Data Validation Package

April 2011
Groundwater and Surface Water Sampling at the Gunnison, Colorado, Processing Site

August 2011

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Gunnison, Colorado, Processing Site

Sampling Period: April 25-28, 2011, May 25, 2011, and June 14, 2011

This event included annual sampling of wells and surface water locations at the Gunnison, Colorado, Processing Site. Sampling and analyses were conducted as specified in *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PLN/S04351, continually updated).

Samples were collected from 28 monitoring wells, three domestic wells, and six surface locations in April at the processing site as specified in the draft 2010 *Ground Water Compliance Action Plan for the Gunnison, Colorado, Processing Site*. Domestic wells 0476 and 0478 were sampled in May and June because the homes were vacant in April and the wells were not in use. Domestic well 0479, which was included in the sampling letter, was not sampled because the residence is connected to the Dos Rios water system. This location will be removed from the long-term monitoring program. Duplicate samples were collected from locations 0012R and 0161. One equipment blank was collected during this sampling event. Water levels were measured at all monitoring wells that were sampled.

Manganese and uranium were selected as the constituents of potential concern at the Gunnison site because they exceeded a risk-based benchmark and a groundwater standard, respectively. A variety of tailings-related contaminants were monitored in the past, which were eliminated as constituents of potential concern because concentrations did not exceed groundwater standards and/or did not pose a significant risk to human health and the environment. Monitoring wells with sample concentrations that exceeded the U.S. Environmental Protection Agency (EPA) maximum contaminant level (MCL) for uranium (40 CFR 192) or the EPA drinking water equivalent level (DWEL) for manganese are listed in Table 1.

Time-concentration graphs for selected processing site monitoring wells are included with the analytical data. Time-concentration graphs for manganese indicate that concentrations of manganese in groundwater beneath and downgradient of the site are above the DWEL, but concentrations are generally decreasing with time. Time-concentration graphs for uranium indicate that concentrations of uranium in groundwater beneath and downgradient of the site are above the MCL, with concentrations decreasing in some portions of the aquifer and remaining constant or increasing in others.

Uranium concentrations in the five domestic wells sampled near the processing site were all below the EPA drinking water standard (0.030 milligrams per liter [mg/L]), and manganese concentrations in these wells were all below the DWEL.

Table 1. Gunnison Locations That Exceed the Uranium MCL and Manganese DWEL

Analyte	MCL[a]	DWEL[b]	Location	Concentration[c]
Uranium	0.044		0006	0.640
			0012R	0.310
			0013	0.120
			0113	0.200
			0183	0.054
Manganese		1.6	0105	3.7
			0106	5.2
			0112	4.9
			0113	2.3
			0135	2.7

[a] Uranium standard is listed in 40 CFR 192.04 Table 1 to Subpart A; units are in mg/L.
[b] DWEL from EPA 's *2011 Edition of the Drinking Water Standards and Health Advisories.*
[c] Units are in mg/L.

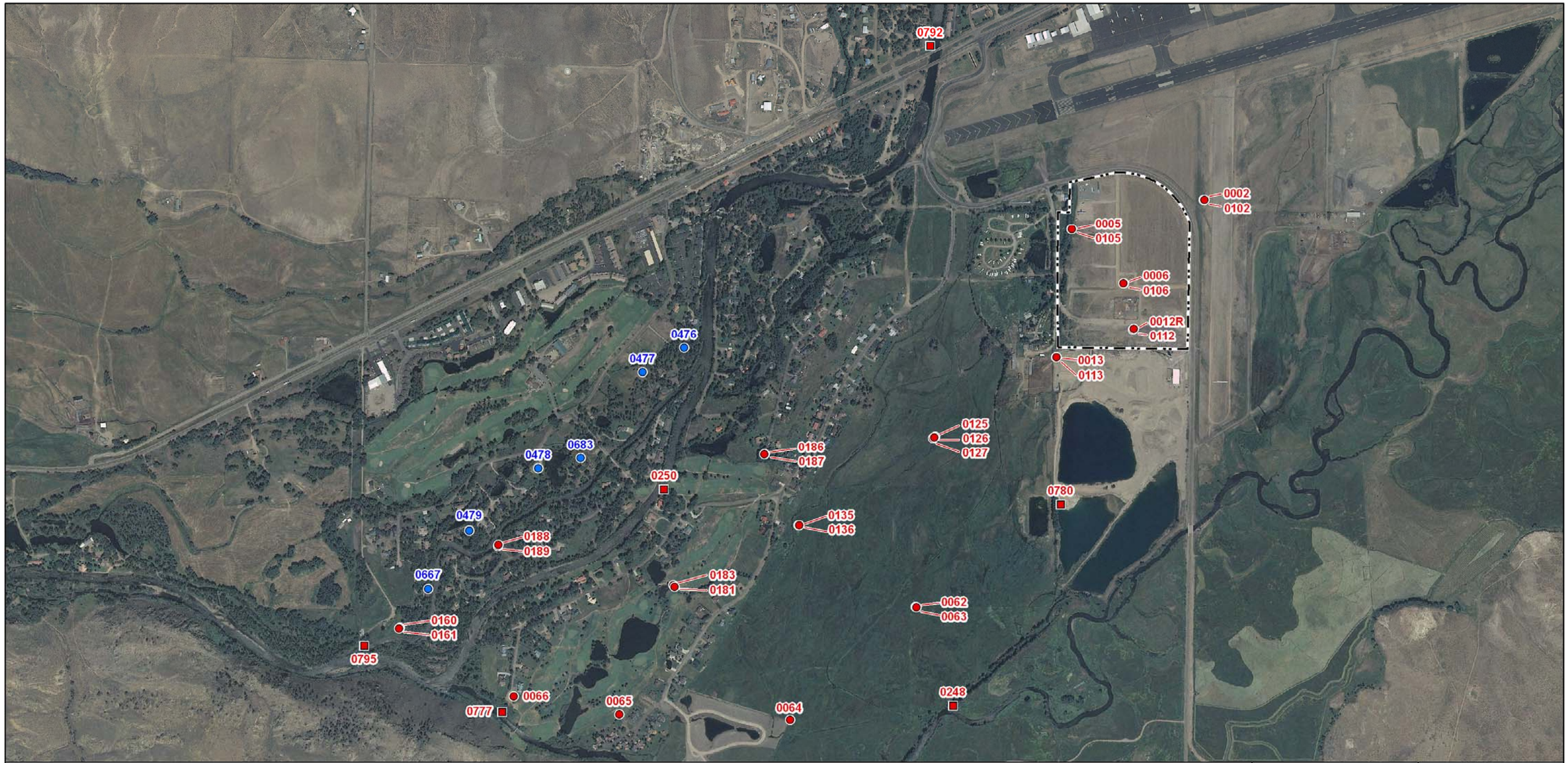
Surface water uranium concentrations were compared to a statistical benchmark derived from location 0792 data, which is located on the Gunnison River upstream from the site. The benchmark value is equal to the nonparametric, 95th upper tolerance limit because there are more than 15 percent but less than 50 percent non-detects. The uranium concentration at the Gunnison River downstream location 0795 and south fork location 0250 were less than the benchmark value indicating minimal impact to the Gunnison River from site activities. Uranium concentration at the gravel pit pond (0780) is elevated compared to the benchmark as expected because the gravel pit is recharged by contaminated groundwater from the site. Uranium concentrations at Tomichi Creek locations (0248 and 0777) were elevated compared to the benchmark because Tomichi Creek receives discharge from the gravel pit pond.

Table 2. Comparison of Surface Water Uranium Concentrations to the Benchmark Value

Description	Location	Uranium Concentration (mg/L)	Benchmark Value
Tomichi Creek	0248	0.012	0.0010
Gunnison River	0250	0.0008	
Tomichi Creek	0777	0.005	
Valco Pond	0780	0.031	
Gunnison River	0795	0.0009	

Sam Campbell
Site Lead, S.M. Stoller Corporation

9-13-2011
Date



Gunnison, Colorado, Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Gunnison, Colorado	**Date(s) of Water Sampling**	April 25–28, 2011, May 25, 2011, and June 14, 2011
Date(s) of Verification	July 18, 2011	**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 March 30, 2011.
2. Were the sampling locations specified in the planning documents sampled?	No	Domestic well 0479 was not sampled because the residence is connected to the Dos Rios water system.
3. Was a pre-trip calibration conducted as specified in the above-named documents?	No	A pre-trip calibration was not documented.
4. Was an operational check of the field equipment conducted daily?	Yes	
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
6. Was the category of the well documented?	Yes	
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements stabilize prior to sampling?	Yes	Turbidity at well 0183 was greater than 10 NTUs; sample was filtered.
Was the flow rate less than 500 mL/min?	Yes	
If a portable pump was used, was there a 4-hour delay between pump installation and sampling?	NA	

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	Yes	
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	Duplicate samples were collected from locations 0012R and 0161.
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?	NA	Sample chilling was not required.
20. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN): 11043733
Sample Event: April 25–28, 2011
Site(s): Gunnison, Colorado, Processing Site
Laboratory: ALS Laboratory Group, Fort Collins, Colorado
Work Order No.: 1104460
Analysis: Metals
Validator: Steve Donivan
Review Date: July 15, 2011

This validation was performed according to the *Environmental Procedures Catalog* (LMS/PRO/S04325, continually updated), "Standard Practice for Validation of Laboratory Data." The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation on the data review and validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 3.

Table 3. Analytes and Methods

Analyte	Line Item Code	Prep Method	Analytical Method
Manganese, Mn	LMM-01	SW-846 3005A	SW-846 6010B
Uranium, U	LMM-02	SW-846 3005A	SW-846 6020A

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 40 water samples on April 29, 2011, accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all of the samples were listed on the forms and that signatures and dates were present, indicating sample relinquishment and receipt. The COC form had no errors or omissions. Copies of the air waybill labels were included with the receiving documentation.

Preservation and Holding Times

The sample shipments were received intact at ambient temperature, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses and all samples were analyzed within the applicable holding times.

Data Qualifier Summary

The 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	Flag	Reason
1104460-1	0002	Mn	J	Negative calibration blank
1104460-25	0186	Mn	J	Negative calibration blank
1104460-33	0683	Mn	J	Negative calibration blank
1104460-40	Equipment Blank	Mn	J	Negative calibration blank

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, Manganese
Calibrations were performed for manganese on May 10, 2011. The initial calibration was performed using three calibration standards resulting in a calibration curve with a correlation coefficient (r^2) value greater than 0.995. The absolute value of the curve intercept was less than 3 times the method detection limit. Initial and continuing calibration verification checks were made at the required frequency resulting in 17 verification checks. All initial and continuing calibration verification results were within the acceptance range. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the practical quantitation limit (PQL). All check results were within the acceptance range.

Method SW-846 6020A, Uranium
Calibration was performed for uranium on May 9, 2011. The initial calibration was performed using four calibration standards resulting in a calibration curve with a correlation coefficient (r^2) value greater than 0.995. The absolute value of the curve intercept was less than 3 times the method detection limit. Initial and continuing calibration verification checks were made at the required frequency resulting in 13 verification checks. All initial and continuing calibration verification results were within the acceptance range. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the PQL. All check results were within the acceptance range. The mass calibration and resolution was checked at the beginning of each analytical run in accordance with the procedure. Internal standard recoveries were stable and within acceptance ranges.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. All method blank and initial and continuing calibration blank results were below the PQLs for magnesium and uranium. In cases where blank concentration exceeds

the instrument detection limit, the associated sample results are qualified with a "U" flag (not detected) when the sample result is greater than the method detection limit but less than 5 times the blank concentration. Many of the manganese blanks were negative, with the absolute values greater than the method detection limit, but less than the PQL. Associated sample results that are less than 5 times the detection limit are qualified with a "J" flag as estimated values.

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

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

Matrix Spike Analysis

Matrix spike and matrix spike duplicate (MS/MSD) pairs were analyzed for manganese and uranium as a measure of method performance in the sample matrix. The MS/MSD recoveries met the acceptance criteria for both analytes.

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 less than 5 times the PQL, the range should be no greater than the PQL. The replicate results met these criteria demonstrating acceptable laboratory precision.

Laboratory Control Samples

Laboratory control samples (LCS) were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. The LCS results were acceptable for all analysis.

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 PQL for method 6010 analytes, or 100 times the PQL 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 samples were diluted prior to analysis of uranium to reduce interferences. The required detection limits were achieved for both analytes.

Completeness

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

Electronic Data Deliverable (EDD) File

The EDD file arrived on May 14, 2011. 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: 11043733 **Lab Code:** PAR **Validator:** Steve Donivan **Validation Date:** 7/15/2011

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

# of Samples: 40 **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 2 duplicates evaluated.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 11043733 **Lab Code:** PAR **Date Due:** 5/27/2011

Matrix: Water **Site Code:** GUN **Date Completed:** 5/17/2011

Analyte	Method Type	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R^2	ICV	CCV	ICB	CCB								
Manganese	ICP/ES	05/10/2011	0.0000	1.0000	OK	OK	OK	OK	OK	102.0	101.0	101.0	0.0	91.0		93.0
Manganese	ICP/ES	05/10/2011							OK	103.0	98.0	97.0	1.0	92.0	2.0	102.0
Uranium	ICP/MS	05/09/2011	0.0000	1.0000	OK	OK	OK	OK	OK	101.0	105.0	100.0	4.0	105.0	1.0	70.0
Uranium	ICP/MS	05/09/2011							OK	97.0	92.0	85.0	2.0		7.0	85.0

General Information

Report Number (RIN): 11053820
Sample Event: May 25, 2011
Site(s): Gunnison, Colorado, Processing Site
Laboratory: ALS Laboratory Group, Fort Collins, Colorado
Work Order No.: 1105428
Analysis: Metals
Validator: Steve Donivan
Review Date: July 18, 2011

This validation was performed according to the *Environmental Procedures Catalog* (LMS/PRO/S04325), "Standard Practice for Validation of Laboratory Data." The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation on the data review and validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 3.

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received one water sample on May 27, 2011, accompanied by a COC form. The COC form was checked to confirm that the sample was listed on the form and that signatures and dates were present indicating sample relinquishment and receipt. The COC form had no errors or omissions. Copies of the air waybill labels were included with the receiving documentation.

Preservation and Holding Times

The sample shipments were received intact at ambient temperature, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses and all samples were analyzed within the applicable holding times.

Data Qualifier Summary

None of the analytical results required qualification.

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 6010M, Manganese
Calibrations were performed for manganese on June 13, 2011. The initial calibration was performed using three calibration standards resulting in a calibration curve with a correlation coefficient (r^2) value greater than 0.995. The absolute value of the curve intercept was less than 3 times the method detection limit. Initial and continuing calibration verification checks were made at the required frequency resulting in 12 verification checks. All initial and continuing calibration verification results were within the acceptance range. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the PQL. All check results were within the acceptance range.

Method SW-846 6020A, Uranium
Calibration was performed for uranium on June 13, 2011. The initial calibration was performed using four calibration standards resulting in a calibration curve with a correlation coefficient (r^2) value greater than 0.995. The absolute value of the curve intercept was less than 3 times the method detection limit. Initial and continuing calibration verification checks were made at the required frequency resulting in 13 verification checks. All initial and continuing calibration verification results were within the acceptance range. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the PQL. All check results were within the acceptance range. The mass calibration and resolution was checked at the beginning of each analytical run in accordance with the procedure. Internal standard recoveries were stable and within acceptance ranges.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. All method blank and initial and continuing calibration blank results were below the PQLs for magnesium and uranium. In cases where blank concentration exceeds the instrument detection limit, the associated sample results are qualified with a "U" flag (not detected) when the sample result is greater than the method detection limit but less than 5 times the blank concentration.

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

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

Matrix Spike Analysis

MS/MSD pairs were analyzed for manganese and uranium as a measure of method performance in the sample matrix. The MS/MSD recoveries met the acceptance criteria for both analytes.

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 less than 5 times the PQL, the range should be no greater than the PQL. The replicate results met these criteria demonstrating acceptable laboratory precision.

Laboratory Control Samples

LCS were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. The LCS results were acceptable for all analyses.

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 PQL for method 6010 analytes, or 100 times the PQL 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 samples were diluted prior to analysis of uranium to reduce interferences. The required detection limits were achieved for both analytes.

Completeness

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

Electronic Data Deliverable File

The EDD file arrived on May 24, 2011. 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: 11053820 **Lab Code:** PAR **Validator:** Steve Donivan **Validation Date:** 7/18/2011

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

# of Samples: 1 **Matrix:** WATER **Requested Analysis Completed:** Yes

Chain of Custody

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

Sample

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

Select Quality Parameters

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

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 11053820 **Lab Code:** PAR **Date Due:** 6/24/2011

Matrix: Water **Site Code:** GUN **Date Completed:** 6/30/2011

Analyte	Method Type	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R^2	ICV	CCV	ICB	CCB								
Manganese	ICP/ES	06/13/2011	0.0000	1.0000	OK	OK	OK	OK	OK	99.0	98.0	99.0	1.0	95.0	6.0	107.0
Uranium	ICP/MS	06/13/2011	0.0000	1.0000	OK	OK	OK	OK	OK	105.0	102.0	106.0	3.0	107.0		100.0

General Information

Report Number (RIN): 11063878
Sample Event: June 14, 2011
Site(s): Gunnison, Colorado, Processing Site
Laboratory: ALS Laboratory Group, Fort Collins, Colorado
Work Order No.: 1106237
Analysis: Metals
Validator: Steve Donivan
Review Date: July 18, 2011

This validation was performed according to the *Environmental Procedures Catalog* (LMS/PRO/S04325), "Standard Practice for Validation of Laboratory Data." The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation on the data review and validation. All analyses were successfully completed. The samples were prepared and analyzed using accepted procedures based on methods specified by line item code, which are listed in Table 3.

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received one water sample on June 16, 2011, accompanied by a COC form. The COC form was checked to confirm that the sample was listed on the form and that signatures and dates were present indicating sample relinquishment and receipt. The COC form had no errors or omissions. Copies of the air waybill labels were included with the receiving documentation.

Preservation and Holding Times

The sample shipments were received intact at ambient temperature, which complies with requirements. All samples were received in the correct container types, had been preserved correctly for the requested analyses, and all samples were analyzed within the applicable holding times.

Data Qualifier Summary

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

Table 5. Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
1106237-1	0476	Mn	U	Less than 5 times the method blank
1106237-1	0476	U	J	Poor replicate precision

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 6010M, Manganese
Calibrations were performed for manganese on June 20, 2011. The initial calibration was performed using three calibration standards resulting in a calibration curve with a correlation coefficient (r^2) value greater than 0.995. The absolute value of the curve intercept was less than 3 times the method detection limit. Initial and continuing calibration verification checks were made at the required frequency resulting in eight verification checks. All initial and continuing calibration verification results were within the acceptance range. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the PQL. All check results were within the acceptance range.

Method SW-846 6020A, Uranium
Calibration was performed for uranium on June 20, 2011. The initial calibration was performed using four calibration standards resulting in a calibration curve with a correlation coefficient (r^2) value greater than 0.995. The absolute value of the curve intercept was less than 3 times the method detection limit. Initial and continuing calibration verification checks were made at the required frequency resulting in six verification checks. All initial and continuing calibration verification results were within the acceptance range. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the PQL. All check results were within the acceptance range. The mass calibration and resolution was checked at the beginning of each analytical run in accordance with the procedure. Internal standard recoveries were stable and within acceptance ranges.

Method and Calibration Blanks

Method blanks are analyzed to assess any contamination that may have occurred during sample preparation. Calibration blanks are analyzed to assess instrument contamination prior to and during sample analysis. All method blank and initial and continuing calibration blank results were below the PQLs for magnesium and uranium. In cases where blank concentration exceeds the instrument detection limit, the associated sample results are qualified with a “U” flag (not detected) when the sample result is greater than the method detection limit but less than 5 times the blank concentration.

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

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

Matrix Spike Analysis

MS/MSD pairs were analyzed for manganese and uranium as a measure of method performance in the sample matrix. The MS/MSD recoveries met the acceptance criteria for both analytes.

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 less than 5 times the PQL, the range should be no greater than the PQL. The uranium replicate results did not meet these criteria. The sample uranium result is qualified with a "J" flag as an estimated value.

Laboratory Control Samples

LCS were analyzed at the correct frequency to provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. The LCS results were acceptable for all analyses.

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 PQL for method 6010 analytes, or 100 times the PQL 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 samples were diluted prior to analysis of uranium to reduce interferences. The required detection limits were achieved for both analytes.

Completeness

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

Electronic Data Deliverable File

The EDD file arrived on June 30, 2011. 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: 11063878 **Lab Code:** PAR **Validator:** Steve Donivan **Validation Date:** 7/18/2011

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

# of Samples: 1 **Matrix:** WATER **Requested Analysis Completed:** Yes

Chain of Custody

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

Sample

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

Select Quality Parameters

- ☑ Holding Times
- ☑ Detection Limits
- ☐ Field/Trip Blanks
- ☐ Field Duplicates

All analyses were completed within the applicable holding times.

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

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 11063878 **Lab Code:** PAR **Date Due:** 7/7/2011

Matrix: Water **Site Code:** GUN **Date Completed:** 6/30/2011

Analyte	Method Type	Date Analyzed	CALIBRATION						Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R^2	ICV	CCV	ICB	CCB								
Manganese	ICP/ES	06/20/2011	0.0000	1.0000	OK	OK	OK	OK	OK	96.0	96.0	96.0	0.0	92.0		101.0
Uranium	ICP/MS	06/20/2011	0.0000	1.0000	OK	OK	OK	OK	OK	101.0	109.0	106.0	2.0	108.0		120.0
Uranium	ICP/MS	06/20/2011											22.0			

Sampling Quality Control Assessment

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

Sampling Protocol

Sample results for all monitoring wells (except monitoring well 0183) 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. The turbidity criteria was not met at monitoring well 0183; this well was noted as needing additional well development.

The groundwater sample results for well 0189 were qualified with a "Q" flag in the database indicating the data are considered qualitative because the wells were sampled using Category II criteria.

The turbidity exceeded 10 NTUs at the time of sampling at groundwater location 0183, 0189, and surface water location 0777. The samples collected from these locations were field filtered.

Equipment Blank Assessment

Equipment blanks are prepared and analyzed to document contamination attributable to the sample collection process. One equipment blank was submitted with these samples. There were no analytes detected in this blank.

Field Duplicate Assessment

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates, which measure only laboratory performance. The relative percent difference for duplicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than the PQL, the range should be no greater than the PQL. Duplicate samples were collected from locations 0012R and 0161. The duplicate results met these criteria, demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 11043733 **Lab Code:** PAR **Project:** Gunnison **Validation Date:** 7/15/2011

Duplicate: 2597 **Sample:** 0161

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Manganese	3.4	B		1	2.9	B		1	15.87		UG/L
Uranium	19			10	18			10	5.41		UG/L

Duplicate: 2598 **Sample:** 0012R

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Manganese	410			1	370			1	10.26		UG/L
Uranium	310			50	280			50	10.17		UG/L

Certification

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

Laboratory Coordinator: Steve Donivan — Date: 8-10-2011

Data Validation Lead: Steve Donivan — Date: 8-10-2011

Attachment 1
Assessment of Anomalous Data

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Potential Outliers Report

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Potential Outliers Report

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

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

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

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

There were no potential outliers identified, and the data for this event are acceptable as qualified.

Data Validation Outliers Report - No Field Parameters
Comparison: All Historical Data
Laboratory: ALS Laboratory Group
RIN: 11043733
Report Date: 7/20/2011

					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	
GUN01	0062	N001	04/27/2011	Manganese	0.0013	B	F	0.083		F	0.0029	B	F	6	0	No
GUN01	0064	N001	04/27/2011	Uranium	0.0091		F	0.019		F	0.01		F	6	0	No
GUN01	0065	N001	04/27/2011	Uranium	0.028		F	0.034		F	0.03		FQ	6	0	No
GUN01	0106	N001	04/26/2011	Uranium	0.014		F	0.013		F	0.0002	U		33	15	No
GUN01	0127	N001	04/28/2011	Uranium	0.015		F	0.053			0.016		F	28	0	No
GUN01	0161	N002	04/26/2011	Manganese	0.0029	B	F	2.31			0.0054		F	31	10	No
GUN01	0161	N001	04/26/2011	Manganese	0.0034	B	F	2.31			0.0054		F	31	10	No
GUN01	0189	0001	04/26/2011	Manganese	0.81		FQ	2.7			0.82		FQ	30	0	No
GUN01	0777	0001	04/25/2011	Manganese	0.04			0.149			0.05			14	0	No

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

Attachment 2
Data Presentation

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Groundwater Quality Data

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Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0002 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/27/2011	N001	10	-	15	0.00044	B	FJ	#	0.00011	
Oxidation Reduction Potential	mV	04/27/2011	N001	10	-	15	67.7		F	#		
pH	s.u.	04/27/2011	N001	10	-	15	7.28		F	#		
Specific Conductance	umhos /cm	04/27/2011	N001	10	-	15	555		F	#		
Temperature	C	04/27/2011	N001	10	-	15	7.71		F	#		
Turbidity	NTU	04/27/2011	N001	10	-	15	3.54		F	#		
Uranium	mg/L	04/27/2011	N001	10	-	15	0.0029		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0005 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	10	-	15	0.81		F	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	10	-	15	18.9		F	#		
pH	s.u.	04/26/2011	N001	10	-	15	7.15		F	#		
Specific Conductance	umhos /cm	04/26/2011	N001	10	-	15	540		F	#		
Temperature	C	04/26/2011	N001	10	-	15	5.39		F	#		
Turbidity	NTU	04/26/2011	N001	10	-	15	3.36		F	#		
Uranium	mg/L	04/26/2011	N001	10	-	15	0.043		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0006 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	10	-	15	0.03		F	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	10	-	15	102.2		F	#		
pH	s.u.	04/26/2011	N001	10	-	15	6.86		F	#		
Specific Conductance	umhos /cm	04/26/2011	N001	10	-	15	2179		F	#		
Temperature	C	04/26/2011	N001	10	-	15	7.14		F	#		
Turbidity	NTU	04/26/2011	N001	10	-	15	9.2		F	#		
Uranium	mg/L	04/26/2011	N001	10	-	15	0.64		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0012R WELL Replacement well for 0012, broken casing, decommissioned

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	6.03	-	16	0.41		F	#	0.00011	
Manganese	mg/L	04/26/2011	N002	6.03	-	16	0.37		F	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	6.03	-	16	100		F	#		
pH	s.u.	04/26/2011	N001	6.03	-	16	6.89		F	#		
Specific Conductance	umhos /cm	04/26/2011	N001	6.03	-	16	1182		F	#		
Temperature	C	04/26/2011	N001	6.03	-	16	6.05		F	#		
Turbidity	NTU	04/26/2011	N001	6.03	-	16	7.29		F	#		
Uranium	mg/L	04/26/2011	N001	6.03	-	16	0.31		F	#	0.00015	
Uranium	mg/L	04/26/2011	N002	6.03	-	16	0.28		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0013 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	11	-	16	0.019		F	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	11	-	16	85.1		F	#		
pH	s.u.	04/26/2011	N001	11	-	16	7		F	#		
Specific Conductance	umhos /cm	04/26/2011	N001	11	-	16	1005		F	#		
Temperature	C	04/26/2011	N001	11	-	16	6.86		F	#		
Turbidity	NTU	04/26/2011	N001	11	-	16	1.89		F	#		
Uranium	mg/L	04/26/2011	N001	11	-	16	0.12		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0062 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/27/2011	N001	47.9	-	57.9	0.0013	B	F	#	0.00011	
Oxidation Reduction Potential	mV	04/27/2011	N001	47.9	-	57.9	70		F	#		
pH	s.u.	04/27/2011	N001	47.9	-	57.9	7.42		F	#		
Specific Conductance	umhos /cm	04/27/2011	N001	47.9	-	57.9	539		F	#		
Temperature	C	04/27/2011	N001	47.9	-	57.9	7.7		F	#		
Turbidity	NTU	04/27/2011	N001	47.9	-	57.9	1.44		F	#		
Uranium	mg/L	04/27/2011	N001	47.9	-	57.9	0.0085		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0063 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/27/2011	N001	87.9	-	97.9	0.021		F	#	0.00011	
Oxidation Reduction Potential	mV	04/27/2011	N001	87.9	-	97.9	67.6		F	#		
pH	s.u.	04/27/2011	N001	87.9	-	97.9	7.47		F	#		
Specific Conductance	umhos /cm	04/27/2011	N001	87.9	-	97.9	515		F	#		
Temperature	C	04/27/2011	N001	87.9	-	97.9	7.65		F	#		
Turbidity	NTU	04/27/2011	N001	87.9	-	97.9	3.79		F	#		
Uranium	mg/L	04/27/2011	N001	87.9	-	97.9	0.013		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0064 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/27/2011	N001	86.7	-	96.7	0.0071		F	#	0.00011	
Oxidation Reduction Potential	mV	04/27/2011	N001	86.7	-	96.7	50.5		F	#		
pH	s.u.	04/27/2011	N001	86.7	-	96.7	7.34		F	#		
Specific Conductance	umhos /cm	04/27/2011	N001	86.7	-	96.7	478		F	#		
Temperature	C	04/27/2011	N001	86.7	-	96.7	7.65		F	#		
Turbidity	NTU	04/27/2011	N001	86.7	-	96.7	1.7		F	#		
Uranium	mg/L	04/27/2011	N001	86.7	-	96.7	0.0091		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0065 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/27/2011	N001	49.7	-	59.7	0.024		F	#	0.00011	
Oxidation Reduction Potential	mV	04/27/2011	N001	49.7	-	59.7	71		F	#		
pH	s.u.	04/27/2011	N001	49.7	-	59.7	7.32		F	#		
Specific Conductance	umhos /cm	04/27/2011	N001	49.7	-	59.7	722		F	#		
Temperature	C	04/27/2011	N001	49.7	-	59.7	10.41		F	#		
Turbidity	NTU	04/27/2011	N001	49.7	-	59.7	5.58		F	#		
Uranium	mg/L	04/27/2011	N001	49.7	-	59.7	0.028		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0066 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/25/2011	N001	40.2	-	50.2	0.012		F	#	0.00011	
Oxidation Reduction Potential	mV	04/25/2011	N001	40.2	-	50.2	149.1		F	#		
pH	s.u.	04/25/2011	N001	40.2	-	50.2	7.16		F	#		
Specific Conductance	umhos /cm	04/25/2011	N001	40.2	-	50.2	508		F	#		
Temperature	C	04/25/2011	N001	40.2	-	50.2	6.81		F	#		
Turbidity	NTU	04/25/2011	N001	40.2	-	50.2	3.95		F	#		
Uranium	mg/L	04/25/2011	N001	40.2	-	50.2	0.023		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0102 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/27/2011	N001	42	-	47	0.0023	B	F	#	0.00011	
Oxidation Reduction Potential	mV	04/27/2011	N001	42	-	47	70		F	#		
pH	s.u.	04/27/2011	N001	42	-	47	7.53		F	#		
Specific Conductance	umhos /cm	04/27/2011	N001	42	-	47	588		F	#		
Temperature	C	04/27/2011	N001	42	-	47	9.37		F	#		
Turbidity	NTU	04/27/2011	N001	42	-	47	4.21		F	#		
Uranium	mg/L	04/27/2011	N001	42	-	47	0.0042		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0105 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	42	-	47	3.7		F	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	42	-	47	31.3		F	#		
pH	s.u.	04/26/2011	N001	42	-	47	6.65		F	#		
Specific Conductance	umhos /cm	04/26/2011	N001	42	-	47	527		F	#		
Temperature	C	04/26/2011	N001	42	-	47	8.15		F	#		
Turbidity	NTU	04/26/2011	N001	42	-	47	4.92		F	#		
Uranium	mg/L	04/26/2011	N001	42	-	47	0.012		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0106 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	34	-	39	5.2		F	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	34	-	39	90.6		F	#		
pH	s.u.	04/26/2011	N001	34	-	39	5.88		F	#		
Specific Conductance	umhos /cm	04/26/2011	N001	34	-	39	1936		F	#		
Temperature	C	04/26/2011	N001	34	-	39	7.82		F	#		
Turbidity	NTU	04/26/2011	N001	34	-	39	8.49		F	#		
Uranium	mg/L	04/26/2011	N001	34	-	39	0.014		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0112 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	40	-	45	4.9		F	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	40	-	45	54.9		F	#		
pH	s.u.	04/26/2011	N001	40	-	45	6.21		F	#		
Specific Conductance	umhos /cm	04/26/2011	N001	40	-	45	930		F	#		
Temperature	C	04/26/2011	N001	40	-	45	7.99		F	#		
Turbidity	NTU	04/26/2011	N001	40	-	45	5.64		F	#		
Uranium	mg/L	04/26/2011	N001	40	-	45	0.043		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0113 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	41	-	46	2.3		F	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	41	-	46	71.7		F	#		
pH	s.u.	04/26/2011	N001	41	-	46	6.81		F	#		
Specific Conductance	umhos /cm	04/26/2011	N001	41	-	46	788		F	#		
Temperature	C	04/26/2011	N001	41	-	46	10.21		F	#		
Turbidity	NTU	04/26/2011	N001	41	-	46	5.58		F	#		
Uranium	mg/L	04/26/2011	N001	41	-	46	0.2		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0125 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/28/2011	N001	17.8	-	22.8	0.051		F	#	0.00011	
Oxidation Reduction Potential	mV	04/28/2011	N001	17.8	-	22.8	162.2		F	#		
pH	s.u.	04/28/2011	N001	17.8	-	22.8	7.14		F	#		
Specific Conductance	umhos /cm	04/28/2011	N001	17.8	-	22.8	637		F	#		
Temperature	C	04/28/2011	N001	17.8	-	22.8	5.5		F	#		
Turbidity	NTU	04/28/2011	N001	17.8	-	22.8	3.02		F	#		
Uranium	mg/L	04/28/2011	N001	17.8	-	22.8	0.011		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0126 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/28/2011	N001	54	-	59	0.015		F	#	0.00011	
Oxidation Reduction Potential	mV	04/28/2011	N001	54	-	59	140.9		F	#		
pH	s.u.	04/28/2011	N001	54	-	59	7.16		F	#		
Specific Conductance	umhos /cm	04/28/2011	N001	54	-	59	692		F	#		
Temperature	C	04/28/2011	N001	54	-	59	7.79		F	#		
Turbidity	NTU	04/28/2011	N001	54	-	59	6.84		F	#		
Uranium	mg/L	04/28/2011	N001	54	-	59	0.01		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0127 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/28/2011	N001	94	-	99	0.032		F	#	0.00011	
Oxidation Reduction Potential	mV	04/28/2011	N001	94	-	99	136.2		F	#		
pH	s.u.	04/28/2011	N001	94	-	99	7.35		F	#		
Specific Conductance	umhos /cm	04/28/2011	N001	94	-	99	754		F	#		
Temperature	C	04/28/2011	N001	94	-	99	7.26		F	#		
Turbidity	NTU	04/28/2011	N001	94	-	99	1.86		F	#		
Uranium	mg/L	04/28/2011	N001	94	-	99	0.015		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0135 WELL Well is knocked over!!

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/27/2011	N001	18	-	23	2.7		F	#	0.00011	
Oxidation Reduction Potential	mV	04/27/2011	N001	18	-	23	44		F	#		
pH	s.u.	04/27/2011	N001	18	-	23	6.95		F	#		
Specific Conductance	umhos /cm	04/27/2011	N001	18	-	23	474		F	#		
Temperature	C	04/27/2011	N001	18	-	23	5.66		F	#		
Turbidity	NTU	04/27/2011	N001	18	-	23	4.25		F	#		
Uranium	mg/L	04/27/2011	N001	18	-	23	0.0024		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0136 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/27/2011	N001	53	-	58	0.072		F	#	0.00011	
Oxidation Reduction Potential	mV	04/27/2011	N001	53	-	58	0.1		F	#		
pH	s.u.	04/27/2011	N001	53	-	58	7.34		F	#		
Specific Conductance	umhos /cm	04/27/2011	N001	53	-	58	763		F	#		
Temperature	C	04/27/2011	N001	53	-	58	8.28		F	#		
Turbidity	NTU	04/27/2011	N001	53	-	58	2.76		F	#		
Uranium	mg/L	04/27/2011	N001	53	-	58	0.017		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0160 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	51	-	56	0.12		F	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	51	-	56	62.7		F	#		
pH	s.u.	04/26/2011	N001	51	-	56	6.66		F	#		
Specific Conductance	umhos /cm	04/26/2011	N001	51	-	56	786		F	#		
Temperature	C	04/26/2011	N001	51	-	56	6.54		F	#		
Turbidity	NTU	04/26/2011	N001	51	-	56	9.74		F	#		
Uranium	mg/L	04/26/2011	N001	51	-	56	0.022		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0161 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	93	-	98	0.0034	B	F	#	0.00011	
Manganese	mg/L	04/26/2011	N002	93	-	98	0.0029	B	F	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	93	-	98	79		F	#		
pH	s.u.	04/26/2011	N001	93	-	98	6.63		F	#		
Specific Conductance	umhos /cm	04/26/2011	N001	93	-	98	842		F	#		
Temperature	C	04/26/2011	N001	93	-	98	6.85		F	#		
Turbidity	NTU	04/26/2011	N001	93	-	98	5.07		F	#		
Uranium	mg/L	04/26/2011	N001	93	-	98	0.019		F	#	0.000029	
Uranium	mg/L	04/26/2011	N002	93	-	98	0.018		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0181 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/25/2011	N001	18	-	23	0.29		F	#	0.00011	
Oxidation Reduction Potential	mV	04/25/2011	N001	18	-	23	122.6		F	#		
pH	s.u.	04/25/2011	N001	18	-	23	6.99		F	#		
Specific Conductance	umhos /cm	04/25/2011	N001	18	-	23	570		F	#		
Temperature	C	04/25/2011	N001	18	-	23	7.3		F	#		
Turbidity	NTU	04/25/2011	N001	18	-	23	7.48		F	#		
Uranium	mg/L	04/25/2011	N001	18	-	23	0.011		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0183 WELL Casing bent.

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	0001	93	-	98	0.0012	B	F	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	93	-	98	113		F	#		
pH	s.u.	04/26/2011	N001	93	-	98	6.65		F	#		
Specific Conductance	umhos /cm	04/26/2011	N001	93	-	98	1155		F	#		
Temperature	C	04/26/2011	N001	93	-	98	6.17		F	#		
Turbidity	NTU	04/26/2011	N001	93	-	98	22.2		F	#		
Uranium	mg/L	04/26/2011	0001	93	-	98	0.054		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0186 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	53	-	58	0.00052	B	FJ	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	53	-	58	-29.9		F	#		
pH	s.u.	04/26/2011	N001	53	-	58	7.63		F	#		
Specific Conductance	umhos /cm	04/26/2011	N001	53	-	58	604		F	#		
Temperature	C	04/26/2011	N001	53	-	58	6.11		F	#		
Turbidity	NTU	04/26/2011	N001	53	-	58	8.68		F	#		
Uranium	mg/L	04/26/2011	N001	53	-	58	0.02		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0187 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	93	-	98	0.99		F	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	93	-	98	54.3		F	#		
pH	s.u.	04/26/2011	N001	93	-	98	6.47		F	#		
Specific Conductance	umhos /cm	04/26/2011	N001	93	-	98	800		F	#		
Temperature	C	04/26/2011	N001	93	-	98	6.78		F	#		
Turbidity	NTU	04/26/2011	N001	93	-	98	4.65		F	#		
Uranium	mg/L	04/26/2011	N001	93	-	98	0.012		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0188 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	53	-	58	0.002	B	F	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	53	-	58	-25.8		F	#		
pH	s.u.	04/26/2011	N001	53	-	58	7.19		F	#		
Specific Conductance	umhos /cm	04/26/2011	N001	53	-	58	731		F	#		
Temperature	C	04/26/2011	N001	53	-	58	6.52		F	#		
Turbidity	NTU	04/26/2011	N001	53	-	58	4.65		F	#		
Uranium	mg/L	04/26/2011	N001	53	-	58	0.027		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0189 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)			Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	0001	93	-	98	0.81		FQ	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	93	-	98	2.9		FQ	#		
pH	s.u.	04/26/2011	N001	93	-	98	6.32		FQ	#		
Specific Conductance	umhos /cm	04/26/2011	N001	93	-	98	2113		FQ	#		
Temperature	C	04/26/2011	N001	93	-	98	5.9		FQ	#		
Turbidity	NTU	04/26/2011	N001	93	-	98	12.2		FQ	#		
Uranium	mg/L	04/26/2011	0001	93	-	98	0.015		FQ	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0476 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	06/14/2011	N001	-	0.0015	B	U	#	0.00011	
Oxidation Reduction Potential	mV	06/14/2011	N001	-	120			#		
pH	s.u.	06/14/2011	N001	-	6.67			#		
Specific Conductance	umhos /cm	06/14/2011	N001	-	255			#		
Temperature	C	06/14/2011	N001	-	15.6			#		
Turbidity	NTU	06/14/2011	N001	-	1.17			#		
Uranium	mg/L	06/14/2011	N001	-	0.0016	E*	J	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0477 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	05/25/2011	N001	-	0.021			#	0.00011	
Oxidation Reduction Potential	mV	05/25/2011	N001	-	130.9			#		
pH	s.u.	05/25/2011	N001	-	7.71			#		
Specific Conductance	umhos /cm	05/25/2011	N001	-	234			#		
Temperature	C	05/25/2011	N001	-	10.81			#		
Turbidity	NTU	05/25/2011	N001	-	8.2			#		
Uranium	mg/L	05/25/2011	N001	-	0.0012			#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0478 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/27/2011	N001	-	0.62			#	0.00011	
Oxidation Reduction Potential	mV	04/27/2011	N001	-	87.9			#		
pH	s.u.	04/27/2011	N001	-	7.39			#		
Specific Conductance	umhos /cm	04/27/2011	N001	-	310			#		
Temperature	C	04/27/2011	N001	-	14.37			#		
Turbidity	NTU	04/27/2011	N001	-	4.85			#		
Uranium	mg/L	04/27/2011	N001	-	0.003			#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0667 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	-	0.00055	B		#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	-	51.4			#		
pH	s.u.	04/26/2011	N001	-	7.29			#		
Specific Conductance	umhos /cm	04/26/2011	N001	-	217			#		
Temperature	C	04/26/2011	N001	-	9.14			#		
Turbidity	NTU	04/26/2011	N001	-	3.52			#		
Uranium	mg/L	04/26/2011	N001	-	0.00097			#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0683 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	-	0.00044	B	J	#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	-	89			#		
pH	s.u.	04/26/2011	N001	-	7.39			#		
Specific Conductance	umhos /cm	04/26/2011	N001	-	295			#		
Temperature	C	04/26/2011	N001	-	15.5			#		
Turbidity	NTU	04/26/2011	N001	-	5.99			#		
Uranium	mg/L	04/26/2011	N001	-	0.0035			#	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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Surface Water Quality Data

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Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0248 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/27/2011	N001	0.1			#	0.00011	
Oxidation Reduction Potential	mV	04/27/2011	N001	79.4			#		
pH	s.u.	04/27/2011	N001	8.06			#		
Specific Conductance	umhos/cm	04/27/2011	N001	398			#		
Temperature	C	04/27/2011	N001	8.45			#		
Turbidity	NTU	04/27/2011	N001	7.13			#		
Uranium	mg/L	04/27/2011	N001	0.012			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0250 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/25/2011	N001	0.031			#	0.00011	
Oxidation Reduction Potential	mV	04/25/2011	N001	132.5			#		
pH	s.u.	04/25/2011	N001	8.27			#		
Specific Conductance	umhos/cm	04/25/2011	N001	216			#		
Temperature	C	04/25/2011	N001	8.55			#		
Turbidity	NTU	04/25/2011	N001	7.16			#		
Uranium	mg/L	04/25/2011	N001	0.00076			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0777 SURFACE LOCATION Tomichi Creek SSE of well 0058

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/25/2011	0001	0.04			#	0.00011	
Uranium	mg/L	04/25/2011	0001	0.005			#	0.000029	
Oxidation Reduction Potential	mV	04/25/2011	N001	180.6			#		
pH	s.u.	04/25/2011	N001	8.2			#		
Specific Conductance	umhos/cm	04/25/2011	N001	265			#		
Temperature	C	04/25/2011	N001	8.18			#		
Turbidity	NTU	04/25/2011	N001	26.3			#		

Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0780 SURFACE LOCATION NE CORNER VALCO PIT

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	0.02			#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	85.3			#		
pH	s.u.	04/26/2011	N001	8.26			#		
Specific Conductance	umhos/cm	04/26/2011	N001	517			#		
Temperature	C	04/26/2011	N001	8.78			#		
Turbidity	NTU	04/26/2011	N001	7.87			#		
Uranium	mg/L	04/26/2011	N001	0.031			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0792 SURFACE LOCATION KMONKS, SURFACE LOCATION, 8/11/94

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	0.035			#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	137			#		
pH	s.u.	04/26/2011	N001	7.19			#		
Specific Conductance	umhos/cm	04/26/2011	N001	305			#		
Temperature	C	04/26/2011	N001	4.79			#		
Turbidity	NTU	04/26/2011	N001	9.74			#		
Uranium	mg/L	04/26/2011	N001	0.00078			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011
Location: 0795 SURFACE LOCATION KMONKS, SURFACE LOCATION, 8/11/94

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/26/2011	N001	0.03			#	0.00011	
Oxidation Reduction Potential	mV	04/26/2011	N001	45.5			#		
pH	s.u.	04/26/2011	N001	8.11			#		
Specific Conductance	umhos/cm	04/26/2011	N001	217			#		
Temperature	C	04/26/2011	N001	4.34			#		
Turbidity	NTU	04/26/2011	N001	8.15			#		
Uranium	mg/L	04/26/2011	N001	0.00084			#	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: 11043733
Report Date: 7/20/2011

Parameter	Site Code	Location ID	Sample Date	Sample ID	Units	Result	Qualifiers Lab	Qualifiers Data	Detection Limit	Uncertainty	Sample Type
Manganese	GUN01	0999	04/27/2011	N001	mg/L	0.00011	U	J	0.00011		E
Uranium	GUN01	0999	04/27/2011	N001	mg/L	0.000029	U		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 GUN01, Gunnison Processing Site
REPORT DATE: 7/20/2011

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)
0002	U	7646.75	04/27/2011	15:25:36	5.43	7641.32
0005	O	7644.66	04/26/2011	16:10:34	6.48	7638.18
0006	O	7647.23	04/26/2011	15:25:36	11.28	7635.95
0012R		7645.95	04/26/2011	14:40:34	11.78	7634.17
0013	D	7643.75	04/26/2011	13:50:52	12.18	7631.57
0062	O	7630.61	04/27/2011	17:20:20	6.25	7624.36
0063	O	7630.34	04/27/2011	16:55:07	7.45	7622.89
0064	O	7620.76	04/27/2011	18:10:24	6.57	7614.19
0065	O	7610.27	04/27/2011	11:00:04	2.1	7608.17
0066	O	7606.22	04/25/2011	17:25:19	2.07	7604.15
0102	U	7647.3	04/27/2011	16:05:56	6.05	7641.25
0105	O	7646.11	04/26/2011	16:20:57	5.43	7640.68
0106	O	7647.22	04/26/2011	15:40:49	11.4	7635.82
0112	O	7645.74	04/26/2011	14:55:06	12.14	7633.6
0113	D	7643.83	04/26/2011	13:25:12	12.25	7631.58
0125	D	7633.52	04/28/2011	07:50:45	6.41	7627.11
0126	D	7634.14	04/28/2011	08:20:18	6.51	7627.63
0127	D	7634.64	04/28/2011	08:40:27	8.33	7626.31
0135	D	7627.03	04/27/2011	09:15:07	5.9	7621.13
0136	D	7626.24	04/27/2011	14:10:58	5.32	7620.92
0160	D	7604.39	04/26/2011	10:00:01	5.35	7599.04
0161	D	7605.63	04/26/2011	10:25:01	6.72	7598.91
0181	D	7616.38	04/25/2011	16:40:38	2.72	7613.66
0183	D	7616.27	04/26/2011	19:40:41	4.37	7611.9
0186	D	7627.21	04/26/2011	08:50:41	5.78	7621.43
0187	D	7625.91	04/26/2011	08:30:08	5.36	7620.55
0188	D	7613.65	04/26/2011	11:40:40	6.02	7607.63
0189	D	7613.56	04/26/2011	11:25:05	6.51	7607.05

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

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Time-Concentration Graphs

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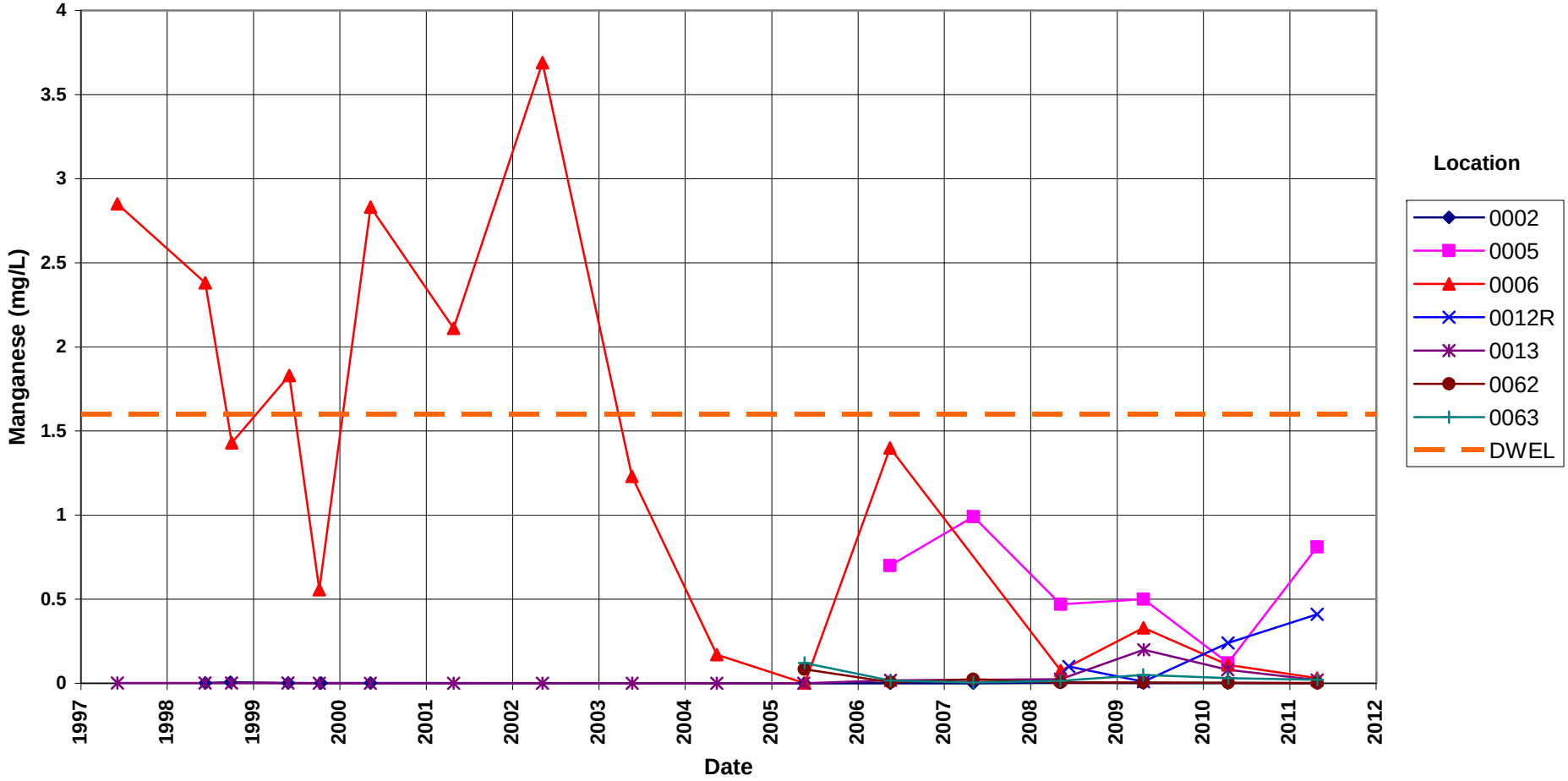
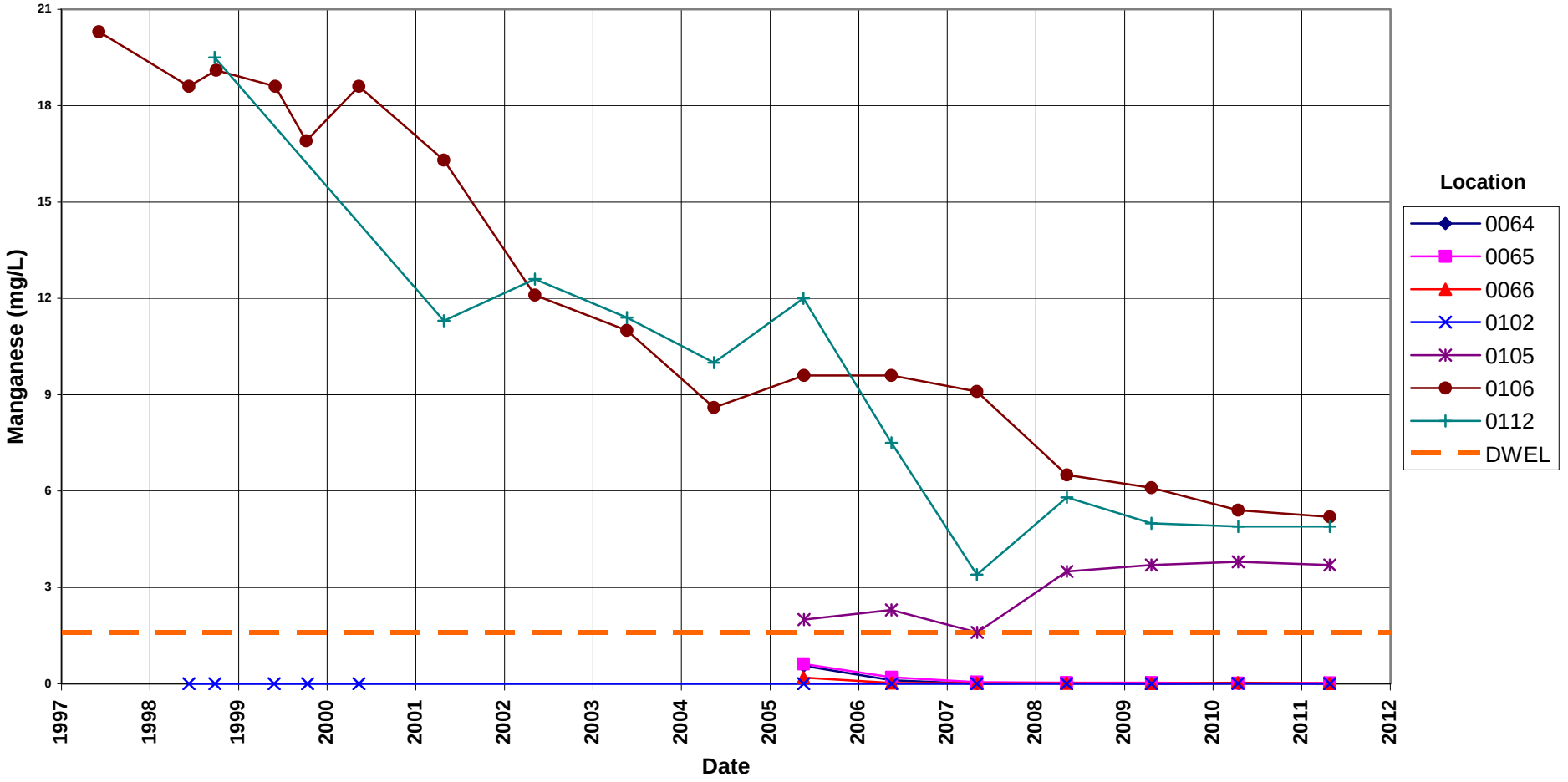
Gunnison Processing Site
Manganese Concentration
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



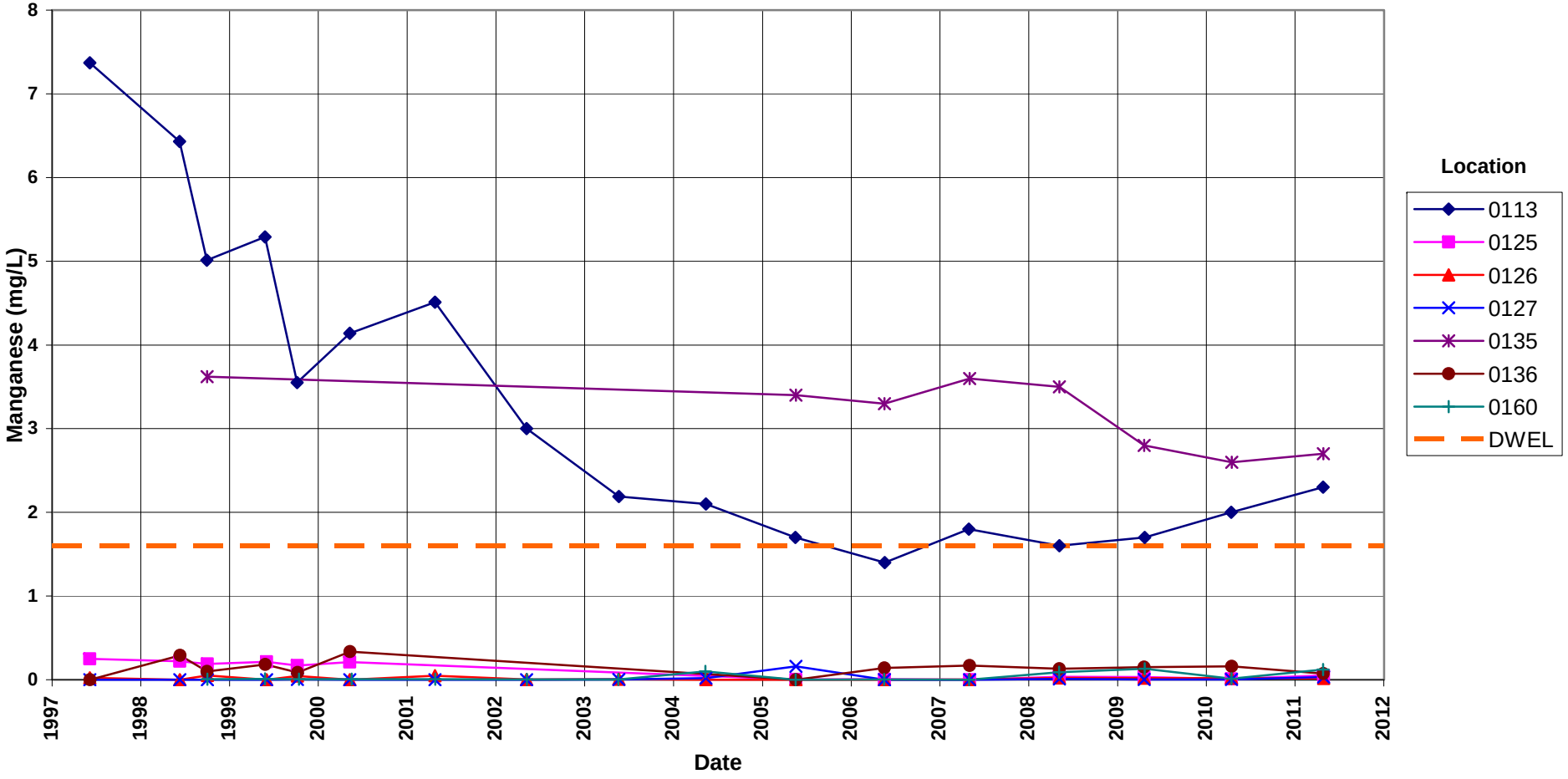
Gunnison Processing Site
Manganese Concentration

Drinking Water Equivalent Level (DWEL) = 1.6 mg/L

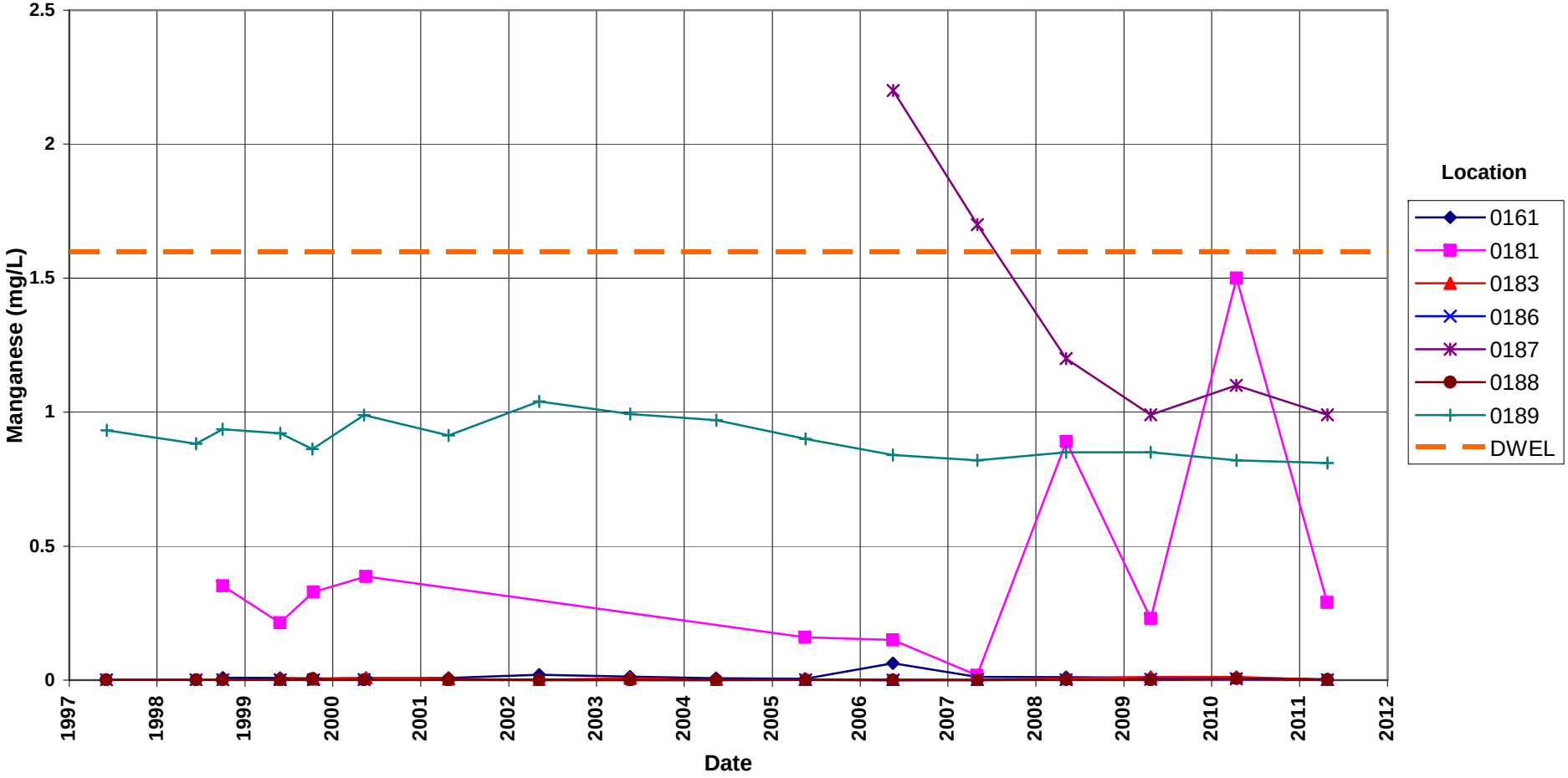


Gunnison Processing Site
Manganese Concentration

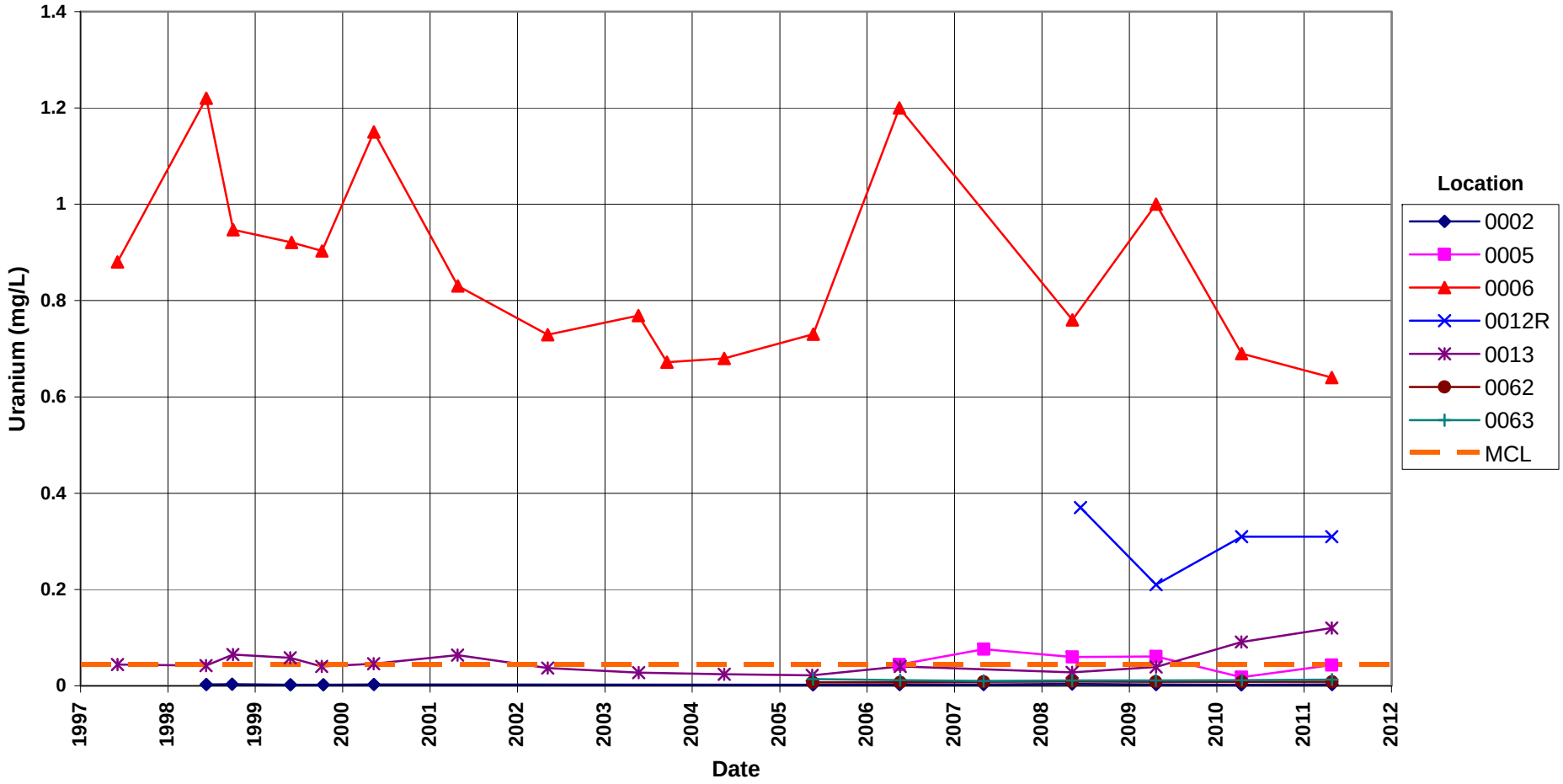
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



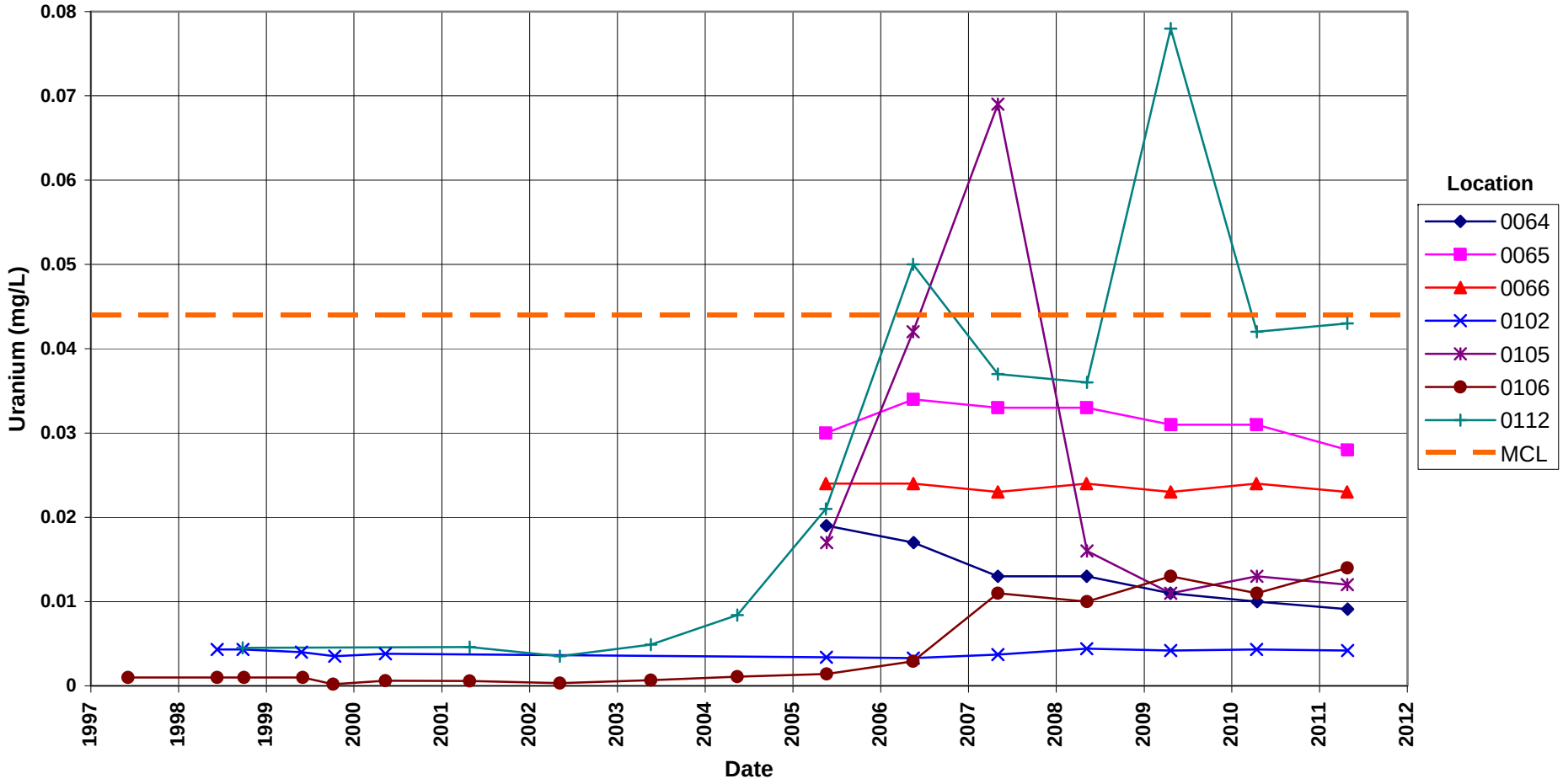
Gunnison Processing Site
Manganese Concentration
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



Gunnison Processing Site
Uranium Concentration
Maximum Contaminant Level (MCL) = 0.044 mg/L

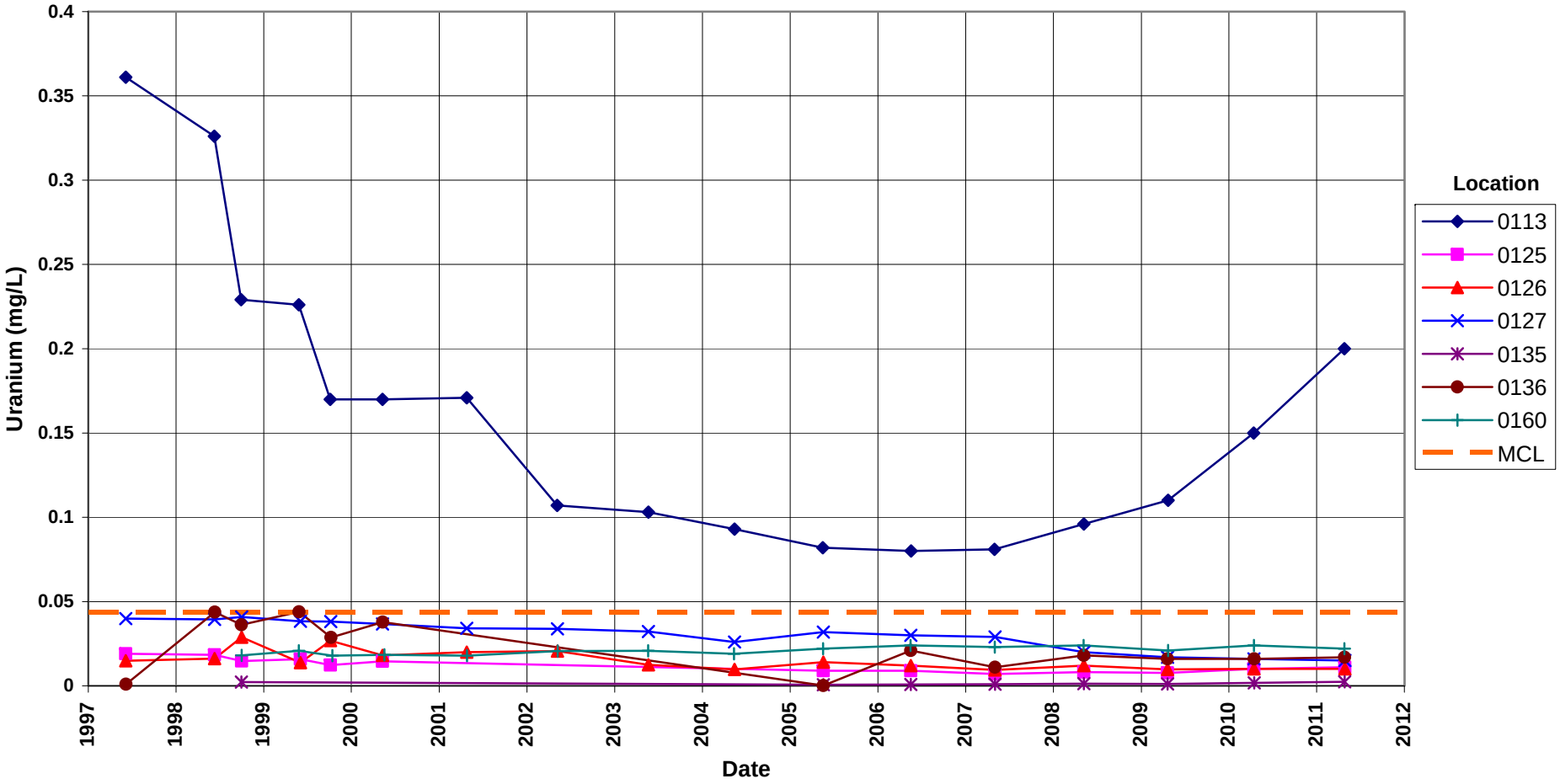


Gunnison Processing Site
Uranium Concentration
Maximum Contaminant Level (MCL) = 0.044 mg/L

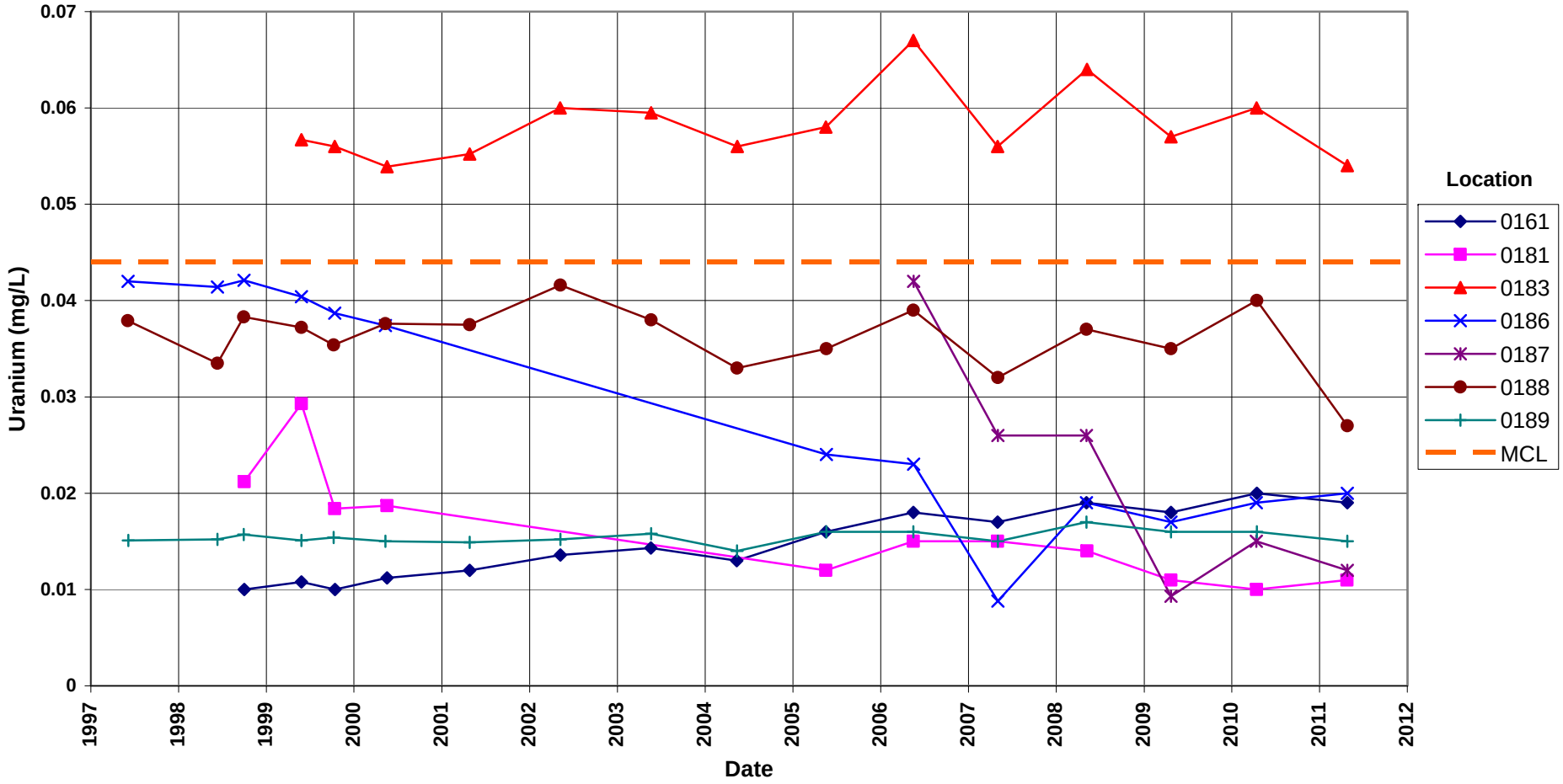


Gunnison Processing Site
Uranium Concentration

Maximum Contaminant Level (MCL) = 0.044 mg/L



Gunnison Processing Site
Uranium Concentration
Maximum Contaminant Level (MCL) = 0.044 mg/L



Attachment 3
Sampling and Analysis Work Order

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Stoller

established 1959

Task Order LM-501
Control Number: 11-0487

March 30, 2011

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

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller)
April 2011 Environmental Sampling at Gunnison, Colorado

REFERENCE: Task Order LM00-501-02-108-402, Gunnison, CO, Processing Site

Dear Mr. Desormeau:

The purpose of this letter is to inform you of the upcoming sampling at Gunnison, CO. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Gunnison, CO, Processing Site. Water quality data will be collected at this site as part of the routine environmental sampling currently scheduled to begin the week of April 25, 2011.

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

Processing Site (GUN01) Monitoring Wells*

002 Al	013 Al	065 Al	106 Al	126 Al	160 Al	186 Al
005 Al	062 Al	066 Al	112 Al	127 Al	161 Al	187 Al
006 Al	063 Al	102 Al	113 Al	135 Al	181 Al	188 Al
012R Al	064 Al	105 Al	125 Al	136 Al	183 Al	189 Al

Processing Site (GUN01) Domestic Wells*

476 Nr	477 Nr	478 Nr	479 Nr	667 Al	683 Nr

*NOTE: Al = Alluvium; Nr = no recovery of data for classifying

Surface Locations (GUN01)

248	250	777	780	792	795

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.

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

Please call me at (970) 248-6654 if you have any questions.

Sincerely,

Sam Campbell

Sam Campbell
Site Lead

SC/lcg/lb

Enclosures (3)

cc: (electronic)
Cheri Bahrke, Stoller
Sam Campbell, Stoller
Steve Donivan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, Stoller
Michelle Morton, Stoller
EDD Delivery
rc-grand.junction
File: GUN 410.02(A)

Sampling Frequencies for Locations at Gunnison, Colorado

Location ID	Quarterly	Semiannually	Annually	Every 5 years	Not Sampled	Notes
Monitoring Wells						
GUN01						
002			X			
005			X			
006			X			
012R			X			
013			X			
062			X			
063			X			
064			X			
065			X			
066			X			
102			X			
105			X			
106			X			
112			X			
113			X			
125			X			
126			X			
127			X			
135			X			
136			X			
160			X			
161			X			
181			X			
183			X			
186			X			
187			X			
188			X			
189			X			
Surface Locations						
GUN01						
248			X			
250			X			
777			X			
780			X			
792			X			
795			X			
Domestic Wells						
GUN01						
476			X			
477			X			
478			X			
479			X			
667			X			
683			X			

GUN01 Sampling conducted in April

Constituent Sampling Breakdown

	Gunnison				
Analyte	**Groundwater**	**Surface Water**	**Required Detection Limit (mg/L)**	**Analytical Method**	**Line Item Code**
Approx. No. Samples/yr	38	6			
Field Measurements					
Alkalinity					
Dissolved Oxygen					
Redox Potential	X	X			
pH	X	X			
Specific Conductance	X	X			
Turbidity	X	X			
Temperature	X	X			
Laboratory Measurements	*GUN01*	*GUN01*			
Aluminum					
Ammonia as N (NH3-N)					
Calcium			5	SW-846 6010	LMM-01
Chloride			0.5	SW-846 9056	WCH-A-039
Chromium					
Gross Alpha					
Gross Beta					
Iron			0.05	SW-846 6020	LMM-02
Lead					
Magnesium			5	SW-846 6010	LMM-01
Manganese	X	X	0.005	SW-846 6010	LMM-01
Molybdenum					
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO3+NO2)-N					
Potassium			1	SW-846 6010	LMM-01
Radium-226					
Radium-228					
Selenium					
Silica					
Sodium			1	SW-846 6010	LMM-01
Strontium					
Sulfate			0.5	SW-846 9056	MIS-A-044
Sulfide					
Total Dissolved Solids			10	SM2540 C	WCH-A-033
Total Organic Carbon					
Uranium	X	X	0.0001	SW-846 6020	LMM-02
Vanadium					
Zinc					
Total No. of Analytes	2	2			

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

Attachment 4
Trip Report

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Stoller established 1959
Grand Junction Office

Memorandum

Control Number N/A

DATE: May 10, 2011

TO: Distribution

FROM: Sam Campbell

SUBJECT: Trip Report

Site: Gunnison, Colorado, Processing Site.

Dates of Sampling Event: April 25 to April 28, 2011.

Team Members: Jeff Price and Sam Campbell.

Number of Locations Sampled: 28 monitoring wells, 6 surface water locations, and 3 domestic wells.

Locations Not Sampled/Reason: Domestic wells 0476 and 0477 were not sampled because the homes were vacant, the wells were not in use, and the pumps were shut off. Sampling of these wells will be attempted in the summer when the wells are in use.

Domestic well 0479, which was included in the sampling letter, was not sampled because the residence is connected to the Dos Rios water system. This location will be removed from the long-term monitoring program.

Location Specific Information: All monitoring wells were purged and sampled using Category I criteria with the exception of monitoring well 0189, which was purged and sampled using Category II criteria.

Monitoring wells 0002, 0065, 0102, 0136, 0181, and 0183 were redeveloped prior to sampling. Monitoring well 0136 was originally sampled prior to development, but anomalous pH readings (>9) in the original sample initiated redevelopment of the well. After redevelopment, pH was in a normal range, the well yield was increased, and the well was reclassified as a Category I well.

Well 0183 could not make turbidity; sample was filtered.

New contact information for domestic well 0478, which is located at 572 Camino Del Rio:

Gary and Nina Short
322 N. Main
Gunnison, CO 81230

The pasture south of the gravel operation that contains numerous monitoring wells was dry because flood irrigation activities have not started yet.

Field Variance: None.

Quality Control Samples: Two duplicate samples and one equipment blank were collected; duplicate samples were collected at monitoring wells 0161 and 0012R. Quality control cross reference is available in the FDCS summary report on the SMS directory. The following are the false identifications assigned to the quality control samples:

False ID	True ID	Sample Type	Ticket Number
2597	0161	Duplicate	JFV 984
2598	0012R	Duplicate	JFV 985
2478	0248	Equipment Blank	JFV 987

Requisition Numbers Assigned: Samples were assigned to report identification number (RIN) 11043733.

Water Level Measurements: Water levels were measured at all sampled monitoring wells.

Well Inspection Summary: Monitoring wells were in good shape with one exception. Maintenance was conducted on monitoring well 0135 to repair damage from flood irrigation and frost heaving. The protective casing was removed, straightened, and replaced after removing concrete from around the protective casing. The inner PVC casing was shortened by 1.58 feet after the repair.

Equipment: All equipment functioned properly.

Stakeholder/Regulatory: None.

Institutional Controls

Fences, Gates, Locks: No issues identified.
Signs: Not applicable
Trespassing/Site Disturbances: Work continues on the former processing site to develop the site as a light industrial complex. Construction of Gunnison County facilities was in progress at the time of sampling.

Site Issues: None

Disposal Cell/Drainage Structure Integrity: Not applicable.
Vegetation/Noxious Weed Concerns: Not applicable.
Maintenance Requirements: None.

Access Issues: Prior to accessing wells in the pasture south of United Sand and Gravel (owner), contact Tracy Hildreth at (970) 596-0561. Tracy leases the land from the gravel company and operates a cattle ranch on the property.

Corrective Action Required/Taken: The elevation of well 0135 needs to updated in the SEEPro database (1.58 feet lower than the current elevation)

(SEC/lcg)

cc: cc: (electronic)
Joe Desormeau, DOE
Sam Campbell, DOE
Steve Donivan, Stoller
Bev Gallagher, Stoller
EDD Delivery

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