Data Validation Package

June 2010
Groundwater and Surface Water Sampling at the Durango, Colorado, Disposal and Processing Sites

August 2010

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Durango, Colorado, Disposal and Processing Sites

Sampling Period: June 8−10, 2010

The 1996 *Long-Term Surveillance Plan for the Bodo Canyon Disposal Site, Durango, Colorado* (LTSP), requires annual monitoring to verify the performance of the disposal cell. Point-of-compliance wells 0607, 0612, 0621, and monitoring wells 0605, 0608, 0618, and 0623 were sampled as specified in the plan.

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. Groundwater and surface water samples were collected at the Raffinate Pond area as a best management practice to monitor selenium and uranium concentrations.

Sampling and analysis was conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PLN/S04351, continually updated). Water levels were measured at each sampled well.

For groundwater samples collected at the disposal site, the concentrations of the indicator parameters (molybdenum, selenium, and uranium) were below their respective 1996 LTSP proposed concentration limits of 0.22 milligram per liter (mg/L), 0.42 mg/L, and 0.077 mg/L. The uranium concentration in well 0618 had been generally increasing since 2005 and is now 0.074 mg/L, which is below the 0.077 mg/L proposed concentration limit.

For groundwater samples collected at the processing site, EPA groundwater standards for cadmium, molybdenum, and uranium were exceeded in samples collected from monitoring wells listed in Table 1 on the following page.

Results from this sampling event are generally consistent with values previously obtained. In reviewing the time-concentration graphs included in this report, selenium concentration at processing site well 0633 increased significantly where a decrease was noted in 2009.

Surface water contaminant concentrations were compared to the values obtained at upgradient locations on the Animas River (0652) and South Creek (0588). The uranium concentration (0.018 mg/L) from location 0588 is an indicator of the quality of water entering the site. Surface water results from Animas River locations adjacent to and downstream of the processing site were compared to statistical benchmark values derived using historical data from location 0652. As shown in Table 2, no benchmark values were exceeded at these locations, which indicates that the natural flushing strategy is not adversely affecting water quality in the Animas River.

Table 1. Durango Processing Site Wells Exceeding EPA Standards in June 2010

Analyte	Standard[a]	Cleanup Goal[c]	Site Code[b]	Location	Concentration (mg/L)
Cadmium	0.01	Not applicable	DUR01	0612	0.042
Selenium	0.01	0.05	DUR01	0630	0.020
				0633	0.13
Selenium	0.01	0.05	DUR02	0598	0.37
				0607	0.47
				0879	0.03
				0884	1.2
Uranium	0.044	Not applicable	DUR01	0612	1.3
				0617	0.12
				0630	0.25
				0631	0.16
				0633	0.48
				0634	0.087
Uranium	0.044	Not applicable	DUR02	0594	0.10
				0598	0.096
				0879	0.086
				0884	0.17

[a] Standards are listed in 40 CFR 192.02 Table 1 to Subpart A; concentrations are in mg/L.
[b] DUR01 = Mill Tailings Area; DUR02 = Raffinate Ponds Area.
[c] 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.

Table 2. Comparison of Animas River Concentrations to Benchmarks

Analyte	Benchmark at 0652	Upgradient 0588	0584	0586	0654	0656	0691
Cadmium	0.0020	0.00013	0.00034	0.00014	0.00015	0.00020	0.00018
Molybdenum	0.010	0.0011	0.00044	0.00046	0.00042	0.00045	0.00043
Selenium	0.005	0.0069	0.00007	0.00018	0.00015	0.00019	0.00014
Uranium	0.0018	0.018	0.00019	0.00019	0.00021	0.00019	0.00019

Concentrations are in mg/L.

David Miller
Site Lead, S.M. Stoller Corporation

9/2/10
Date

Durango, Colorado, Disposal Site Sample Location Map

Durango, Colorado, Processing Site Sample Location Map

Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Durango, Colorado	**Date(s) of Water Sampling**	June 8-10, 2010
Date(s) of Verification	August 5, 2010	**Name of Verifier**	Steve Donivan

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	
List other documents, SOPs, instructions.		Work Order Letter dated May 10, 2010.
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Was a pre-trip calibration conducted as specified in the above-named documents?	Yes	Pre-trip calibration was performed on June 7, 2010.
4. Was an operational check of the field equipment conducted daily?	Yes	Three operational checks were performed.
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
6. Was the category of the well documented?	Yes	
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	Yes	The turbidity in well DUR01-0612 continually increased. The sample was filtered according to procedure.
Was the flow rate less than 500 mL/min?	Yes	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	NA	

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	Yes	
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	Duplicates were collected from locations 0607, 0635, and 0884.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with nondedicated equipment?	Yes	
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were QC samples assigned a fictitious site identification number?	Yes	
Was the true identity of the samples recorded on the Quality Assurance Sample Log or in the Field Data Collection System (FDCS) report?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members (hardcopies) or are dates present for the “Date Signed” fields (FDCS)?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN):	10053097
Sample Event:	June 8-10, 2010
Site(s):	Durango, Colorado
Laboratory:	ALS Laboratory Group
Work Order No.:	1006127
Analysis:	Metals and Wet Chemistry
Validator:	Steve Donivan
Review Date:	August 5, 2010

This validation was performed according to the *Environmental Procedures Catalog* (LMS/PRO/S04325, continually updated) "Standard Practice for Validation of Laboratory Samples." 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-039	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-044	SW-846 9056	SW-846 9056
Total Dissolved Solids	WCH-B-033	MCAWW 160.1	MCAWW 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
1006127-13	0605	Iron	U	Less than 5 times the method blank
1006127-15	0608	Iron	U	Less than 5 times the method blank
1006127-15	0608	Manganese	U	Less than 5 times the calibration blank
1006127-16	0612	Iron	U	Less than 5 times the calibration blank
1006127-17	0618	Iron	U	Less than 5 times the method blank
1006127-17	0618	Manganese	U	Less than 5 times the calibration blank
1006127-21	0584	Cadmium	J	Less than 5 times the equipment blank
1006127-21	0584	Selenium	J	Less than 5 times the equipment blank

Table 4 (continued). Data Qualifier Summary

Sample Number	Location	Analyte(s)	Flag	Reason
1006127-22	0586	Cadmium	J	Less than 5 times the equipment blank
1006127-22	0586	Selenium	J	Less than 5 times the equipment blank
1006127-23	0652	Cadmium	J	Less than 5 times the equipment blank
1006127-23	0652	Selenium	J	Less than 5 times the equipment blank
1006127-24	0691	Cadmium	J	Less than 5 times the equipment blank
1006127-24	0691	Selenium	J	Less than 5 times the equipment blank
1006127-25	0588	Cadmium	J	Less than 5 times the equipment blank
1006127-26	0654	Cadmium	J	Less than 5 times the equipment blank
1006127-26	0654	Selenium	J	Less than 5 times the equipment blank
1006127-27	0656	Cadmium	J	Less than 5 times the equipment blank
1006127-27	0656	Selenium	J	Less than 5 times the equipment blank

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 31 water samples on June 12, 2010, 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 form had no errors or omissions.

Preservation and Holding Times

The sample shipment was received cool and intact with temperatures 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.

Laboratory Instrument Calibration

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

Method SW-846 6010B
Calibrations for calcium, iron, magnesium, manganese, potassium, and sodium were performed on July 7, 2010, using single point calibrations. Initial and continuing calibration verification checks were made at the required frequency resulting in 10 verification checks. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the practical quantitation limit and all results were within the acceptance range.

Method SW-846 6020A
Calibrations for cadmium, molybdenum, selenium, and uranium were performed on July 7, 2010, 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 method detection limits (MDLs). Initial and continuing calibration verification checks were made at the required frequency resulting in eight verification checks for cadmium, molybdenum, and uranium and nine for selenium. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the 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 SW-846 9056
Initial calibrations were performed for chloride and sulfate using five calibration standards on June 10, 2010. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency resulting in 21 verification checks. All calibration check results were within the acceptance criteria.

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

Method and Calibration Blanks

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

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 practical quantitation limit for method 6010 analytes, or 100 times the practical quantitation limit for method 6020 analytes. The serial dilution data met the acceptance criteria for all data evaluated.

Detection Limits/Dilutions

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

Completeness

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

Chromatography Peak Integration

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

Electronic Data Deliverable (EDD) File

The EDD file received arrived on July 12, 2010. 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: 10053097 **Lab Code:** PAR **Validator:** Steve Donivan **Validation Date:** 8/4/2010

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

Metals Data Validation Worksheet

RIN: 10053097 **Lab Code:** PAR **Date Due:** 7/10/2010

Matrix: Water **Site Code:** DUR **Date Completed:** 7/13/2010

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
		Int.	R^2	ICV	CCV	ICB	CCB								
CADMIUM	07/07/2010	0.0000	1.0000	OK	OK	OK	OK	OK	94.0	93.0	94.0	1.0	99.0		83.0
CADMIUM	07/07/2010								95.0						
CALCIUM	07/07/2010			OK	OK	OK	OK	OK	100.0	107.0	107.0	0.0	107.0	6.0	101.0
IRON	07/07/2010			OK	OK	OK	OK	OK	103.0	96.0	93.0	3.0	105.0		90.0
MAGNESIUM	07/07/2010			OK	OK	OK	OK	OK	100.0	104.0	107.0	1.0	108.0	4.0	99.0
MANGANESE	07/07/2010			OK	OK	OK	OK	OK	101.0	95.0	95.0	0.0	97.0		103.0
MANGANESE	07/07/2010								100.0				97.0		104.0
MOLYBDENUM	07/07/2010	0.0000	1.0000	OK	OK	OK	OK	OK	92.0	96.0	93.0	3.0	96.0		97.0
MOLYBDENUM	07/07/2010								91.0	93.0	92.0	1.0			99.0
POTASSIUM	07/07/2010			OK	OK	OK	OK	OK	98.0	122.0	123.0	1.0			78.0
SELENIUM	07/07/2010	0.0000	1.0000	OK	OK	OK	OK	OK	95.0	102.0	99.0	3.0	103.0	4.0	92.0
SELENIUM	07/07/2010								91.0	94.0	94.0	0.0			
SODIUM	07/07/2010			OK	OK	OK	OK	OK	94.0	111.0	112.0	0.0		2.0	82.0
URANIUM	07/07/2010	0.0000	1.0000	OK	OK	OK	OK	OK	91.0	83.0	105.0	3.0	105.0	0.0	120.0
URANIUM	07/07/2010								91.0	93.0	93.0	0.0			100.0

SAMPLE MANAGEMENT SYSTEM

Wet Chemistry Data Validation Worksheet

RIN: 10053097 **Lab Code:** PAR **Date Due:** 7/10/2010

Matrix: Water **Site Code:** DUR **Date Completed:** 7/13/2010

Analyte	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	ICV	CCV	ICB	CCB						
CHLORIDE	06/15/2010	0.000	1.0000	OK	OK	OK	OK	OK		92.0			
CHLORIDE	06/17/2010				OK		OK		90.00	93.0	93.0	0	
SULFATE	06/15/2010	0.000	1.0000	OK	OK	OK	OK	OK		101.0			
SULFATE	06/16/2010				OK		OK		91.00	87.0	93.0	2.00	
TOTAL DISSOLVED SOLIDS	06/16/2010							OK	104.00			1.00	

Sampling Quality Control Assessment

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

Sampling Protocol

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

All monitoring wells were sampled using a peristaltic pump and dedicated tubing, or a dedicated bladder pump. Wells 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 six wells were qualified with a "Q" flag, indicating the data are qualitative because of the sampling technique.

Surface water locations were sampled using a peristaltic pump.

Equipment Blank Assessment

An equipment blank (field ID 2628) was collected after decontamination of the hose reel used to collect the surface water samples. Cadmium, selenium, and uranium were detected in this blank. The associated sample that is greater than the MDL, but less than 5 times the blank concentration is qualified with a "J" flag. The equipment blank results indicate adequate decontamination of the sampling equipment.

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 wells DUR01-0635, DUR02-0884, and DUR03-0607. The duplicate results met the EPA recommended laboratory duplicate criteria of less than 20 percent relative difference for results that are greater than 5 times the practical quantitation limit, indicating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Equipment/Trip Blanks

RIN: 10053097 **Lab Code:** PAR **Project:** Durango **Validation Date:** 8/4/2010

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	1006127-29	SW6020	CADMIUM	0.093		0.012	UG/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
1006127-21	IGU 629	0584	0.34	1		J
1006127-22	IGU 630	0586	0.14	1		J
1006127-23	IGU 631	0652	0.23	1		J
1006127-24	IGU 632	0691	0.18	1		J
1006127-25	IGU 633	0588	0.13	1		J
1006127-26	IGU 634	0654	0.15	1		J
1006127-27	IGU 635	0656	0.2	1		J

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	1006127-29	SW6020	SELENIUM	0.044	B	0.032	UG/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
1006127-21	IGU 629	0584	0.069	1	B	J
1006127-22	IGU 630	0586	0.18	1		J
1006127-23	IGU 631	0652	0.11	1		J
1006127-24	IGU 632	0691	0.14	1		J
1006127-25	IGU 633	0588	0.81	1		
1006127-26	IGU 634	0654	0.15	1		J
1006127-27	IGU 635	0656	0.19	1		J

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	1006127-29	SW6020	URANIUM	0.029		0.0029	UG/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
1006127-21	IGU 629	0584	0.19	1	E	
1006127-22	IGU 630	0586	0.19	1		
1006127-23	IGU 631	0652	0.16	1		
1006127-24	IGU 632	0691	0.19	1		
1006127-25	IGU 633	0588	18	1		
1006127-26	IGU 634	0654	0.21	1		

SAMPLE MANAGEMENT SYSTEM

Validation Report: Equipment/Trip Blanks

RIN: 10053097 **Lab Code:** PAR **Project:** Durango **Validation Date:** 8/4/2010

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	1006127-29		URANIUM				

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
1006127-27	IGU 635	0656	0.19	1		

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 10053097 **Lab Code:** PAR **Project:** Durango **Validation Date:** 8/4/2010

Duplicate: 2625 **Sample:** 0884

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
SELENIUM	1200			100	1200			100	0		UG/L
URANIUM	170			100	170			100	0		UG/L

Duplicate: 2626 **Sample:** 0607

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
CALCIUM	300000			1	300000			1	0		UG/L
CHLORIDE	13			5	14			10	7.41		MG/L
IRON	170			1	200			1	16.22		UG/L
MAGNESIUM	190000			1	190000			1	0		UG/L
MANGANESE	83			1	85			1	2.38		UG/L
MOLYBDENUM	0.032	U		1	0.032	U		1			UG/L
POTASSIUM	9700			1	9700			1	0		UG/L
SELENIUM	0.15			1	0.078	B		1			UG/L
SODIUM	280000			10	290000			10	3.51		UG/L
SULFATE	1700			20	1700			50	0		MG/L
TOTAL DISSOLVED SOLIDS	3100			1	3100			1	0		MG/L
URANIUM	0.084			1	0.093			1	10.17		UG/L

Duplicate: 2627 **Sample:** 0635

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
CADMIUM					0.17			1			UG/L
MANGANESE	86			1	85			1	1.17		UG/L
MOLYBDENUM	1.5			1	1.5			1	0		UG/L
SELENIUM	5.9			1	7.2			1	19.85		UG/L
SULFATE	1300			20	1300			20	0		MG/L
URANIUM	11			1	11			1	0		UG/L

Certification

All laboratory analytical quality control criteria were met except as qualified in this report. The data qualifiers listed on the SEEPro database reports are defined on the last page of each report. All data in this package are considered validated and available for use.

Laboratory Coordinator: Steve Donivan — 8-19-2010 Date

Data Validation Lead: Steve Donivan — 8-19-2010 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 SEEPro database. The application compares the new data set with historical data and lists all new data that fall outside the historical data range. Data listed in the report are highlighted if the concentration detected is not within 50 percent of historical minimum or maximum values. A determination is also made if the data are normally distributed using the Shapiro-Wilk Test.
2. Apply the appropriate statistical test. Dixon's Extreme Value test is used to test for statistical outliers when the sample size is less than or equal to 25. This test considers both extreme values that are much smaller than the rest of the data (case 1) and extreme values that are much larger than the rest of the data (case 2). This test is valid only if the data without the suspected outlier are normally distributed. Rosner's Test is a parametric test that is used to detect outliers for sample sizes of 25 or more. This test also assumes that the data without the suspected outliers are normally distributed.
3. Scientifically review statistical outliers and decide on their disposition.

Two results from this sampling event were identified as potential outliers. The manganese result for DUR01-0617 was above the historical maximum and the sulfate result for DUR03-0621 was below the historical minimum. There were no analytical errors identified during the review of the data. The data for this RIN are acceptable as qualified.

Data Validation Outliers Report - No Field Parameters
Comparison: All Historical Data
Laboratory: ALS Laboratory Group
RIN: 10053097
Report Date: 8/5/2010

					Current			Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier
						Qualifiers			Qualifiers			Qualifiers				
Site Code	Location Code	Sample ID	Sample Date	Analyte	Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
DUR01	0617	N001	06/09/2010	Manganese	1.3		F	0.6		F	0.0015	B	F	40	3	Yes
DUR01	0630	N001	06/08/2010	Sulfate	1600		F	2550			1700		FQ	21	0	No
DUR01	0633	N001	06/09/2010	Manganese	0.0046	B	F	0.98		F	0.005	B	F	23	0	No
DUR01	0633	N001	06/09/2010	Selenium	0.13		F	0.123		F	0.006		F	23	0	No
DUR01	0633	N001	06/09/2010	Uranium	0.48		F	1.59			0.58		F	23	0	No
DUR01	0863	N001	06/08/2010	Molybdenum	0.00056		F	0.0074	B		0.00062	B	UF	13	12	No
DUR01	0863	N001	06/08/2010	Uranium	0.000094		F	0.0028			0.0001		F	13	6	No
DUR02	0588	N001	06/09/2010	Molybdenum	0.0011			0.0033	U		0.0012		U	17	12	No
DUR03	0605	N001	06/09/2010	Sodium	250		FQ	408			260		F	39	0	No
DUR03	0605	N001	06/09/2010	Uranium	0.00004		FQ	0.003	U		0.000053	B	UF	40	30	No
DUR03	0608	N001	06/09/2010	Sulfate	520		F	1280			524			60	0	No
DUR03	0612	0001	06/09/2010	Molybdenum	0.000052	B	FQ	0.16			0.00021	B	FQ	29	21	No
DUR03	0618	N001	06/09/2010	Molybdenum	0.00055		F	0.03			0.00061	B	UF	14	13	No
DUR03	0621	N001	06/09/2010	Molybdenum	0.00014		F	0.1			0.00016	B	UF	27	25	No
DUR03	0621	N001	06/09/2010	Sulfate	2800		F	4000	I		2900		F	25	0	Yes
DUR03	0623	N001	06/09/2010	Calcium	300		FQ	284			200		FQ	34	0	No
DUR03	0623	N001	06/09/2010	Selenium	0.000053	B	FQ	0.05	UI		0.0001	U	L	35	28	No
DUR03	0623	N001	06/09/2010	Total Dissolved Solids	2800		FQ	2700		FQ	1500		FQ	29	0	No
DUR03	0623	N001	06/09/2010	Uranium	0.0009		FQ	0.0061		FQ	0.00099	B	L	34	9	No

Data Validation Outliers Report - Field Parameters Only
Comparison: All Historical Data
Laboratory: Field Measurements
RIN: 10053097
Report Date: 8/5/2010

					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	0633	N001	06/09/2010	Alkalinity, Total (As CaCO3)	283		F	702			360		F	29	0	No
DUR01	0633	N001	06/09/2010	pH	7.34		F	7.25		F	6.38			20	0	No
DUR01	0863	N001	06/08/2010	Specific Conductance	2299		F	2258		F	1620			13	0	No
DUR02	0884	N001	06/10/2010	Alkalinity, Total (As CaCO3)	437		F	380		F	189		F	18	0	No
DUR02	0884	N001	06/10/2010	Temperature	13.09		F	15.6		F	13.54		F	13	0	No
DUR03	0612	N001	06/09/2010	Specific Conductance	4045		FQ	3920		F	1750			25	0	No
DUR03	0623	N001	06/09/2010	Specific Conductance	3130		FQ	3040			100			32	0	No
DUR03	0623	N001	06/09/2010	Temperature	13.8		FQ	12.68		FQ	6			32	0	No
DUR03	0623	N001	06/09/2010	Turbidity	2.14		FQ	132		L	2.54		FQ	13	0	No

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

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Attachment 2
Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/08/2010	0001	37.41	-	57.41	419		F	#		
Cadmium	mg/L	06/08/2010	0001	37.41	-	57.41	0.042		F	#	0.00023	
Chloride	mg/L	06/08/2010	0001	37.41	-	57.41	200		F	#	10	
Manganese	mg/L	06/08/2010	0001	37.41	-	57.41	5.5		F	#	0.000054	
Molybdenum	mg/L	06/08/2010	0001	37.41	-	57.41	0.09		F	#	0.00064	
Oxidation Reduction Potential	mV	06/08/2010	N001	37.41	-	57.41	101.2		F	#		
pH	s.u.	06/08/2010	N001	37.41	-	57.41	6.71		F	#		
Selenium	mg/L	06/08/2010	0001	37.41	-	57.41	0.00081		F	#	0.00016	
Specific Conductance	umhos /cm	06/08/2010	N001	37.41	-	57.41	4369		F	#		
Sulfate	mg/L	06/08/2010	0001	37.41	-	57.41	1800		F	#	25	
Temperature	C	06/08/2010	N001	37.41	-	57.41	14.34		F	#		
Turbidity	NTU	06/08/2010	N001	37.41	-	57.41	36.8		F	#		
Uranium	mg/L	06/08/2010	0001	37.41	-	57.41	1.3		F	#	0.000058	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/09/2010	N001	14	-	29	450		F	#		
Manganese	mg/L	06/09/2010	N001	14	-	29	1.3		F	#	0.000054	
Molybdenum	mg/L	06/09/2010	N001	14	-	29	0.0017		F	#	0.000064	
Oxidation Reduction Potential	mV	06/09/2010	N001	14	-	29	-71.5		F	#		
pH	s.u.	06/09/2010	N001	14	-	29	6.9		F	#		
Selenium	mg/L	06/09/2010	N001	14	-	29	0.0015		F	#	0.000065	
Specific Conductance	umhos /cm	06/09/2010	N001	14	-	29	3670		F	#		
Sulfate	mg/L	06/09/2010	N001	14	-	29	1900		F	#	25	
Temperature	C	06/09/2010	N001	14	-	29	12.02		F	#		
Turbidity	NTU	06/09/2010	N001	14	-	29	5.65		F	#		
Uranium	mg/L	06/09/2010	N001	14	-	29	0.12		F	#	0.0000058	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/08/2010	N001	28.3	-	38.3	292		F	#		
Manganese	mg/L	06/08/2010	N001	28.3	-	38.3	0.81		F	#	0.000054	
Molybdenum	mg/L	06/08/2010	N001	28.3	-	38.3	0.0038		F	#	0.00016	
Oxidation Reduction Potential	mV	06/08/2010	N001	28.3	-	38.3	6.3		F	#		
pH	s.u.	06/08/2010	N001	28.3	-	38.3	6.95		F	#		
Selenium	mg/L	06/08/2010	N001	28.3	-	38.3	0.02		F	#	0.00016	
Specific Conductance	umhos /cm	06/08/2010	N001	28.3	-	38.3	3264		F	#		
Sulfate	mg/L	06/08/2010	N001	28.3	-	38.3	1600		F	#	25	
Temperature	C	06/08/2010	N001	28.3	-	38.3	14.72		F	#		
Turbidity	NTU	06/08/2010	N001	28.3	-	38.3	8.23		F	#		
Uranium	mg/L	06/08/2010	N001	28.3	-	38.3	0.25		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/09/2010	N001	6	-	16	379		F	#		
Manganese	mg/L	06/09/2010	N001	6	-	16	0.47		F	#	0.000054	
Molybdenum	mg/L	06/09/2010	N001	6	-	16	0.0054		F	#	0.000064	
Oxidation Reduction Potential	mV	06/09/2010	N001	6	-	16	-94.5		F	#		
pH	s.u.	06/09/2010	N001	6	-	16	7.27		F	#		
Selenium	mg/L	06/09/2010	N001	6	-	16	0.0013		F	#	0.000065	
Specific Conductance	umhos /cm	06/09/2010	N001	6	-	16	2123		F	#		
Sulfate	mg/L	06/09/2010	N001	6	-	16	630		F	#	10	
Temperature	C	06/09/2010	N001	6	-	16	12.42		F	#		
Turbidity	NTU	06/09/2010	N001	6	-	16	3.83		F	#		
Uranium	mg/L	06/09/2010	N001	6	-	16	0.16		F	#	0.0000058	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/09/2010	N001	4	-	14	283		F	#		
Manganese	mg/L	06/09/2010	N001	4	-	14	0.0046	B	F	#	0.000054	
Molybdenum	mg/L	06/09/2010	N001	4	-	14	0.0055		F	#	0.00032	
Oxidation Reduction Potential	mV	06/09/2010	N001	4	-	14	-22		F	#		
pH	s.u.	06/09/2010	N001	4	-	14	7.34		F	#		
Selenium	mg/L	06/09/2010	N001	4	-	14	0.13		F	#	0.00032	
Specific Conductance	umhos /cm	06/09/2010	N001	4	-	14	4186		F	#		
Sulfate	mg/L	06/09/2010	N001	4	-	14	2200		F	#	25	
Temperature	C	06/09/2010	N001	4	-	14	13.98		F	#		
Turbidity	NTU	06/09/2010	N001	4	-	14	5.12		F	#		
Uranium	mg/L	06/09/2010	N001	4	-	14	0.48		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/08/2010	N001	8	-	18	484		FQ	#		
Manganese	mg/L	06/08/2010	N001	8	-	18	0.07		FQ	#	0.000054	
Molybdenum	mg/L	06/08/2010	N001	8	-	18	0.0015		FQ	#	0.000032	
Oxidation Reduction Potential	mV	06/08/2010	N001	8	-	18	183		FQ	#		
pH	s.u.	06/08/2010	N001	8	-	18	6.91		FQ	#		
Selenium	mg/L	06/08/2010	N001	8	-	18	0.0015		FQ	#	0.000032	
Specific Conductance	umhos /cm	06/08/2010	N001	8	-	18	4694		FQ	#		
Sulfate	mg/L	06/08/2010	N001	8	-	18	2200		FQ	#	25	
Temperature	C	06/08/2010	N001	8	-	18	14.32		FQ	#		
Turbidity	NTU	06/08/2010	N001	8	-	18	3.46		FQ	#		
Uranium	mg/L	06/08/2010	N001	8	-	18	0.087		FQ	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/08/2010	N001	5.5	-	15.5	403		F	#		
Cadmium	mg/L	06/08/2010	N002	5.5	-	15.5	0.00017		F	#	0.000012	
Manganese	mg/L	06/08/2010	N001	5.5	-	15.5	0.086		F	#	0.000054	
Manganese	mg/L	06/08/2010	N002	5.5	-	15.5	0.085		F	#	0.000054	
Molybdenum	mg/L	06/08/2010	N001	5.5	-	15.5	0.0015		F	#	0.000032	
Molybdenum	mg/L	06/08/2010	N002	5.5	-	15.5	0.0015		F	#	0.000032	
Oxidation Reduction Potential	mV	06/08/2010	N001	5.5	-	15.5	-16.4		F	#		
pH	s.u.	06/08/2010	N001	5.5	-	15.5	6.84		F	#		
Selenium	mg/L	06/08/2010	N001	5.5	-	15.5	0.0059		F	#	0.000032	
Selenium	mg/L	06/08/2010	N002	5.5	-	15.5	0.0072		F	#	0.000032	
Specific Conductance	umhos /cm	06/08/2010	N001	5.5	-	15.5	2772		F	#		
Sulfate	mg/L	06/08/2010	N001	5.5	-	15.5	1300		F	#	10	
Sulfate	mg/L	06/08/2010	N002	5.5	-	15.5	1300		F	#	10	
Temperature	C	06/08/2010	N001	5.5	-	15.5	14.09		F	#		
Turbidity	NTU	06/08/2010	N001	5.5	-	15.5	6.35		F	#		
Uranium	mg/L	06/08/2010	N001	5.5	-	15.5	0.011		F	#	0.0000029	
Uranium	mg/L	06/08/2010	N002	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: 8/5/2010
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 CaCO3)	mg/L	06/08/2010	N001	58	-	67.5	531		F	#		
Cadmium	mg/L	06/08/2010	N001	58	-	67.5	0.000075		F	#	0.000012	
Manganese	mg/L	06/08/2010	N001	58	-	67.5	0.11		F	#	0.000054	
Molybdenum	mg/L	06/08/2010	N001	58	-	67.5	0.00056		F	#	0.000032	
Oxidation Reduction Potential	mV	06/08/2010	N001	58	-	67.5	-20.1		F	#		
pH	s.u.	06/08/2010	N001	58	-	67.5	6.99		F	#		
Selenium	mg/L	06/08/2010	N001	58	-	67.5	0.00024		F	#	0.000032	
Specific Conductance	umhos /cm	06/08/2010	N001	58	-	67.5	2299		F	#		
Sulfate	mg/L	06/08/2010	N001	58	-	67.5	640		F	#	10	
Temperature	C	06/08/2010	N001	58	-	67.5	13.29		F	#		
Turbidity	NTU	06/08/2010	N001	58	-	67.5	2.98		F	#		
Uranium	mg/L	06/08/2010	N001	58	-	67.5	0.000094		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/10/2010	N001	8.5	-	38.5	328		FQ	#		
Oxidation Reduction Potential	mV	06/10/2010	N001	8.5	-	38.5	31.6		FQ	#		
pH	s.u.	06/10/2010	N001	8.5	-	38.5	6.96		FQ	#		
Selenium	mg/L	06/10/2010	N001	8.5	-	38.5	0.0069		FQ	#	0.000032	
Specific Conductance	umhos /cm	06/10/2010	N001	8.5	-	38.5	4117		FQ	#		
Temperature	C	06/10/2010	N001	8.5	-	38.5	12.55		FQ	#		
Turbidity	NTU	06/10/2010	N001	8.5	-	38.5	7.01		FQ	#		
Uranium	mg/L	06/10/2010	N001	8.5	-	38.5	0.1		FQ	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/10/2010	N001	66.2	-	96.2	359		F	#		
Oxidation Reduction Potential	mV	06/10/2010	N001	66.2	-	96.2	28.4		F	#		
pH	s.u.	06/10/2010	N001	66.2	-	96.2	6.99		F	#		
Selenium	mg/L	06/10/2010	N001	66.2	-	96.2	0.37		F	#	0.000032	
Specific Conductance	umhos /cm	06/10/2010	N001	66.2	-	96.2	8392		F	#		
Temperature	C	06/10/2010	N001	66.2	-	96.2	13.21		F	#		
Turbidity	NTU	06/10/2010	N001	66.2	-	96.2	4.95		F	#		
Uranium	mg/L	06/10/2010	N001	66.2	-	96.2	0.096		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/10/2010	N001	35	-	55	324		FQ	#		
Oxidation Reduction Potential	mV	06/10/2010	N001	35	-	55	18.7		FQ	#		
pH	s.u.	06/10/2010	N001	35	-	55	6.97		FQ	#		
Selenium	mg/L	06/10/2010	N001	35	-	55	0.47		FQ	#	0.000032	
Specific Conductance	umhos /cm	06/10/2010	N001	35	-	55	2987		FQ	#		
Temperature	C	06/10/2010	N001	35	-	55	14.24		FQ	#		
Turbidity	NTU	06/10/2010	N001	35	-	55	8.99		FQ	#		
Uranium	mg/L	06/10/2010	N001	35	-	55	0.0023		FQ	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/10/2010	N001	27	-	36.9	362		F	#		
Oxidation Reduction Potential	mV	06/10/2010	N001	27	-	36.9	72.7		F	#		
pH	s.u.	06/10/2010	N001	27	-	36.9	6.86		F	#		
Selenium	mg/L	06/10/2010	N001	27	-	36.9	0.03		F	#	0.000032	
Specific Conductance	umhos /cm	06/10/2010	N001	27	-	36.9	8444		F	#		
Temperature	C	06/10/2010	N001	27	-	36.9	11.97		F	#		
Turbidity	NTU	06/10/2010	N001	27	-	36.9	6.87		F	#		
Uranium	mg/L	06/10/2010	N001	27	-	36.9	0.086		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/10/2010	N001	36.5	-	46.5	437		F	#		
Oxidation Reduction Potential	mV	06/10/2010	N001	36.5	-	46.5	60.2		F	#		
pH	s.u.	06/10/2010	N001	36.5	-	46.5	7.06		F	#		
Selenium	mg/L	06/10/2010	N001	36.5	-	46.5	1.2		F	#	0.0032	
Selenium	mg/L	06/10/2010	N002	36.5	-	46.5	1.2		F	#	0.0032	
Specific Conductance	umhos /cm	06/10/2010	N001	36.5	-	46.5	5385		F	#		
Temperature	C	06/10/2010	N001	36.5	-	46.5	13.09		F	#		
Turbidity	NTU	06/10/2010	N001	36.5	-	46.5	1.54		F	#		
Uranium	mg/L	06/10/2010	N001	36.5	-	46.5	0.17		F	#	0.00029	
Uranium	mg/L	06/10/2010	N002	36.5	-	46.5	0.17		F	#	0.00029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/09/2010	N001	36	-	56	670		FQ	#		
Calcium	mg/L	06/09/2010	N001	36	-	56	130		FQ	#	0.0037	
Chloride	mg/L	06/09/2010	N001	36	-	56	32		FQ	#	1	
Iron	mg/L	06/09/2010	N001	36	-	56	0.061	B	UFQ	#	0.0072	
Magnesium	mg/L	06/09/2010	N001	36	-	56	110		FQ	#	0.0032	
Manganese	mg/L	06/09/2010	N001	36	-	56	0.033		FQ	#	0.000054	
Molybdenum	mg/L	06/09/2010	N001	36	-	56	0.000032	U	FQ	#	0.000032	
Oxidation Reduction Potential	mV	06/09/2010	N001	36	-	56	-42.2		FQ	#		
pH	s.u.	06/09/2010	N001	36	-	56	6.93		FQ	#		
Potassium	mg/L	06/09/2010	N001	36	-	56	10		FQ	#	0.02	
Selenium	mg/L	06/09/2010	N001	36	-	56	0.000065	B	FQ	#	0.000032	
Sodium	mg/L	06/09/2010	N001	36	-	56	250		FQ	#	0.23	
Specific Conductance	umhos /cm	06/09/2010	N001	36	-	56	2433		FQ	#		
Sulfate	mg/L	06/09/2010	N001	36	-	56	650		FQ	#	10	
Temperature	C	06/09/2010	N001	36	-	56	15.62		FQ	#		
Total Dissolved Solids	mg/L	06/09/2010	N001	36	-	56	1800		FQ	#	40	
Turbidity	NTU	06/09/2010	N001	36	-	56	0.85		FQ	#		
Uranium	mg/L	06/09/2010	N001	36	-	56	0.00004		FQ	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/09/2010	N001	36.7	-	56.7	388		F	#		
Calcium	mg/L	06/09/2010	N001	36.7	-	56.7	300		F	#	0.0037	
Calcium	mg/L	06/09/2010	N002	36.7	-	56.7	300		F	#	0.0037	
Chloride	mg/L	06/09/2010	N001	36.7	-	56.7	13		F	#	1	
Chloride	mg/L	06/09/2010	N002	36.7	-	56.7	14		F	#	2	
Iron	mg/L	06/09/2010	N001	36.7	-	56.7	0.17		F	#	0.0072	
Iron	mg/L	06/09/2010	N002	36.7	-	56.7	0.2		F	#	0.0072	
Magnesium	mg/L	06/09/2010	N001	36.7	-	56.7	190		F	#	0.0032	
Magnesium	mg/L	06/09/2010	N002	36.7	-	56.7	190		F	#	0.0032	
Manganese	mg/L	06/09/2010	N001	36.7	-	56.7	0.083		F	#	0.000054	
Manganese	mg/L	06/09/2010	N002	36.7	-	56.7	0.085		F	#	0.000054	
Molybdenum	mg/L	06/09/2010	N001	36.7	-	56.7	0.000032	U	F	#	0.000032	
Molybdenum	mg/L	06/09/2010	N002	36.7	-	56.7	0.000032	U	F	#	0.000032	
Oxidation Reduction Potential	mV	06/09/2010	N001	36.7	-	56.7	-128.2		F	#		
pH	s.u.	06/09/2010	N001	36.7	-	56.7	6.88		F	#		
Potassium	mg/L	06/09/2010	N001	36.7	-	56.7	9.7		F	#	0.02	
Potassium	mg/L	06/09/2010	N002	36.7	-	56.7	9.7		F	#	0.02	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/5/2010
Location: 0607 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Selenium	mg/L	06/09/2010	N001	36.7	-	56.7	0.00015		F	#	0.000032	
Selenium	mg/L	06/09/2010	N002	36.7	-	56.7	0.000078	B	F	#	0.000032	
Sodium	mg/L	06/09/2010	N001	36.7	-	56.7	280		F	#	0.23	
Sodium	mg/L	06/09/2010	N002	36.7	-	56.7	290		F	#	0.23	
Specific Conductance	umhos /cm	06/09/2010	N001	36.7	-	56.7	3444		F	#		
Sulfate	mg/L	06/09/2010	N001	36.7	-	56.7	1700		F	#	10	
Sulfate	mg/L	06/09/2010	N002	36.7	-	56.7	1700		F	#	25	
Temperature	C	06/09/2010	N001	36.7	-	56.7	12.56		F	#		
Total Dissolved Solids	mg/L	06/09/2010	N001	36.7	-	56.7	3100		F	#	40	
Total Dissolved Solids	mg/L	06/09/2010	N002	36.7	-	56.7	3100		F	#	40	
Turbidity	NTU	06/09/2010	N001	36.7	-	56.7	2.72		F	#		
Uranium	mg/L	06/09/2010	N001	36.7	-	56.7	0.000084		F	#	0.0000029	
Uranium	mg/L	06/09/2010	N002	36.7	-	56.7	0.000093		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/09/2010	N001	29	-	39	347		F	#		
Calcium	mg/L	06/09/2010	N001	29	-	39	160		F	#	0.0037	
Chloride	mg/L	06/09/2010	N001	29	-	39	14		F	#	1	
Iron	mg/L	06/09/2010	N001	29	-	39	0.026	B	UF	#	0.0072	
Magnesium	mg/L	06/09/2010	N001	29	-	39	100		F	#	0.0032	
Manganese	mg/L	06/09/2010	N001	29	-	39	0.00031	B	UF	#	0.000054	
Molybdenum	mg/L	06/09/2010	N001	29	-	39	0.00084		F	#	0.000032	
Oxidation Reduction Potential	mV	06/09/2010	N001	29	-	39	43.4		F	#		
pH	s.u.	06/09/2010	N001	29	-	39	7.08		F	#		
Potassium	mg/L	06/09/2010	N001	29	-	39	3.6		F	#	0.02	
Selenium	mg/L	06/09/2010	N001	29	-	39	0.0036		F	#	0.000032	
Sodium	mg/L	06/09/2010	N001	29	-	39	55		F	#	0.023	
Specific Conductance	umhos /cm	06/09/2010	N001	29	-	39	1572		F	#		
Sulfate	mg/L	06/09/2010	N001	29	-	39	520		F	#	10	
Temperature	C	06/09/2010	N001	29	-	39	10.58		F	#		
Total Dissolved Solids	mg/L	06/09/2010	N001	29	-	39	1200		F	#	20	
Turbidity	NTU	06/09/2010	N001	29	-	39	1.29		F	#		
Uranium	mg/L	06/09/2010	N001	29	-	39	0.0031		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/09/2010	0001	98.09	-	108.09	2246		FQ	#		
Calcium	mg/L	06/09/2010	0001	98.09	-	108.09	9		FQ	#	0.0037	
Chloride	mg/L	06/09/2010	0001	98.09	-	108.09	50		FQ	#	2	
Iron	mg/L	06/09/2010	0001	98.09	-	108.09	0.063	B	UFQ	#	0.0072	
Magnesium	mg/L	06/09/2010	0001	98.09	-	108.09	4.4		FQ	#	0.0032	
Manganese	mg/L	06/09/2010	0001	98.09	-	108.09	0.013		FQ	#	0.000054	
Molybdenum	mg/L	06/09/2010	0001	98.09	-	108.09	0.000052	B	FQ	#	0.000032	
Oxidation Reduction Potential	mV	06/09/2010	N001	98.09	-	108.09	-342.6		FQ	#		
pH	s.u.	06/09/2010	N001	98.09	-	108.09	7.6		FQ	#		
Potassium	mg/L	06/09/2010	0001	98.09	-	108.09	12		FQ	#	0.02	
Selenium	mg/L	06/09/2010	0001	98.09	-	108.09	0.000054	B	FQ	#	0.000032	
Sodium	mg/L	06/09/2010	0001	98.09	-	108.09	840		FQ	#	0.23	
Specific Conductance	umhos /cm	06/09/2010	N001	98.09	-	108.09	4045		FQ	#		
Sulfate	mg/L	06/09/2010	0001	98.09	-	108.09	68		FQ	#	5	
Temperature	C	06/09/2010	N001	98.09	-	108.09	13.14		FQ	#		
Total Dissolved Solids	mg/L	06/09/2010	0001	98.09	-	108.09	2700		FQ	#	80	
Turbidity	NTU	06/09/2010	N001	98.09	-	108.09	20.8		FQ	#		
Uranium	mg/L	06/09/2010	0001	98.09	-	108.09	0.00012		FQ	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/09/2010	N001	29.77	-	49.77	347		F	#		
Calcium	mg/L	06/09/2010	N001	29.77	-	49.77	280		F	#	0.0037	
Chloride	mg/L	06/09/2010	N001	29.77	-	49.77	33		F	#	2	
Iron	mg/L	06/09/2010	N001	29.77	-	49.77	0.024	B	UF	#	0.0072	
Magnesium	mg/L	06/09/2010	N001	29.77	-	49.77	150		F	#	0.0032	
Manganese	mg/L	06/09/2010	N001	29.77	-	49.77	0.0005	B	UF	#	0.000054	
Molybdenum	mg/L	06/09/2010	N001	29.77	-	49.77	0.00055		F	#	0.000032	
Oxidation Reduction Potential	mV	06/09/2010	N001	29.77	-	49.77	-6.2		F	#		
pH	s.u.	06/09/2010	N001	29.77	-	49.77	6.95		F	#		
Potassium	mg/L	06/09/2010	N001	29.77	-	49.77	2.8	EN	F	#	0.02	
Selenium	mg/L	06/09/2010	N001	29.77	-	49.77	0.0062		F	#	0.000032	
Sodium	mg/L	06/09/2010	N001	29.77	-	49.77	99		F	#	0.023	
Specific Conductance	umhos /cm	06/09/2010	N001	29.77	-	49.77	2326		F	#		
Sulfate	mg/L	06/09/2010	N001	29.77	-	49.77	1000		F	#	10	
Temperature	C	06/09/2010	N001	29.77	-	49.77	11.55		F	#		
Total Dissolved Solids	mg/L	06/09/2010	N001	29.77	-	49.77	1900		F	#	40	
Turbidity	NTU	06/09/2010	N001	29.77	-	49.77	0.52		F	#		
Uranium	mg/L	06/09/2010	N001	29.77	-	49.77	0.074		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/09/2010	N001	78.46	-	88.46	5		F	#		
Calcium	mg/L	06/09/2010	N001	78.46	-	88.46	470		F	#	0.0037	
Chloride	mg/L	06/09/2010	N001	78.46	-	88.46	11		F	#	1	
Iron	mg/L	06/09/2010	N001	78.46	-	88.46	140		F	#	0.0072	
Magnesium	mg/L	06/09/2010	N001	78.46	-	88.46	360		F	#	0.0032	
Manganese	mg/L	06/09/2010	N001	78.46	-	88.46	2.8		F	#	0.000054	
Molybdenum	mg/L	06/09/2010	N001	78.46	-	88.46	0.00014		F	#	0.000032	
Oxidation Reduction Potential	mV	06/09/2010	N001	78.46	-	88.46	166		F	#		
pH	s.u.	06/09/2010	N001	78.46	-	88.46	5.03		F	#		
Potassium	mg/L	06/09/2010	N001	78.46	-	88.46	16		F	#	0.02	
Selenium	mg/L	06/09/2010	N001	78.46	-	88.46	0.0026		F	#	0.000032	
Sodium	mg/L	06/09/2010	N001	78.46	-	88.46	180		F	#	0.023	
Specific Conductance	umhos /cm	06/09/2010	N001	78.46	-	88.46	4318		F	#		
Sulfate	mg/L	06/09/2010	N001	78.46	-	88.46	2800		F	#	25	
Temperature	C	06/09/2010	N001	78.46	-	88.46	13.52		F	#		
Total Dissolved Solids	mg/L	06/09/2010	N001	78.46	-	88.46	4500		F	#	80	
Turbidity	NTU	06/09/2010	N001	78.46	-	88.46	3.85		F	#		
Uranium	mg/L	06/09/2010	N001	78.46	-	88.46	0.000095		F	#	0.0000029	

Groundwater Quality Data by Location (USEE100) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/5/2010
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 CaCO3)	mg/L	06/09/2010	N001	19.35	-	39.35	471		FQ	#		
Calcium	mg/L	06/09/2010	N001	19.35	-	39.35	300		FQ	#	0.0037	
Chloride	mg/L	06/09/2010	N001	19.35	-	39.35	42		FQ	#	1	
Iron	mg/L	06/09/2010	N001	19.35	-	39.35	9.5		FQ	#	0.0072	
Magnesium	mg/L	06/09/2010	N001	19.35	-	39.35	260		FQ	#	0.0032	
Manganese	mg/L	06/09/2010	N001	19.35	-	39.35	0.53		FQ	#	0.000054	
Molybdenum	mg/L	06/09/2010	N001	19.35	-	39.35	0.0011		FQ	#	0.000032	
Oxidation Reduction Potential	mV	06/09/2010	N001	19.35	-	39.35	-63.1		FQ	#		
pH	s.u.	06/09/2010	N001	19.35	-	39.35	7		FQ	#		
Potassium	mg/L	06/09/2010	N001	19.35	-	39.35	3.2		FQ	#	0.02	
Selenium	mg/L	06/09/2010	N001	19.35	-	39.35	0.000053	B	FQ	#	0.000032	
Sodium	mg/L	06/09/2010	N001	19.35	-	39.35	160		FQ	#	0.023	
Specific Conductance	umhos /cm	06/09/2010	N001	19.35	-	39.35	3130		FQ	#		
Sulfate	mg/L	06/09/2010	N001	19.35	-	39.35	1500		FQ	#	10	
Temperature	C	06/09/2010	N001	19.35	-	39.35	13.8		FQ	#		
Total Dissolved Solids	mg/L	06/09/2010	N001	19.35	-	39.35	2800		FQ	#	40	
Turbidity	NTU	06/09/2010	N001	19.35	-	39.35	2.14		FQ	#		
Uranium	mg/L	06/09/2010	N001	19.35	-	39.35	0.0009		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.

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: 8/5/2010
Location: 0584 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	06/08/2010	0001	41			#		
Cadmium	mg/L	06/08/2010	0001	0.00034		J	#	0.000012	
Molybdenum	mg/L	06/08/2010	0001	0.00044			#	0.000032	
Selenium	mg/L	06/08/2010	0001	0.000069	B	J	#	0.000032	
Uranium	mg/L	06/08/2010	0001	0.00019	E		#	0.0000029	
Oxidation Reduction Potential	mV	06/08/2010	N001	-12.1			#		
pH	s.u.	06/08/2010	N001	7.99			#		
Specific Conductance	umhos/cm	06/08/2010	N001	173			#		
Temperature	C	06/08/2010	N001	12.3			#		
Turbidity	NTU	06/08/2010	N001	70			#		

Surface Water Quality Data by Location (USEE102) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/5/2010
Location: 0586 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	06/09/2010	0001	73			#		
Cadmium	mg/L	06/09/2010	0001	0.00014		J	#	0.000012	
Molybdenum	mg/L	06/09/2010	0001	0.00046			#	0.000032	
Selenium	mg/L	06/09/2010	0001	0.00018		J	#	0.000032	
Uranium	mg/L	06/09/2010	0001	0.00019			#	0.0000029	
Oxidation Reduction Potential	mV	06/09/2010	N001	31			#		
pH	s.u.	06/09/2010	N001	7.79			#		
Specific Conductance	umhos/cm	06/09/2010	N001	155			#		
Temperature	C	06/09/2010	N001	12.3			#		
Turbidity	NTU	06/09/2010	N001	123			#		

Surface Water Quality Data by Location (USEE102) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/5/2010
Location: 0652 SURFACE LOCATION SURFACE WATER AND SED.

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	06/09/2010	0001	39			#		
Cadmium	mg/L	06/09/2010	0001	0.00023		J	#	0.000012	
Molybdenum	mg/L	06/09/2010	0001	0.00041			#	0.000032	
Selenium	mg/L	06/09/2010	0001	0.00011		J	#	0.000032	
Uranium	mg/L	06/09/2010	0001	0.00016			#	0.0000029	
Oxidation Reduction Potential	mV	06/09/2010	N001	-92			#		
pH	s.u.	06/09/2010	N001	7.9			#		
Specific Conductance	umhos/cm	06/09/2010	N001	155			#		
Temperature	C	06/09/2010	N001	13.61			#		
Turbidity	NTU	06/09/2010	N001	120			#		

Surface Water Quality Data by Location (USEE102) FOR SITE DUR01, Durango Mill Tailings Process Site
REPORT DATE: 8/5/2010
Location: 0691 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	06/08/2010	0001	44			#		
Cadmium	mg/L	06/08/2010	0001	0.00018		J	#	0.000012	
Molybdenum	mg/L	06/08/2010	0001	0.00043			#	0.000032	
Selenium	mg/L	06/08/2010	0001	0.00014		J	#	0.000032	
Uranium	mg/L	06/08/2010	0001	0.00019			#	0.0000029	
Oxidation Reduction Potential	mV	06/08/2010	N001	-30.9			#		
pH	s.u.	06/08/2010	N001	7.8			#		
Specific Conductance	umhos/cm	06/08/2010	N001	175			#		
Temperature	C	06/08/2010	N001	14.88			#		
Turbidity	NTU	06/08/2010	N001	81.4			#		

Surface Water Quality Data by Location (USEE102) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/5/2010
Location: 0588 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	06/09/2010	N001	314			#		
Cadmium	mg/L	06/09/2010	N001	0.00013		J	#	0.000012	
Molybdenum	mg/L	06/09/2010	N001	0.0011			#	0.000032	
Oxidation Reduction Potential	mV	06/09/2010	N001	-116			#		
pH	s.u.	06/09/2010	N001	8.25			#		
Selenium	mg/L	06/09/2010	N001	0.00081			#	0.000032	
Specific Conductance	umhos/cm	06/09/2010	N001	1420			#		
Temperature	C	06/09/2010	N001	26.1			#		
Turbidity	NTU	06/09/2010	N001	3.07			#		
Uranium	mg/L	06/09/2010	N001	0.018			#	0.0000029	

Surface Water Quality Data by Location (USEE102) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/5/2010
Location: 0654 SURFACE LOCATION RESERVED FOR CDAY

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	06/09/2010	0001	18			#		
Cadmium	mg/L	06/09/2010	0001	0.00015		J	#	0.000012	
Molybdenum	mg/L	06/09/2010	0001	0.00042			#	0.000032	
Selenium	mg/L	06/09/2010	0001	0.00015		J	#	0.000032	
Uranium	mg/L	06/09/2010	0001	0.00021			#	0.0000029	
Oxidation Reduction Potential	mV	06/09/2010	N001	11			#		
pH	s.u.	06/09/2010	N001	7.92			#		
Specific Conductance	umhos/cm	06/09/2010	N001	168			#		
Temperature	C	06/09/2010	N001	14.1			#		
Turbidity	NTU	06/09/2010	N001	79			#		

Surface Water Quality Data by Location (USEE102) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/5/2010
Location: 0656 SURFACE LOCATION RESERVED FOR CDAY

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Alkalinity, Total (As CaCO3)	mg/L	06/09/2010	0001	34			#		
Cadmium	mg/L	06/09/2010	0001	0.0002		J	#	0.000012	
Molybdenum	mg/L	06/09/2010	0001	0.00045			#	0.000032	
Selenium	mg/L	06/09/2010	0001	0.00019		J	#	0.000032	
Uranium	mg/L	06/09/2010	0001	0.00019			#	0.0000029	
Oxidation Reduction Potential	mV	06/09/2010	N001	-98			#		
pH	s.u.	06/09/2010	N001	8			#		
Specific Conductance	umhos/cm	06/09/2010	N001	175			#		
Temperature	C	06/09/2010	N001	15.2			#		
Turbidity	NTU	06/09/2010	N001	83			#		

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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Equipment Blank Data

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BLANKS REPORT

LAB: PARAGON/ALS LABORATORY GROUP (Fort Collins, CO)
RIN: 10053097
Report Date: 8/5/2010

Parameter	Site Code	Location ID	Sample Date	Sample ID	Units	Result	Qualifiers Lab	Qualifiers Data	Detection Limit	Uncertainty	Sample Type
Cadmium	DUR02	0999	06/09/2010	N001	mg/L	0.000093			0.000012		E
Molybdenum	DUR02	0999	06/09/2010	N001	mg/L	0.000032	U		0.000032		E
Selenium	DUR02	0999	06/09/2010	N001	mg/L	0.000044	B		0.000032		E
Uranium	DUR02	0999	06/09/2010	N001	mg/L	0.000029			0.0000029		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: 8/5/2010

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	06/08/2010	14:50:15	39.83	6461.11
0617	D	6498.11	06/09/2010	07:50:22	27.97	6470.14
0630	D	6494.44	06/08/2010	16:35:07	32.08	6462.36
0631	D	6477.91	06/09/2010	09:05:34	7	6470.91
0633	D	6481.81	06/09/2010	08:20:17	6.57	6475.24
0634	D	6491.75	06/08/2010	13:30:29	13.05	6478.7
0635	D	6497.68	06/08/2010	14:10:55	13.04	6484.64
0863		6513.32	06/08/2010	15:20:33	55.54	6457.78

STATIC WATER LEVELS (USEE700) FOR SITE DUR02, Durango Raffinate Pond Process Site
REPORT DATE: 8/5/2010

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	06/10/2010	08:40:26	17.82	6454.67
0598	O	6479.09	06/10/2010	10:50:04	20.22	6458.87
0607	U	6527.95	06/10/2010	11:15:03	48.08	6479.87
0879		6473.91	06/10/2010	10:20:58	16.11	6457.8
0884		6476.37	06/10/2010	09:30:53	17.7	6458.67

STATIC WATER LEVELS (USEE700) FOR SITE DUR03, Durango Disposal Site
REPORT DATE: 8/5/2010

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	06/09/2010	12:25:03	38.45	7151.15
0607	D	7099.1	06/09/2010	11:40:22	40.54	7058.56
0608	D	7035	06/09/2010	14:20:12	31.21	7003.79
0612	D	7109.8	06/09/2010	11:00:57	97.5	7012.3
0618	D	7036.41	06/09/2010	13:10:08	33.13	7003.28
0621	U	7035.77	06/09/2010	14:10:34	49.24	6986.53
0623	U	7048.67	06/09/2010	14:55:44	31.23	7017.44

FLOW CODES: D DOWN GRADIENT O ON SITE U UPGRADIENT

Time-Concentration Graphs

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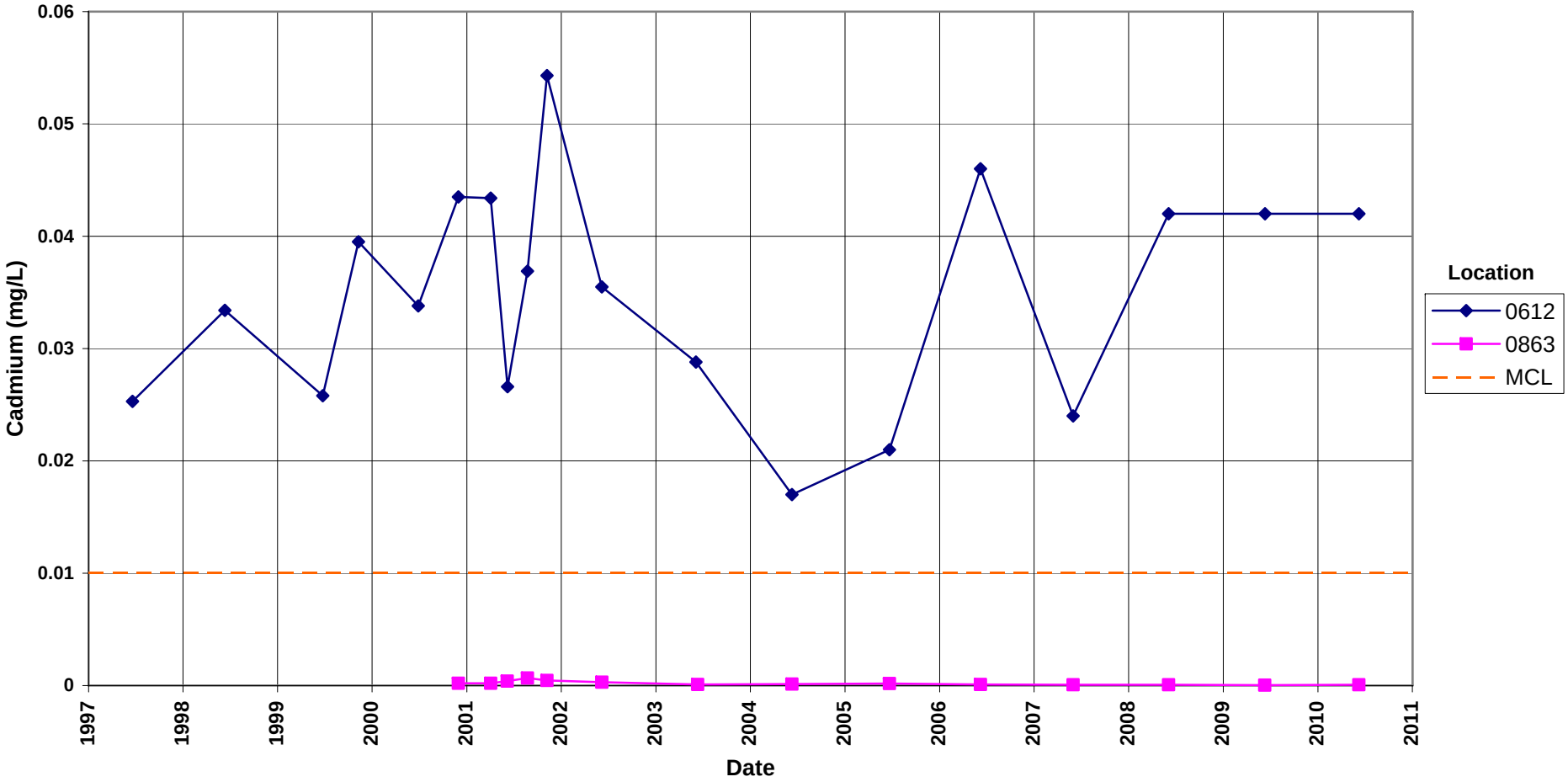
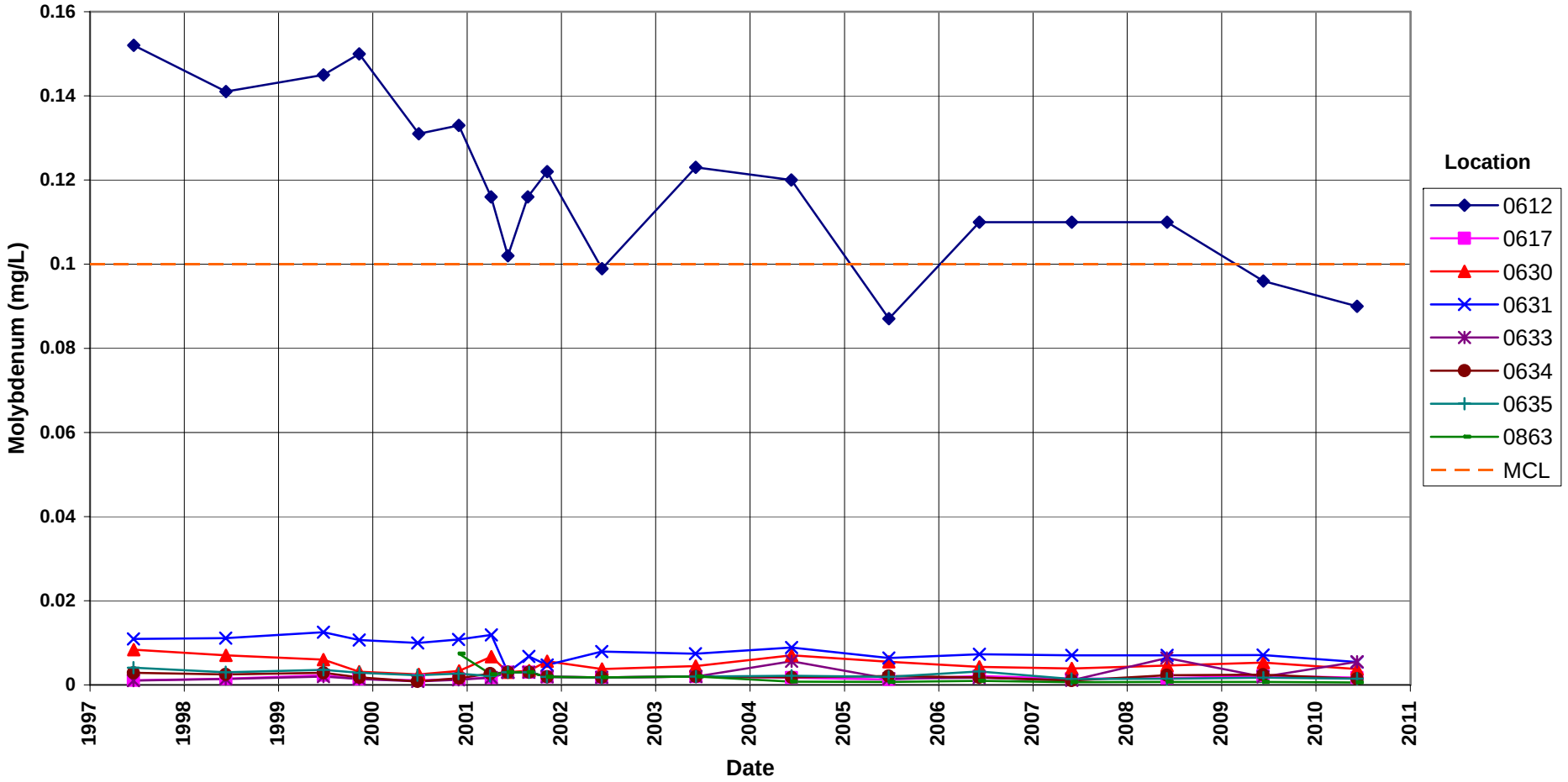
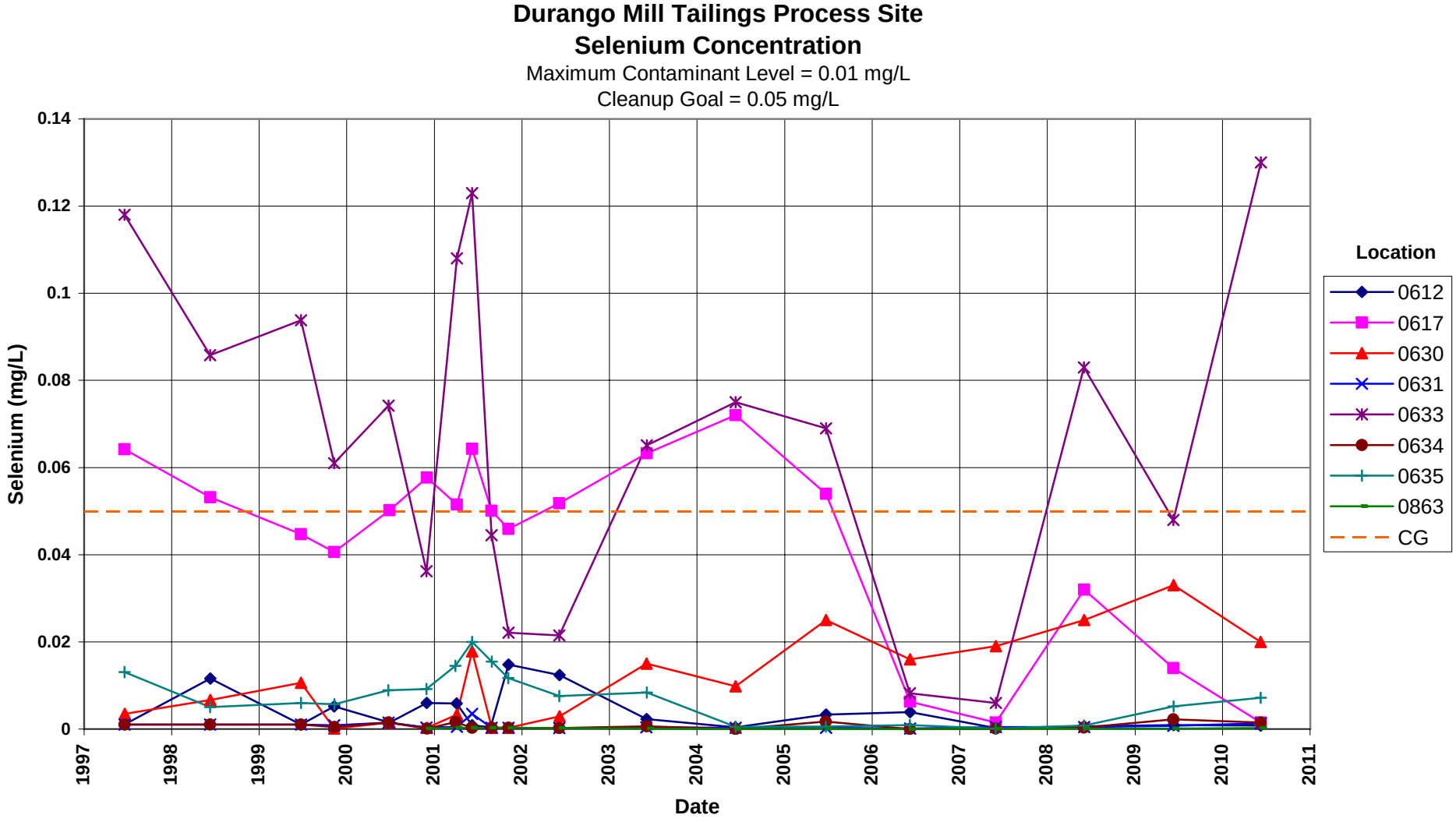
Durango Mill Tailings Process Site
Cadmium Concentration
Maximum Contaminant Level = 0.01 mg/L

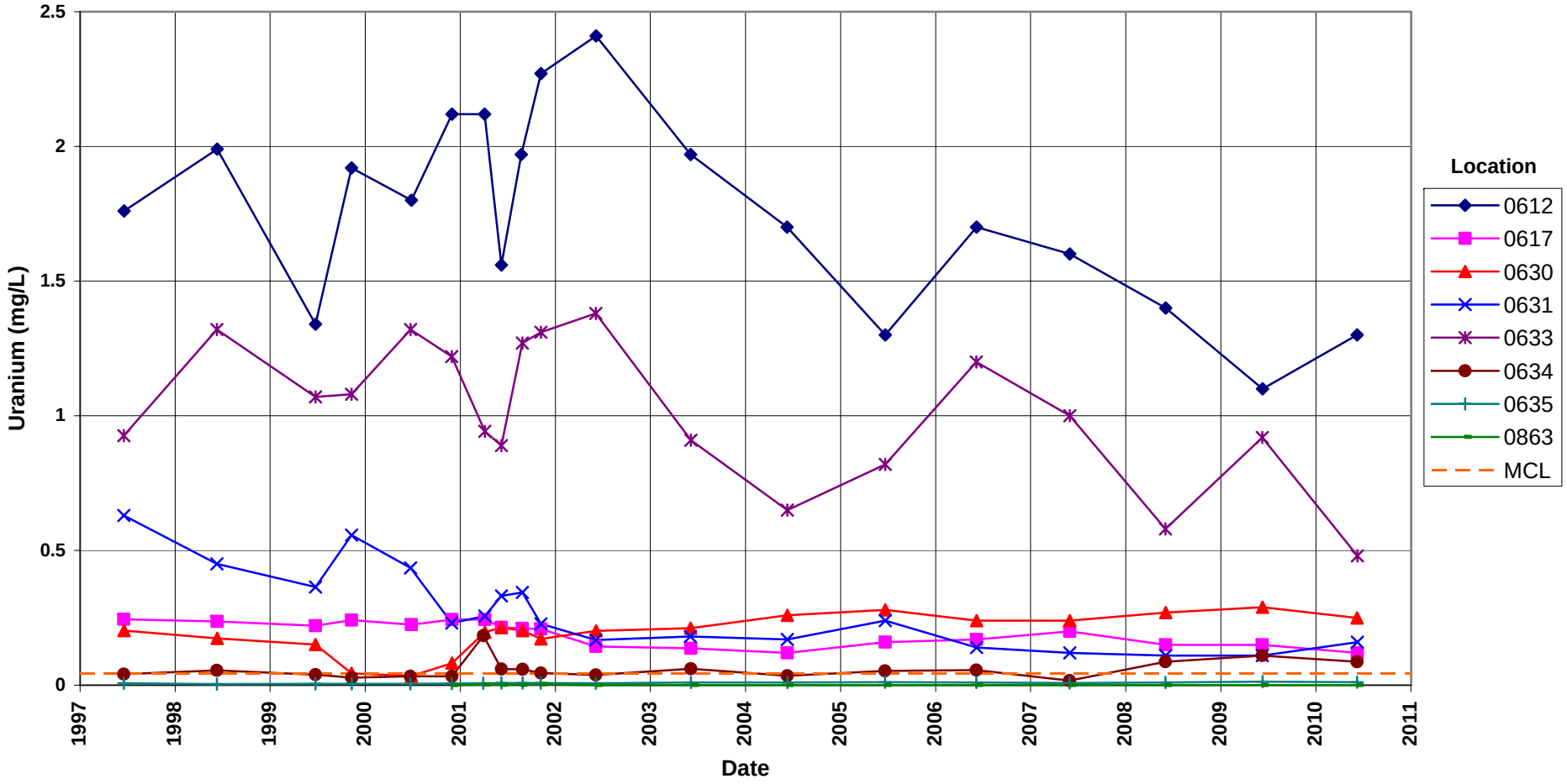


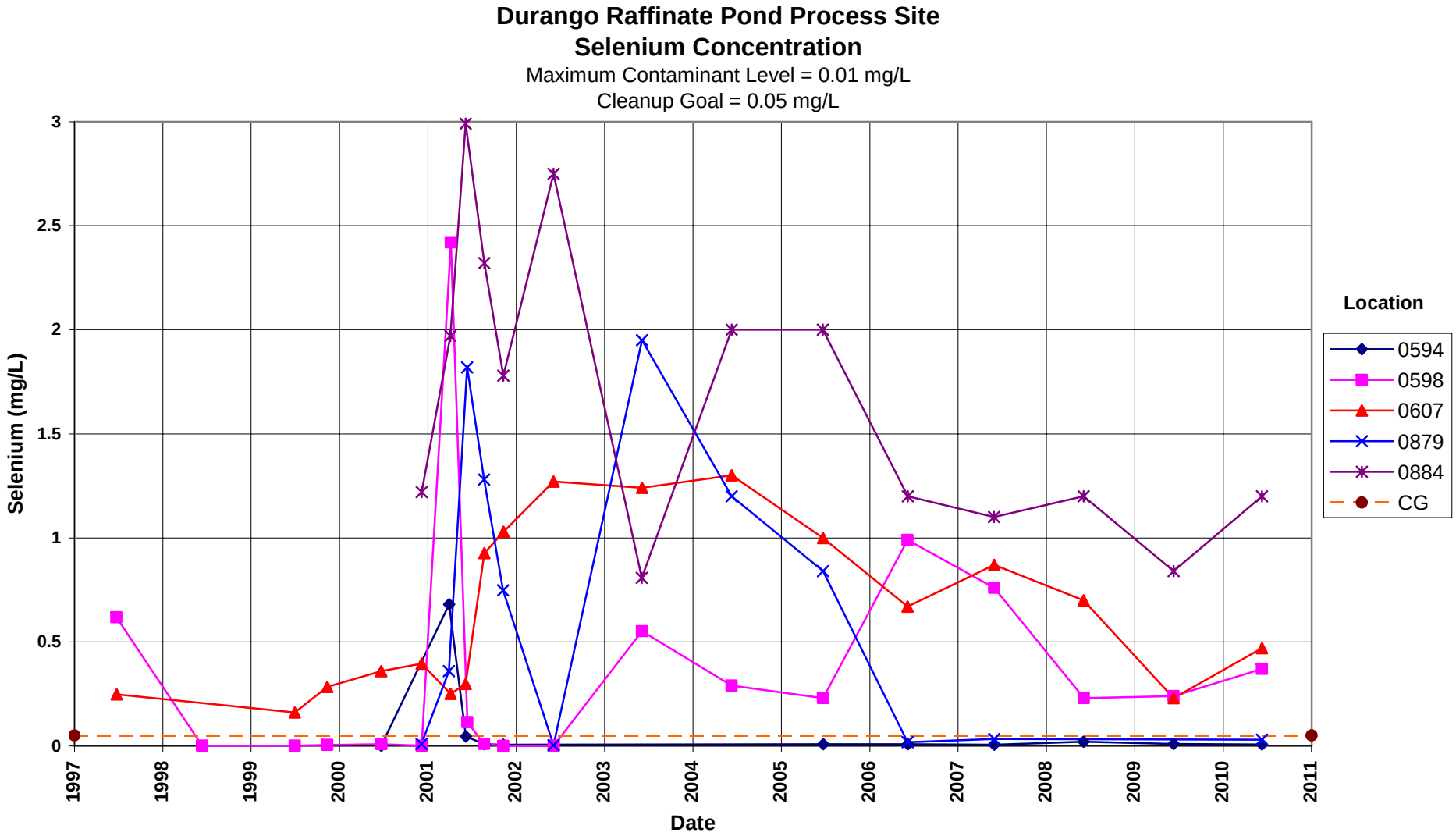
Durango Mill Tailings Process Site
Molybdenum Concentration
Maximum Contaminant Level = 0.1 mg/L



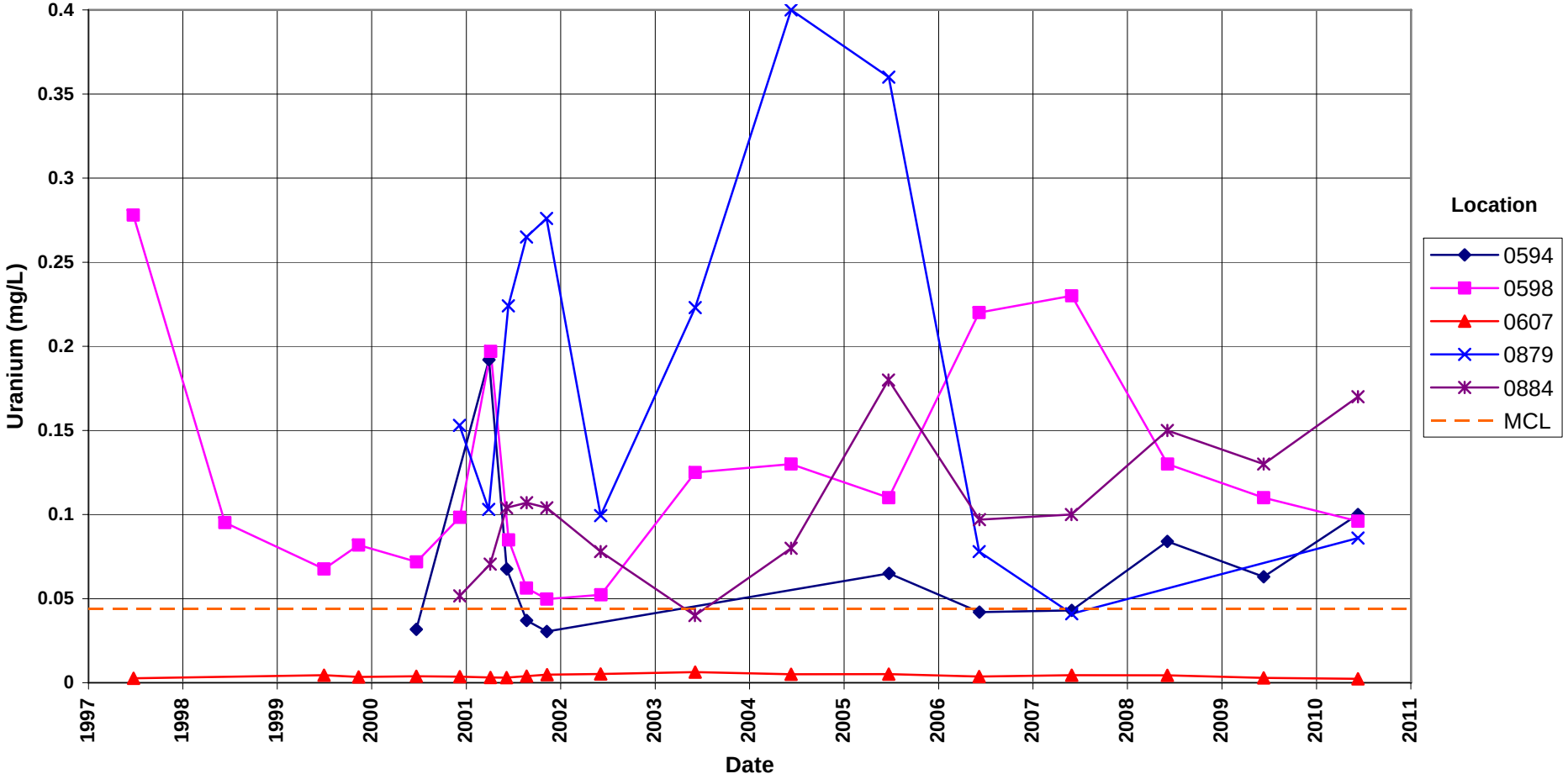

Durango Mill Tailings Process Site
Selenium Concentration
Maximum Contaminant Level = 0.01 mg/L
Cleanup Goal = 0.05 mg/L
Selenium (mg/L)
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
0612
0617
0630
0631
0633
0634
0635
0863
CG

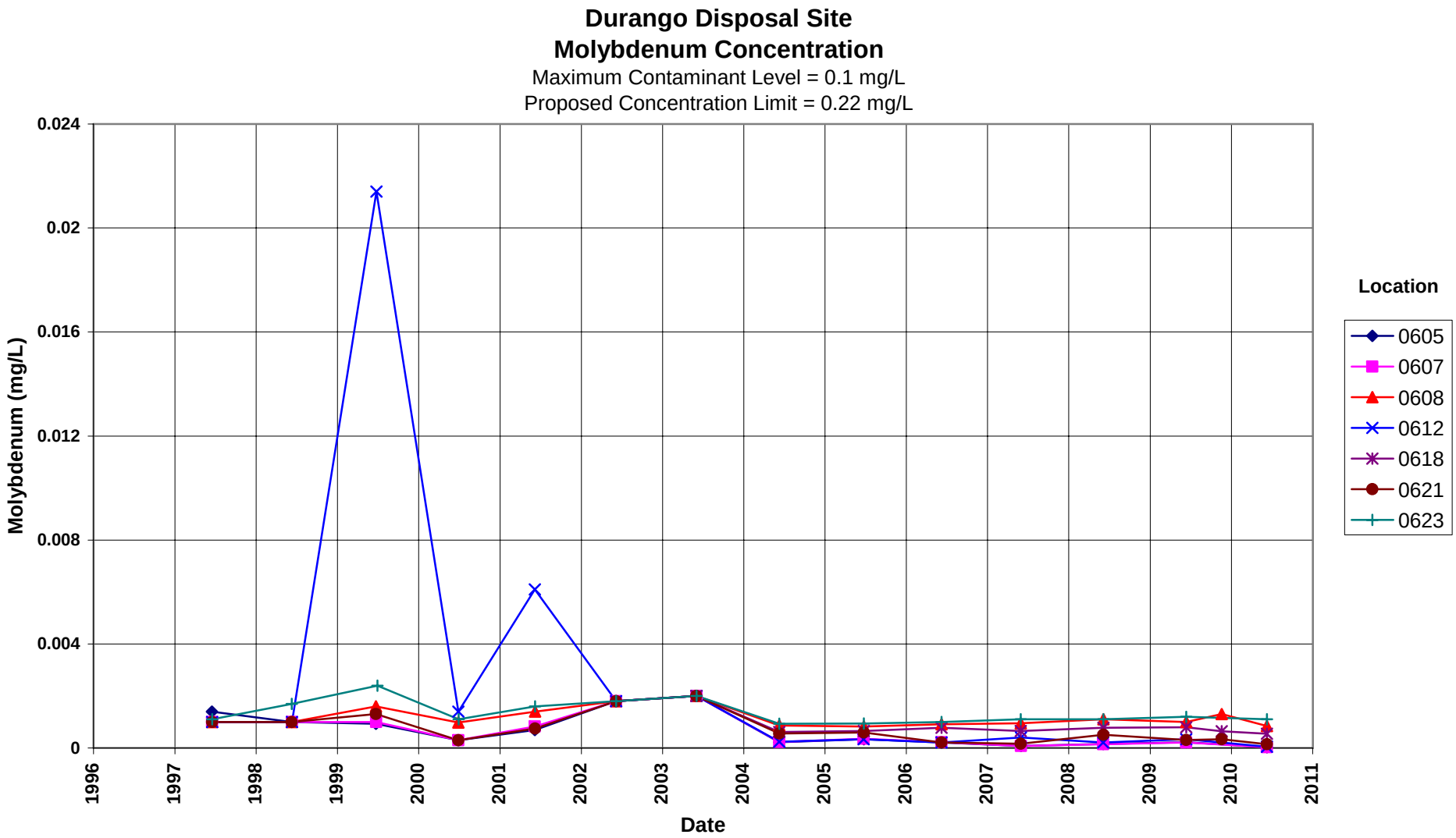
Durango Mill Tailings Process Site
Uranium Concentration
Maximum Contaminant Level = 0.044 mg/L

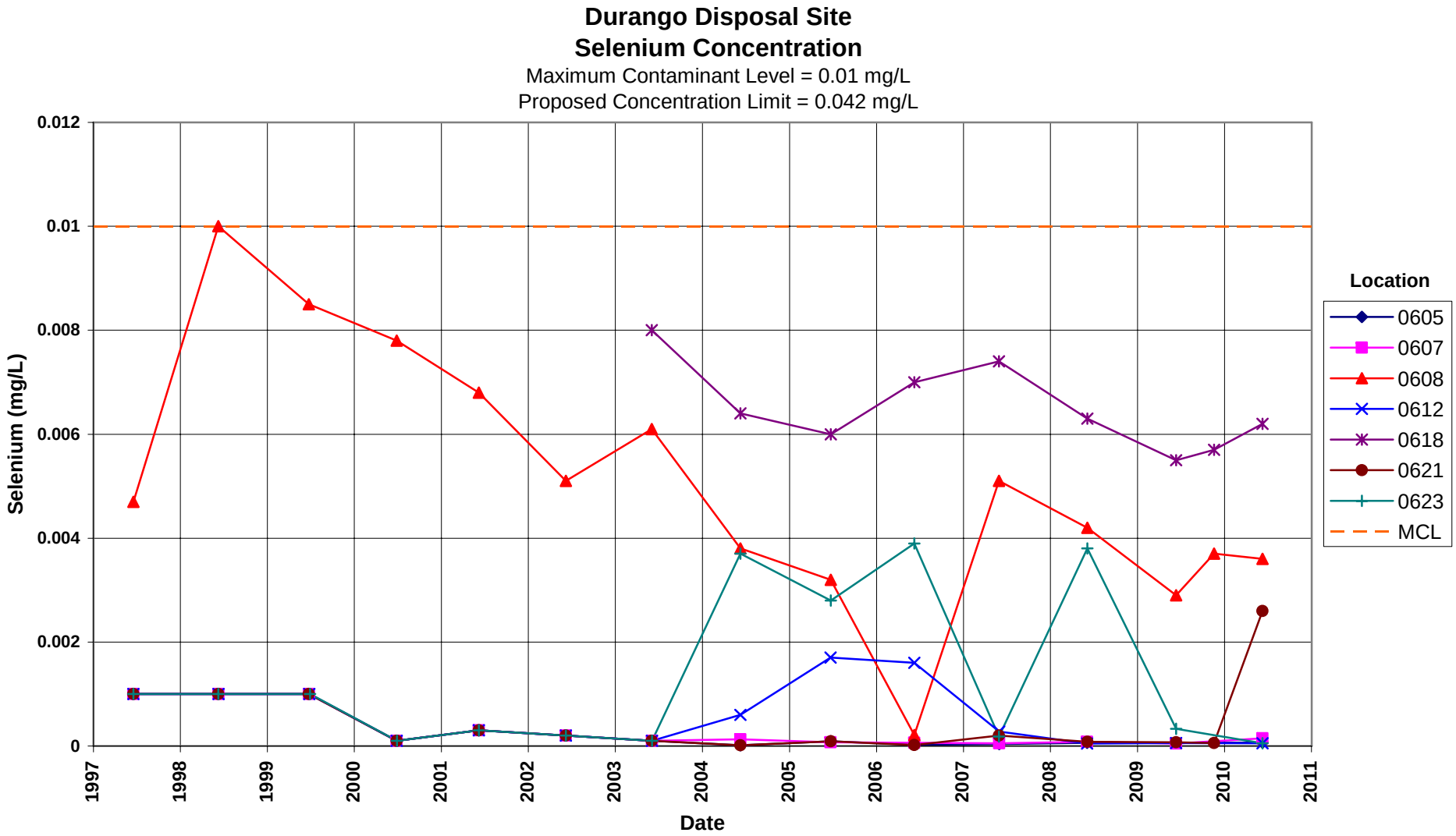


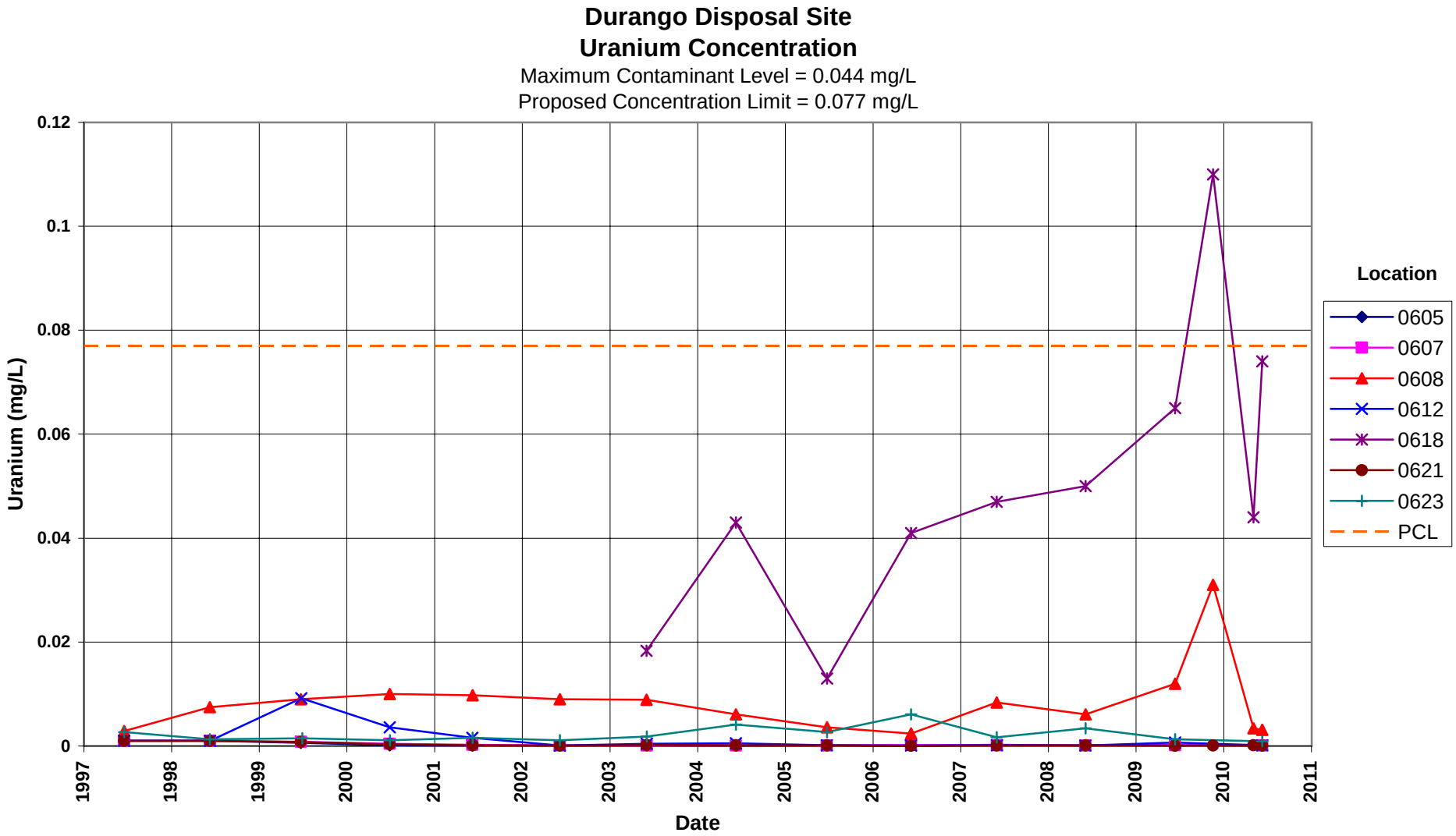

Durango Raffinate Pond Process Site
Selenium Concentration
Maximum Contaminant Level = 0.01 mg/L
Cleanup Goal = 0.05 mg/L
Selenium (mg/L)
3
2.5
2
1.5
1
0.5
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
0594
0598
0607
0879
0884
CG

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




Durango Disposal Site
Molybdenum Concentration
Maximum Contaminant Level = 0.1 mg/L
Proposed Concentration Limit = 0.22 mg/L
Molybdenum (mg/L)
0.024
0.02
0.016
0.012
0.008
0.004
0
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
0605
0607
0608
0612
0618
0621
0623


Durango Disposal Site
Selenium Concentration
Maximum Contaminant Level = 0.01 mg/L
Proposed Concentration Limit = 0.042 mg/L
Selenium (mg/L)
0.012
0.01
0.008
0.006
0.004
0.002
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
0605
0607
0608
0612
0618
0621
0623
MCL


Durango Disposal Site
Uranium Concentration
Maximum Contaminant Level = 0.044 mg/L
Proposed Concentration Limit = 0.077 mg/L
Uranium (mg/L)
0.12
0.1
0.08
0.06
0.04
0.02
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
Date
Location
0605
0607
0608
0612
0618
0621
0623
PCL

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Attachment 3
Sampling and Analysis Work Order

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Stoller established 1959

Task Order LM00-501
Control Number 10-0591

May 10, 2010

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

SUBJECT: Contract No. DE-AM01-07LM00060, Stoller
June 2010 Environmental Sampling at Durango, Colorado

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

Dear Mr. Desormeau:

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, Colorado, processing and disposal sites. Water quality data will be collected from monitoring wells and surface water locations at these sites as part of the routine environmental sampling currently scheduled to begin the week of June 7, 2010.

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

Monitor Wells*

DUR01 Mill Site

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

DUR02 Raffinate Pond

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

DUR03 Bodo Canyon

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

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

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

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.

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

Sincerely,

David Miller
Site Lead

DM/lcg/lb

Enclosures (3)

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

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
656			X			

Sampling conducted in June

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					
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
Nitrate + Nitrite as N (NO3+NO2)-N					
Potassium	DUR03 only		1	SW-846 6010	LMM-01
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
Zinc					
Total No. of Analytes	13	4			

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

Attachment 4
Trip Report

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Stoller established 1959
Grand Junction Office

Memorandum

Control Number N/A

DATE: June 23, 2010

TO: David E. Miller

FROM: Gretchen Baer

SUBJECT: Sampling Trip Report

Site: Durango, Colorado, Processing and Disposal Sites

Date of Sampling Event: June 8−10, 2010

Team Members: Gretchen Baer and Dave Atkinson

Number of Locations Sampled: 20 well locations, 7 surface water locations, 3 duplicate samples, and 1 equipment blank for a total of 31 samples. All monitoring wells were sampled according to the low flow purging and sampling procedure.

Locations Not Sampled/Reason: All locations were sampled.

Location Specific Information:

Site	Location IDs	Comments
DUR01	0584 0586 0652 0691	Surface water was field-filtered (turbidity >10 NTU).
DUR02	0654 0656	
DUR01	0586	Surface water was collected from east bank, rather than from west bank, as indicated on map.
DUR01	0612	Groundwater was field-filtered (turbidity >10 NTU).
DUR01	0633	Alkalinity was double-checked because it was below historical levels.
DUR01	0634	Cat II
DUR02	0594 0607	
DUR03	0605 0612 0623	
DUR01	0635	Rusty clumps observed early in purge.
DUR02	0594	HEX KEY is needed to open well cover.
DUR02	0607	Well casing is bent.
DUR02	0884	No bladder pump. Installed new 3/8-in downhole tubing to mid point of screen. All wl measurements are to top of outer casing.

Site	Location IDs	Comments
DUR03	0612	This June 2010 ORP is significantly different from June 2009 ORP but June 2010 ORP is within historical range. High alkalinity is within historical range.
DUR03	0621	pH slow to stabilize; settles out at ~5.

DUR01: Durango Mill Tailings
DUR02: Durango Raffinate Pond
DUR03: Durango Disposal Cell

Stakeholder/Regulatory: J. Desormeau (DOE) observed sampling at the disposal site monitoring wells 0608, 0618, and 0621. He signed the Job Safety Analysis (JSA).

Field Variance: None.

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
2627	IGU 638	DUR01 0635	Duplicate	Groundwater
2625	IGU 636	DUR02 0884	Duplicate	Groundwater
2626	IGU 628	DUR03 0607	Duplicate	Groundwater
2628	IGU 637	Associated with DUR01 0691 DUR02 0654 DUR02 0656	Equipment Blank	Water

RIN Number Assigned: All samples were assigned to RIN 10053097.

Sample Shipment: All samples were shipped overnight to ALS Laboratory Group from Durango, Colorado, on June 11, 2010.

Well Inspection Summary: All wells were in good condition.

Equipment: Wells were sampled with a peristaltic pump and dedicated tubing or a dedicated bladder pump. Surface waters were sampled using a peristaltic pump and dedicated tubing, a peristaltic pump and tubing reel, or by container immersion. An equipment blank was collected after decontamination of the tubing reel. All other equipment was dedicated or disposable.

Water Level Measurements: Water level measurements were collected at all sampled wells. Data loggers were not downloaded during this event.

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

Fences, Gates, Locks: All were in good condition.
Signs: No missing signs.
Trespassing/Site Disturbances: None observed.

Site Issues:

Disposal Cell/Drainage Structure Integrity: N/A
Vegetation/Noxious Weed Concerns: N/A
Maintenance Requirements:

- Well 0607 (DUR02) needs to be secured and modified to the current surface level. The casing is bent about 10 feet from the top.
- Well 0612 (DUR01) needs to be further investigated to determine if the casing is damaged because the water continues to have high turbidity. Suggest that a camera be lowered in to it to view the quality of the casing and screen.

Site Access: Samplers called Durango police dispatch @ 970-385-2900 as soon as they arrived at the Durango Mill Tailings site (DUR01, aka "the dog park") to let them know about sampling activities.

Corrective Action Taken: None.

(GRB/lcg)

cc: (electronic)
Joe Desormeau, DOE
Cheri Bahrke, Stoller
Steve Donivan, Stoller
EDD Delivery

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