Data Validation Package

June 2015
Groundwater and Surface Water Sampling at the Durango, Colorado, Disposal and Processing Sites

October 2015

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Durango, Colorado, Disposal and Processing Sites

Sampling Period: June 1-3, 2015

Annual groundwater and surface-water monitoring events were conducted at the Durango, Colorado, Disposal and Processing sites as specified in the applicable site documents. Sample collection and analyses were conducted according to procedures in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (SAP) (LMS/PRO/S04351, continually updated). Water levels were measured at each sampled well.

The 2015 *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. 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 milligrams per liter (mg/L), 0.042 mg/L, and 0.077 mg/L, respectively.

The 2008 *Ground Water Compliance Action Plan for the Durango, Colorado, UMTRA Project Site* (GCAP) 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. Groundwater and surface water samples were also 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, as defined in Title 40 *Code of Federal Regulations* Section 192 (40 CFR 192) for cadmium, selenium, and uranium were exceeded in samples collected from processing site monitoring wells as shown in Table 1.

Table 1. Durango Processing Site Wells Exceeding EPA Standards in June 2015

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	0.017
				0633	0.017
			DUR02	0598	0.056
				0607	0.44
				0879	0.010
				0884	0.72
Uranium	0.044	Not applicable	DUR01	0612	1.2
				0617	0.18
				0630	0.28
				0631	0.14
				0633	0.66
			DUR02	0598	0.058
				0879	0.078
				0884	0.14

[a] Standards are listed in 40 CFR 192.02 Table 1 to Subpart A; concentrations are in mg/L.
[b] Cleanup goal for selenium from the 2008 *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 were compared to background threshold values (BTVs) using historical data from location DUR01 0652, which is located upstream of the site on the Animas River. As shown in Table 2, no BTVs were exceeded during this event for cadmium, molybdenum, and uranium. For selenium, the BTV of 0.0006 mg/L was slightly exceeded at two locations. The selenium BTV is relatively low due to the high percentage of non-detects in the historical data. The selenium BTV is close to typical selenium detection limits, which have ranged from 0.000018 to 0.0015 mg/L since 2009.

Table 2. Comparison of Animas River June 2015 Concentrations to BTVs

Analyte	BTV for DUR01 0652[a]	DUR01 0652	DUR01 0584	DUR01 0586	DUR02 0654	DUR02 0678	DUR01 0691
Cadmium	0.0008	ND	0.0001	ND	ND	ND	0.0002
Molybdenum	0.0023	0.0005	0.0006	0.0010	0.0006	0.0009	0.0005
Selenium	0.0006[c]	ND	ND[b]	ND[b]	0.0012	ND[b]	0.0007
Uranium	0.0019	0.0005	0.0003	0.0006	0.0005	0.0004	0.0003

Concentrations are in milligrams per liter (mg/L)
ND: Not Detected
[a] BTV = background threshold values based on historical data set from upstream location DUR01 0652
[b] These selenium results were qualified as not detected during data validation.
[c] The detection limit for selenium reported for the June 2015 results was 0.0003 mg/L

Data associated with this sampling event are available electronically on GEMS and are available on the Durango webpage at www.lm.doe.gov/Durango/Processing/Documents.aspx.

David Miller, Site Lead
Navarro Research and Engineering, Inc.

4/15/16
Date

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Durango, Colorado, Disposal Site, Sample Location Map

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Durango, Colorado, Processing Sites, Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Durango, Colorado, Disposal and Processing Sites	**Date(s) of Water Sampling**	June 1-3, 2015
Date(s) of Verification	August 4 and 20, 2015	**Name of Verifier**	Gretchen Baer

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List any Program Directives or other documents, SOPs, instructions.		Work Order letter dated April 29, 2015. Program Directive DUR-2014-01.
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Were calibrations conducted as specified in the above-named documents?	Yes	
4. Was an operational check of the field equipment conducted daily?	Yes	
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
6. Were wells categorized correctly?	Yes	See Sampling Protocol section on page 23.
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 from locations DUR01 0612, DUR02 0678, and DUR03 0608.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	Yes	
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 in Table 2 of the SAP?	Yes	Seven samples were filtered.
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Was all pertinent information documented on the field data sheets?	Yes	
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	Water levels were measured at each sampled monitoring well.

Laboratory Performance Assessment

General Information

Report Number (RIN):	15057084
Sample Event:	June 1-3, 2015
Site(s):	Durango, Colorado, Disposal and Processing Sites (Groundwater and Surface Water)
Laboratory:	ALS Laboratory Group
Work Order No.:	1506107
Analysis:	Metals and Wet Chemistry
Validator:	Gretchen Baer
Review Date:	August 4 and 20, 2015

This validation was performed according to the *Environmental Procedures Catalog* (LMS/POL/S04325), "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, Sulfate	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
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
1506107-1	0584	Molybdenum	J	Less than 5 times the equipment blank.
1506107-1	0584	Selenium	U	Less than 5 times the calibration blank.
1506107-1	0584	Uranium	J	Less than 5 times the equipment blank.
1506107-2	0586	Molybdenum	J	Less than 5 times the equipment blank.
1506107-2	0586	Selenium	U	Less than 5 times the calibration blank.
1506107-2	0586	Uranium	J	Less than 5 times the equipment blank.
1506107-3	0612	Selenium	U	Less than 5 times the calibration blank.
1506107-4	0617	Selenium	U	Less than 5 times the calibration blank.
1506107-6	0631	Selenium	U	Less than 5 times the calibration blank.

Table 4 (continued). Data Qualifier Summary

Sample Number	Location	Analyte(s)	Flag	Reason
1506107-10	0652	Molybdenum	J	Less than 5 times the equipment blank.
1506107-10	0652	Uranium	J	Less than 5 times the equipment blank.
1506107-11	0691	Molybdenum	J	Less than 5 times the equipment blank.
1506107-11	0691	Selenium	J	Less than 5 times the equipment blank.
1506107-11	0691	Uranium	J	Less than 5 times the equipment blank.
1506107-13	0612 Dup	Selenium	U	Less than 5 times the calibration blank.
1506107-19	0654	Molybdenum	J	Less than 5 times the equipment blank.
1506107-19	0654	Selenium	J	Less than 5 times the equipment blank.
1506107-19	0654	Uranium	J	Less than 5 times the equipment blank.
1506107-20	0678	Molybdenum	J	Less than 5 times the equipment blank.
1506107-20	0678	Selenium	U	Less than 5 times the calibration blank.
1506107-20	0678	Selenium	J	Less than 5 times the equipment blank.
1506107-20	0678	Uranium	J	Less than 5 times the equipment blank.
1506107-23	0678 Dup	Molybdenum	J	Less than 5 times the equipment blank.
1506107-23	0678 Dup	Selenium	U	Less than 5 times the calibration blank.
1506107-23	0678 Dup	Selenium	J	Less than 5 times the equipment blank.
1506107-23	0678 Dup	Uranium	J	Less than 5 times the equipment blank.
1506107-24	0605	Selenium	U	Less than 5 times the calibration blank.
1506107-25	0607	Selenium	J	Reporting limit verification < 70%.
1506107-26	0608	Iron	J	Field duplicate range > PQL.
1506107-26	0608	Manganese	U	Less than 5 times the calibration blank.
1506107-27	0612	Selenium	U	Less than 5 times the calibration blank.
1506107-28	0618	Selenium	U	Less than 5 times the calibration blank.
1506107-31	0608 Dup	Iron	J	Field duplicate range > PQL.
1506107-31	0608 Dup	Manganese	U	Less than 5 times the calibration blank.

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 31 water samples on June 5, 2015, accompanied by a Chain of Custody 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 Chain of Custody form was complete with no errors or omissions.

Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler at 0.4 °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 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 EPA 160.1
There are no calibration requirements associated with the determination of total dissolved solids.

Method SW-846 6010B
Calibrations for calcium, iron, magnesium, manganese, potassium, and sodium were performed on June 11 and August 6, 2015, using three calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. 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 following exception. A calcium check result was slightly above the acceptance range. All affected results were greater than 5 times the PQL, so no qualification is necessary.

Method SW-846 6020A
Calibrations for cadmium, molybdenum, selenium, and uranium were performed on June 10 and August 6, 2015, 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 MDL. 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 associated with the samples were within the acceptance range, with the following exception. The selenium check results on August 6, 2015, were below the acceptance range. Affected results less than 5 times the PQL are qualified with a “J” flag (estimated). Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

Method SW-846 9056
Initial calibrations were performed for chloride and sulfate using five calibration standards on June 3, 2015. 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 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 PQL for all analytes. In cases where a blank concentration exceeds or equals 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.

Inductively Coupled Plasma Interference Check Sample Analysis

Interference check samples 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. The spike recoveries met the acceptance criteria for all analytes evaluated.

Laboratory Replicate Analysis

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

Laboratory Control Sample

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

Metals Serial Dilution

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

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.

Anion/Cation Balance

The anion/cation balance is used to determine if major ion concentrations have been quantified correctly. The total anions should balance with (be equal to) the total cations when expressed in milliequivalents per liter. Table 5 shows the total anion and cation results in the samples from this event where there is sufficient data to perform the calculation. The charge balance is expressed as relative percent difference. Typically, a charge balance difference less than or equal to 10 percent is considered acceptable.

Table 5. Comparison of Major Anions and Cations

Location	Cations (meq/L)	Anions (meq/L)	Charge Balance (%)
0605	30.1	27.9	3.8
0607	45.0	43.4	1.9
0608	14.5	12.7	6.8
0612	48.8	44.8	4.2
0618	19.8	18.3	4.0
0621	62.6	66.9	3.3
0623	45.7	43.1	2.9

The charge-balance difference was below 10 percent, indicating that there are no significant errors associated with the measurement of major ion concentrations for the locations listed.

Electronic Data Deliverable (EDD) File

The revised EDD file received arrived on August 20, 2015, in response to Request for Information #15-4713. The revision included corrections to some metals results. 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: 15057084 **Lab Code:** PAR **Validator:** Gretchen Baer **Validation Date:** 8/3/2015

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

# of Samples: 31 **Matrix:** WATER **Requested Analysis Completed:** Yes

Chain of Custody

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

Sample

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

Select Quality Parameters

☑ Holding Times	All analyses were completed within the applicable holding times.
☑ Detection Limits	The reported detection limits are equal to or below contract requirements.
☑ Field/Trip Blanks	There was 1 trip/equipment blank evaluated.
☑ Field Duplicates	There were 3 duplicates evaluated.

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 15057084 **Lab Code:** PAR **Date Due:** 7/3/2015

Matrix: Water **Site Code:** DUR01 **Date Completed:** 6/16/2015

Analyte	Date Analyzed	CALIBRATION				Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	CCV	CCB						
CHLORIDE	06/08/2015	0.004	1.0000	OK	OK	OK	99	100	101	1	
SULFATE	06/08/2015	0.330	0.9999	OK	OK	OK	95	101	102	1	
TOTAL DISSOLVED SOLIDS	06/09/2015					OK	103			1	

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 15057084 **Lab Code:** PAR **Date Due:** 7/3/2015

Matrix: Water **Site Code:** DUR01 **Date Completed:** 6/16/2015

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								
Calcium	ICP/ES	06/11/2015	0.0000	1.0000	OK	OK	OK	107.0	105.0	112.0	1.0	100.0	1.0	111.0
Calcium	ICP/ES	08/06/2015	0.0000	1.0000	OK	OK	OK	103.0			0.0	98.0	1.0	94.0
Calcium	ICP/ES	06/11/2015					OK	107.0	102.0	105.0	1.0	100.0	0.0	132.0
Iron	ICP/ES	06/11/2015					OK	113.0	113.0	112.0	1.0	99.0		106.0
Iron	ICP/ES	08/06/2015	0.0000	1.0000	OK	OK	OK	108.0	101.0	115.0	1.0	102.0	3.0	107.0
Iron	ICP/ES	06/11/2015	0.0000	1.0000	OK	OK	OK	111.0	114.0	109.0	4.0	101.0		105.0
Magnesium	ICP/ES	08/06/2015	0.0000	1.0000	OK	OK	OK	98.0			2.0	104.0	5.0	83.0
Magnesium	ICP/ES	06/11/2015					OK	103.0	101.0	100.0	0.0	106.0	2.0	107.0
Magnesium	ICP/ES	06/11/2015	0.0000	1.0000	OK	OK	OK	101.0	106.0	108.0	1.0	104.0	3.0	91.0
Manganese	ICP/ES	08/06/2015	0.0000	1.0000	OK	OK	OK	108.0	104.0	101.0	0.0	105.0	1.0	104.0
Manganese	ICP/ES	06/11/2015					OK	105.0	113.0	112.0	1.0	109.0		99.0
Manganese	ICP/ES	06/11/2015	0.0000	1.0000	OK	OK	OK	106.0	102.0	103.0	1.0	109.0		99.0
Potassium	ICP/ES	06/11/2015					OK	103.0	96.0	99.0	3.0			89.0
Potassium	ICP/ES	06/11/2015	0.0000	1.0000	OK	OK	OK	103.0	95.0	97.0	2.0		10.0	95.0
Potassium	ICP/ES	08/06/2015	0.0000	1.0000	OK	OK	OK	102.0	114.0	108.0	0.0		5.0	89.0
Sodium	ICP/ES	06/11/2015	0.0000	1.0000	OK	OK	OK	110.0	93.0	95.0	1.0		3.0	101.0
Sodium	ICP/ES	08/06/2015	0.0000	1.0000	OK	OK	OK	104.0			0.0		6.0	94.0

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 15057084 **Lab Code:** PAR **Date Due:** 7/3/2015

Matrix: Water **Site Code:** DUR01 **Date Completed:** 6/16/2015

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								
Sodium	ICP/ES	06/11/2015					OK	110.0	95.0	103.0	4.0		10.0	110.0
Cadmium	ICP/MS	06/10/2015					OK	112.0	102.0	107.0	5.0			
Cadmium	ICP/MS	06/10/2015	0.0000	1.0000	OK	OK	OK	110.0	108.0	116.0	7.0	102.0		122.0
Molybdenum	ICP/MS	08/06/2015	0.0000	1.0000	OK	OK	OK	107.0	102.0	109.0		104.0		103.0
Molybdenum	ICP/MS	06/10/2015	0.0000	1.0000	OK	OK	OK	101.0	101.0	104.0	3.0			
Molybdenum	ICP/MS	06/10/2015							100.0	100.0	1.0			
Molybdenum	ICP/MS	06/10/2015							102.0	100.0	3.0	106.0		105.0
Molybdenum	ICP/MS	06/10/2015	0.0000	1.0000	OK	OK	OK	104.0	103.0	106.0	3.0			
Selenium	ICP/MS	06/10/2015	0.0000	1.0000	OK	OK	OK	110.0	104.0	105.0	1.0	98.0		114.0
Selenium	ICP/MS	06/10/2015					OK	106.0	106.0	104.0	2.0			
Selenium	ICP/MS	06/10/2015							102.0	109.0	6.0			
Selenium	ICP/MS	06/10/2015							104.0	104.0	0.0			
Selenium	ICP/MS	08/06/2015	0.0000	1.0000	OK	OK	OK	112.0	113.0	114.0		95.0		57.0
Uranium	ICP/MS	06/10/2015					OK	106.0	108.0	110.0	2.0			
Uranium	ICP/MS	06/10/2015	0.0000	1.0000	OK	OK	OK	106.0	105.0	105.0	0.0	105.0	5.0	95.0
Uranium	ICP/MS	06/10/2015							99.0	106.0	1.0			
Uranium	ICP/MS	06/10/2015							108.0	109.0	1.0		4.0	

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 15057084 **Lab Code:** PAR **Date Due:** 7/3/2015

Matrix: Water **Site Code:** DUR01 **Date Completed:** 6/16/2015

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	08/06/2015	0.0000	1.0000	OK	OK	OK	109.0	104.0	110.0		105.0		100.0

Sampling Quality Control Assessment

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

Sampling Protocol

All monitoring wells were sampled using the Category I or II low-flow sampling criteria, with the following exception. Well DUR02 0879 was sampled according to Program Directive DUR-2014-01 using high-flow purging protocols. 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 0594, DUR02 0607, DUR03 0605, DUR03 0612, and DUR03 0623 were classified as Category II due to water level drawdown. The sample results for these seven wells were qualified with a "Q" flag, indicating the data are qualitative because of the sampling technique.

Equipment Blanks

Equipment blanks are prepared and analyzed to document contamination attributable to the sample collection process. One equipment blank was submitted with these samples. Molybdenum, selenium, and uranium were detected in the blank. Associated sample results for these analytes that are greater than the MDL but less than 5 times the blank concentration are qualified with a "J" flag as estimated values.

Field Duplicate Assessment

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates, which measure only laboratory performance. Duplicate samples were collected from locations DUR01 0612, DUR02 0678, and DUR03 0608. The relative percent difference (RPD) for duplicate results that are greater than 5 times the PQL should be less than 20 percent. The RPD is not used to evaluate results that are less than 5 times the PQL. For these results (RPD is "NA" on the Field Duplicates report), the range should be no greater than the PQL. The duplicate results met the criteria, with the exception of the range between results for iron at DUR03 0608. There were no analytical errors identified during the review of the data. The iron results for this location are qualified with a "J" flag as estimated values.

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 Donivan — Date: 10-9-2015

Data Validation Lead: Gretchen Baer — Date: 10/9/15

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 can result from transcription errors, data-coding errors, or measurement system problems. However, outliers can also represent true extreme values of a distribution and can 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.** Do this 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 as to whether the data are normally distributed using the Shapiro-Wilk Test.
2. **Apply the appropriate statistical test.** Dixon's Test for extreme values 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.

Four laboratory results were identified as potential outliers. (See the Data Validation Outliers Reports, below. Note that the potential outliers are listed by Site Code in the first column and that DUR01 is the code for the Mill Tailings Process Site; DUR02 is the code for the Raffinate Pond Process Site; and DUR03 is the code for the Durango Disposal Site.) The data associated with these results were reviewed in detail with no errors noted. The laboratory results for this RIN are acceptable as qualified.

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Data Validation Outliers Report - No Field Parameters
Comparison: All historical Data Beginning 1/1/2005
Laboratory: ALS Laboratory Group
RIN: 15057084
Report Date: 9/1/2015

					Current			**Historical Maximum**			**Historical Minimum**			**Number of Data Points**		**Statistical Outlier**
						Qualifiers			*Qualifiers*			*Qualifiers*				
Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	*Lab*	*Data*	Result	*Lab*	*Data*	Result	*Lab*	*Data*	N	N Below Detect	
DUR01	0612	N001	06/03/2015	Manganese	6.70		F	6.10		F	3.40		F	12	0	No
DUR01	0612	N002	06/03/2015	Manganese	6.60		F	6.10		F	3.40		F	12	0	No
DUR01	0612	N001	06/03/2015	Molybdenum	0.0810		F	0.110		F	0.0820		F	12	0	No
DUR01	0612	N001	06/03/2015	Selenium	0.0140		UF	0.00390		F	0.00025		FQ	12	0	No
DUR01	0612	N002	06/03/2015	Selenium	0.00660	J	UF	0.00390		F	0.00025		FQ	12	0	No
DUR01	0630	N001	06/03/2015	Manganese	0.340		F	1.10		F	0.380		F	10	0	No
DUR01	0631	N001	06/03/2015	Manganese	0.930		F	0.480		F	0.180		F	11	0	Yes
DUR01	0634	N001	06/03/2015	Manganese	0.350		FQ	0.270		FQ	0.0150	B	FQ	10	0	No
DUR01	0635	N001	06/03/2015	Manganese	0.0810		F	0.490		FQ	0.0850		F	12	0	NA
DUR01	0635	N001	06/03/2015	Uranium	0.0280		F	0.0170		F	0.00730		F	12	0	Yes
DUR02	0588	N001	06/01/2015	Selenium	0.00150			0.00110			0.00046			7	0	No
DUR02	0598	N001	06/02/2015	Selenium	0.0560		F	0.990		F	0.0680		F	11	0	NA
DUR02	0598	N001	06/02/2015	Uranium	0.0580		F	0.230		F	0.0710		F	11	0	NA
DUR03	0605	N001	06/03/2015	Potassium	6.90		FQ	11.0		F	8.80	N	FQ	13	0	No
DUR03	0607	N001	06/03/2015	Iron	1.60		F	0.220		F	0.0360	B	F	12	4	Yes
DUR03	0607	N001	06/03/2015	Manganese	0.0980		F	0.0910		FQ	0.0690		F	12	0	No
DUR03	0607	N001	06/03/2015	Potassium	7.00		F	11.0		F	8.00		F	12	0	No
DUR03	0608	N001	06/02/2015	Calcium	120		F	280		F	131		F	17	0	No
DUR03	0608	N006	06/02/2015	Calcium	120		F	280		F	131		F	17	0	No
DUR03	0608	N001	06/02/2015	Chloride	9.70		F	35.0		F	11.0		F	17	0	NA

Data Validation Outliers Report - No Field Parameters
Comparison: All historical Data Beginning 1/1/2005
Laboratory: ALS Laboratory Group
RIN: 15057084
Report Date: 9/1/2015

					Current			Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
						Qualifiers			Qualifiers			Qualifiers				
Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
DUR03	0608	N006	06/02/2015	Chloride	10.00		F	35.0		F	11.0		F	17	0	NA
DUR03	0608	N006	06/02/2015	Magnesium	75.0		F	250		F	76.0		F	17	0	NA
DUR03	0608	N006	06/02/2015	Potassium	2.60		F	7.50		F	2.67	B	F	17	0	No
DUR03	0608	N001	06/02/2015	Sodium	50.0		F	110		F	51.0		F	17	0	No
DUR03	0608	N006	06/02/2015	Sodium	48.0		F	110		F	51.0		F	17	0	No
DUR03	0608	N006	06/02/2015	Sulfate	330		F	1200		F	420		F	17	0	NA
DUR03	0608	N001	06/02/2015	Sulfate	330		F	1200		F	420		F	17	0	NA
DUR03	0608	N006	06/02/2015	Total Dissolved Solids	840		F	2200		F	940		F	16	0	NA
DUR03	0608	N001	06/02/2015	Total Dissolved Solids	840		F	2200		F	940		F	16	0	NA
DUR03	0612	N001	06/03/2015	Iron	0.180		FQ	0.130		UFQ	0.0140	B	FQ	11	8	No
DUR03	0612	N001	06/03/2015	Potassium	6.40		FQ	12.0		FQ	9.80		F	11	0	Yes
DUR03	0612	N001	06/03/2015	Selenium	0.00190		UFQ	0.00170		FQ	0.000041	B	FQJ	11	3	NA
DUR03	0612	N001	06/03/2015	Sodium	1100		FQ	1000		FQ	730		F	11	0	No
DUR03	0612	N001	06/03/2015	Sulfate	5.30		FQ	240		FQ	8.50		FQ	11	0	No
DUR03	0618	N001	06/02/2015	Calcium	170		F	370		F	220		F	21	0	No
DUR03	0618	N001	06/02/2015	Chloride	21.0		F	51.0		F	27.0		F	21	0	No
DUR03	0618	N001	06/02/2015	Magnesium	95.0		F	200		F	120		F	21	0	No
DUR03	0618	N001	06/02/2015	Sulfate	560		F	1500		F	740		F	21	0	No
DUR03	0618	N001	06/02/2015	Total Dissolved Solids	1200		F	2500		F	1500		F	19	0	No
DUR03	0621	N001	06/02/2015	Chloride	9.90		F	27.0		F	10.00		F	21	0	NA

Data Validation Outliers Report - No Field Parameters
Comparison: All historical Data Beginning 1/1/2005
Laboratory: ALS Laboratory Group
RIN: 15057084
Report Date: 9/1/2015

					Current			**Historical Maximum**			**Historical Minimum**			**Number of Data Points**		**Statistical Outlier**
						Qualifiers			*Qualifiers*			*Qualifiers*				
Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	*Lab*	*Data*	Result	*Lab*	*Data*	Result	*Lab*	*Data*	N	N Below Detect	
DUR03	0621	N001	06/02/2015	Selenium	0.00770		F	0.00650		F	0.00002	U	F	53	15	No
DUR03	0621	N001	06/02/2015	Sodium	210		F	204		F	89.0		F	21	0	NA
DUR03	0623	0001	06/02/2015	Calcium	320		FQ	300		FQ	200		FQ	15	0	NA

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

NA: Data are not normally or lognormally distributed.

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Attachment 2
Data Presentation

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Groundwater Quality Data
Durango Disposal Site

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General Water Quality Data by Location (USEE105) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 9/2/2015
Location: 0605 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/03/2015	N001	36 - 56	654		FQ	#		
Calcium	mg/L	06/03/2015	N001	36 - 56	140		FQ	#	0.024	
Chloride	mg/L	06/03/2015	N001	36 - 56	31		FQ	#	4	
Iron	mg/L	06/03/2015	N001	36 - 56	0.1		FQ	#	0.0067	
Magnesium	mg/L	06/03/2015	N001	36 - 56	120		FQ	#	0.03	
Manganese	mg/L	06/03/2015	N001	36 - 56	0.036		FQ	#	0.00024	
Molybdenum	mg/L	06/03/2015	N001	36 - 56	0.00032	U	FQ	#	0.00032	
Oxidation Reduction Potential	mV	06/03/2015	N001	36 - 56	-87.2		FQ	#		
pH	s.u.	06/03/2015	N001	36 - 56	6.9		FQ	#		
Potassium	mg/L	06/03/2015	N001	36 - 56	6.9		FQ	#	0.052	
Selenium	mg/L	06/03/2015	N001	36 - 56	0.00084	J	UFQ	#	0.00032	
Sodium	mg/L	06/03/2015	N001	36 - 56	300		FQ	#	0.047	
Specific Conductance	umhos /cm	06/03/2015	N001	36 - 56	2392		FQ	#		
Sulfate	mg/L	06/03/2015	N001	36 - 56	670		FQ	#	10	
Temperature	C	06/03/2015	N001	36 - 56	11.86		FQ	#		
Total Dissolved Solids	mg/L	06/03/2015	N001	36 - 56	1700		FQ	#	40	
Turbidity	NTU	06/03/2015	N001	36 - 56	6.15		FQ	#		
Uranium	mg/L	06/03/2015	N001	36 - 56	0.00007	J	FQ	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 9/2/2015
Location: 0607 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/03/2015	N001	36.7 - 56.7	383		F	#		
Calcium	mg/L	06/03/2015	N001	36.7 - 56.7	290		F	#	0.024	
Chloride	mg/L	06/03/2015	N001	36.7 - 56.7	12		F	#	2	
Iron	mg/L	06/03/2015	N001	36.7 - 56.7	1.6		F	#	0.0067	
Magnesium	mg/L	06/03/2015	N001	36.7 - 56.7	200		F	#	0.03	
Manganese	mg/L	06/03/2015	N001	36.7 - 56.7	0.098		F	#	0.00024	
Molybdenum	mg/L	06/03/2015	N001	36.7 - 56.7	0.00032	U	F	#	0.00032	
Oxidation Reduction Potential	mV	06/03/2015	N001	36.7 - 56.7	-79.9		F	#		
pH	s.u.	06/03/2015	N001	36.7 - 56.7	6.75		F	#		
Potassium	mg/L	06/03/2015	N001	36.7 - 56.7	7		F	#	0.052	
Selenium	mg/L	06/03/2015	N001	36.7 - 56.7	0.00032	U	JF	#	0.00032	
Sodium	mg/L	06/03/2015	N001	36.7 - 56.7	320		F	#	0.047	
Specific Conductance	umhos /cm	06/03/2015	N001	36.7 - 56.7	3376		F	#		
Sulfate	mg/L	06/03/2015	N001	36.7 - 56.7	1700		F	#	25	
Temperature	C	06/03/2015	N001	36.7 - 56.7	11.87		F	#		
Total Dissolved Solids	mg/L	06/03/2015	N001	36.7 - 56.7	3000		F	#	80	
Turbidity	NTU	06/03/2015	N001	36.7 - 56.7	4.18		F	#		
Uranium	mg/L	06/03/2015	N001	36.7 - 56.7	0.00013		F	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 9/2/2015
Location: 0608 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/02/2015	N001	29	-	39	275		F	#		
Calcium	mg/L	06/02/2015	N001	29	-	39	120		F	#	0.024	
Calcium	mg/L	06/02/2015	N006	29	-	39	120		F	#	0.024	
Chloride	mg/L	06/02/2015	N001	29	-	39	9.7		F	#	2	
Chloride	mg/L	06/02/2015	N006	29	-	39	10		F	#	2	
Iron	mg/L	06/02/2015	N001	29	-	39	0.069	J	JF	#	0.0067	
Iron	mg/L	06/02/2015	N006	29	-	39	0.32		JF	#	0.0067	
Magnesium	mg/L	06/02/2015	N001	29	-	39	76		F	#	0.03	
Magnesium	mg/L	06/02/2015	N006	29	-	39	75		F	#	0.03	
Manganese	mg/L	06/02/2015	N001	29	-	39	0.00083	J	UF	#	0.00024	
Manganese	mg/L	06/02/2015	N006	29	-	39	0.0025	J	UF	#	0.00024	
Molybdenum	mg/L	06/02/2015	N001	29	-	39	0.0012		F	#	0.00032	
Molybdenum	mg/L	06/02/2015	N006	29	-	39	0.001		F	#	0.00032	
Oxidation Reduction Potential	mV	06/02/2015	N001	29	-	39	137.2		F	#		
pH	s.u.	06/02/2015	N001	29	-	39	7.02		F	#		
Potassium	mg/L	06/02/2015	N001	29	-	39	2.8		F	#	0.052	
Potassium	mg/L	06/02/2015	N006	29	-	39	2.6		F	#	0.052	
Selenium	mg/L	06/02/2015	N001	29	-	39	0.0027		F	#	0.00032	

General Water Quality Data by Location (USEE105) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 9/2/2015
Location: 0608 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Selenium	mg/L	06/02/2015	N006	29	-	39	0.003		F	#	0.00032	
Sodium	mg/L	06/02/2015	N001	29	-	39	50		F	#	0.047	
Sodium	mg/L	06/02/2015	N006	29	-	39	48		F	#	0.047	
Specific Conductance	umhos /cm	06/02/2015	N001	29	-	39	1171		F	#		
Sulfate	mg/L	06/02/2015	N001	29	-	39	330		F	#	5	
Sulfate	mg/L	06/02/2015	N006	29	-	39	330		F	#	5	
Temperature	C	06/02/2015	N001	29	-	39	9.94		F	#		
Total Dissolved Solids	mg/L	06/02/2015	N001	29	-	39	840		F	#	20	
Total Dissolved Solids	mg/L	06/02/2015	N006	29	-	39	840		F	#	20	
Turbidity	NTU	06/02/2015	N001	29	-	39	2.01		F	#		
Uranium	mg/L	06/02/2015	N001	29	-	39	0.011		F	#	0.000029	
Uranium	mg/L	06/02/2015	N006	29	-	39	0.011		F	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 9/2/2015
Location: 0612 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/03/2015	N001	98.09 - 108.09	2164		FQ	#		
Calcium	mg/L	06/03/2015	N001	98.09 - 108.09	7.6		FQ	#	0.024	
Chloride	mg/L	06/03/2015	N001	98.09 - 108.09	50		FQ	#	1	
Iron	mg/L	06/03/2015	N001	98.09 - 108.09	0.18		FQ	#	0.0067	
Magnesium	mg/L	06/03/2015	N001	98.09 - 108.09	4.5		FQ	#	0.03	
Manganese	mg/L	06/03/2015	N001	98.09 - 108.09	0.0087		FQ	#	0.00024	
Molybdenum	mg/L	06/03/2015	N001	98.09 - 108.09	0.00032	U	FQ	#	0.00032	
Oxidation Reduction Potential	mV	06/03/2015	N001	98.09 - 108.09	-337.7		FQ	#		
pH	s.u.	06/03/2015	N001	98.09 - 108.09	7.57		FQ	#		
Potassium	mg/L	06/03/2015	N001	98.09 - 108.09	6.4		FQ	#	0.052	
Selenium	mg/L	06/03/2015	N001	98.09 - 108.09	0.0019		UFQ	#	0.00032	
Sodium	mg/L	06/03/2015	N001	98.09 - 108.09	1100		FQ	#	0.23	
Specific Conductance	umhos /cm	06/03/2015	N001	98.09 - 108.09	4061		FQ	#		
Sulfate	mg/L	06/03/2015	N001	98.09 - 108.09	5.3		FQ	#	2.5	
Temperature	C	06/03/2015	N001	98.09 - 108.09	12.05		FQ	#		
Total Dissolved Solids	mg/L	06/03/2015	N001	98.09 - 108.09	2600		FQ	#	80	
Turbidity	NTU	06/03/2015	N001	98.09 - 108.09	6.71		FQ	#		
Uranium	mg/L	06/03/2015	N001	98.09 - 108.09	0.0002		FQ	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 9/2/2015
Location: 0618 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/02/2015	N001	29.77	-	49.77	300		F	#		
Calcium	mg/L	06/02/2015	N001	29.77	-	49.77	170		F	#	0.12	
Chloride	mg/L	06/02/2015	N001	29.77	-	49.77	21		F	#	4	
Iron	mg/L	06/02/2015	N001	29.77	-	49.77	0.046	J	F	#	0.033	
Magnesium	mg/L	06/02/2015	N001	29.77	-	49.77	95		F	#	0.15	
Manganese	mg/L	06/02/2015	N001	29.77	-	49.77	0.0012	U	F	#	0.0012	
Molybdenum	mg/L	06/02/2015	N001	29.77	-	49.77	0.00068	J	F	#	0.00032	
Oxidation Reduction Potential	mV	06/02/2015	N001	29.77	-	49.77	113.2		F	#		
pH	s.u.	06/02/2015	N001	29.77	-	49.77	6.91		F	#		
Potassium	mg/L	06/02/2015	N001	29.77	-	49.77	2.2	J	F	#	0.26	
Selenium	mg/L	06/02/2015	N001	29.77	-	49.77	0.0038		UF	#	0.00032	
Sodium	mg/L	06/02/2015	N001	29.77	-	49.77	79		F	#	0.23	
Specific Conductance	umhos /cm	06/02/2015	N001	29.77	-	49.77	1555		F	#		
Sulfate	mg/L	06/02/2015	N001	29.77	-	49.77	560		F	#	10	
Temperature	C	06/02/2015	N001	29.77	-	49.77	12.06		F	#		
Total Dissolved Solids	mg/L	06/02/2015	N001	29.77	-	49.77	1200		F	#	40	
Turbidity	NTU	06/02/2015	N001	29.77	-	49.77	0.77		F	#		
Uranium	mg/L	06/02/2015	N001	29.77	-	49.77	0.064		F	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 9/2/2015
Location: 0621 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/02/2015	N001	78.46	-	88.46	0		F	#		
Calcium	mg/L	06/02/2015	N001	78.46	-	88.46	440		F	#	0.024	
Chloride	mg/L	06/02/2015	N001	78.46	-	88.46	9.9		F	#	4	
Iron	mg/L	06/02/2015	N001	78.46	-	88.46	130		F	#	0.0067	
Magnesium	mg/L	06/02/2015	N001	78.46	-	88.46	380		F	#	0.03	
Manganese	mg/L	06/02/2015	N001	78.46	-	88.46	3.4		F	#	0.00024	
Molybdenum	mg/L	06/02/2015	N001	78.46	-	88.46	0.00032	U	F	#	0.00032	
Oxidation Reduction Potential	mV	06/02/2015	N001	78.46	-	88.46	210.1		F	#		
pH	s.u.	06/02/2015	N001	78.46	-	88.46	4.53		F	#		
Potassium	mg/L	06/02/2015	N001	78.46	-	88.46	11		F	#	0.052	
Selenium	mg/L	06/02/2015	N001	78.46	-	88.46	0.0077		F	#	0.00032	
Sodium	mg/L	06/02/2015	N001	78.46	-	88.46	210		F	#	0.047	
Specific Conductance	umhos /cm	06/02/2015	N001	78.46	-	88.46	4274		F	#		
Sulfate	mg/L	06/02/2015	N001	78.46	-	88.46	3200		F	#	25	
Temperature	C	06/02/2015	N001	78.46	-	88.46	11.75		F	#		
Total Dissolved Solids	mg/L	06/02/2015	N001	78.46	-	88.46	4400		F	#	80	
Turbidity	NTU	06/02/2015	N001	78.46	-	88.46	2.55		F	#		
Uranium	mg/L	06/02/2015	N001	78.46	-	88.46	0.000029	U	F	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 9/2/2015
Location: 0623 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/02/2015	N001	19.35	-	39.35	432		FQ	#		
Calcium	mg/L	06/02/2015	0001	19.35	-	39.35	320		FQ	#	0.12	
Chloride	mg/L	06/02/2015	0001	19.35	-	39.35	42		FQ	#	10	
Iron	mg/L	06/02/2015	0001	19.35	-	39.35	9.2		FQ	#	0.033	
Magnesium	mg/L	06/02/2015	0001	19.35	-	39.35	260		FQ	#	0.15	
Manganese	mg/L	06/02/2015	0001	19.35	-	39.35	0.66		FQ	#	0.0012	
Molybdenum	mg/L	06/02/2015	0001	19.35	-	39.35	0.00075	J	FQ	#	0.00032	
Oxidation Reduction Potential	mV	06/02/2015	N001	19.35	-	39.35	-61.5		FQ	#		
pH	s.u.	06/02/2015	N001	19.35	-	39.35	6.92		FQ	#		
Potassium	mg/L	06/02/2015	0001	19.35	-	39.35	2.5	J	FQ	#	0.26	
Selenium	mg/L	06/02/2015	0001	19.35	-	39.35	0.00032	U	FQ	#	0.00032	
Sodium	mg/L	06/02/2015	0001	19.35	-	39.35	190		FQ	#	0.23	
Specific Conductance	umhos /cm	06/02/2015	N001	19.35	-	39.35	3203		FQ	#		
Sulfate	mg/L	06/02/2015	0001	19.35	-	39.35	1600		FQ	#	25	
Temperature	C	06/02/2015	N001	19.35	-	39.35	11.51		FQ	#		
Total Dissolved Solids	mg/L	06/02/2015	0001	19.35	-	39.35	2700		FQ	#	80	
Turbidity	NTU	06/02/2015	N001	19.35	-	39.35	43.8		FQ	#		
Uranium	mg/L	06/02/2015	0001	19.35	-	39.35	0.0013		FQ	#	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.	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 Sites

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General Water Quality Data by Location (USEE105) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 9/2/2015
Location: 0612 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/03/2015	N001	37.41 - 57.41	414		F	#		
Cadmium	mg/L	06/03/2015	N001	37.41 - 57.41	0.043		F	#	0.0012	
Cadmium	mg/L	06/03/2015	N002	37.41 - 57.41	0.046		F	#	0.0012	
Manganese	mg/L	06/03/2015	N001	37.41 - 57.41	6.7		F	#	0.00024	
Manganese	mg/L	06/03/2015	N002	37.41 - 57.41	6.6		F	#	0.00024	
Molybdenum	mg/L	06/03/2015	N001	37.41 - 57.41	0.081		F	#	0.0032	
Molybdenum	mg/L	06/03/2015	N002	37.41 - 57.41	0.082		F	#	0.0032	
Oxidation Reduction Potential	mV	06/03/2015	N001	37.41 - 57.41	-28.2		F	#		
pH	s.u.	06/03/2015	N001	37.41 - 57.41	6.6		F	#		
Selenium	mg/L	06/03/2015	N001	37.41 - 57.41	0.014		UF	#	0.0032	
Selenium	mg/L	06/03/2015	N002	37.41 - 57.41	0.0066	J	UF	#	0.0032	
Specific Conductance	umhos /cm	06/03/2015	N001	37.41 - 57.41	3589		F	#		
Sulfate	mg/L	06/03/2015	N001	37.41 - 57.41	1500		F	#	25	
Sulfate	mg/L	06/03/2015	N002	37.41 - 57.41	1500		F	#	25	
Temperature	C	06/03/2015	N001	37.41 - 57.41	13.99		F	#		
Turbidity	NTU	06/03/2015	N001	37.41 - 57.41	7.72		F	#		
Uranium	mg/L	06/03/2015	N001	37.41 - 57.41	1.2		F	#	0.00029	
Uranium	mg/L	06/03/2015	N002	37.41 - 57.41	1.2		F	#	0.00029	

General Water Quality Data by Location (USEE105) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 9/2/2015
Location: 0617 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/03/2015	N001	14	-	29	390		F	#		
Manganese	mg/L	06/03/2015	N001	14	-	29	0.84		F	#	0.00024	
Molybdenum	mg/L	06/03/2015	N001	14	-	29	0.0013		F	#	0.00032	
Oxidation Reduction Potential	mV	06/03/2015	N001	14	-	29	-233.3		F	#		
pH	s.u.	06/03/2015	N001	14	-	29	6.75		F	#		
Selenium	mg/L	06/03/2015	N001	14	-	29	0.001	J	UF	#	0.00032	
Specific Conductance	umhos /cm	06/03/2015	N001	14	-	29	3196		F	#		
Sulfate	mg/L	06/03/2015	N001	14	-	29	1700		F	#	12	
Temperature	C	06/03/2015	N001	14	-	29	13.67		F	#		
Turbidity	NTU	06/03/2015	N001	14	-	29	3.2		F	#		
Uranium	mg/L	06/03/2015	N001	14	-	29	0.18		F	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 9/2/2015
Location: 0630 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/03/2015	N001	28.3 - 38.3	295		F	#		
Manganese	mg/L	06/03/2015	N001	28.3 - 38.3	0.34		F	#	0.0012	
Molybdenum	mg/L	06/03/2015	N001	28.3 - 38.3	0.0029		F	#	0.00032	
Oxidation Reduction Potential	mV	06/03/2015	N001	28.3 - 38.3	-61		F	#		
pH	s.u.	06/03/2015	N001	28.3 - 38.3	6.62		F	#		
Selenium	mg/L	06/03/2015	N001	28.3 - 38.3	0.017		F	#	0.00032	
Specific Conductance	umhos /cm	06/03/2015	N001	28.3 - 38.3	3020		F	#		
Sulfate	mg/L	06/03/2015	N001	28.3 - 38.3	1600		F	#	12	
Temperature	C	06/03/2015	N001	28.3 - 38.3	13.84		F	#		
Turbidity	NTU	06/03/2015	N001	28.3 - 38.3	4.32		F	#		
Uranium	mg/L	06/03/2015	N001	28.3 - 38.3	0.28		F	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 9/2/2015
Location: 0631 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/03/2015	N001	6	-	16	320		F	#		
Manganese	mg/L	06/03/2015	N001	6	-	16	0.93		F	#	0.00024	
Molybdenum	mg/L	06/03/2015	N001	6	-	16	0.0066		F	#	0.00032	
Oxidation Reduction Potential	mV	06/03/2015	N001	6	-	16	-166.4		F	#		
pH	s.u.	06/03/2015	N001	6	-	16	7.06		F	#		
Selenium	mg/L	06/03/2015	N001	6	-	16	0.00058	J	UF	#	0.00032	
Specific Conductance	umhos /cm	06/03/2015	N001	6	-	16	1077		F	#		
Sulfate	mg/L	06/03/2015	N001	6	-	16	210		F	#	5	
Temperature	C	06/03/2015	N001	6	-	16	14.37		F	#		
Turbidity	NTU	06/03/2015	N001	6	-	16	4.81		F	#		
Uranium	mg/L	06/03/2015	N001	6	-	16	0.14		F	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 9/2/2015
Location: 0633 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/03/2015	N001	4	-	14	474		FQ	#		
Manganese	mg/L	06/03/2015	N001	4	-	14	0.48		FQ	#	0.00024	
Molybdenum	mg/L	06/03/2015	N001	4	-	14	0.0016		FQ	#	0.00032	
Oxidation Reduction Potential	mV	06/03/2015	N001	4	-	14	-273.4		FQ	#		
pH	s.u.	06/03/2015	N001	4	-	14	6.81		FQ	#		
Selenium	mg/L	06/03/2015	N001	4	-	14	0.017		FQ	#	0.00032	
Specific Conductance	umhos /cm	06/03/2015	N001	4	-	14	6873		FQ	#		
Sulfate	mg/L	06/03/2015	N001	4	-	14	4000		FQ	#	50	
Temperature	C	06/03/2015	N001	4	-	14	13.5		FQ	#		
Turbidity	NTU	06/03/2015	N001	4	-	14	3.9		FQ	#		
Uranium	mg/L	06/03/2015	N001	4	-	14	0.66		FQ	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 9/2/2015
Location: 0634 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/03/2015	N001	8	-	18	536		FQ	#		
Manganese	mg/L	06/03/2015	N001	8	-	18	0.35		FQ	#	0.00024	
Molybdenum	mg/L	06/03/2015	N001	8	-	18	0.0014		FQ	#	0.00032	
Oxidation Reduction Potential	mV	06/03/2015	N001	8	-	18	-213.4		FQ	#		
pH	s.u.	06/03/2015	N001	8	-	18	7.01		FQ	#		
Selenium	mg/L	06/03/2015	N001	8	-	18	0.00032	U	FQ	#	0.00032	
Specific Conductance	umhos /cm	06/03/2015	N001	8	-	18	4738		FQ	#		
Sulfate	mg/L	06/03/2015	N001	8	-	18	2200		FQ	#	25	
Temperature	C	06/03/2015	N001	8	-	18	13.44		FQ	#		
Turbidity	NTU	06/03/2015	N001	8	-	18	4.75		FQ	#		
Uranium	mg/L	06/03/2015	N001	8	-	18	0.034		FQ	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 9/2/2015
Location: 0635 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/03/2015	N001	5.5	-	15.5	475		F	#		
Manganese	mg/L	06/03/2015	N001	5.5	-	15.5	0.081		F	#	0.00024	
Molybdenum	mg/L	06/03/2015	N001	5.5	-	15.5	0.0014		F	#	0.00032	
Oxidation Reduction Potential	mV	06/03/2015	N001	5.5	-	15.5	-160.7		F	#		
pH	s.u.	06/03/2015	N001	5.5	-	15.5	6.71		F	#		
Selenium	mg/L	06/03/2015	N001	5.5	-	15.5	0.00059	J	F	#	0.00032	
Specific Conductance	umhos /cm	06/03/2015	N001	5.5	-	15.5	3266		F	#		
Sulfate	mg/L	06/03/2015	N001	5.5	-	15.5	1600		F	#	12	
Temperature	C	06/03/2015	N001	5.5	-	15.5	12.57		F	#		
Turbidity	NTU	06/03/2015	N001	5.5	-	15.5	6.87		F	#		
Uranium	mg/L	06/03/2015	N001	5.5	-	15.5	0.028		F	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 9/2/2015
Location: 0863 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/03/2015	N001	58	-	67.5	515		F	#		
Cadmium	mg/L	06/03/2015	N001	58	-	67.5	0.00012	U	F	#	0.00012	
Manganese	mg/L	06/03/2015	N001	58	-	67.5	0.11		F	#	0.00024	
Molybdenum	mg/L	06/03/2015	N001	58	-	67.5	0.00062	J	F	#	0.00032	
Oxidation Reduction Potential	mV	06/03/2015	N001	58	-	67.5	-127.1		F	#		
pH	s.u.	06/03/2015	N001	58	-	67.5	6.94		F	#		
Selenium	mg/L	06/03/2015	N001	58	-	67.5	0.00032	U	F	#	0.00032	
Specific Conductance	umhos /cm	06/03/2015	N001	58	-	67.5	2212		F	#		
Sulfate	mg/L	06/03/2015	N001	58	-	67.5	630		F	#	10	
Temperature	C	06/03/2015	N001	58	-	67.5	13.24		F	#		
Turbidity	NTU	06/03/2015	N001	58	-	67.5	4.64		F	#		
Uranium	mg/L	06/03/2015	N001	58	-	67.5	0.00025		F	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 9/2/2015
Location: 0594 WELL Original location DH-116.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/01/2015	N001	8.5	-	38.5	407		FQ	#		
Oxidation Reduction Potential	mV	06/01/2015	N001	8.5	-	38.5	-79		FQ	#		
pH	s.u.	06/01/2015	N001	8.5	-	38.5	6.77		FQ	#		
Selenium	mg/L	06/01/2015	0001	8.5	-	38.5	0.0049		FQ	#	0.00032	
Specific Conductance	umhos /cm	06/01/2015	N001	8.5	-	38.5	4253		FQ	#		
Temperature	C	06/01/2015	N001	8.5	-	38.5	20.7		FQ	#		
Turbidity	NTU	06/01/2015	N001	8.5	-	38.5	11.6		FQ	#		
Uranium	mg/L	06/01/2015	0001	8.5	-	38.5	0.029		FQ	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 9/2/2015
Location: 0598 WELL Original location Bureau of Rec well DH-110.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/02/2015	N001	66.2	-	96.2	333		F	#		
Oxidation Reduction Potential	mV	06/02/2015	N001	66.2	-	96.2	-21.9		F	#		
pH	s.u.	06/02/2015	N001	66.2	-	96.2	6.92		F	#		
Selenium	mg/L	06/02/2015	N001	66.2	-	96.2	0.056		F	#	0.00032	
Specific Conductance	umhos /cm	06/02/2015	N001	66.2	-	96.2	7093		F	#		
Turbidity	NTU	06/02/2015	N001	66.2	-	96.2	9.25		F	#		
Uranium	mg/L	06/02/2015	N001	66.2	-	96.2	0.058		F	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 9/2/2015
Location: 0607 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/01/2015	N001	35	-	55	300		FQ	#		
Oxidation Reduction Potential	mV	06/01/2015	N001	35	-	55	88		FQ	#		
pH	s.u.	06/01/2015	N001	35	-	55	7.04		FQ	#		
Selenium	mg/L	06/01/2015	N001	35	-	55	0.44		FQ	#	0.00032	
Specific Conductance	umhos /cm	06/01/2015	N001	35	-	55	2065		FQ	#		
Temperature	C	06/01/2015	N001	35	-	55	15.77		FQ	#		
Turbidity	NTU	06/01/2015	N001	35	-	55	5.23		FQ	#		
Uranium	mg/L	06/01/2015	N001	35	-	55	0.0034		FQ	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 9/2/2015
Location: 0879 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/02/2015	N001	27	-	36.9	404			#		
Oxidation Reduction Potential	mV	06/02/2015	N001	27	-	36.9	47			#		
pH	s.u.	06/02/2015	N001	27	-	36.9	6.6			#		
Selenium	mg/L	06/02/2015	N001	27	-	36.9	0.01			#	0.00032	
Specific Conductance	umhos /cm	06/02/2015	N001	27	-	36.9	8136			#		
Temperature	C	06/02/2015	N001	27	-	36.9	14.35			#		
Turbidity	NTU	06/02/2015	N001	27	-	36.9	5.46			#		
Uranium	mg/L	06/02/2015	N001	27	-	36.9	0.078			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 9/2/2015
Location: 0884 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/02/2015	N001	36.5	-	46.5	247		F	#		
Oxidation Reduction Potential	mV	06/02/2015	N001	36.5	-	46.5	161.9		F	#		
pH	s.u.	06/02/2015	N001	36.5	-	46.5	7.09		F	#		
Selenium	mg/L	06/02/2015	N001	36.5	-	46.5	0.72		F	#	0.00032	
Specific Conductance	umhos /cm	06/02/2015	N001	36.5	-	46.5	3720		F	#		
Temperature	C	06/02/2015	N001	36.5	-	46.5	14.43		F	#		
Turbidity	NTU	06/02/2015	N001	36.5	-	46.5	0.65		F	#		
Uranium	mg/L	06/02/2015	N001	36.5	-	46.5	0.14		F	#	0.000029	

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

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

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

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

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Surface Water Quality Data

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General Water Quality Data by Location (USEE105) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 9/2/2015
Location: 0584 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/03/2015	N001	0	-	0	52			#		
Cadmium	mg/L	06/03/2015	0001	0	-	0	0.00013	J		#	0.00012	
Molybdenum	mg/L	06/03/2015	0001	0	-	0	0.00058	J	J	#	0.00032	
Oxidation Reduction Potential	mV	06/03/2015	N001	0	-	0	-95.8			#		
pH	s.u.	06/03/2015	N001	0	-	0	7.93			#		
Selenium	mg/L	06/03/2015	0001	0	-	0	0.0019		U	#	0.00032	
Specific Conductance	umhos /cm	06/03/2015	N001	0	-	0	208			#		
Temperature	C	06/03/2015	N001	0	-	0	14.58			#		
Turbidity	NTU	06/03/2015	N001	0	-	0	84.8			#		
Uranium	mg/L	06/03/2015	0001	0	-	0	0.0003		J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 9/2/2015
Location: 0586 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/02/2015	N001	0	-	0	47			#		
Cadmium	mg/L	06/02/2015	0001	0	-	0	0.00012	U		#	0.00012	
Molybdenum	mg/L	06/02/2015	0001	0	-	0	0.00095	J	J	#	0.00032	
Oxidation Reduction Potential	mV	06/02/2015	N001	0	-	0	175			#		
pH	s.u.	06/02/2015	N001	0	-	0	7.64			#		
Selenium	mg/L	06/02/2015	0001	0	-	0	0.003		U	#	0.00032	
Specific Conductance	umhos /cm	06/02/2015	N001	0	-	0	176			#		
Temperature	C	06/02/2015	N001	0	-	0	9.79			#		
Turbidity	NTU	06/02/2015	N001	0	-	0	117			#		
Uranium	mg/L	06/02/2015	0001	0	-	0	0.00057		J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 9/2/2015
Location: 0652 SURFACE LOCATION SURFACE WATER AND SED.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/02/2015	N001	0 - 0	68			#		
Cadmium	mg/L	06/02/2015	0001	0 - 0	0.00012	U		#	0.00012	
Molybdenum	mg/L	06/02/2015	0001	0 - 0	0.00052	J	J	#	0.00032	
Oxidation Reduction Potential	mV	06/02/2015	N001	0 - 0	220			#		
pH	s.u.	06/02/2015	N001	0 - 0	6.98			#		
Selenium	mg/L	06/02/2015	0001	0 - 0	0.00032	U		#	0.00032	
Specific Conductance	umhos /cm	06/02/2015	N001	0 - 0	214			#		
Temperature	C	06/02/2015	N001	0 - 0	9.66			#		
Turbidity	NTU	06/02/2015	N001	0 - 0	117			#		
Uranium	mg/L	06/02/2015	0001	0 - 0	0.00047		J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 9/2/2015
Location: 0691 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/03/2015	N001	0	-	0	47			#		
Cadmium	mg/L	06/03/2015	0001	0	-	0	0.00015	J		#	0.00012	
Molybdenum	mg/L	06/03/2015	0001	0	-	0	0.00045	J	J	#	0.00032	
Oxidation Reduction Potential	mV	06/03/2015	N001	0	-	0	-19.7			#		
pH	s.u.	06/03/2015	N001	0	-	0	7.64			#		
Selenium	mg/L	06/03/2015	0001	0	-	0	0.00071	J	J	#	0.00032	
Specific Conductance	umhos /cm	06/03/2015	N001	0	-	0	164			#		
Temperature	C	06/03/2015	N001	0	-	0	9.74			#		
Turbidity	NTU	06/03/2015	N001	0	-	0	73.5			#		
Uranium	mg/L	06/03/2015	0001	0	-	0	0.00031		J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 9/2/2015
Location: 0588 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/01/2015	N001	0	-	0	301			#		
Cadmium	mg/L	06/01/2015	N001	0	-	0	0.00012	U		#	0.00012	
Molybdenum	mg/L	06/01/2015	N001	0	-	0	0.0014			#	0.00032	
Oxidation Reduction Potential	mV	06/01/2015	N001	0	-	0	108.1			#		
pH	s.u.	06/01/2015	N001	0	-	0	8.08			#		
Selenium	mg/L	06/01/2015	N001	0	-	0	0.0015			#	0.00032	
Specific Conductance	umhos /cm	06/01/2015	N001	0	-	0	1268			#		
Temperature	C	06/01/2015	N001	0	-	0	18.02			#		
Turbidity	NTU	06/01/2015	N001	0	-	0	1.44			#		
Uranium	mg/L	06/01/2015	N001	0	-	0	0.019			#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 9/2/2015
Location: 0654 SURFACE LOCATION RESERVED FOR CDAY

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/02/2015	N001	0 - 0	52			#		
Cadmium	mg/L	06/02/2015	0001	0 - 0	0.00012	U		#	0.00012	
Molybdenum	mg/L	06/02/2015	0001	0 - 0	0.00058	J	J	#	0.00032	
Oxidation Reduction Potential	mV	06/02/2015	N001	0 - 0	148			#		
pH	s.u.	06/02/2015	N001	0 - 0	7.74			#		
Selenium	mg/L	06/02/2015	0001	0 - 0	0.0012		J	#	0.00032	
Specific Conductance	umhos /cm	06/02/2015	N001	0 - 0	175			#		
Temperature	C	06/02/2015	N001	0 - 0	11.53			#		
Turbidity	NTU	06/02/2015	N001	0 - 0	126			#		
Uranium	mg/L	06/02/2015	0001	0 - 0	0.00045		J	#	0.000029	

General Water Quality Data by Location (USEE105) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 9/2/2015
Location: 0678 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (as $CaCO_3$)	mg/L	06/02/2015	N001	0	-	0	41			#		
Cadmium	mg/L	06/02/2015	0001	0	-	0	0.00012	U		#	0.00012	
Cadmium	mg/L	06/02/2015	0002	0	-	0	0.00012	U		#	0.00012	
Molybdenum	mg/L	06/02/2015	0001	0	-	0	0.00086	J	J	#	0.00032	
Molybdenum	mg/L	06/02/2015	0002	0	-	0	0.00054	J	J	#	0.00032	
Oxidation Reduction Potential	mV	06/02/2015	N001	0	-	0	144			#		
pH	s.u.	06/02/2015	N001	0	-	0	7.85			#		
Selenium	mg/L	06/02/2015	0001	0	-	0	0.0016		UJ	#	0.00032	
Selenium	mg/L	06/02/2015	0002	0	-	0	0.00092	J	UJ	#	0.00032	
Specific Conductance	umhos /cm	06/02/2015	N001	0	-	0	189			#		
Temperature	C	06/02/2015	N001	0	-	0	12.56			#		
Turbidity	NTU	06/02/2015	N001	0	-	0	140			#		
Uranium	mg/L	06/02/2015	0001	0	-	0	0.00035		J	#	0.000029	
Uranium	mg/L	06/02/2015	0002	0	-	0	0.00047		J	#	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.	G	Possible grout contamination, pH > 9.	J	Estimated value.
L	Less than 3 bore volumes purged prior to sampling.	Q	Qualitative result due to sampling technique.	R	Unusable result.
U	Parameter analyzed for but was not detected.	X	Location is undefined.		

QA QUALIFIER:

#	Validated according to quality assurance guidelines.

Equipment Blank Data

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BLANKS REPORT

LAB: PARAGON/ALS LABORATORY GROUP (Fort Collins, CO)
RIN: 15057084
Report Date: 9/2/2015

Parameter	Site Code	Location ID	Sample Date	Sample ID	Units	Result	Qualifiers Lab	Qualifiers Data	Detection Limit	Uncertainty	Sample Type
Cadmium	DUR01	0999	06/03/2015	N001	mg/L	0.00012	U		0.00012		E
Molybdenum	DUR01	0999	06/03/2015	N001	mg/L	0.00034	J		0.00032		E
Selenium	DUR01	0999	06/03/2015	N001	mg/L	0.00037	J		0.00032		E
Uranium	DUR01	0999	06/03/2015	N001	mg/L	0.0021			0.000029		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 DUR03, Durango Disposal Site
REPORT DATE: 9/2/2015

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0605	U	7189.6	06/03/2015	08:25:56	38.50	7151.10
0607	D	7099.1	06/03/2015	09:10:36	38.95	7060.15
0608	D	7035	06/02/2015	16:35:21	26.65	7008.35
0612	D	7109.8	06/03/2015	10:00:54	97.28	7012.52
0618	D	7036.41	06/02/2015	15:20:36	28.68	7007.73
0621	U	7035.77	06/02/2015	16:00:59	48.74	6987.03
0623	U	7048.67	06/02/2015	17:40:48	34.91	7013.76

FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWNGRADIENT
F OFFSITE N UNKNOWN O ONSITE U UPGRADIENT

STATIC WATER LEVELS (USEE700) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 9/2/2015

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0612	D	6500.94	06/03/2015	16:45:25	40.75	6460.19
0617	D	6498.11	06/03/2015	15:00:36	28.52	6469.59
0630	D	6494.44	06/03/2015	16:15:10	33.02	6461.42
0631	D	6477.91	06/03/2015	14:30:14	6.59	6471.32
0633	D	6481.81	06/03/2015	13:45:24	11.11	6470.70
0634	D	6491.75	06/03/2015	11:30:23	17.28	6474.47
0635	D	6497.68	06/03/2015	12:10:54	12.22	6485.46
0863		6513.32	06/03/2015	18:00:22	58.69	6454.63

STATIC WATER LEVELS (USEE700) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 9/2/2015

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0594	O	6472.49	06/01/2015	15:55:57	17.45	6455.04
0598	O	6479.09	06/02/2015	12:55:27	16.55	6462.54
0607	U	6527.95	06/01/2015	17:00:05	49.50	6478.45
0879		6473.91	06/02/2015	12:15:07	16.28	6457.63
0884		6476.37	06/02/2015	09:40:14	14.69	6461.68

FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWNGRADIENT
F OFFSITE N UNKNOWN O ONSITE U UPGRADIENT

Time-Concentration Graphs
Durango Disposal Site

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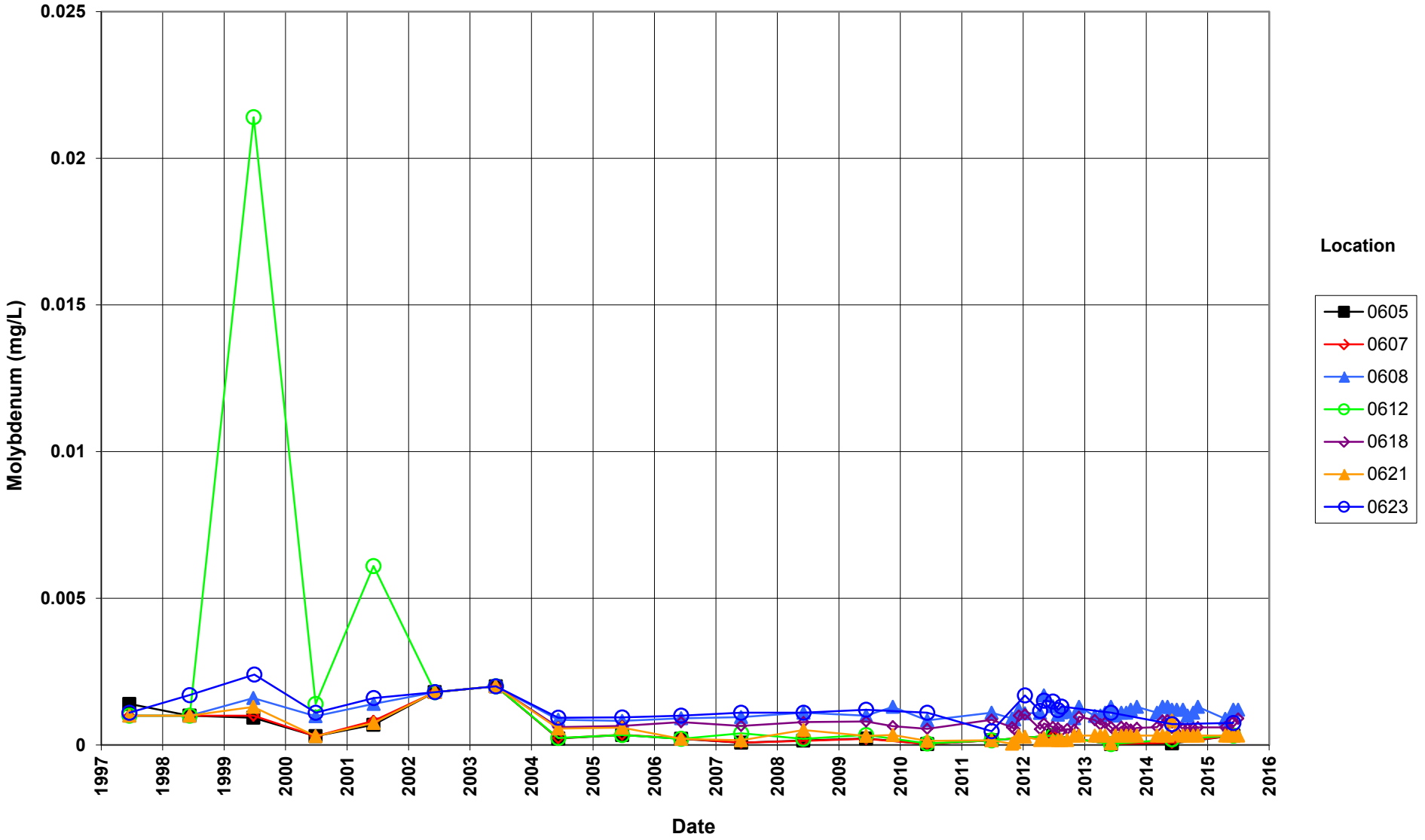
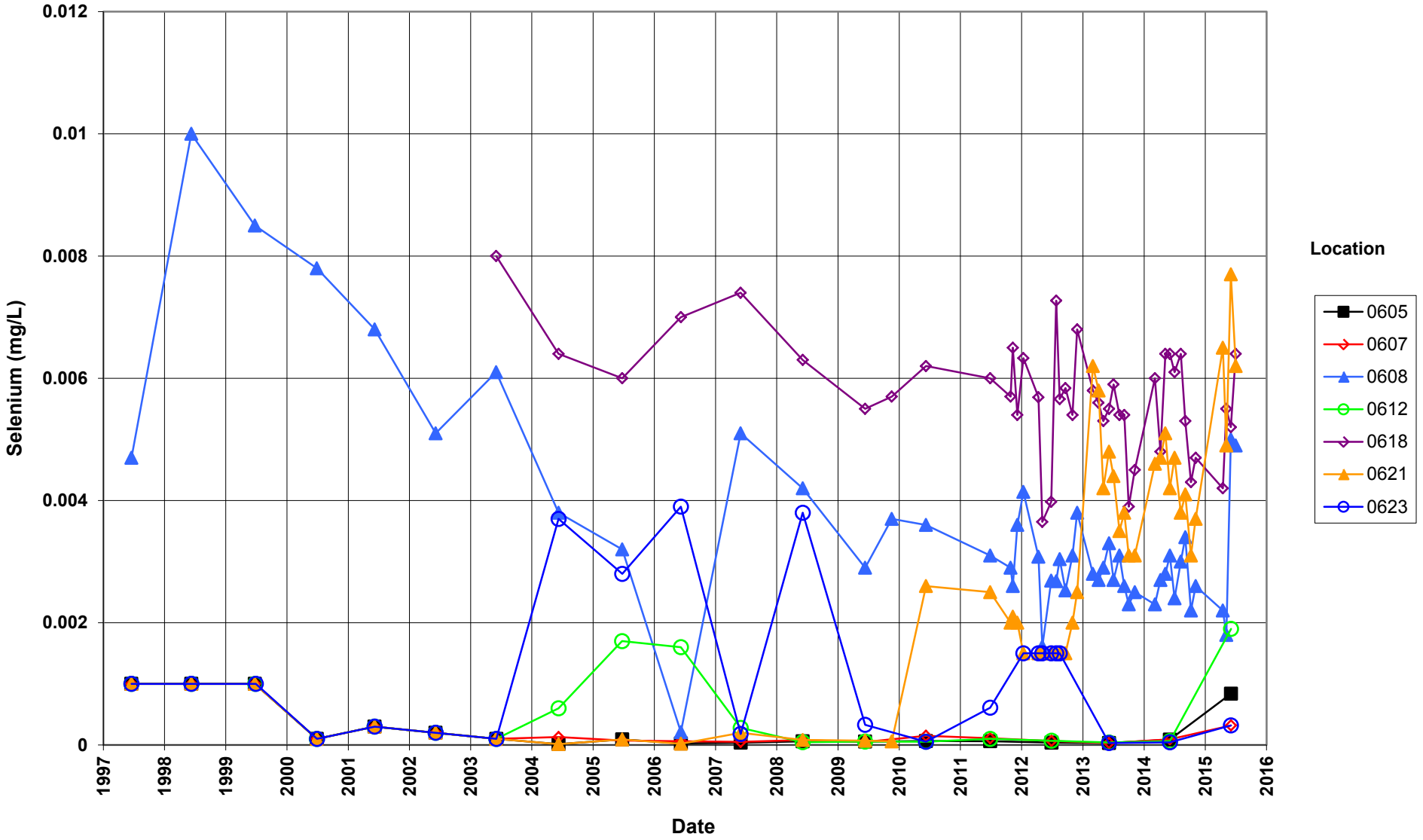
Durango Disposal Site
Molybdenum Concentration

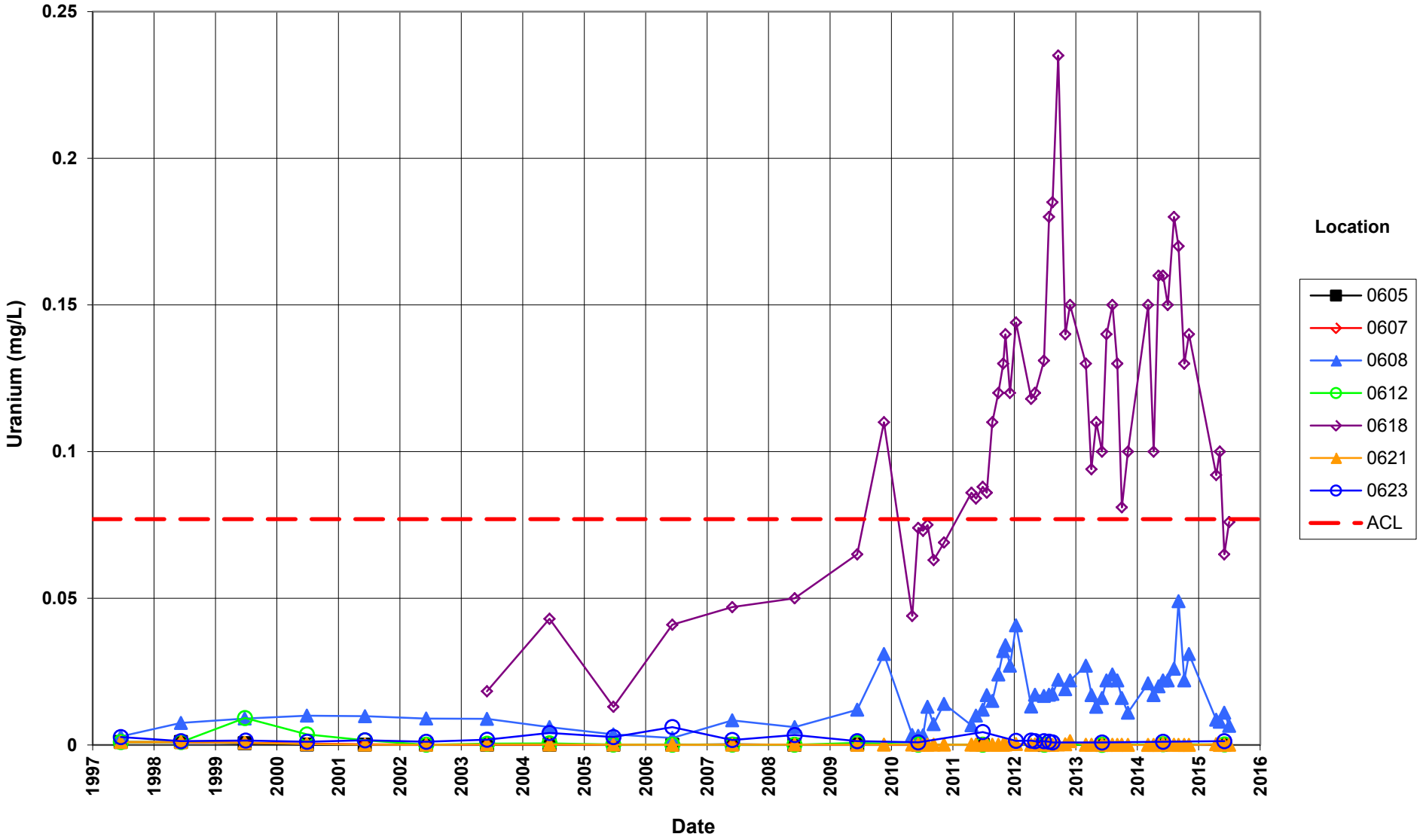
Approved Concentration Limit = 0.22 mg/L



Durango Disposal Site
Selenium Concentration
Approved Concentration Limit (ACL)= 0.042 mg/L



Durango Disposal Site
Uranium Concentration
Approved Concentration Limit (ACL)= 0.077 mg/L



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Time-Concentration Graphs
Durango Processing Sites

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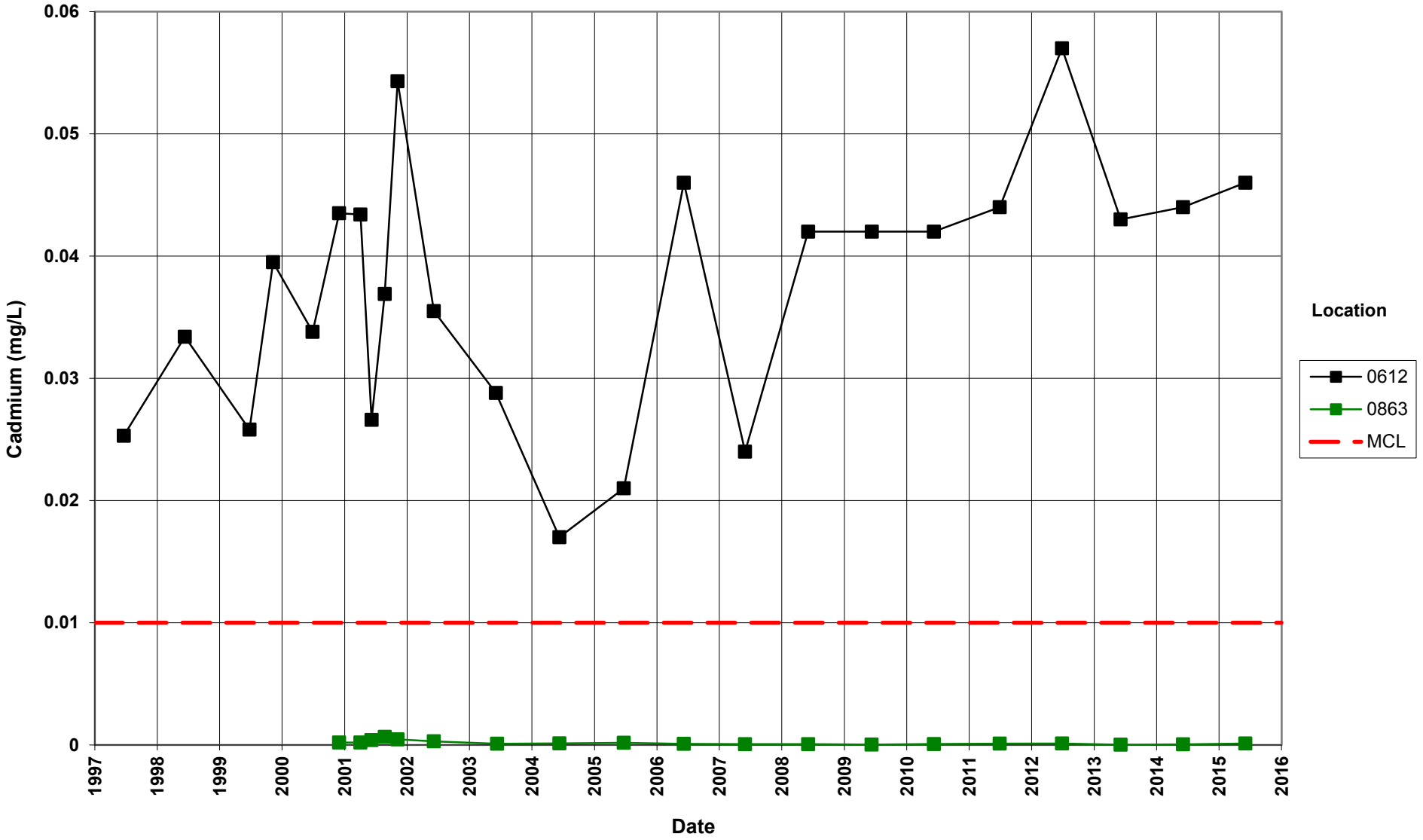
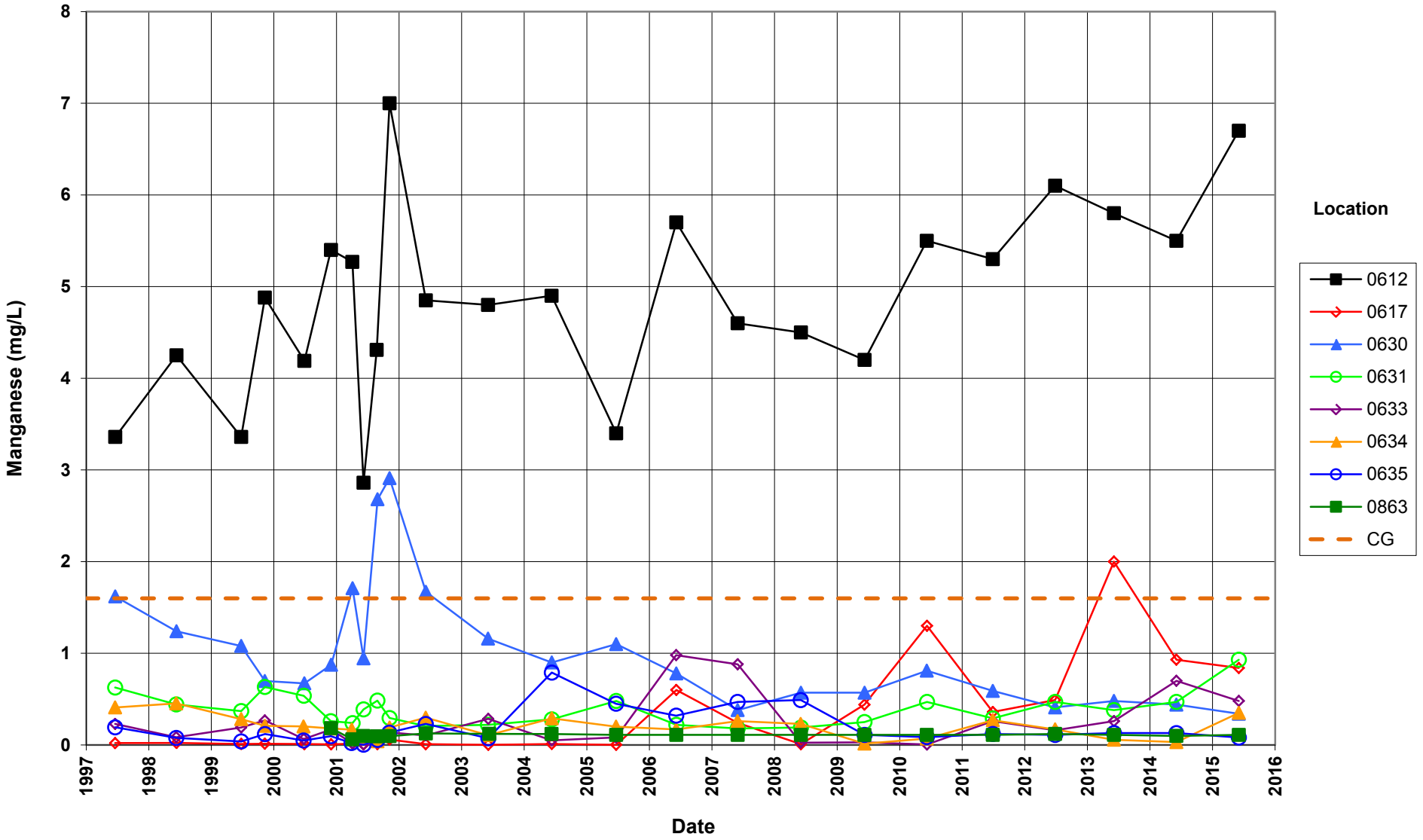
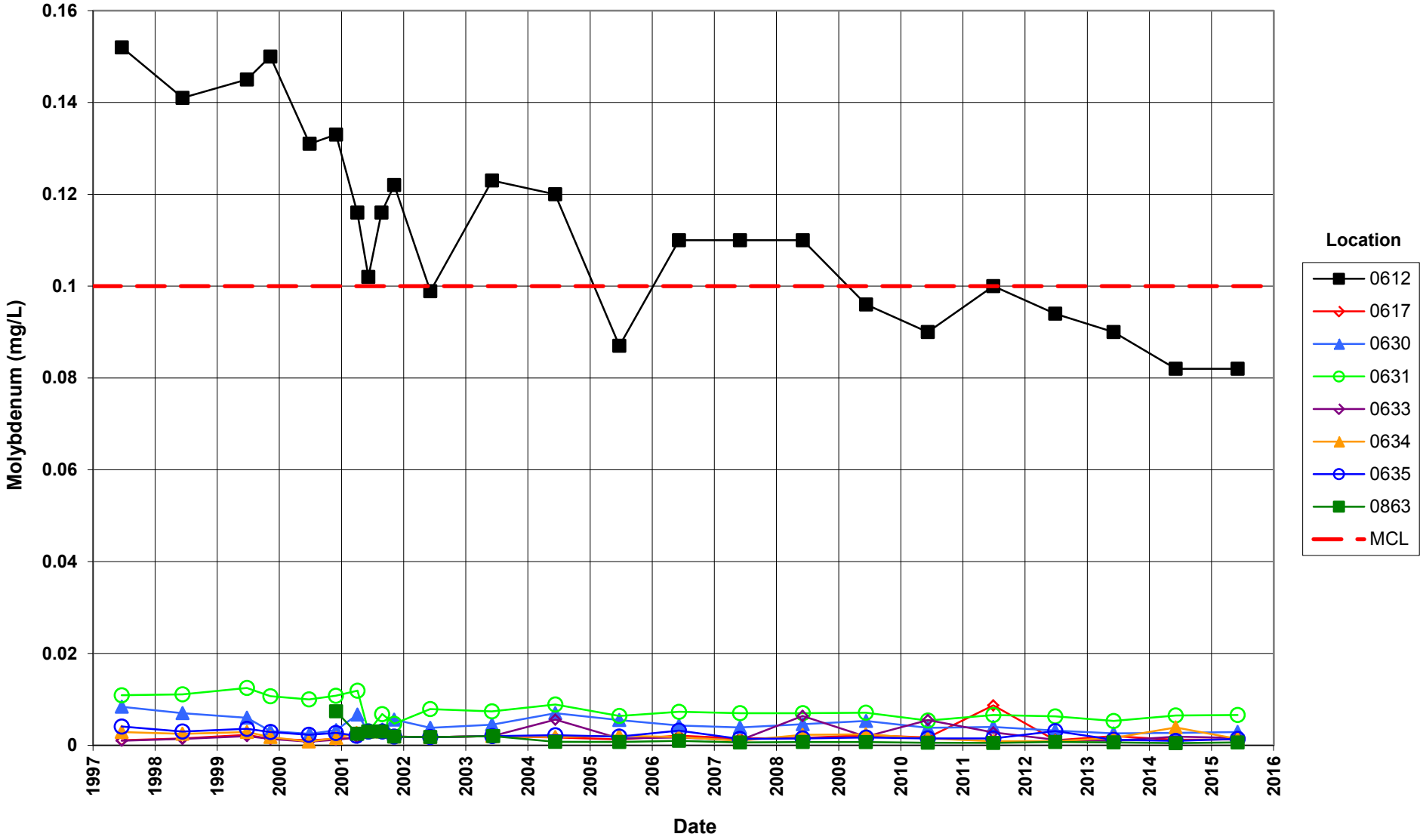
Durango Mill Tailings Process Site
Cadmium Concentration
Maximum Concentration Limit (MCL) = 0.01 mg/L



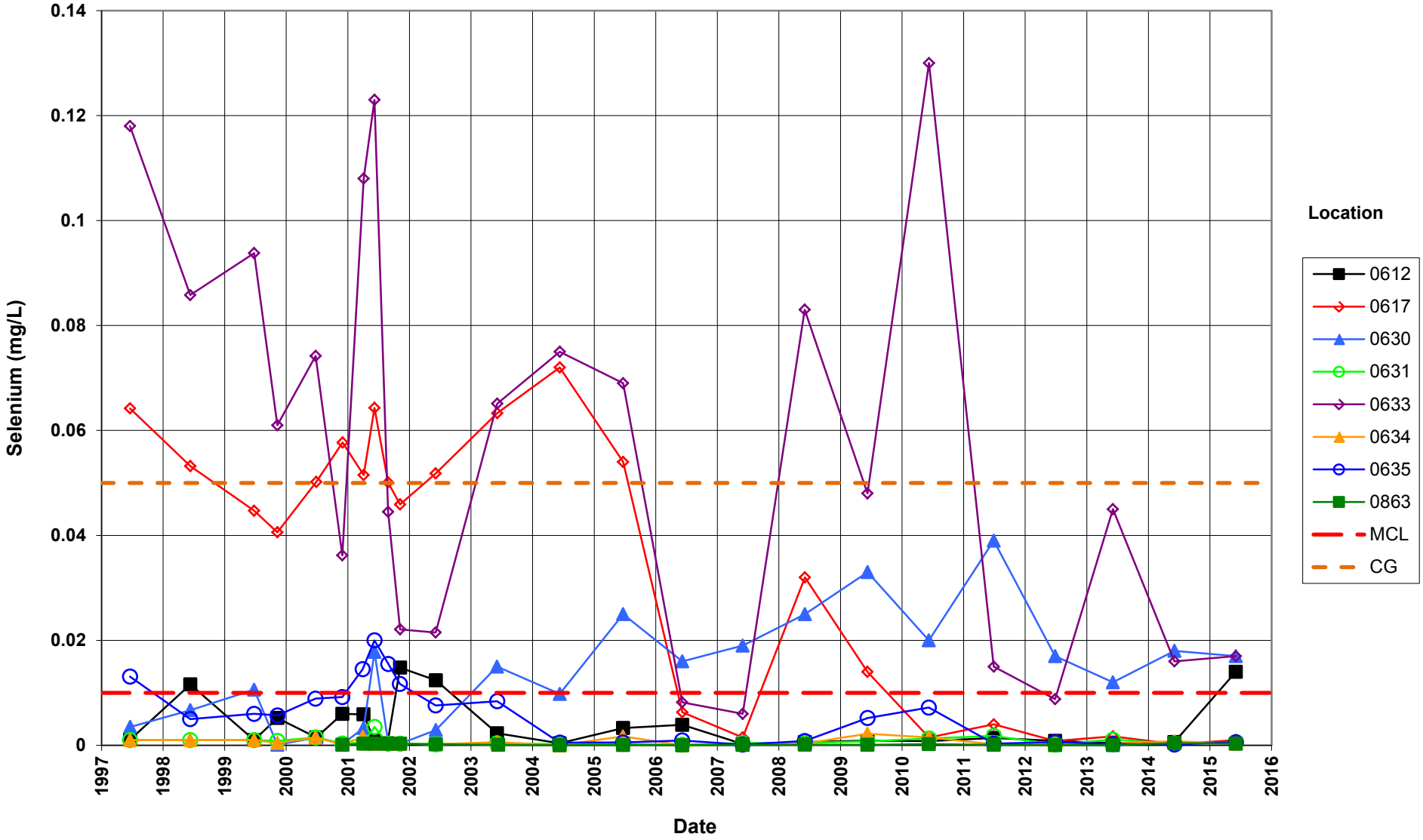
Durango Mill Tailings Process Site
Manganese Concentration
Compliance Goal (CG) = 1.6 mg/L



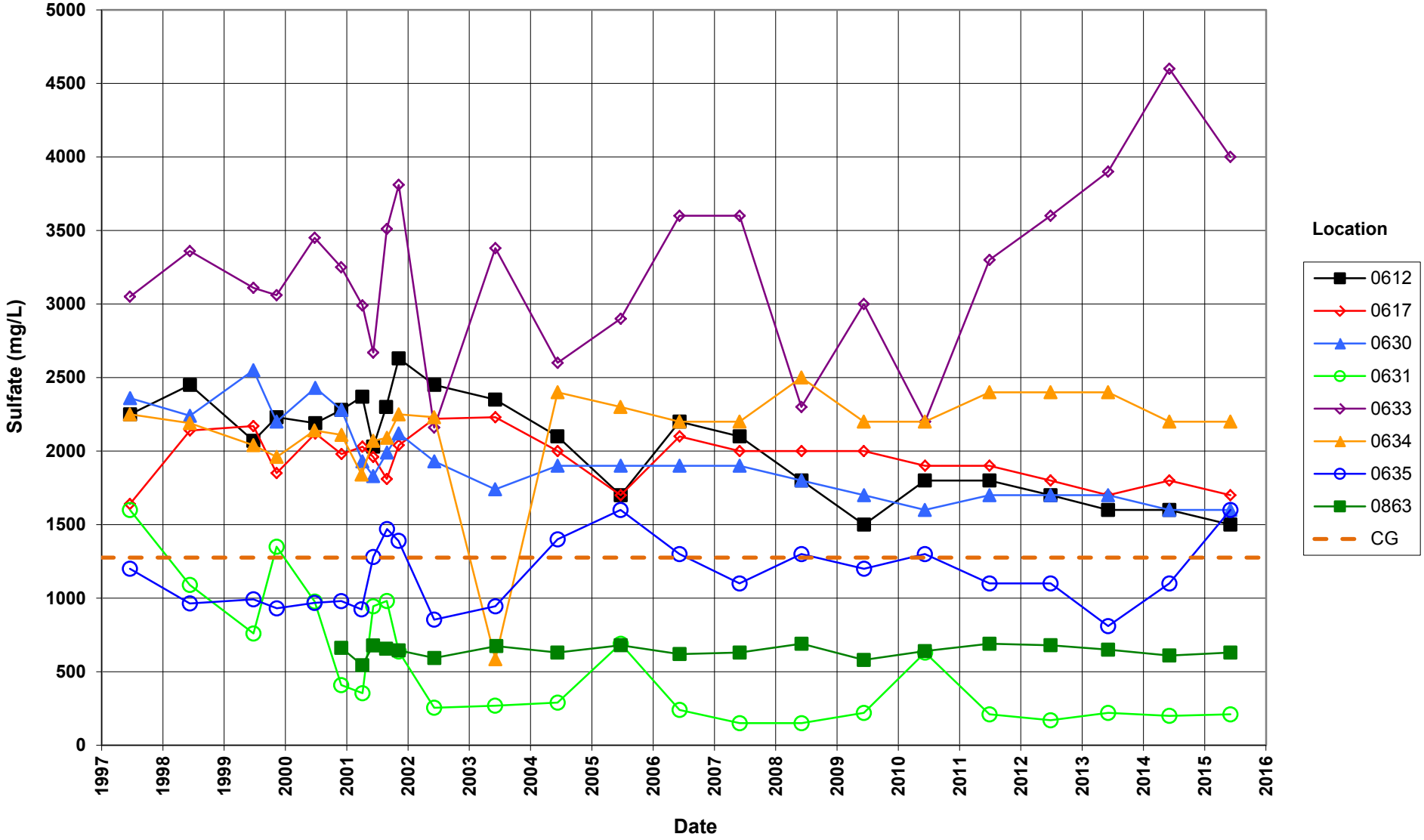
Durango Mill Tailings Process Site
Molybdenum Concentration
Maximum Concentration Limit (MCL) = 0.1 mg/L



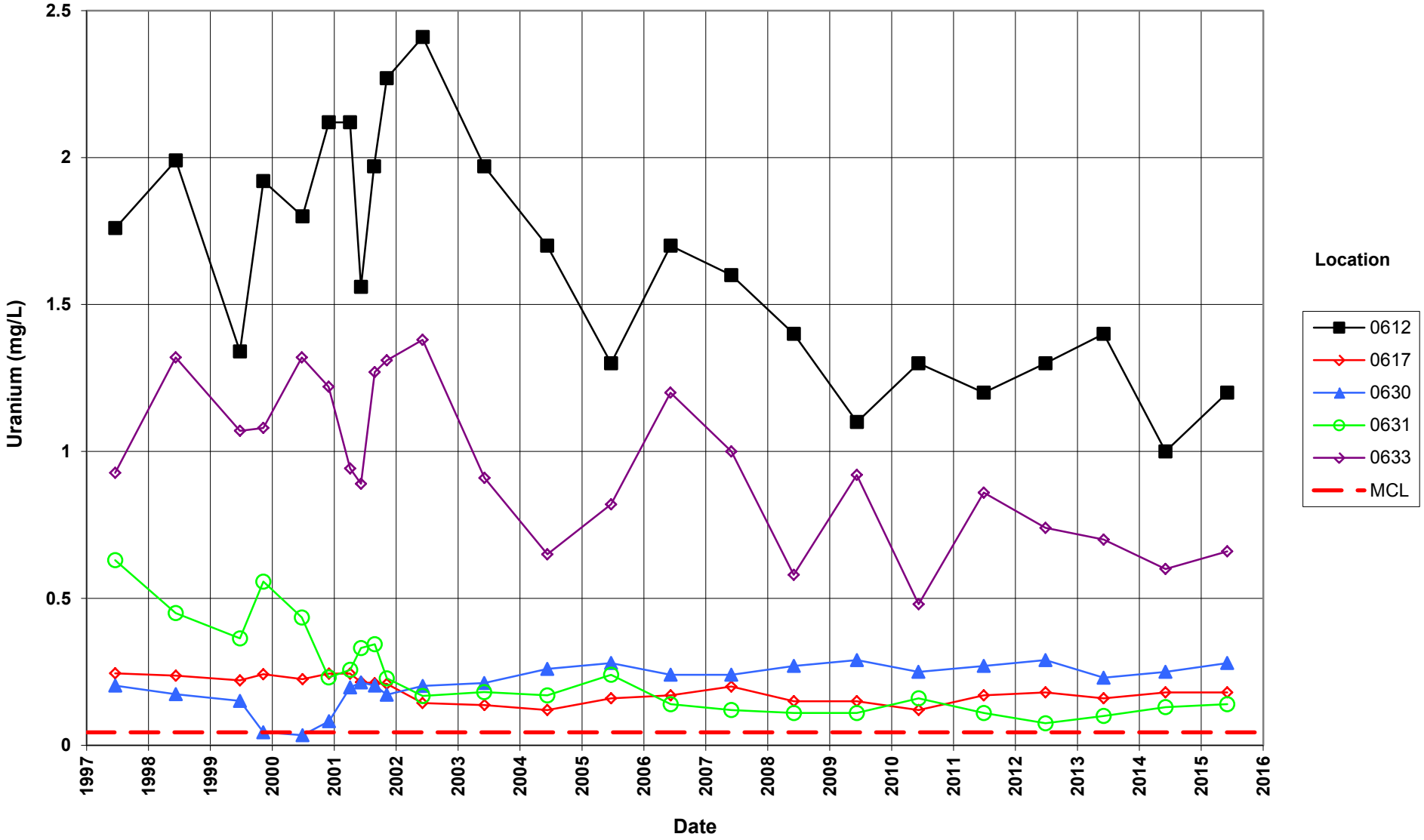
Durango Mill Tailings Process Site
Selenium Concentration
Maximum Concentration Limit (MCL) = 0.01 mg/L
Compliance Goal (CG)= 0.05 mg/L



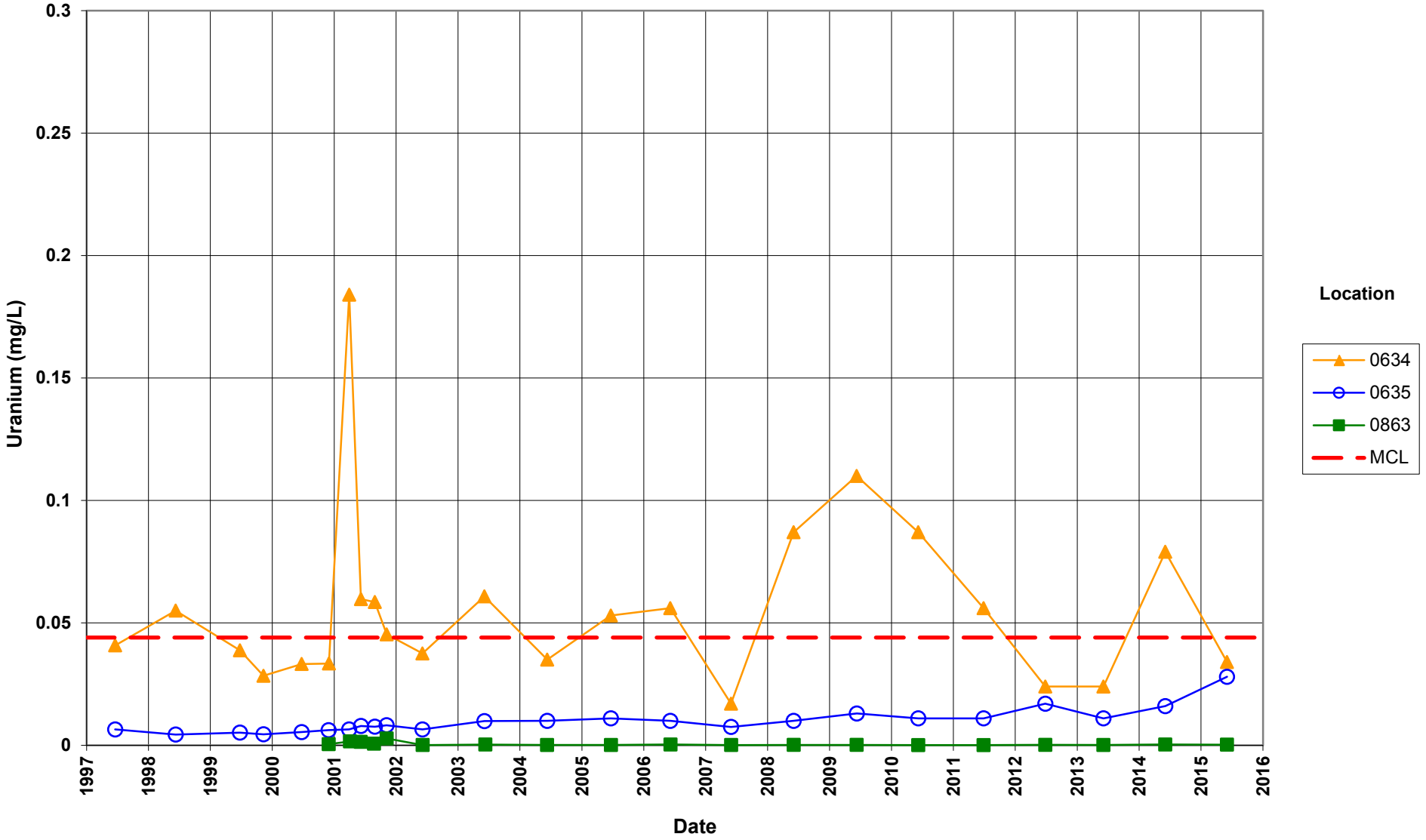
Durango Mill Tailings Process Site
Sulfate Concentration
Compliance Goal (CG) = 1,276 mg/L



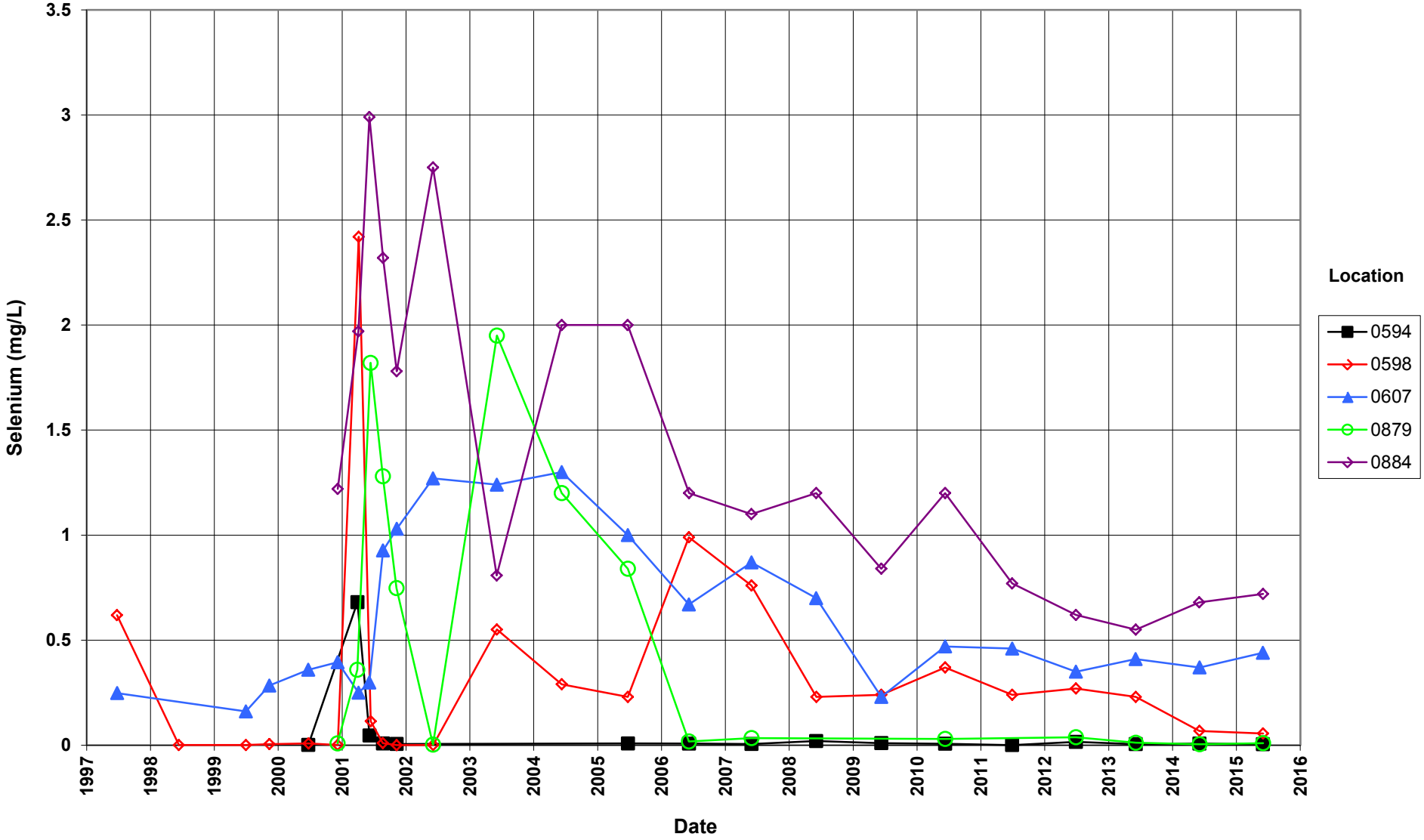
Durango Mill Tailings Process Site
Uranium Concentration
Maximum Concentration Limit (MCL) = 0.044 mg/L

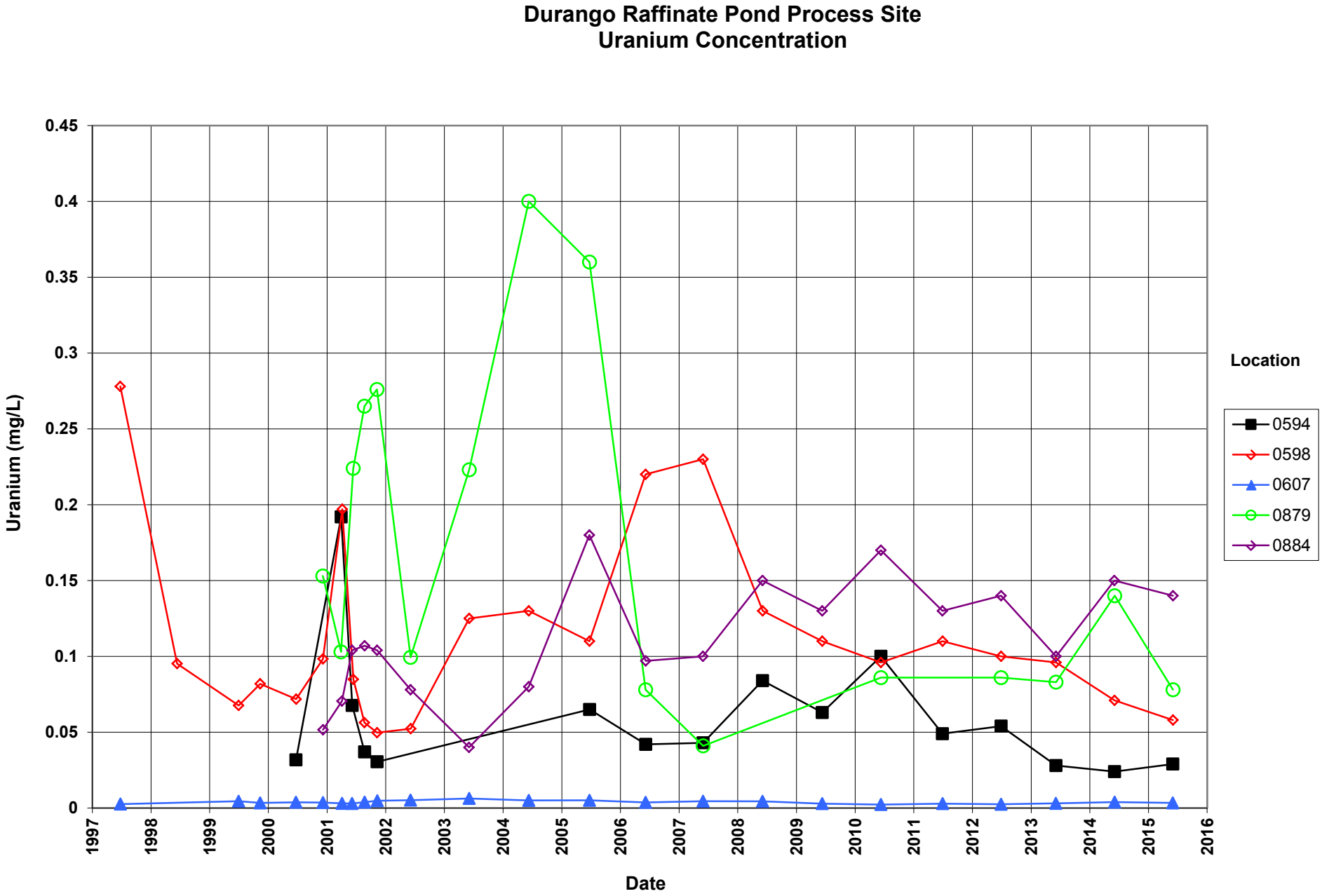


Durango Mill Tailings Process Site
Uranium Concentration
Maximum Concentration Limit (MCL) = 0.044 mg/L



Durango Raffinate Pond Process Site
Selenium Concentration




Durango Raffinate Pond Process Site
Uranium Concentration
Uranium (mg/L)
0.45
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Date
Location
0594
0598
0607
0879
0884

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Time-Concentration Graphs
River Locations

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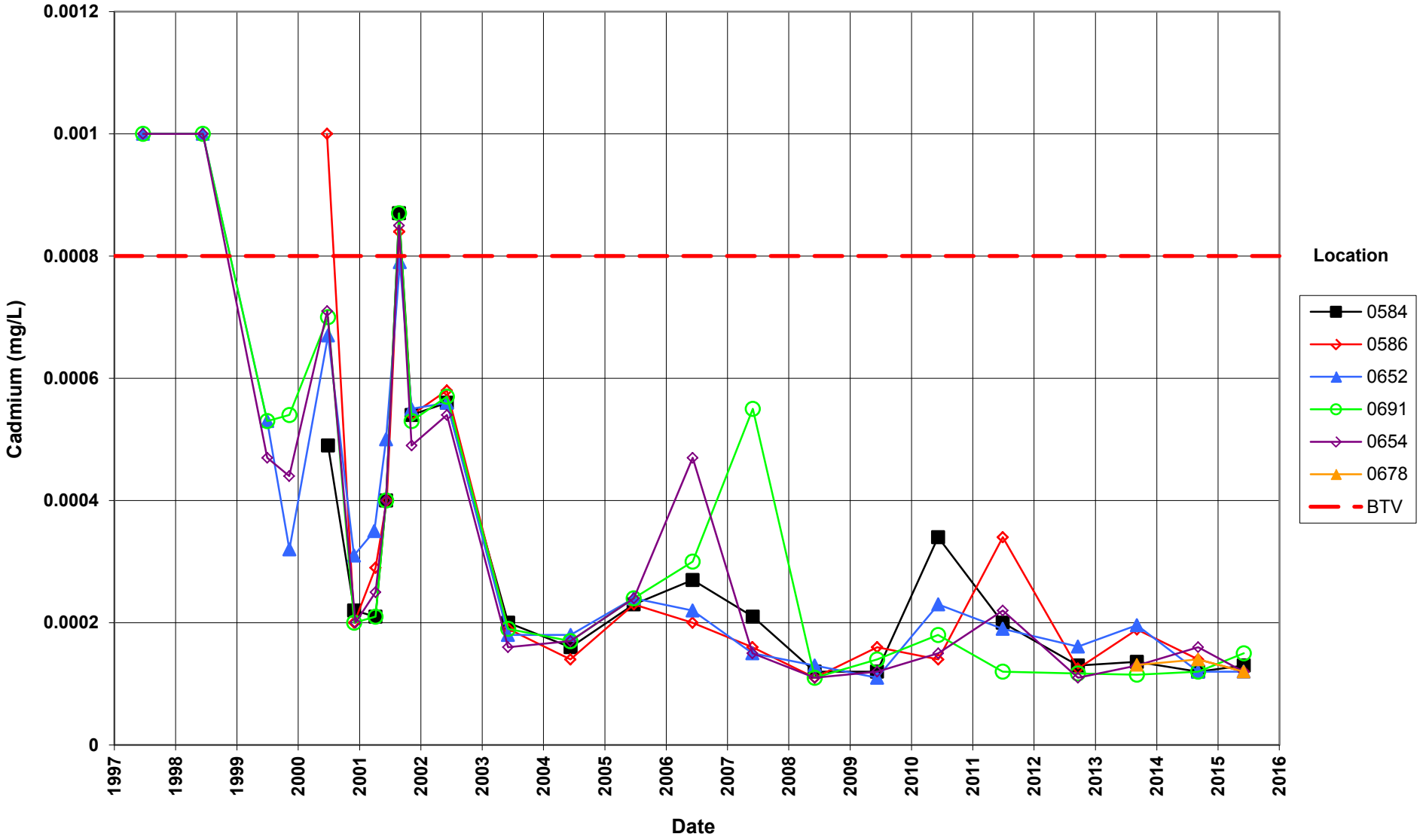
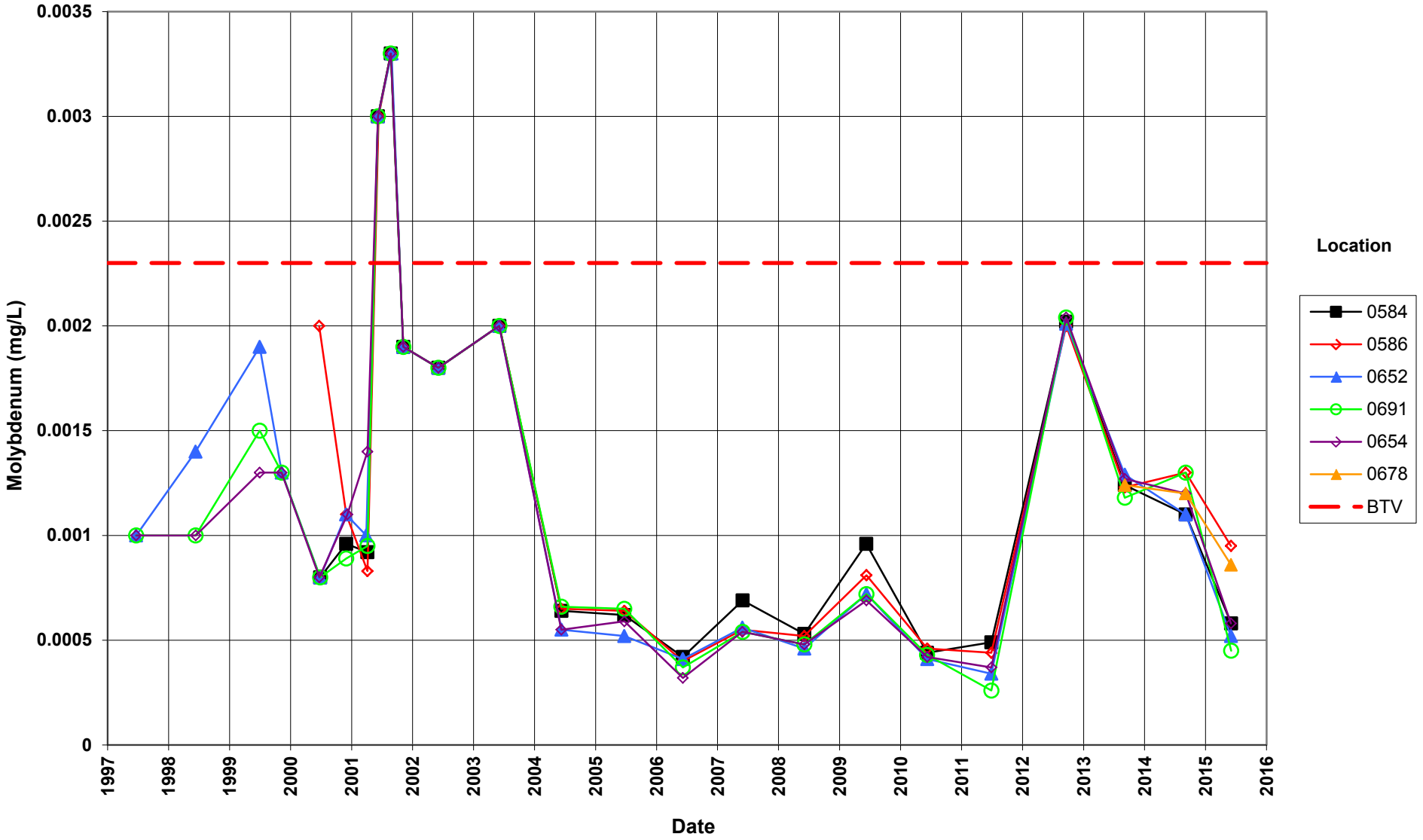
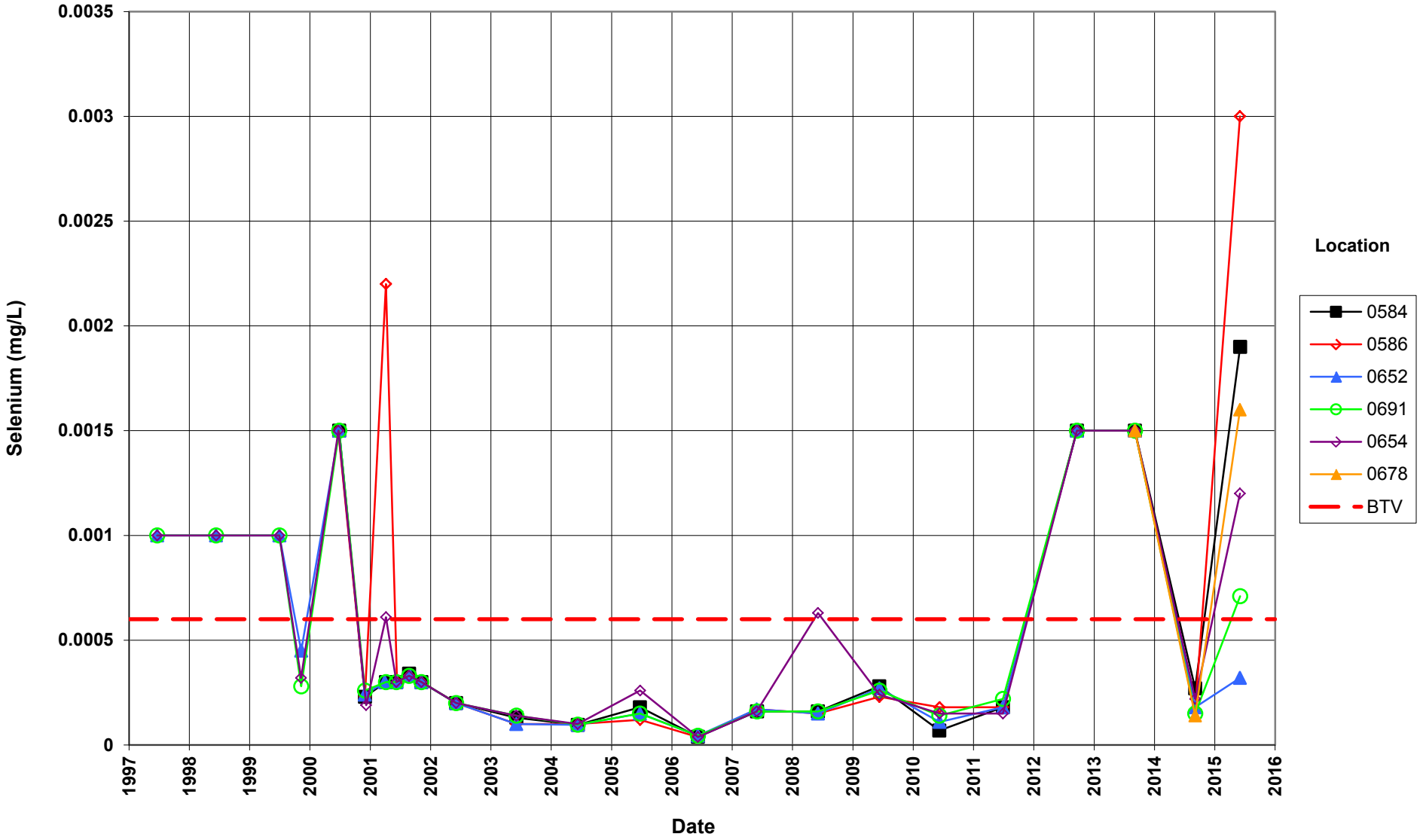
Durango Mill Tailings Process Site
Cadmium Concentration
Background Threshold Value (BTV) = 0.0008 mg/L



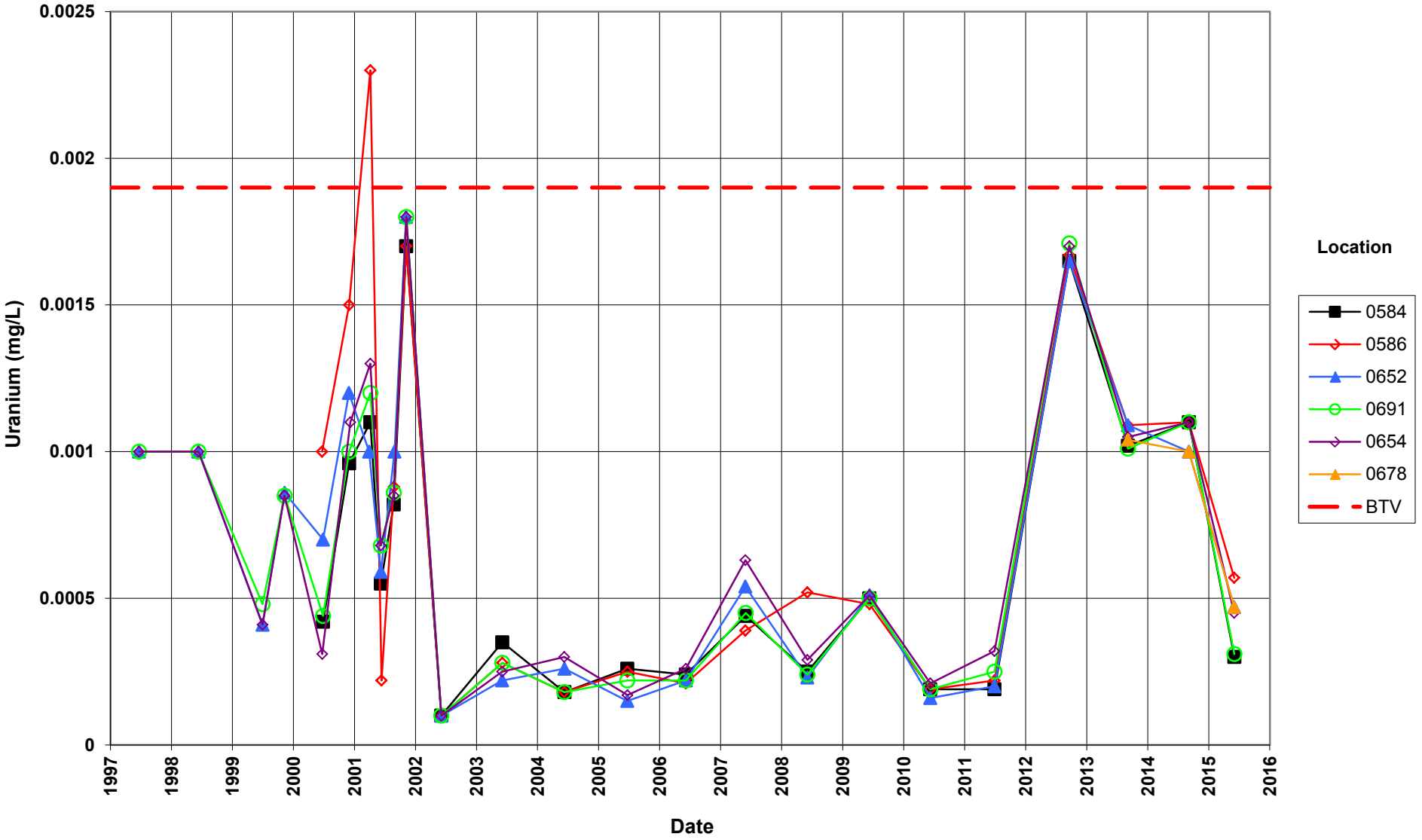
Durango Mill Tailings Process Site
Molybdenum Concentration
Background Threshold Value (BTV) = 0.0023 mg/L



Durango Mill Tailings Process Site
Selenium Concentration
Background Threshold Value (BTV) = 0.0006 mg/L



Durango Mill Tailings Process Site
Uranium Concentration
Background Threshold Value (BTV) = 0.0019 mg/L



Attachment 3
Sampling and Analysis Work Order

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Stoller Newport News Nuclear

April 29, 2015

Task Assignment 103
Control Number 15-0507

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-LM0000415, Stoller Newport News Nuclear, Inc. (SN3), a wholly owned subsidiary of Huntington Ingalls Industries, Inc. Task Assignment 103 LTS&M - UMTRCA TI & TII, D&D, Others, and AS&T June 2015 Environmental Sampling at the Durango Processing and Disposal, Sites

REFERENCE: Task Assignment 103, 3-103-1-02-104, Durango, Colorado, 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 1, 2015. Surface water sampling will be conducted in September. We will notify you of the exact date and time the week before the scheduled sampling.

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

MONITORING WELLS

DUR01 Mill Site

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

DUR02 Raffinate Pond

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

DUR03 Bodo Canyon

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

SURFACE LOCATIONS

DUR01 Mill Site

584 586 652 691

DUR02 Raffinate Pond

588 654 678

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).

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

Sincerely,

David Miller
Site Manager

DM/lcg/bkb

Enclosures (3)

cc: (electronic)
Christina Pennal, DOE
Steve Donivan, SN3
Lauren Goodknight, SN3
David Miller, SN3
Diana Osborne, SN3
EDD Delivery
rc-grand.junction
File: DUP 400.02
DUD 400.02

Constituent Sampling Breakdown

Site	Durango				
Analyte	Groundwater	Surface Water	Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Approx. No. Samples/yr	20	7			
Field Measurements					
Alkalinity	X	X			
Dissolved Oxygen					
Redox Potential	X	X			
pH	X	X			
Specific Conductance	X	X			
Turbidity	X				
Temperature	X	X			
Laboratory Measurements					
Aluminum					
Ammonia as N (NH3-N)					
Cadmium	0612 & 0863 only	X	0.001	SW-846 6020	LMM-02
Calcium	DUR03 only		5	SW-846 6010	LMM-01
Chloride	DUR03 only		0.5	SW-846 9056	MIS-A-039
Chromium					
Gross Alpha					
Gross Beta					
Iron	DUR03 only		0.1	SW-846 6020	LMM-01
Lead					
Magnesium	DUR03 only		5	SW-846 6010	LMM-01
Manganese	All Mill Tailings Areas and Bodo Canyon locations		0.005	SW-846 6010	LMM-01
Molybdenum	All Mill Tailings Areas and Bodo Canyon locations	X	0.003	SW-846 6020	LMM-02
Nickel					
Nickel-63					
Nitrate + Nitrite as N (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.

Sampling Frequencies for Locations at Durango, Colorado

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitoring Wells						
DUR01 Mill Tailings						
612			X			
617			X			
630			X			
631			X			Download datalogger
633			X			Download datalogger
634			X			
635			X			
859					X	Download datalogger
863			X			Download datalogger
DUR02 Raffinate Pond						
594			X			Se and U ONLY
596					X	Download datalogger
598			X			Se and U ONLY
607			X			Se and U ONLY
879			X			Se and U ONLY
884			X			Se and U ONLY
888					X	Download datalogger
889					X	Download datalogger
890					X	Download datalogger
DUR03 Bodo Canyon						
605			X			
607			X			POC WELL
608			X			"
612			X			"
618			X			"; supplements 608
621			X			"
623			X			BACKGROUND
MW-1					X	Download datalogger
NVP					X	Download datalogger
P7					X	Download datalogger
Surface Locations						
DUR01 Mill Tailings						
584			X			
586			X			
652			X			RIVER
691			X			RIVER
DUR02 Raffinate Pond						
588			X			
654			X			RIVER
678			X			RIVER; new location; replaces 0656

Sampling conducted annually in June.

Attachment 4
Trip Report

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Stoller Newport News Nuclear

Memorandum

DATE: June 30, 2015

TO: David Miller

FROM: Gretchen Baer

SUBJECT: Trip Report

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

Dates of Sampling Event: June 1-3, 2015

Team Members: Gretchen Baer and Eric Szabelski. Jalena Dayvault was present on June 2 and 3 to observe sampling.

Number of Locations Sampled: Samples were collected from all 27 of the locations identified on the sampling notification letter as follows:

	Groundwater Locations	Surface Water Locations
Mill Tailings Site, DUR01	8	4
Raffinate Pond Site, DUR02	5	3
Bodo Canyon Site, DUR03	7	---

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

Location Specific Information:

Site	Location IDs	Comments
DUR01	0586	River location was sampled from the east bank, below the treatment system.
DUR01	0633	Small black particles in water
DUR01	0633, 0634	Category II
DUR02	0594, 0607	Category II
DUR02	0879	Sampled per Program Directive DUR-2014-01: 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 cannot be removed. 3 casing volumes was calculated as 25 L.
DUR02	0884	The inner casing is 2.2 ft below the top of the protective casing. Initial WL is measured from inner casing, as normal.
DUR03	0605, 0612, 0623	Category II

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	Associated Samples
DUR01 2171	NGR 312	DUR01 0612	Duplicate	Groundwater	N/A
DUR01 2640	NGR 319	0999	Equipment Blank	Surface Water	DUR01 0584, 0586, 0652, 0691, DUR02 0654, 0678
DUR02 2643	NGR 320	DUR02 0678	Duplicate	Surface Water	N/A
DUR03 2173	NGR 314	DUR03 0608	Duplicate	Groundwater	N/A

Requisition Index Number (RIN) Assigned: Samples were assigned to RIN 15057084. Field data sheets can be found in \\crow\RAApps\SMS\15057084\FieldData.

Sample Shipment: Samples were shipped overnight via FedEx to ALS Fort Collins, CO, from Grand Junction, CO, on June 4, 2015.

Water Level Measurements: Water levels were measured in all sampled wells.

Well Inspection Summary: All wells were in good condition with the exception of well DUR02 0607, which is bent (this has been noted in previous trip reports).

Sampling Method: Samples were collected according to the *Sampling and Analysis Plan (SAP) for the U. S. Department of Energy Office of Legacy Management Sites* (LMS/PRO/S04351, continually updated) and Program Directive DUR-2014-01.

Field Variance: None. Samples were collected according to the SAP.

Equipment: All equipment functioned properly.

Stakeholder/Regulatory/DOE: Jalena Dayvault was present on June 2 and 3 to observe sampling.

Institutional Controls:

Fences, Gates, and Locks: All gates were locked and in good condition. 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 were observed.
Trespassing/Site Disturbances: At the disposal site on June 3, 2015, a motorcyclist drove onto the site and contacted J. Dayvault to ask for help getting a gate opened on the county road northwest of the site. No other issues were observed.
Disposal Cell/Drainage Structure Integrity: No issues observed.

Safety Issues: None.

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

General Information: Nothing to note.

Immediate Actions Taken: None.

Future Actions Required or Suggested: None.

(GB/lcg)

cc: (electronic)
Jalena Dayvault, DOE
Steve Donivan, SN3
David Miller, SN3
EDD Delivery

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