N001	19.35 - 39.35	3005		FQ	#		
Sulfate	mg/L	06/05/2013	0001	19.35 - 39.35	1500		FQ	#	25	
Temperature	C	06/05/2013	N001	19.35 - 39.35	13.44		FQ	#		
Total Dissolved Solids	mg/L	06/05/2013	0001	19.35 - 39.35	3000		FQ	#	80	
Turbidity	NTU	06/05/2013	N001	19.35 - 39.35	19		FQ	#		
Uranium	mg/L	06/05/2013	0001	19.35 - 39.35	0.00086		FQ	#	0.0000029	

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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**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: 10/29/2013

Location: 0612 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)		Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	N001	37.41	- 57.41	393		F	#		
Cadmium	mg/L	06/04/2013	N001	37.41	- 57.41	0.043		F	#	0.00058	
Manganese	mg/L	06/04/2013	N001	37.41	- 57.41	5.8		F	#	0.00011	
Molybdenum	mg/L	06/04/2013	N001	37.41	- 57.41	0.09		F	#	0.0016	
Oxidation Reduction Potential	mV	06/04/2013	N001	37.41	- 57.41	42.6		F	#		
pH	s.u.	06/04/2013	N001	37.41	- 57.41	6.63		F	#		
Selenium	mg/L	06/04/2013	N001	37.41	- 57.41	0.00044		FJ	#	0.000032	
Specific Conductance	umhos /cm	06/04/2013	N001	37.41	- 57.41	3823		F	#		
Sulfate	mg/L	06/04/2013	N001	37.41	- 57.41	1600		F	#	25	
Temperature	C	06/04/2013	N001	37.41	- 57.41	12.53		F	#		
Turbidity	NTU	06/04/2013	N001	37.41	- 57.41	1.56		F	#		
Uranium	mg/L	06/04/2013	N001	37.41	- 57.41	1.4		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site

REPORT DATE: 10/29/2013

Location: 0617 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Qualifiers Lab Data QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	N001	14 - 29	431	F #		
Manganese	mg/L	06/04/2013	N001	14 - 29	2	F #	0.00011	
Molybdenum	mg/L	06/04/2013	N001	14 - 29	0.002	F #	0.00032	
Oxidation Reduction Potential	mV	06/04/2013	N001	14 - 29	-132.5	F #		
pH	s.u.	06/04/2013	N001	14 - 29	6.83	F #		
Selenium	mg/L	06/04/2013	N001	14 - 29	0.0017	F #	0.000032	
Specific Conductance	umhos /cm	06/04/2013	N001	14 - 29	3152	F #		
Sulfate	mg/L	06/04/2013	N001	14 - 29	1700	F #	25	
Temperature	C	06/04/2013	N001	14 - 29	12.59	F #		
Turbidity	NTU	06/04/2013	N001	14 - 29	9.7	F #		
Uranium	mg/L	06/04/2013	N001	14 - 29	0.16	F #	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site

REPORT DATE: 10/29/2013

Location: 0630 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	N001	28.3	-	38.3	294		F	#		
Manganese	mg/L	06/04/2013	N001	28.3	-	38.3	0.48		F	#	0.00011	
Molybdenum	mg/L	06/04/2013	N001	28.3	-	38.3	0.0026		F	#	0.00032	
Oxidation Reduction Potential	mV	06/04/2013	N001	28.3	-	38.3	5.7		F	#		
pH	s.u.	06/04/2013	N001	28.3	-	38.3	6.73		F	#		
Selenium	mg/L	06/04/2013	N001	28.3	-	38.3	0.012		F	#	0.00032	
Specific Conductance	umhos /cm	06/04/2013	N001	28.3	-	38.3	3064		F	#		
Sulfate	mg/L	06/04/2013	N001	28.3	-	38.3	1700		F	#	25	
Temperature	C	06/04/2013	N001	28.3	-	38.3	19.96		F	#		
Turbidity	NTU	06/04/2013	N001	28.3	-	38.3	9.17		F	#		
Uranium	mg/L	06/04/2013	N001	28.3	-	38.3	0.23		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 10/29/2013
Location: 0631 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	N001	6	-	16	366		F	#		
Manganese	mg/L	06/04/2013	N001	6	-	16	0.38		F	#	0.00011	
Molybdenum	mg/L	06/04/2013	N001	6	-	16	0.0053		F	#	0.00032	
Oxidation Reduction Potential	mV	06/04/2013	N001	6	-	16	-73.8		F	#		
pH	s.u.	06/04/2013	N001	6	-	16	7.25		F	#		
Selenium	mg/L	06/04/2013	N001	6	-	16	0.0011		F	#	0.000032	
Specific Conductance	umhos/cm	06/04/2013	N001	6	-	16	1433		F	#		
Sulfate	mg/L	06/04/2013	N001	6	-	16	220		F	#	5	
Temperature	C	06/04/2013	N001	6	-	16	14.23		F	#		
Turbidity	NTU	06/04/2013	N001	6	-	16	1.69		F	#		
Uranium	mg/L	06/04/2013	N001	6	-	16	0.1		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site

REPORT DATE: 10/29/2013

Location: 0633 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	N001	4	-	14	638		FQ	#		
Manganese	mg/L	06/04/2013	N001	4	-	14	0.26		FQ	#	0.00011	
Molybdenum	mg/L	06/04/2013	N001	4	-	14	0.001	B	FQ	#	0.00032	
Oxidation Reduction Potential	mV	06/04/2013	N001	4	-	14	-138.4		FQ	#		
pH	s.u.	06/04/2013	N001	4	-	14	6.72		FQ	#		
Selenium	mg/L	06/04/2013	N001	4	-	14	0.045		FQ	#	0.00032	
Specific Conductance	umhos /cm	06/04/2013	N001	4	-	14	7708		FQ	#		
Sulfate	mg/L	06/04/2013	N001	4	-	14	3900		FQ	#	50	
Temperature	C	06/04/2013	N001	4	-	14	14.71		FQ	#		
Turbidity	NTU	06/04/2013	N001	4	-	14	9.26		FQ	#		
Uranium	mg/L	06/04/2013	N001	4	-	14	0.7		FQ	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site

REPORT DATE: 10/29/2013

Location: 0634 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	N001	8	-	18	402		FQ	#		
Manganese	mg/L	06/04/2013	N001	8	-	18	0.057		FQ	#	0.00011	
Molybdenum	mg/L	06/04/2013	N001	8	-	18	0.0016		FQ	#	0.000032	
Oxidation Reduction Potential	mV	06/04/2013	N001	8	-	18	48.5		FQ	#		
pH	s.u.	06/04/2013	N001	8	-	18	6.99		FQ	#		
Selenium	mg/L	06/04/2013	N001	8	-	18	0.00037		FQJ	#	0.000032	
Specific Conductance	umhos /cm	06/04/2013	N001	8	-	18	4636		FQ	#		
Sulfate	mg/L	06/04/2013	N001	8	-	18	2400		FQ	#	50	
Temperature	C	06/04/2013	N001	8	-	18	13.37		FQ	#		
Turbidity	NTU	06/04/2013	N001	8	-	18	3.94		FQ	#		
Uranium	mg/L	06/04/2013	N001	8	-	18	0.024		FQ	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site

REPORT DATE: 10/29/2013

Location: 0635 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	N001	5.5 - 15.5	453		F	#		
Manganese	mg/L	06/04/2013	N001	5.5 - 15.5	0.13		F	#	0.00011	
Molybdenum	mg/L	06/04/2013	N001	5.5 - 15.5	0.0012		F	#	0.000032	
Oxidation Reduction Potential	mV	06/04/2013	N001	5.5 - 15.5	-64.1		F	#		
pH	s.u.	06/04/2013	N001	5.5 - 15.5	6.85		F	#		
Selenium	mg/L	06/04/2013	N001	5.5 - 15.5	0.00025		FJ	#	0.000032	
Specific Conductance	umhos /cm	06/04/2013	N001	5.5 - 15.5	2192		F	#		
Sulfate	mg/L	06/04/2013	N001	5.5 - 15.5	810		F	#	10	
Temperature	C	06/04/2013	N001	5.5 - 15.5	13.56		F	#		
Turbidity	NTU	06/04/2013	N001	5.5 - 15.5	3.69		F	#		
Uranium	mg/L	06/04/2013	N001	5.5 - 15.5	0.011		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 10/29/2013
Location: 0863 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	N001	58	-	67.5	479		F	#		
Cadmium	mg/L	06/04/2013	N001	58	-	67.5	0.000021	B	F	#	0.000012	
Cadmium	mg/L	06/04/2013	N002	58	-	67.5	0.000014	B	F	#	0.000012	
Manganese	mg/L	06/04/2013	N001	58	-	67.5	0.11		F	#	0.00011	
Manganese	mg/L	06/04/2013	N002	58	-	67.5	0.11		F	#	0.00011	
Molybdenum	mg/L	06/04/2013	N001	58	-	67.5	0.00061		F	#	0.000032	
Molybdenum	mg/L	06/04/2013	N002	58	-	67.5	0.00064		F	#	0.000032	
Oxidation Reduction Potential	mV	06/04/2013	N001	58	-	67.5	34.2		F	#		
pH	s.u.	06/04/2013	N001	58	-	67.5	6.96		F	#		
Selenium	mg/L	06/04/2013	N001	58	-	67.5	0.000032	U	F	#	0.000032	
Selenium	mg/L	06/04/2013	N002	58	-	67.5	0.000032	U	F	#	0.000032	
Specific Conductance	umhos/cm	06/04/2013	N001	58	-	67.5	2146		F	#		
Sulfate	mg/L	06/04/2013	N001	58	-	67.5	650		F	#	10	
Sulfate	mg/L	06/04/2013	N002	58	-	67.5	650		F	#	10	
Temperature	C	06/04/2013	N001	58	-	67.5	12.41		F	#		
Turbidity	NTU	06/04/2013	N001	58	-	67.5	2.62		F	#		
Uranium	mg/L	06/04/2013	N001	58	-	67.5	0.00013	*	FJ	#	0.0000029	
Uranium	mg/L	06/04/2013	N002	58	-	67.5	0.0001		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site

REPORT DATE: 10/29/2013

Location: 0594 WELL Original location DH-116.

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	N001	8.5 - 38.5	438		F	#		
Oxidation Reduction Potential	mV	06/04/2013	N001	8.5 - 38.5	120.5		F	#		
pH	s.u.	06/04/2013	N001	8.5 - 38.5	7		F	#		
Selenium	mg/L	06/04/2013	N001	8.5 - 38.5	0.0053		F	#	0.00032	
Specific Conductance	umhos /cm	06/04/2013	N001	8.5 - 38.5	50		RF	#		
Temperature	C	06/04/2013	N001	8.5 - 38.5	20.98		F	#		
Turbidity	NTU	06/04/2013	N001	8.5 - 38.5	4.29		F	#		
Uranium	mg/L	06/04/2013	N001	8.5 - 38.5	0.028		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site

REPORT DATE: 10/29/2013

Location: 0598 WELL Original location Bureau of Rec well DH-110.

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Oxidation Reduction Potential	mV	06/04/2013	N001	66.2	-	96.2	-10.7		F	#		
pH	s.u.	06/04/2013	N001	66.2	-	96.2	6.86		F	#		
Selenium	mg/L	06/04/2013	N001	66.2	-	96.2	0.23		F	#	0.00032	
Specific Conductance	umhos /cm	06/04/2013	N001	66.2	-	96.2	7554		F	#		
Temperature	C	06/04/2013	N001	66.2	-	96.2	18.21		F	#		
Turbidity	NTU	06/04/2013	N001	66.2	-	96.2	7.83		F	#		
Uranium	mg/L	06/04/2013	N001	66.2	-	96.2	0.096		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site

REPORT DATE: 10/29/2013

Location: 0607 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Qualifiers Lab Data QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/03/2013	0001	35 - 55	329	FQ #		
Oxidation Reduction Potential	mV	06/03/2013	N001	35 - 55	157.1	FQ #		
pH	s.u.	06/03/2013	N001	35 - 55	7.48	FQ #		
Selenium	mg/L	06/03/2013	0001	35 - 55	0.41	FQ #	0.00032	
Specific Conductance	umhos/cm	06/03/2013	N001	35 - 55	2184	FQ #		
Temperature	C	06/03/2013	N001	35 - 55	17.26	FQ #		
Turbidity	NTU	06/03/2013	N001	35 - 55	15.4	FQ #		
Uranium	mg/L	06/03/2013	0001	35 - 55	0.0031	FQ #	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site

REPORT DATE: 10/29/2013

Location: 0879 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)			Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	N001	27	-	36.9	423			#		
Oxidation Reduction Potential	mV	06/04/2013	N001	27	-	36.9	3.6			#		
pH	s.u.	06/04/2013	N001	27	-	36.9	6.79			#		
Selenium	mg/L	06/04/2013	N001	27	-	36.9	0.012			#	0.00032	
Specific Conductance	umhos /cm	06/04/2013	N001	27	-	36.9	7932			#		
Temperature	C	06/04/2013	N001	27	-	36.9	14.75			#		
Turbidity	NTU	06/04/2013	N001	27	-	36.9	1.62			#		
Uranium	mg/L	06/04/2013	N001	27	-	36.9	0.083			#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site
 REPORT DATE: 10/29/2013
 Location: 0884 WELL

Parameter	Units	Sample Date	ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	06/04/2013	N001	36.5 - 46.5	317		F	#		
Oxidation Reduction Potential	mV	06/04/2013	N001	36.5 - 46.5	50		F	#		
pH	s.u.	06/04/2013	N001	36.5 - 46.5	7		F	#		
Selenium	mg/L	06/04/2013	N001	36.5 - 46.5	0.55		F	#	0.00032	
Specific Conductance	umhos /cm	06/04/2013	N001	36.5 - 46.5	3749		F	#		
Temperature	C	06/04/2013	N001	36.5 - 46.5	15.11		F	#		
Turbidity	NTU	06/04/2013	N001	36.5 - 46.5	2.05		F	#		
Uranium	mg/L	06/04/2013	N001	36.5 - 46.5	0.1		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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Surface Water Quality Data

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Surface Water Quality Data by Location (USEE102) FOR SITE DUR01, Durango Mill Tailings Process Site

REPORT DATE: 10/29/2013

Location: 0584 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Alkalinity, Total (as CaCO ₃)	mg/L	09/04/2013	N001	111			#		
Cadmium	mg/L	09/04/2013	N001	0.000136	B		#	0.00011	
Molybdenum	mg/L	09/04/2013	N001	0.00124	B		#	0.000165	
Oxidation Reduction Potential	mV	09/04/2013	N001	126			#		
pH	s.u.	09/04/2013	N001	8.06			#		
Selenium	mg/L	09/04/2013	N001	0.0015	U		#	0.0015	
Specific Conductance	umhos/cm	09/04/2013	N001	522			#		
Temperature	C	09/04/2013	N001	22.99			#		
Turbidity	NTU	09/04/2013	N001	4.62			#		
Uranium	mg/L	09/04/2013	N001	0.00102			#	0.000067	

Surface Water Quality Data by Location (USEE102) FOR SITE DUR01, Durango Mill Tailings Process Site

REPORT DATE: 10/29/2013

Location: 0586 SURFACE LOCATION

Parameter	Units	Sample Date	ID	Result	Qualifiers Lab	Data QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	09/04/2013	N001	113		#		
Cadmium	mg/L	09/04/2013	N001	0.000189	B	#	0.00011	
Cadmium	mg/L	09/04/2013	N002	0.000168	B	#	0.00011	
Molybdenum	mg/L	09/04/2013	N001	0.00119	B	#	0.000165	
Molybdenum	mg/L	09/04/2013	N002	0.00123	B	#	0.000165	
Oxidation Reduction Potential	mV	09/04/2013	N001	100.4		#		
pH	s.u.	09/04/2013	N001	7.96		#		
Selenium	mg/L	09/04/2013	N001	0.0015	U	#	0.0015	
Selenium	mg/L	09/04/2013	N002	0.0015	U	#	0.0015	
Specific Conductance	umhos/cm	09/04/2013	N001	523		#		
Temperature	C	09/04/2013	N001	18.09		#		
Turbidity	NTU	09/04/2013	N001	6.15		#		
Uranium	mg/L	09/04/2013	N001	0.00106		#	0.000067	
Uranium	mg/L	09/04/2013	N002	0.00109		#	0.000067	

Surface Water Quality Data by Location (USEF.102) FOR SITE DUR01, Durango Mill Tailings Process Site

REPORT DATE: 10/29/2013

Location: 0652 SURFACE LOCATION SURFACE WATER AND SED.

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Alkalinity, Total (as CaCO ₃)	mg/L	09/04/2013	N001	106			#		
Cadmium	mg/L	09/04/2013	N001	0.000196	B		#	0.00011	
Molybdenum	mg/L	09/04/2013	N001	0.00129	B		#	0.000165	
Oxidation Reduction Potential	mV	09/04/2013	N001	131.7			#		
pH	s.u.	09/04/2013	N001	8.17			#		
Selenium	mg/L	09/04/2013	N001	0.0015	U		#	0.0015	
Specific Conductance	umhos/cm	09/04/2013	N001	487			#		
Temperature	C	09/04/2013	N001	21.91			#		
Turbidity	NTU	09/04/2013	N001	7.55			#		
Uranium	mg/L	09/04/2013	N001	0.00109			#	0.000067	

Surface Water Quality Data by Location (USEE102) FOR SITE DUR01, Durango Mill Tailings Process Site

REPORT DATE: 10/29/2013

Location: 0691 SURFACE LOCATION

Parameter	Units	Sample Date	ID	Result	Qualifiers Lab Data	QA	Detection Limit	Uncertainty
Alkalinity, Total (as CaCO ₃)	mg/L	09/04/2013	N001	101		#		
Cadmium	mg/L	09/04/2013	N001	0.000115	B	#	0.00011	
Molybdenum	mg/L	09/04/2013	N001	0.00118	B	#	0.000165	
Oxidation Reduction Potential	mV	09/04/2013	N001	129		#		
pH	s.u.	09/04/2013	N001	8.14		#		
Selenium	mg/L	09/04/2013	N001	0.0015	U	#	0.0015	
Specific Conductance	umhos/cm	09/04/2013	N001	521		#		
Temperature	C	09/04/2013	N001	23.37		#		
Turbidity	NTU	09/04/2013	N001	4.56		#		
Uranium	mg/L	09/04/2013	N001	0.00101		#	0.000067	

Surface Water Quality Data by Location (USEE102) FOR SITE DUR02, Durango Raffinate Pond Process Site

REPORT DATE: 10/29/2013

Location: 0654 SURFACE LOCATION RESERVED FOR CDAY

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Alkalinity, Total (as CaCO ₃)	mg/L	09/04/2013	N001	96			#		
Cadmium	mg/L	09/04/2013	N001	0.00013	B		#	0.00011	
Molybdenum	mg/L	09/04/2013	N001	0.00127	B		#	0.000165	
Oxidation Reduction Potential	mV	09/04/2013	N001	100.2			#		
pH	s.u.	09/04/2013	N001	8.26			#		
Selenium	mg/L	09/04/2013	N001	0.0015	U		#	0.0015	
Specific Conductance	umhos/cm	09/04/2013	N001	518			#		
Temperature	C	09/04/2013	N001	23.31			#		
Turbidity	NTU	09/04/2013	N001	5.25			#		
Uranium	mg/L	09/04/2013	N001	0.00105			#	0.000067	

Surface Water Quality Data by Location (USEE102) FOR SITE DUR02, Durango Raffinate Pond Process Site

REPORT DATE: 10/29/2013

Location: 0678 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Alkalinity, Total (as CaCO ₃)	mg/L	09/04/2013	N001	109			#		
Cadmium	mg/L	09/04/2013	N001	0.000131	B		#	0.00011	
Molybdenum	mg/L	09/04/2013	N001	0.00124	B		#	0.000165	
Oxidation Reduction Potential	mV	09/04/2013	N001	108.2			#		
pH	s.u.	09/04/2013	N001	8			#		
Selenium	mg/L	09/04/2013	N001	0.0015	U		#	0.0015	
Specific Conductance	umhos/cm	09/04/2013	N001	527			#		
Temperature	C	09/04/2013	N001	26.84			#		
Turbidity	NTU	09/04/2013	N001	8.77			#		
Uranium	mg/L	09/04/2013	N001	0.00104			#	0.000067	

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 Data

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BLANKS REPORT

LAB: GENERAL ENGINEERING (Charleston, SC)

RIN: 13085577

Report Date: 10/29/2013

Parameter	Site Code	Location ID	Sample Date	Sample ID	Units	Result	Qualifiers Lab Data	Detection Limit	Uncertainty	Sample Type
Cadmium	DUR01	0999	09/04/2013	N001	mg/L	0.00011	U	0.00011		E
Molybdenum	DUR01	0999	09/04/2013	N001	mg/L	0.000165	U	0.000165		E
Selenium	DUR01	0999	09/04/2013	N001	mg/L	0.0015	U	0.0015		E
Uranium	DUR01	0999	09/04/2013	N001	mg/L	0.000067	U	0.000067		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. 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.

SAMPLE TYPES:

E Equipment Blank.

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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: 10/29/2013

Site Code	Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
DUR01	0612	D	6500.94	06/04/2013	08:55:25	41.06	6459.88
DUR01	0617	D	6498.11	06/04/2013	10:00:59	29.69	6468.42
DUR01	0630	D	6494.44	06/04/2013	12:50:31	33.09	6461.35
DUR01	0631	D	6477.91	06/04/2013	11:15:28	8.87	6469.04
DUR01	0633	D	6481.81	06/04/2013	10:40:51	11.74	6470.07
DUR01	0634	D	6491.75	06/04/2013	12:05:33	15.9	6475.85
DUR01	0635	D	6497.68	06/04/2013	11:45:39	13.69	6483.99
DUR01	0863		6513.32	06/04/2013	08:30:54	57.55	6455.77
DUR02	0594	O	6472.49	06/04/2013	16:45:38	21.23	6451.26
DUR02	0598	O	6479.09	06/04/2013	15:20:43	21.75	6457.34
DUR02	0607	U	6527.95	06/03/2013	17:45:03	50.11	6477.84
DUR02	0879		6473.91	06/04/2013	15:55:38	12.49	6461.42
DUR02	0884		6476.37	06/04/2013	17:15:26	17.05	6459.32
DUR03	0605	U	7189.6	06/05/2013	16:10:18	38.49	7151.11
DUR03	0607	D	7099.1	06/05/2013	15:45:15	43.79	7055.31
DUR03	0608	D	7035	06/05/2013	10:30:43	37.1	6997.9
DUR03	0612	D	7109.8	06/05/2013	15:10:41	85.15	7024.65
DUR03	0618	D	7036.41	06/05/2013	09:30:03	39.15	6997.26
DUR03	0621	U	7035.77	06/05/2013	10:15:09	52.85	6982.92
DUR03	0623	U	7048.67	06/05/2013	11:25:10	36.19	7012.48

FLOW CODES: B BACKGROUND
N UNKNOWN

C CROSS GRADIENT
O ON SITE

D DOWN GRADIENT
U UPGRADIENT

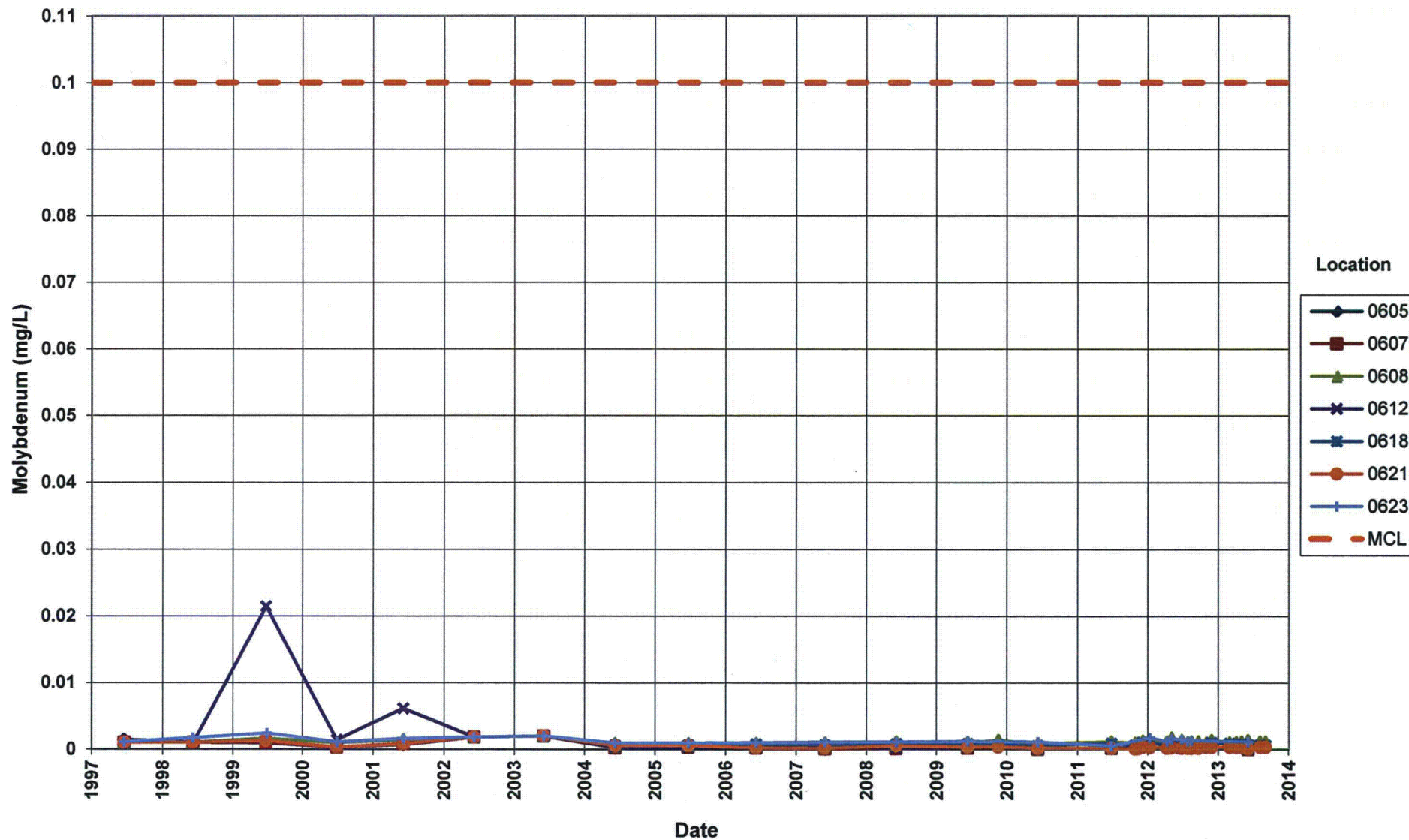
F OFF SITE

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**Time-Concentration Graphs
Durango Disposal Site**

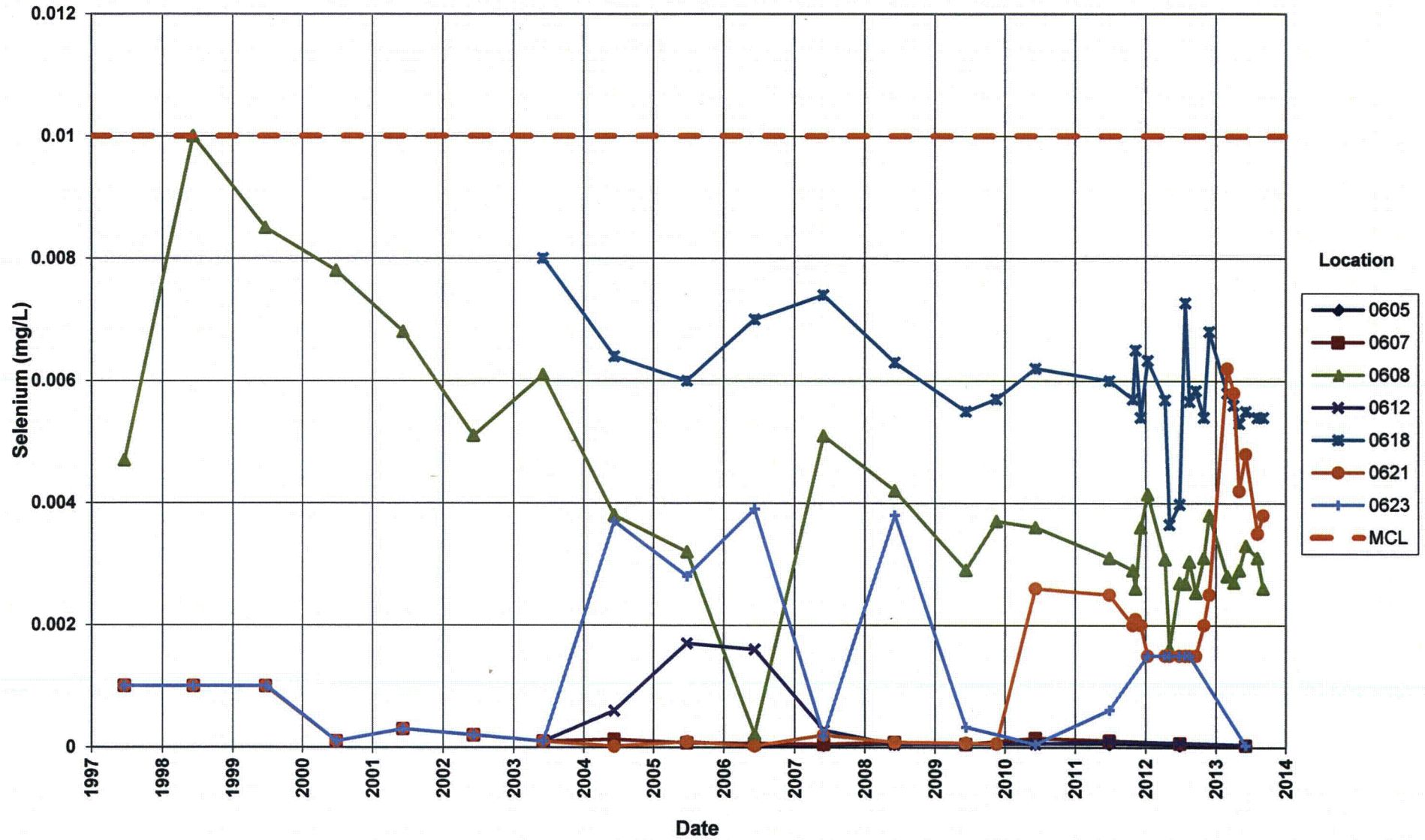
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Durango Disposal Site
Molybdenum Concentration
Maximum Contaminant Level (MCL) = 0.1 mg/L
Proposed Concentration Limit = 0.22 mg/L



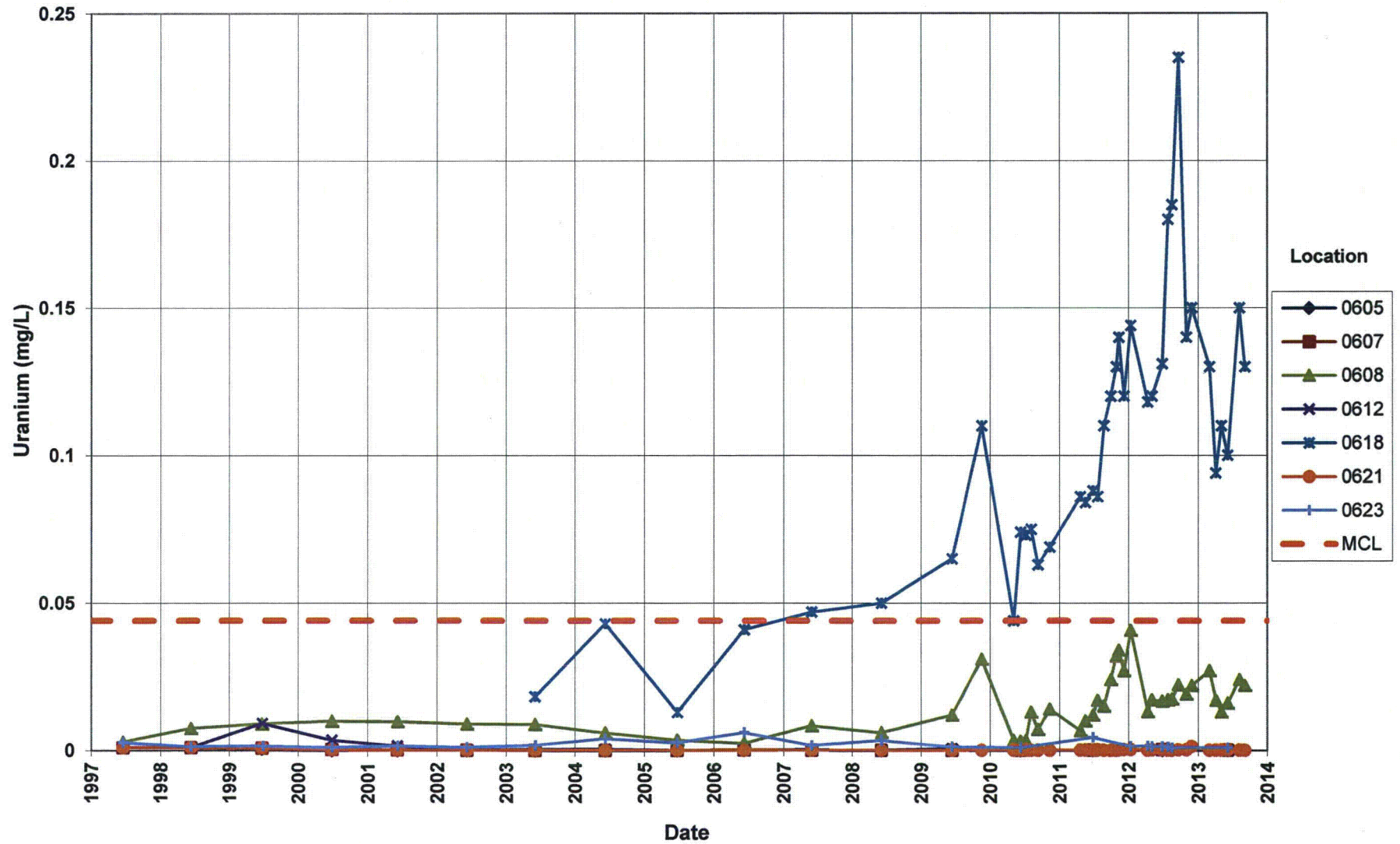
Durango Disposal Site Selenium Concentration

Maximum Contaminant Level (MCL) = 0.01 mg/L
Proposed Concentration Limit = 0.042 mg/L



Durango Disposal Site Uranium Concentration

Maximum Contaminant Level (MCL) = 0.044 mg/L
Proposed Concentration Limit (PCL) = 0.077 mg/L

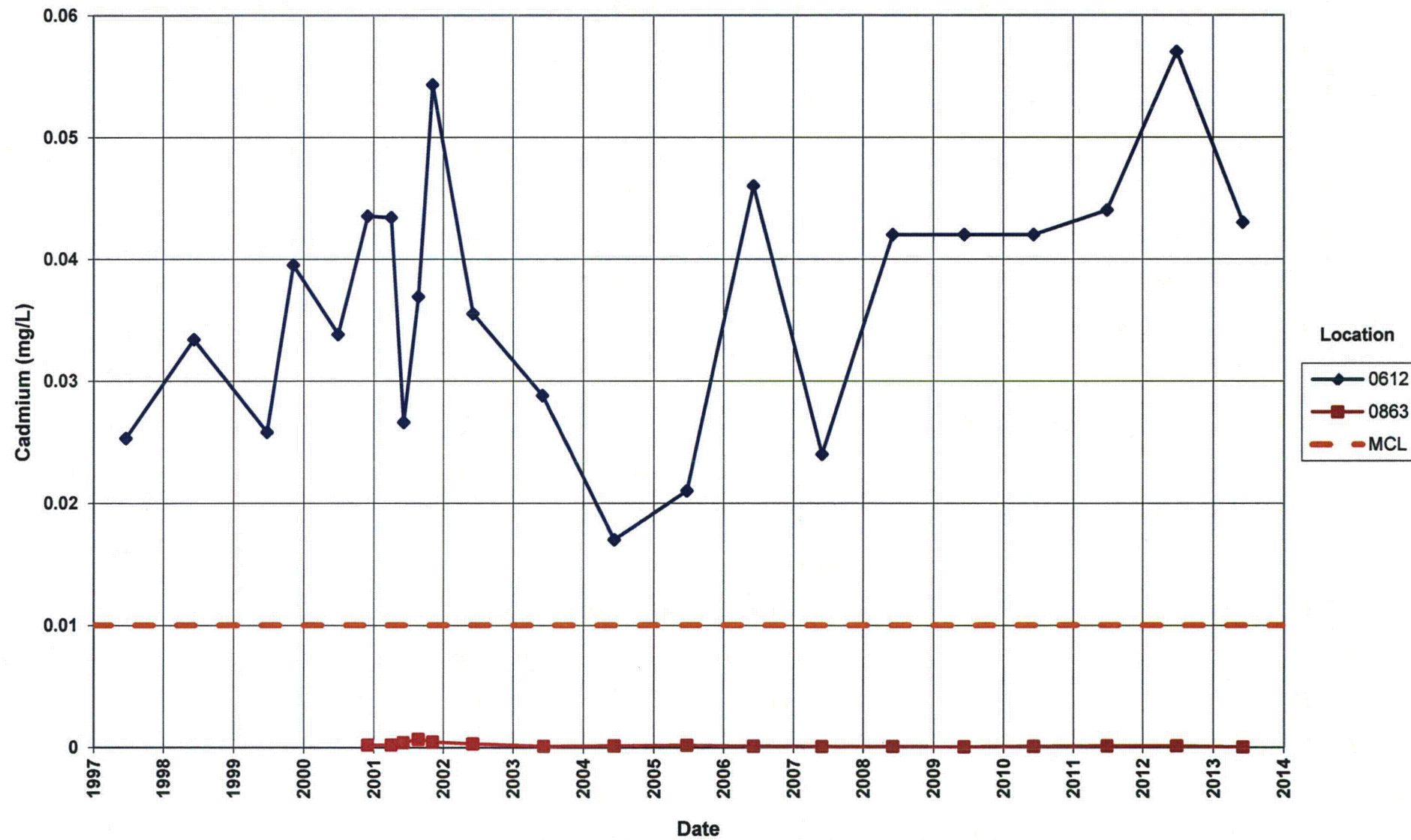


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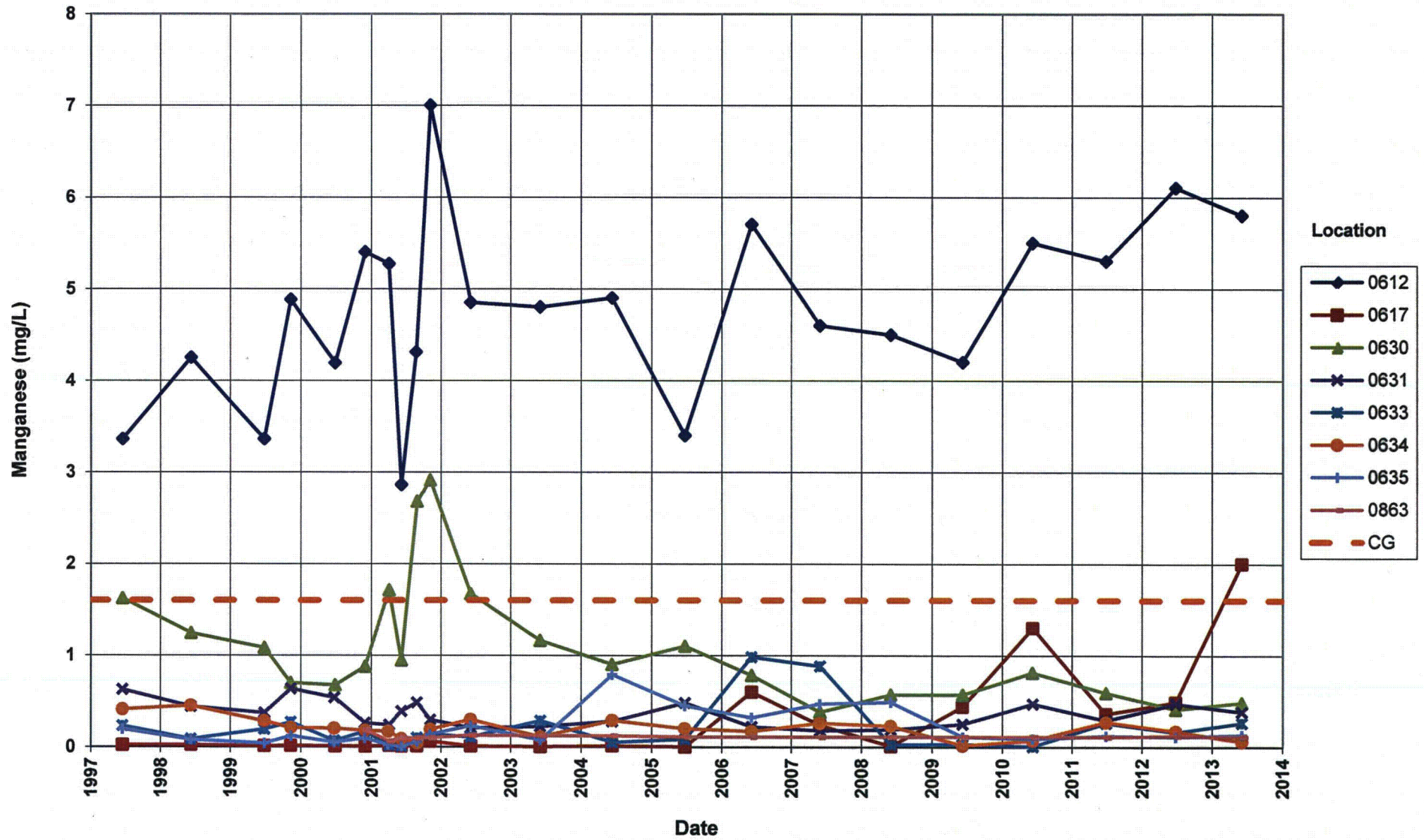
**Time-Concentration Graphs
Durango Processing Site**

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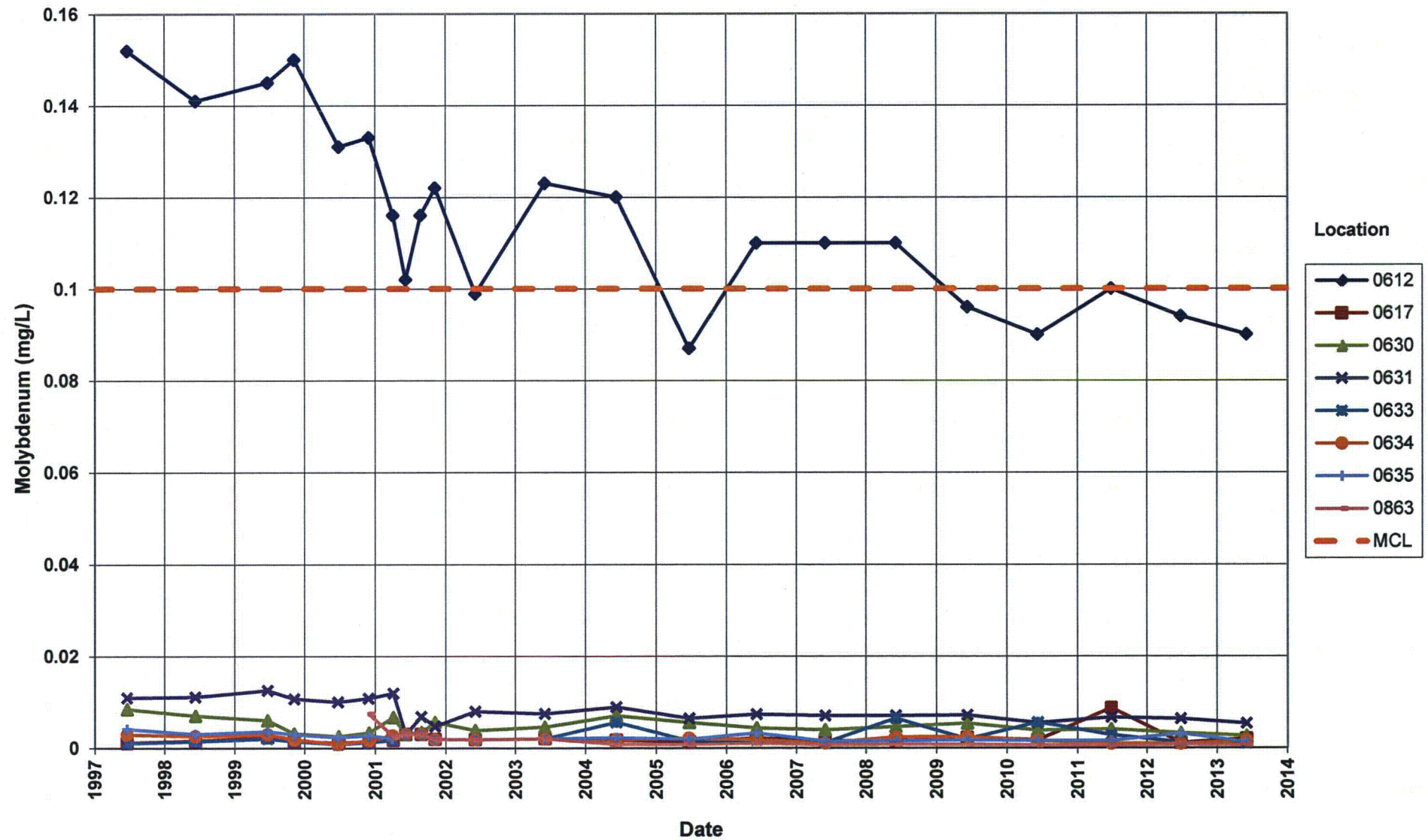
Durango Mill Tailings Process Site
Cadmium Concentration
Maximum Contaminant Level (MCL) = 0.01 mg/L



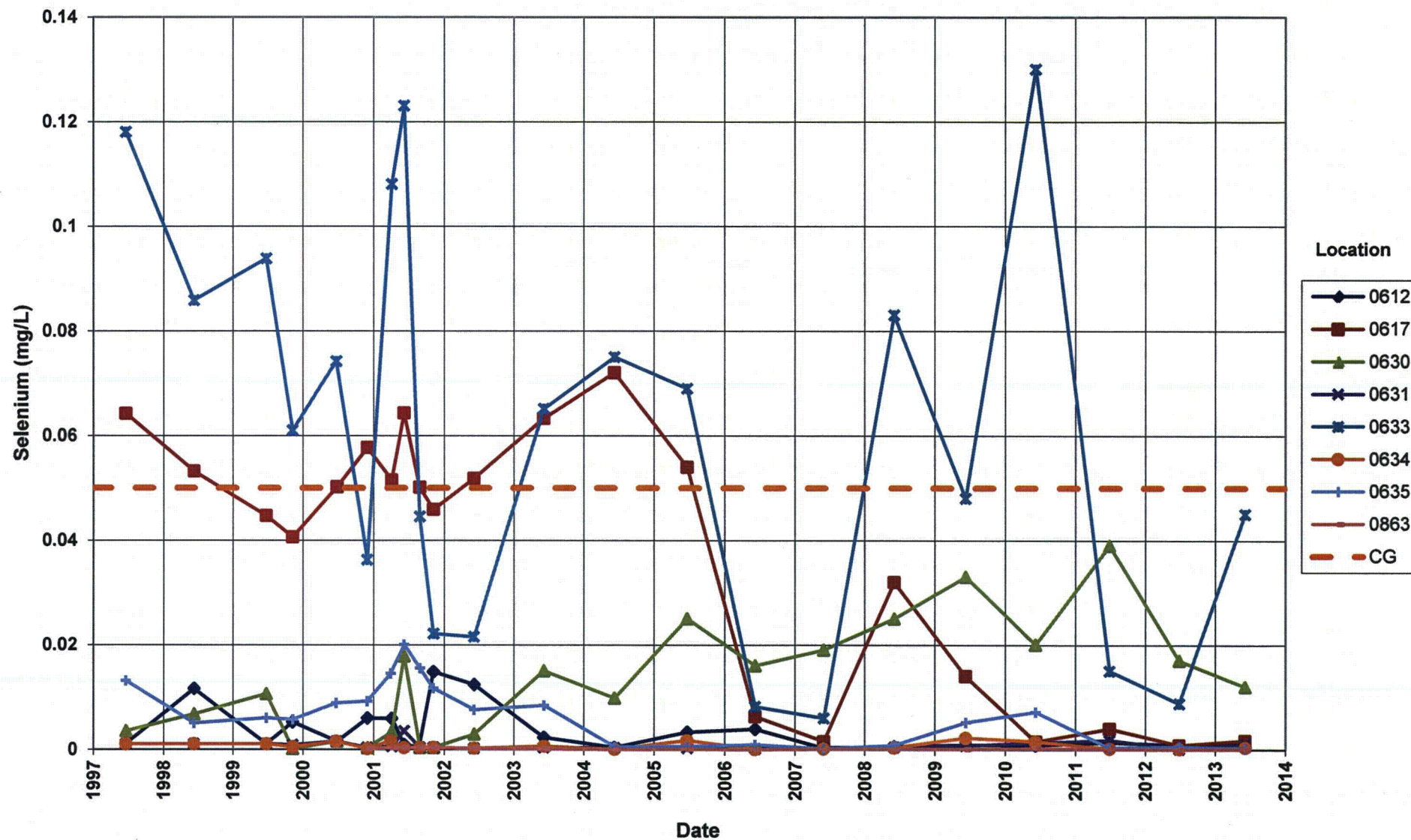
Durango Mill Tailings Process Site
Manganese Concentration
Compliance Goal (CG) = 1.6 mg/L



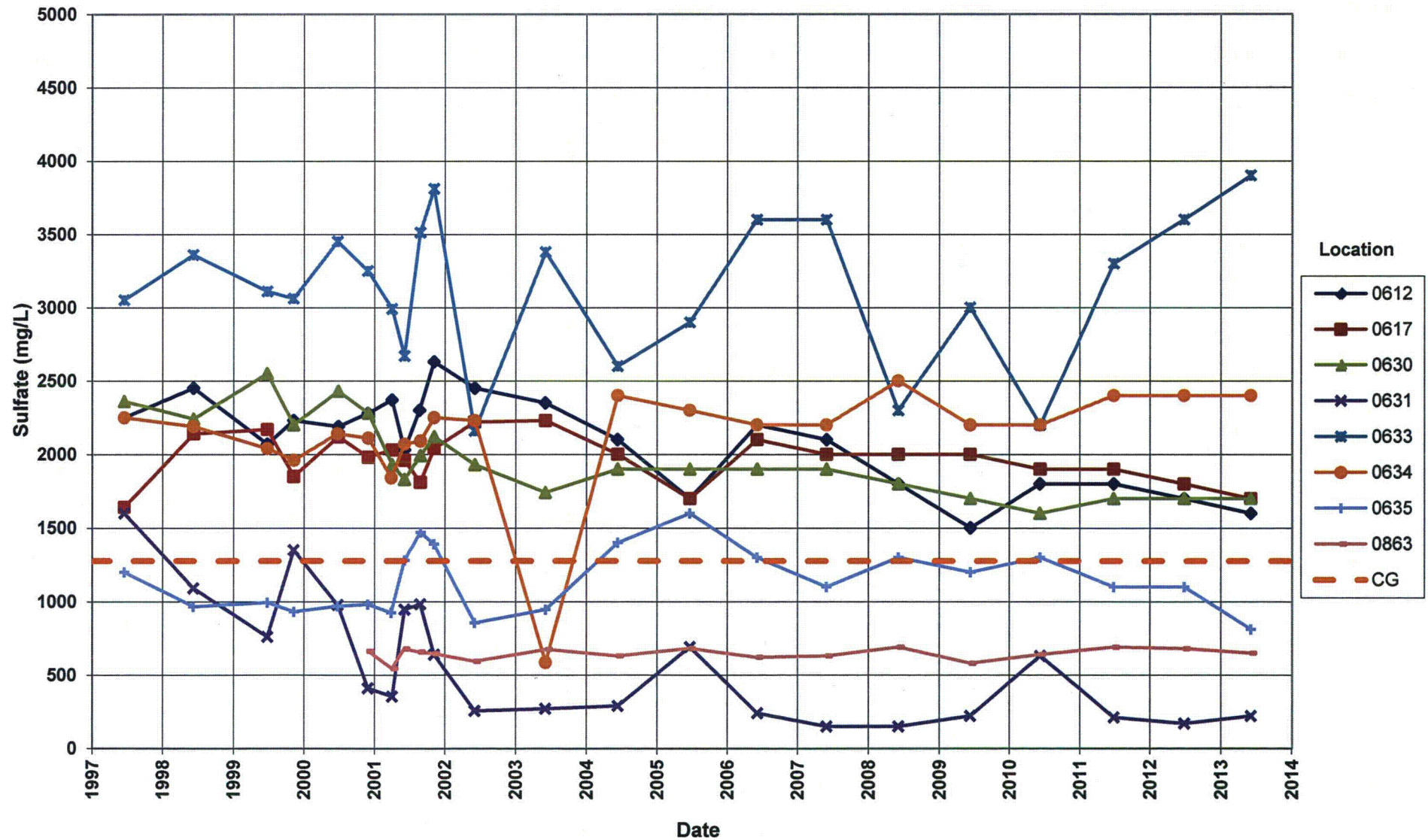
Durango Mill Tailings Process Site **Molybdenum Concentration** Maximum Contaminant Level (MCL) = 0.1 mg/L



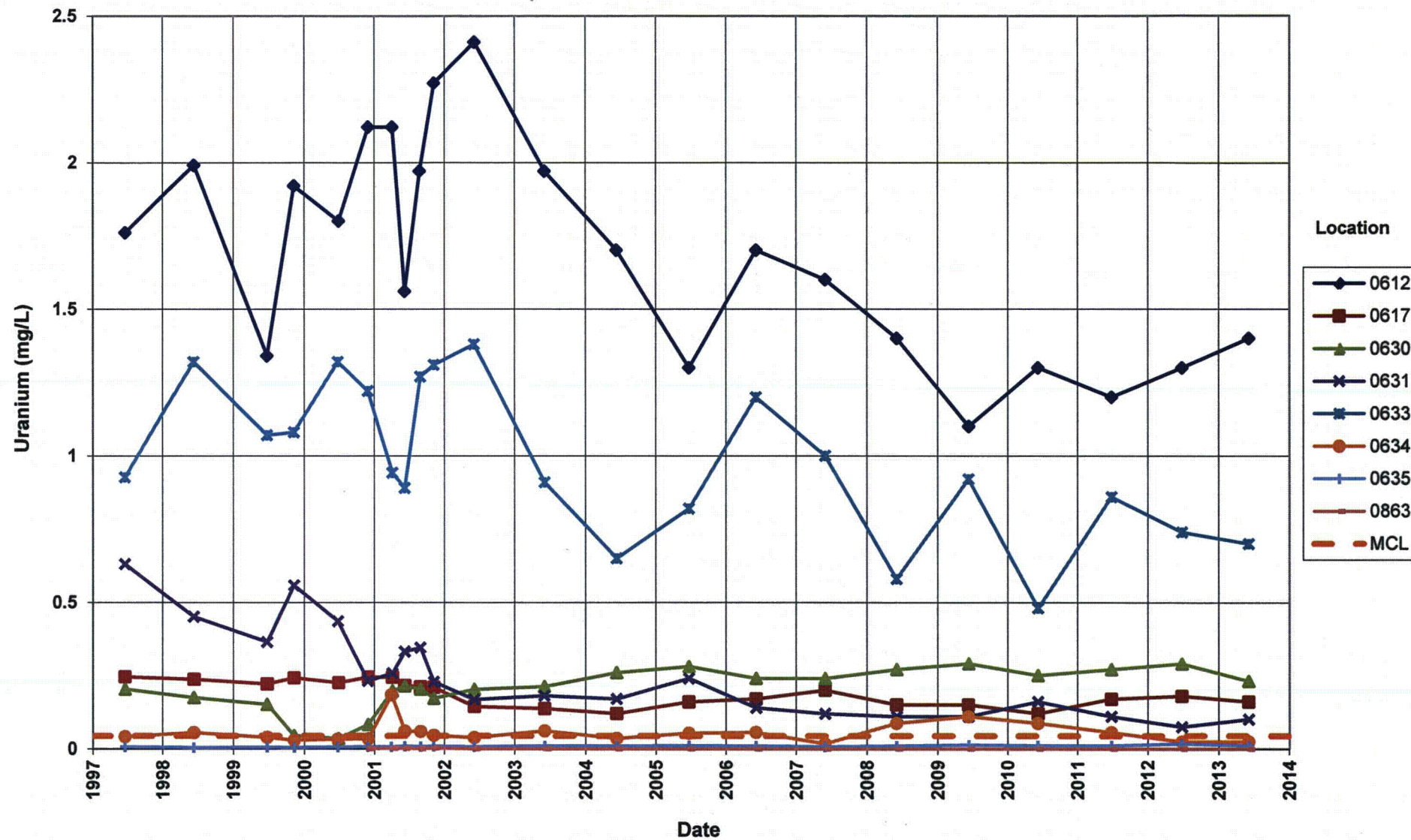
Durango Mill Tailings Process Site
Selenium Concentration
Maximum Contaminant Level (MCL) = 0.01 mg/L
Compliance Goal (CG) = 0.05 mg/L



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



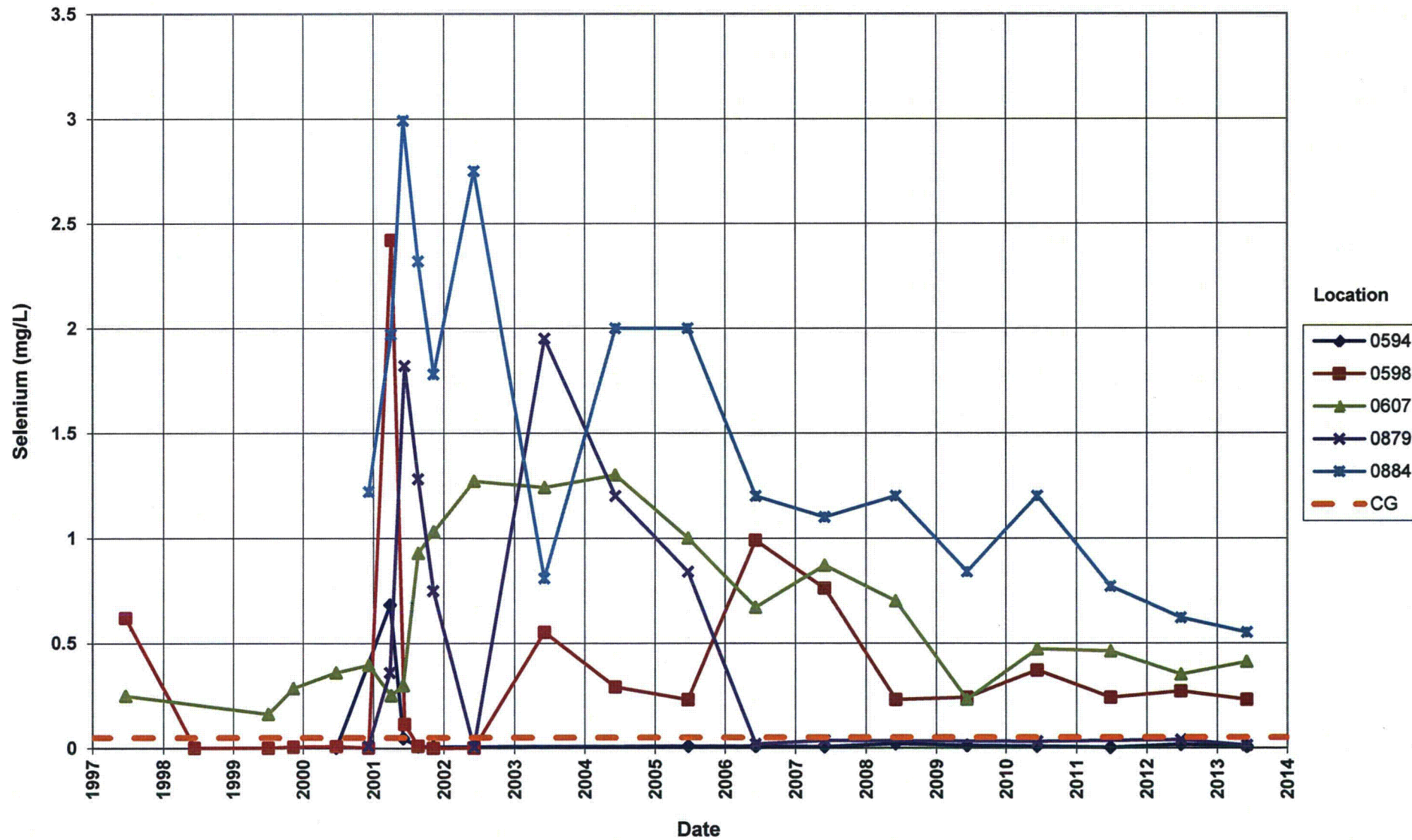
Durango Mill Tailings Process Site
Uranium Concentration
 Maximum Contaminant Level (MCL) = 0.044 mg/L



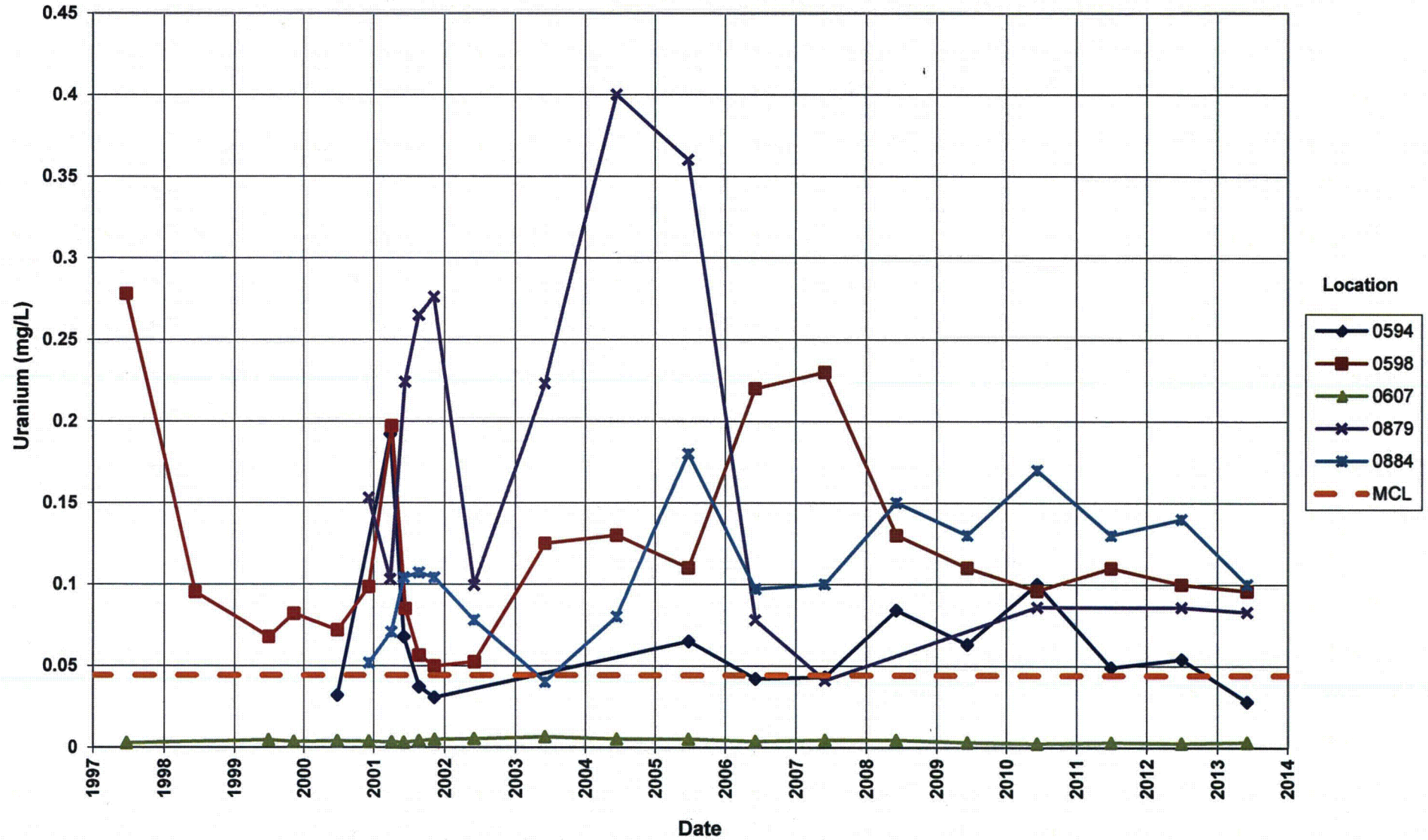
Durango Raffinate Pond Process Site Selenium Concentration

Maximum Contaminant Level (MCL) = 0.01 mg/L

Compliance Goal (CG) = 0.05 mg/L



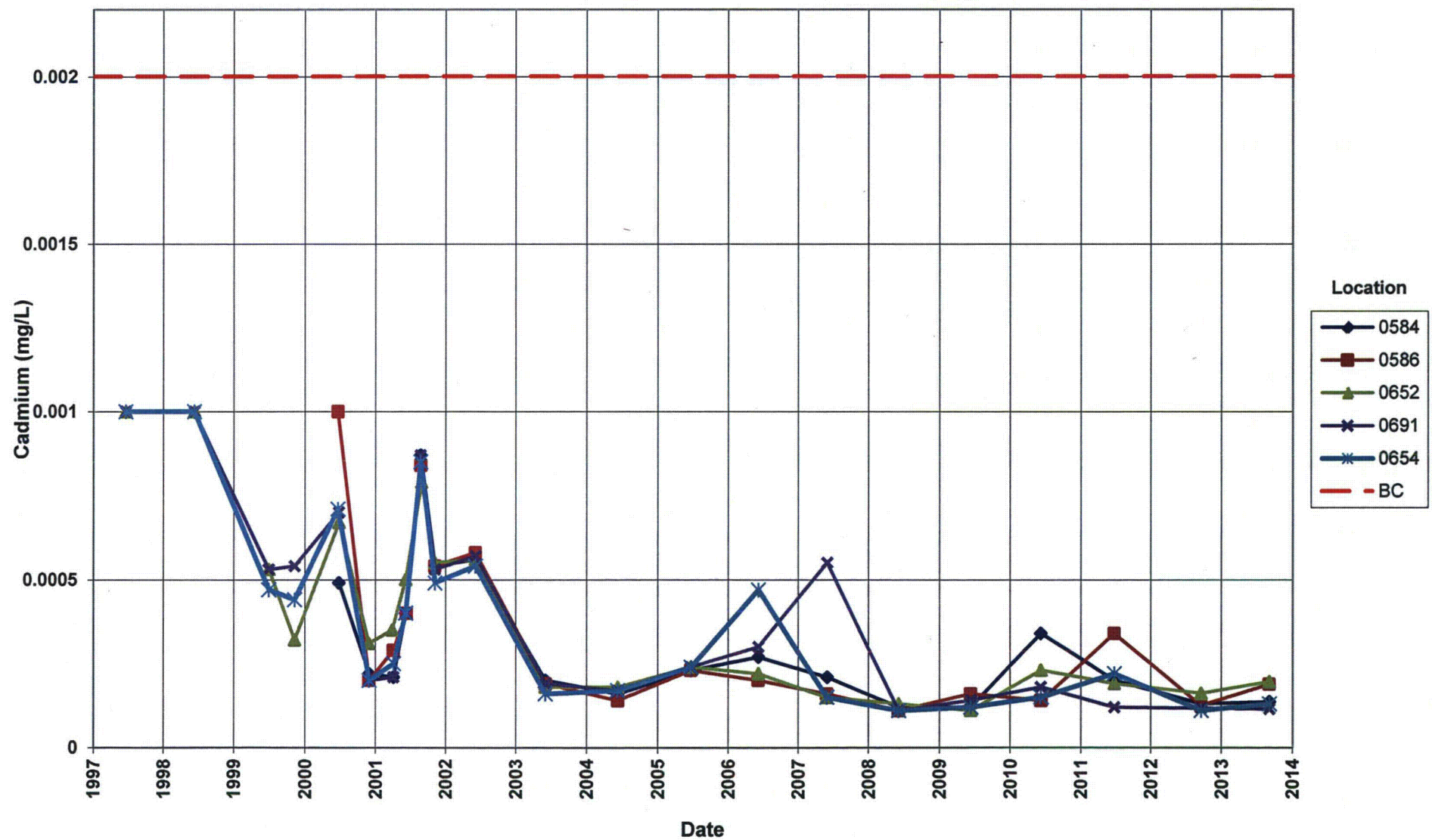
Durango Raffinate Pond Process Site
Uranium Concentration
Maximum Contaminant Level = 0.044 mg/L



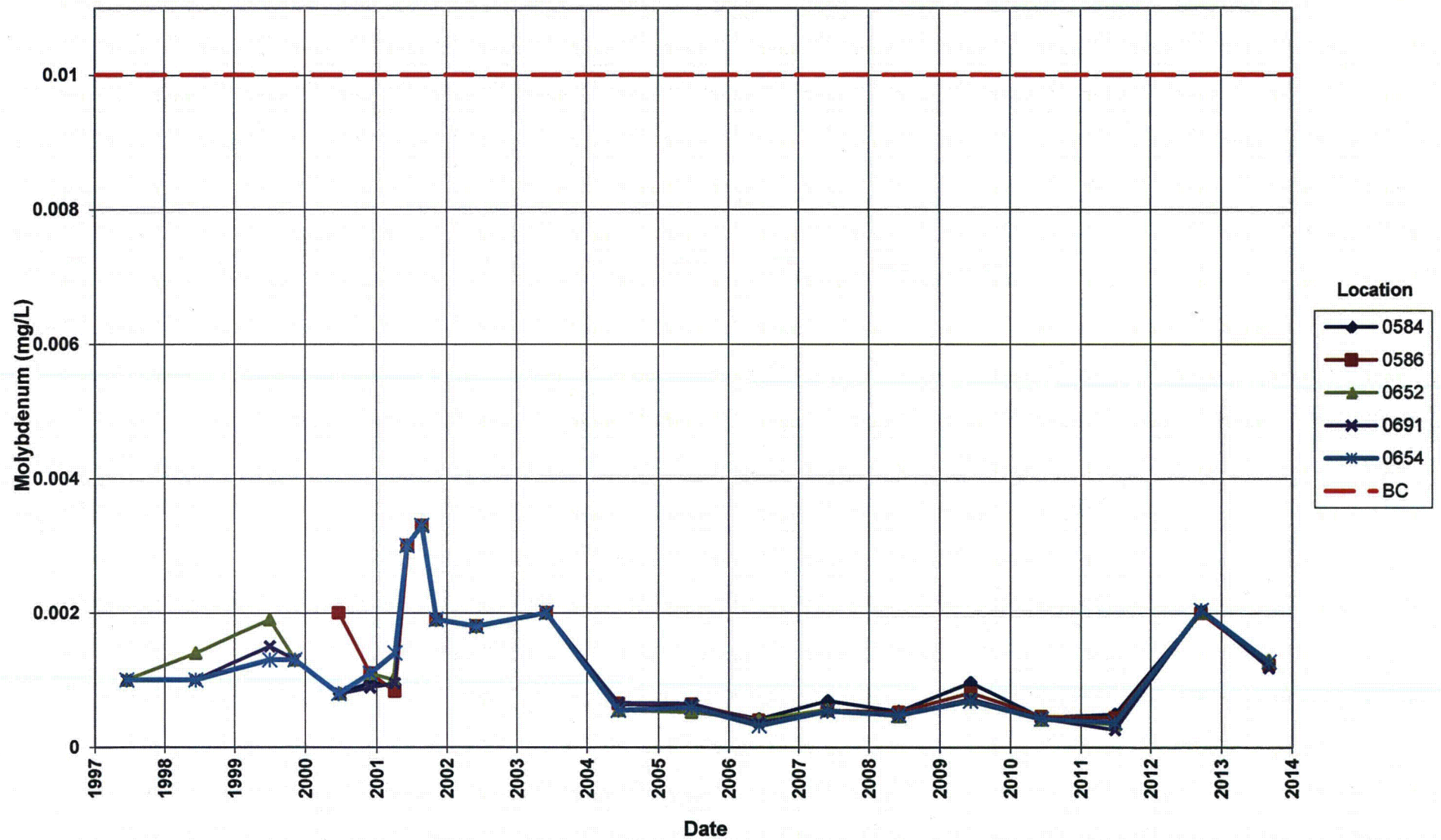
Time-Concentration Graphs
Surface Water

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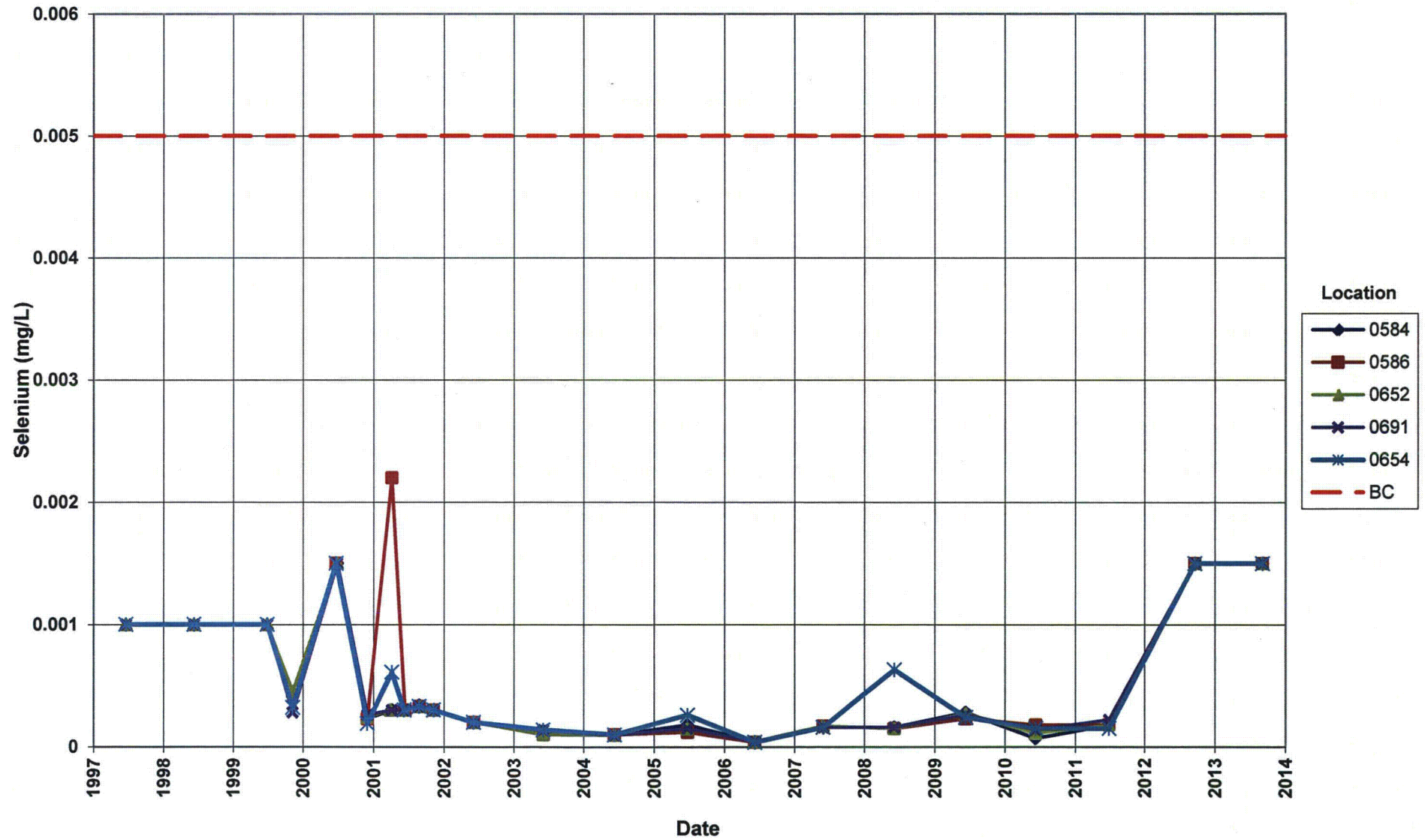
Durango Mill Tailings Process Site
Cadmium Concentration
Benchmark Concentration (BC) = 0.002 mg/L



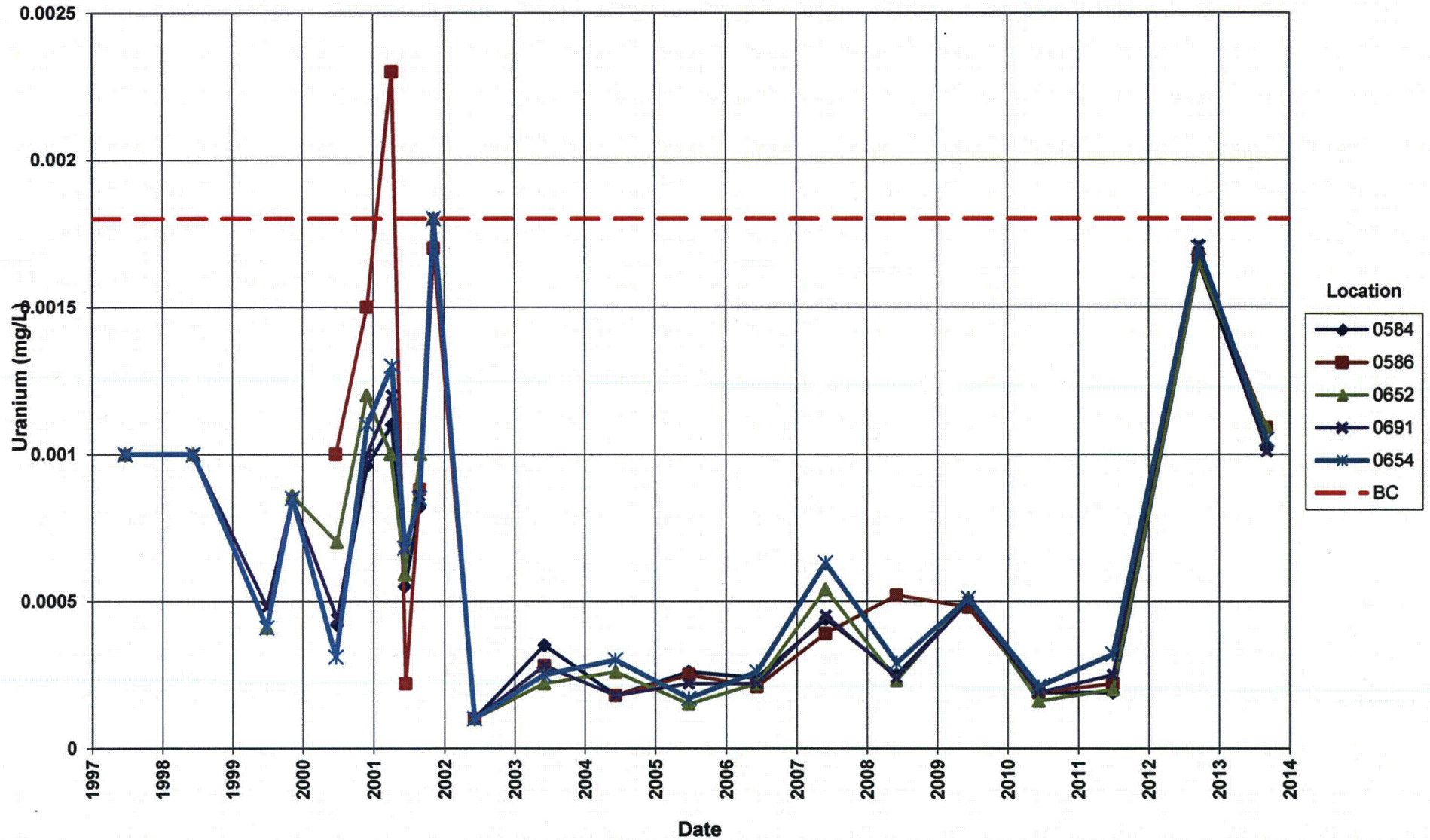
Durango Mill Tailings Process Site
Molybdenum Concentration
Benchmark Concentration (BC) = 0.01 mg/L



Durango Mill Tailings Process Site
Selenium Concentration
Benchmark Concentration (BC) = 0.005 mg/L



Durango Mill Tailings Process Site
Uranium Concentration
Benchmark Concentration (BC) = 0.0018 mg/L



Attachment 3
Sampling and Analysis Work Orders

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established 1959

Task Order LM-501
Control Number 13-0557

May 10, 2013

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 3, 2013. Surface water sampling will be conducted in September. We will notify you of the exact date and time one to two weeks before the scheduled sampling.

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	
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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

Jalena Dayvault
Control Number 13-0557
Page 2

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

Please contact me at (970) 248-6690 if you have any questions.

Sincerely,



Cassie Gauthier
Site Lead

CG/lcg/lb

Enclosures (3)

cc: (electronic)
Karl Stoeckle, DOE
Steve Donovan, Stoller
Bev Gallagher, Stoller
Cassie Gauthier, Stoller
Lauren Goodknight, Stoller
EDD Delivery
rc-grand.junction
File: DUP 410.02 (A)
DUD 410.02 (A)

Sampling Frequencies for Locations at Durango, Colorado

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitoring Wells						
<i>DUR01 Mill Tailings</i>						
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
<i>DUR02 Raffinate Pond</i>						
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
<i>DUR03 Bodo Canyon</i>						
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		Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Analyte	Groundwater	Surface Water			
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 (NO3+NO2)-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.



established 1959

Task Order LM-501
Control Number 13-0749

August 6, 2013

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)
September 2013 Environmental Sampling at the Durango, Colorado,
Processing Site

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

Dear Ms. Dayvault:

The purpose of this letter is to inform you of the upcoming sampling at Durango, Colorado. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Durango site. Water quality data will be collected from surface water locations at this site as part of the routine environmental sampling currently scheduled to begin the week of September 2, 2013. This trip is being done in conjunction with the disposal site monthly sampling. Monitoring well sampling was conducted in June. We will notify you of the exact date and time the week before the scheduled sampling.

The following shows the surface locations scheduled to be sampled during this event.

Surface Locations

DUR01

584	586	652	691
-----	-----	-----	-----

DUR02

588	654	656
-----	-----	-----

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. All analytes and locations were selected based on the site regulatory documents (Processing Site—draft Groundwater Compliance Action Plan; Disposal Site—Long-Term Surveillance and Maintenance Plan).

Jalena Dayvault
Control Number 13-0749
Page 2

Please contact me at (970) 248-6690 if you have any questions.

Sincerely,



Cassandra Gauthier
Site Lead

CG/lcg/lb

Enclosures (3)

cc: (electronic)
Christina Pennal, DOE
Steve Donovan, Stoller
Bev Gallagher, Stoller
Cassandra Gauthier, Stoller
Lauren Goodknight, Stoller
EDD Delivery
rc-grand.junction
File: DUP 410.02 (A)

<p align="center">Sampling Frequencies for Locations at Durango, Colorado</p>
--

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Surface Locations						
<i>DUR01 Mill Tailings</i>						
584			X			
586			X			
652			X			RIVER
691			X			RIVER
<i>DUR02 Raffinate Pond</i>						
588			X			
654			X			RIVER
656			X			
Groundwater sampling conducted in June; surface water sampling conducted in September.						

Constituent Sampling Breakdown

Site	Durango		Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Analyte	Groundwater	Surface Water			
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 (NH ₃ -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 Reports

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Memorandum

DATE: June 18, 2013

TO: Cassandra Gauthier

FROM: Daniel Sellers

SUBJECT: Trip Report

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

Dates of Sampling Event: June 3-6, 2013

Team Members: Dan Sellers and Dave Atkinson

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

Field data sheets can be found [\\crow\SMS\13055370](#) in the Field Data folder.

Splits for uranium analysis were collected at the Treatment System (DUR03 locations 0608, 0618, and 0621) for the Environmental Sciences Laboratory (ESL). These split samples were created by collecting metals samples in 500 mL bottles, acidifying, then splitting ~60 mL in to 125 mL 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	0633, 0634	Cat II
DUR02	0594 0607	

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

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	LGV 153	Duplicate	Groundwater
2173	DUR03 0618	LGV 155	Duplicate	Groundwater
2242	DUR03 0618		ESL Duplicate	Groundwater

Report Identification Number (RIN) Assigned: RIN 13055370 was assigned to samples collected at all three sites (DUR01, DUR02, and DUR03), including the samples collected for the monthly treatment system. The sample collection analytes at well locations DUR03-0608, 0618, and 0621 for the treatment system include the same analytes as identified for these same wells for this sampling event.

RIN 130055368 was assigned to the splits for uranium analysis that were collected at the Treatment System (DUR03 locations 0608, 0618, and 0621) for the Environmental Sciences Laboratory (ESL).

Sample Shipment: All samples for this sampling event were shipped to ALS Laboratory from Durango, Colorado, on June 6, 2013. Split samples were delivered to ESL on June 6, 2013.

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

Well Inspection Summary: All wells were in good condition with the exceptions that 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). This is required due to construction activities that had altered the well; the bladder pump is now wedged in place and does not work and can not be removed.

Equipment: All equipment functioned properly. Except for well DUR02-0879, all wells were sampled using the low-flow procedure. Wells were sampled with a peristaltic pump and dedicated tubing, or dedicated bladder pump. All other equipment was dedicated or disposable.

Institutional Controls

Fences, Gates, Locks: All gates were appropriately closed and locked during the sampling event. The 3359 key worked in a lock that is "daisy-chained" on the gate for the dog park. Key 0356 is used for the Bureau of Reclamation 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. Well DUR02-0879 needs further well development and clarification as to the depth of the screen. The gINT log shows the screen set in two geologic lithologies (cross screened); (1) bottom of screen is set in coal, which cannot be accessed now due to collapse or cave in of the well, and (2) the upper screen is set in shale (Mancos Shale). The total depth of the well is ~8.0 feet less than recorded. The well needs to be further investigated to determine length of the remaining screen, which will then determine which sampling method to use in the future (low flow vs. high flow). The new measurements and well information need to be updated and uploaded to SEEPro and corrected on the gINT log.

Safety Issues: None identified.

Access Issues:

- Samplers called Durango police dispatch @ 970-385-2900 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 for accessing wells 0598 or 0879. It is now required to check in at the Utilities office prior to and after sampling these two wells.

Corrective Action Required/Taken: None.

(DLS/lcg)

cc: (electronic)

Jalena Dayvault, DOE
Steve Donivan, Stoller
David Miller, Stoller
EDD Delivery
rc-grand.junction
File: DUD 0045.20(A)

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Memorandum

DATE: September 10, 2013

TO: Cassandra Gauthier

FROM: Daniel Sellers

SUBJECT: Trip Report

Site: Durango, Colorado, Processing (DUR01) and Raffinate Pond (DUR02) Surface Sampling Sites

Dates of Sampling Event: September 3-4, 2013

Team Members: Joe Treviño and Daniel Sellers. Jalena Dayvault was on site to observe the surface sampling event.

Number of Locations Sampled: Samples were collected at six surface sample locations along the Animas River. Analytes include Cd, Mo, Se, and U. Field data sheets can be found in \\crow\sms\13085577 in the Field Data folder.

Locations Not Sampled/Reason: Surface location 0588 was dry.

Location Specific Information: Surface location DUR02-0656 was not sampled from the historical location along the Animas River due to safety concerns. Sample was taken ~50 yards downstream and given a new location identification (DUR02-0678). This new sample location is directly below the hike/bike trail bridge where the sample was taken from the bridge using a tubing reel with weight and peristaltic pump. New coordinates and map locations have been noted and will be uploaded to the database. This new location will be the future location for sample collection instead of surface location DUR02-0656.

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

False ID	Ticket Number	True ID	Sample Type	Associated Matrix
2517	LJU 847	DUR01-0586	Duplicate	Groundwater
2521	LKV 725	Associated with samples collected with non-dedicated equipment.	Equipment Blank	Surface Water

Requisition Identification Number (RIN) Assigned: RIN 13085577 was assigned to samples collected at both sites (DUR01 and DUR02).

Sample Shipment: All samples for this sampling event were shipped to GEL Laboratories from Grand Junction, Colorado on September 5, 2013.

Water Level Measurements: None.

Equipment: All equipment functioned properly. All surface samples were collected with a peristaltic pump and tubing real with weight.

Institutional Controls

Fences, Gates, Locks: All gates were appropriately closed and locked during the sampling event. The gate to the "Dog Park" was adjusted so that it would open close correctly.

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:

Safety Issues: Location DUR02-0656 was considered a hazard and will no longer be a location to be sampled in the future.

Access Issues: Samplers called Durango police dispatch @ 970-385-2900 prior to arriving at the Durango Processing site (DUR01, aka "the dog park") to let them know about sampling activities.

Corrective Action Required/Taken: Location DUR02-0678 is the new surface location to be sampled in the future instead of location DUR02-0656. Coordinates and pertinent information regarding the new location will be updated in the database.

(DLS/lg)

cc: (electronic)

Jalena Dayvault, DOE

Steve Donovan, Stoller

Cassandra Gauthier, Stoller

Keith Miller, Stoller

EDD Delivery