Data Validation Package

April and June 2013 Groundwater and Surface Water Sampling at the Gunnison, Colorado, Processing Site

July 2013

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Sampling Event Summary

Site: Gunnison, Colorado, Processing Site

Sampling Period: April 15-17 and June 3, 2013

This event included annual sampling of groundwater 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/PRO/S04351, continually updated).

Samples were collected from 27 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*. Monitoring well 0135 was not sampled because the PVC casing was broken about two feet below ground surface. Domestic wells 0476 and 0478 were sampled in June because the homes were unoccupied in April, and the wells were not in use. Duplicate samples were collected from locations 0125 and 0136. 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 at most locations. 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	0.740
			0012R	0.290
			0013	0.054
			0113	0.170
			0183	0.056
Manganese		1.6	0105	2.7
			0106	4.8
			0112	5.1
			0113	2.3

[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	0.006	0.0010
Gunnison River	0250	0.001	
Tomichi Creek	0777	0.005	
Valco Pond	0780	0.033	
Gunnison River	0795	0.001	

Sam Campbell
Site Lead, S.M. Stoller Corporation

9/30/2013
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 15-17, 2013 and June 3, 2013
Date(s) of Verification	June 11, 2013	**Name of Verifier**	Stephen Donivan

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures?	Yes	Work Order letter dated March 7, 2013.
List any Program Directives or other documents, SOPs, instructions.		
2. Were the sampling locations specified in the planning documents sampled?	No	Monitoring well 0135 was not sampled because the PVC well casing appears to be broken about two feet below ground surface.
3. Were calibrations conducted as specified in the above-named documents?	Yes	Calibrations were performed on April 15 and May 31, 2013.
4. Was an operational check of the field equipment conducted daily?	Yes	
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	Yes	
6. Were wells categorized correctly?	Yes	
7. Were the following conditions met when purging a Category I well:		
Was one pump/tubing volume purged prior to sampling?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements meet criteria prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	Yes	

Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	NA	
Was one pump/tubing volume removed prior to sampling?	NA	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	Duplicate samples were collected from locations 0125 and 0126.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	Yes	One equipment blank was collected.
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were the true identities of the QC samples documented?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were chain of custody records completed and was sample custody maintained?	Yes	
17. Was all pertinent information documented on the field data sheets?	Yes	
18. Was the presence or absence of ice in the cooler documented at every sample location?	NA	Sample chilling was not required.
19. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

RIN: 13045222
Sample Event: April 15-17, 2013
Site(s): Gunnison, Colorado, Processing Site
Laboratory: ALS Laboratory Group, Fort Collins, Colorado
Work Order No.: 1304274
Analysis: Metals
Validator: Stephen Donivan
Review Date: June 11, 2013

This validation was performed according to the *Environmental Procedures Catalog* (LMS/POL/S04325), "Standard Practice for Validation of Environmental Data." The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation 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

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
1304274-1	0002	Mn	J	Negative calibration blank
1304274-32	0683	Mn	R	See Potential Outliers Report
1304274-32	0683	U	R	See Potential Outliers Report

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 39 water samples on April 18, 2013, 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 sample submittal documents 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.

Detection and Quantitation Limits

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

Laboratory Instrument Calibration

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

Method SW-846 6010B, Manganese
Calibrations were performed for manganese on April 26, 2013. 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 MDL. Initial and continuing calibration verification checks were made at the required frequency with all check results meeting the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curves near the PQL. The all check results were within the acceptance range.

Method SW-846 6020A, Uranium
Calibration was performed for uranium on April 26, 2013. 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 MDL. Initial and continuing calibration verification checks were made at the required frequency with all check results meeting the acceptance criteria. 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 PQL for magnesium and uranium. Many of the manganese blanks were negative, with the absolute values greater than the MDL, but less than the PQL. Associated sample results that are greater than the MDL but less than 5 times the MDL are qualified with a "J" flag as estimated values.

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

ICP 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 (LCS)

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 MDL. The serial dilution data met the acceptance criteria for all data evaluated.

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 1, 2013. The Sample Management System EDD validation module was used to verify that the EDD file was complete and in compliance with requirements. The module compares the contents of the file to the requested analyses to ensure all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package.

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 13045222 **Lab Code:** PAR **Validator:** Stephen Donivan **Validation Date:** 06/11/2013

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

# of Samples: 39 **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: 13045222 **Lab Code:** PAR **Date Due:** 05/16/2013

Matrix: Water **Site Code:** GUN01 **Date Completed:** 05/01/2013

Analyte	Method Type	Date Analyzed	CALIBRATION				Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R^2	CCV	CCB								
Manganese	ICP/ES	04/26/2013	0.0000	1.0000	OK	OK	OK	104.0	101.0	104.0	3.0	95.0	6.0	108.0
Manganese	ICP/ES	04/26/2013					OK	106.0	101.0	102.0	1.0	97.0		109.0
Uranium	ICP/MS	04/26/2013	0.0000	1.0000	OK	OK	OK	100.0	105.0	96.0	7.0	105.0	3.0	100.0
Uranium	ICP/MS	04/26/2013					OK	99.0	96.0	79.0	5.0		9.0	

Sampling Quality Control Assessment

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

Sampling Protocol

Sample results for all monitoring wells met the Category I 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.

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 0125 and 0126. The duplicate results met these criteria, demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Field Duplicates

RIN: 13045222 **Lab Code:** PAR **Project:** Gunnison **Validation Date:** 06/11/2013

Duplicate: 2597 **Sample:** 0125

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Manganese	9.6			1	8.8			1	8.70		UG/L
Uranium	11			10	11			10	0		UG/L

Duplicate: 2598 **Sample:** 0126

Analyte	Sample Result	Sample Flag	Sample Error	Sample Dilution	Duplicate Result	Duplicate Flag	Duplicate Error	Duplicate Dilution	RPD	RER	Units
Manganese	11			1	11			1	0		UG/L
Uranium	10			10	10			100	0		UG/L

General Information

RIN: 13055372
Sample Event: June 3, 2013
Site(s): Gunnison, Colorado, Processing Site
Laboratory: ALS Laboratory Group, Fort Collins, Colorado
Work Order No.: 1306058
Analysis: Metals
Validator: Stephen Donivan
Review Date: June 26, 2013

This validation was performed according to the *Environmental Procedures Catalog* (LMS/POL/S04325), "Standard Practice for Validation of Environmental Data." The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation 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 5.

Table 5. 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

Data Qualifier Summary

The analytical results were qualified as listed in Table 6. Refer to the sections below for an explanation of the data qualifiers applied.

Table 6. Data Qualifier Summary

Sample Number	Location	Analyte	Flag	Reason
1306058-1	0476	Mn	U	Less than 5 times the calibration blank
1306058-2	0477	Mn	J	Serial dilution result

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received three water samples on June 6, 2013, accompanied by a 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 sample submittal documents 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.

Detection and Quantitation Limits

The MDL was reported for both analytes as required. The MDL, as defined in 40 CFR 136, is the minimum concentration of an analyte that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. The PQL for these analytes is the lowest concentration that can be reliably measured, and is defined as 5 times the MDL. The reported MDLs for both analytes demonstrate compliance with contractual requirements.

Laboratory Instrument Calibration

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

Method SW-846 6010B, Manganese
Calibrations were performed for manganese on June 14, 2013. 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 MDL. Initial and continuing calibration verification checks were made at the required frequency with all check results meeting the acceptance criteria. 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 14, 2013. 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 MDL. Initial and continuing calibration verification checks were made at the required frequency with all check results meeting the acceptance criteria. 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 PQL for magnesium and uranium. In cases where a blank concentration exceeds the MDL, the associated sample results that are less than 5 times the blank concentration are qualified with a "U" flag as not detected.

ICP ICS Analysis

ICP 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

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 MDL. The serial dilution results met the acceptance criteria for all data evaluated with the exception of the manganese result for sample 0477. The associated sample manganese result is qualified with a "J" flag (estimated).

Completeness

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

EDD File

The EDD file arrived on June 24, 2013. The Sample Management System EDD validation module was used to verify that the EDD file was complete and in compliance with requirements. The module compares the contents of the file to the requested analyses to ensure all and only the requested data are delivered. The contents of the EDD were manually examined to verify that the sample results accurately reflect the data contained in the sample data package.

SAMPLE MANAGEMENT SYSTEM

General Data Validation Report

RIN: 13055372 **Lab Code:** PAR **Validator:** Stephen Donivan **Validation Date:** 06/25/2013

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

# of Samples: 3 **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: 13055372 **Lab Code:** PAR **Date Due:** 07/04/2013

Matrix: Water **Site Code:** GUN01 **Date Completed:** 06/25/2013

Analyte	Method Type	Date Analyzed	CALIBRATION				Method Blank	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R^2	CCV	CCB								
Manganese	ICP/ES	06/14/2013	0.0000	1.0000	OK	OK	OK	98.0	96.0	104.0	7.0	94.0	17.0	109.0
Uranium	ICP/MS	06/14/2013	0.0000	1.0000	OK	OK	OK	99.0	103.0	104.0	1.0	100.0	7.0	90.0

Certification

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

Laboratory Coordinator: Stephen Donivan — Date: 9-30-2013

Data Validation Lead: Stephen Donivan — Date: 9-30-2013

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Attachment 1
Assessment of Anomalous Data

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Potential Outliers Report

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Potential Outliers Report

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

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

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

1. Identify extreme values that may be potential outliers by generating the Outliers Report using the Sample Management System from data in the environmental database. The application compares the new data set (in standard environmental database units) with historical data and lists the new data that fall outside the historical data range. A determination is also made if the data are normally distributed using the Shapiro-Wilk Test.

2. Apply the appropriate statistical test. Dixon's Extreme Value test is used to test for statistical outliers when the sample size is less than or equal to 25. This test considers both extreme values that are much smaller than the rest of the data (case 1) and extreme values that are much larger than the rest of the data (case 2). This test is valid only if the data without the suspected outlier are normally distributed. Rosner's Test is a parametric test that is used to detect outliers for sample sizes of 25 or more. This test also assumes that the data without the suspected outliers are normally distributed.

3. Scientifically review statistical outliers and decide on their disposition. The review should include an evaluation of any notable trends in the data that may indicate the outliers represent true extreme values.

The April 2013 laboratory results from location 0683 were identified as potential outliers. This location is a domestic water supply that was not in use when sampled. It was re-sampled on June 3, 2013, to determine if the outlier values were due to sediment accumulated in the stagnant system. The June results confirmed that the data from the April event were anomalous and those data are qualified with an “R” flag (rejected).

The uranium result for Gunnison River location 0795 was identified as a potential outlier. The uranium concentration at this location has been trending upward since 2004; however, this same trend is also observed at the other Gunnison River locations, location 0250 adjacent to the site, and upstream location 0792. Because the data are consistent at all river locations, uranium concentrations are considered a reflection of river water quality and not an indication of impact from the Gunnison site. Sampling or analytical errors are not suspected, and the data are acceptable as qualified.

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum	Qualifiers		Historical Minimum	Qualifiers		Number of Data Points		Statistical Outlier
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
GUN01	0012R	N001	04/15/2013	Manganese	0.65		F	0.57		F	0.0097		F	6	0	No
GUN01	0062	N001	04/16/2013	Manganese	0.0011	B	F	0.083		F	0.0013	B	F	8	0	No
GUN01	0065	N001	04/15/2013	Uranium	0.023		F	0.034		F	0.026		F	8	0	No
GUN01	0105	N001	04/16/2013	Uranium	0.0082		F	0.069		F	0.011		F	8	0	No
GUN01	0106	N001	04/16/2013	Manganese	4.8		F	11		F	4.9		F	10	0	No
GUN01	0106	N001	04/16/2013	Uranium	0.019		F	0.018		F	0.00068	B	F	10	0	No
GUN01	0160	N001	04/16/2013	Uranium	0.026		F	0.025		F	0.019		F	10	0	No
GUN01	0181	N001	04/15/2013	Uranium	0.0067		F	0.015		F	0.0071		F	8	0	No
GUN01	0478	N001	04/17/2013	Manganese	1			0.8			0.38			5	0	No
GUN01	0478	N001	04/17/2013	Uranium	0.0033			0.003			0.0022			5	0	No
GUN01	0667	N001	04/16/2013	Uranium	0.0026			0.0024			0.00057			11	0	No
GUN01	0683	N001	04/17/2013	Manganese	1.6		R	0.0021	B	U	0.00036	B	J	12	6	Yes
GUN01	0683	N001	04/17/2013	Uranium	0.0042		R	0.0035			0.0007			12	0	Yes
GUN01	0780	N001	04/16/2013	Manganese	0.08			0.062			0.0041	B		11	0	No
GUN01	0792	N001	04/16/2013	Uranium	0.0012			0.00091			0.00038			11	0	No
GUN01	0795	N001	04/16/2013	Uranium	0.0012			0.001			0.00035			10	0	Yes

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: 07/12/2013
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	04/15/2013	N001	10	-	15	0.00049	B	FJ	#	0.00011	
Oxidation Reduction Potential	mV	04/15/2013	N001	10	-	15	186.3		F	#		
pH	s.u.	04/15/2013	N001	10	-	15	7.01		F	#		
Specific Conductance	umhos /cm	04/15/2013	N001	10	-	15	507		F	#		
Temperature	C	04/15/2013	N001	10	-	15	8.13		F	#		
Turbidity	NTU	04/15/2013	N001	10	-	15	3.87		F	#		
Uranium	mg/L	04/15/2013	N001	10	-	15	0.0023		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	10	-	15	0.93		F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	10	-	15	69.8		F	#		
pH	s.u.	04/16/2013	N001	10	-	15	7.03		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	10	-	15	458		F	#		
Temperature	C	04/16/2013	N001	10	-	15	6.79		F	#		
Turbidity	NTU	04/16/2013	N001	10	-	15	3.86		F	#		
Uranium	mg/L	04/16/2013	N001	10	-	15	0.036		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	10	-	15	0.038		F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	10	-	15	178.6		F	#		
pH	s.u.	04/16/2013	N001	10	-	15	6.87		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	10	-	15	2251		F	#		
Temperature	C	04/16/2013	N001	10	-	15	7.03		F	#		
Turbidity	NTU	04/16/2013	N001	10	-	15	5.03		F	#		
Uranium	mg/L	04/16/2013	N001	10	-	15	0.74		F	#	0.00029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site

REPORT DATE: 07/12/2013

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	04/15/2013	N001	6.03	-	16	0.65		F	#	0.00011	
Oxidation Reduction Potential	mV	04/15/2013	N001	6.03	-	16	220.4		F	#		
pH	s.u.	04/15/2013	N001	6.03	-	16	6.74		F	#		
Specific Conductance	umhos /cm	04/15/2013	N001	6.03	-	16	1196		F	#		
Temperature	C	04/15/2013	N001	6.03	-	16	8.47		F	#		
Turbidity	NTU	04/15/2013	N001	6.03	-	16	7.12		F	#		
Uranium	mg/L	04/15/2013	N001	6.03	-	16	0.29		F	#	0.00029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	11	-	16	0.081		F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	11	-	16	119.8		F	#		
pH	s.u.	04/16/2013	N001	11	-	16	7.06		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	11	-	16	687		F	#		
Temperature	C	04/16/2013	N001	11	-	16	8.14		F	#		
Turbidity	NTU	04/16/2013	N001	11	-	16	2.65		F	#		
Uranium	mg/L	04/16/2013	N001	11	-	16	0.054		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	47.9	-	57.9	0.0011	B	F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	47.9	-	57.9	177.9		F	#		
pH	s.u.	04/16/2013	N001	47.9	-	57.9	7.23		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	47.9	-	57.9	510		F	#		
Temperature	C	04/16/2013	N001	47.9	-	57.9	7.45		F	#		
Turbidity	NTU	04/16/2013	N001	47.9	-	57.9	2.47		F	#		
Uranium	mg/L	04/16/2013	N001	47.9	-	57.9	0.0075		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	87.9	-	97.9	0.0074		F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	87.9	-	97.9	178.5		F	#		
pH	s.u.	04/16/2013	N001	87.9	-	97.9	7.27		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	87.9	-	97.9	502		F	#		
Temperature	C	04/16/2013	N001	87.9	-	97.9	7.66		F	#		
Turbidity	NTU	04/16/2013	N001	87.9	-	97.9	2.94		F	#		
Uranium	mg/L	04/16/2013	N001	87.9	-	97.9	0.011		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	86.7	-	96.7	0.0067		F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	86.7	-	96.7	179.3		F	#		
pH	s.u.	04/16/2013	N001	86.7	-	96.7	7.09		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	86.7	-	96.7	472		F	#		
Temperature	C	04/16/2013	N001	86.7	-	96.7	7.79		F	#		
Turbidity	NTU	04/16/2013	N001	86.7	-	96.7	1.69		F	#		
Uranium	mg/L	04/16/2013	N001	86.7	-	96.7	0.0095		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/15/2013	N001	49.7	-	59.7	0.018		F	#	0.00011	
Oxidation Reduction Potential	mV	04/15/2013	N001	49.7	-	59.7	149.1		F	#		
pH	s.u.	04/15/2013	N001	49.7	-	59.7	7.16		F	#		
Specific Conductance	umhos /cm	04/15/2013	N001	49.7	-	59.7	669		F	#		
Temperature	C	04/15/2013	N001	49.7	-	59.7	8.8		F	#		
Turbidity	NTU	04/15/2013	N001	49.7	-	59.7	9.98		F	#		
Uranium	mg/L	04/15/2013	N001	49.7	-	59.7	0.023		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/15/2013	N001	40.2	-	50.2	0.043		F	#	0.00011	
Oxidation Reduction Potential	mV	04/15/2013	N001	40.2	-	50.2	172.3		F	#		
pH	s.u.	04/15/2013	N001	40.2	-	50.2	7.06		F	#		
Specific Conductance	umhos /cm	04/15/2013	N001	40.2	-	50.2	680		F	#		
Temperature	C	04/15/2013	N001	40.2	-	50.2	7.27		F	#		
Turbidity	NTU	04/15/2013	N001	40.2	-	50.2	6.22		F	#		
Uranium	mg/L	04/15/2013	N001	40.2	-	50.2	0.023		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/15/2013	N001	42	-	47	0.00011	U	F	#	0.00011	
Oxidation Reduction Potential	mV	04/15/2013	N001	42	-	47	190.4		F	#		
pH	s.u.	04/15/2013	N001	42	-	47	7.2		F	#		
Specific Conductance	umhos /cm	04/15/2013	N001	42	-	47	535		F	#		
Temperature	C	04/15/2013	N001	42	-	47	9.99		F	#		
Turbidity	NTU	04/15/2013	N001	42	-	47	2.85		F	#		
Uranium	mg/L	04/15/2013	N001	42	-	47	0.0035		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	42	-	47	2.7		F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	42	-	47	109		F	#		
pH	s.u.	04/16/2013	N001	42	-	47	6.62		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	42	-	47	481		F	#		
Temperature	C	04/16/2013	N001	42	-	47	9.36		F	#		
Turbidity	NTU	04/16/2013	N001	42	-	47	2.31		F	#		
Uranium	mg/L	04/16/2013	N001	42	-	47	0.0082		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	34	-	39	4.8		F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	34	-	39	129.1		F	#		
pH	s.u.	04/16/2013	N001	34	-	39	5.81		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	34	-	39	1787		F	#		
Temperature	C	04/16/2013	N001	34	-	39	10.38		F	#		
Turbidity	NTU	04/16/2013	N001	34	-	39	7.48		F	#		
Uranium	mg/L	04/16/2013	N001	34	-	39	0.019		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/15/2013	N001	40	-	45	5.1		F	#	0.00011	
Oxidation Reduction Potential	mV	04/15/2013	N001	40	-	45	92.5		F	#		
pH	s.u.	04/15/2013	N001	40	-	45	6.1		F	#		
Specific Conductance	umhos /cm	04/15/2013	N001	40	-	45	883		F	#		
Temperature	C	04/15/2013	N001	40	-	45	10.37		F	#		
Turbidity	NTU	04/15/2013	N001	40	-	45	9.57		F	#		
Uranium	mg/L	04/15/2013	N001	40	-	45	0.033		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	41	-	46	2.3		F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	41	-	46	32.8		F	#		
pH	s.u.	04/16/2013	N001	41	-	46	6.86		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	41	-	46	737		F	#		
Temperature	C	04/16/2013	N001	41	-	46	10.77		F	#		
Turbidity	NTU	04/16/2013	N001	41	-	46	9.08		F	#		
Uranium	mg/L	04/16/2013	N001	41	-	46	0.17		F	#	0.00015	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	17.8	-	22.8	0.0096		F	#	0.00011	
Manganese	mg/L	04/16/2013	N002	17.8	-	22.8	0.0088		F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	17.8	-	22.8	166.4		F	#		
pH	s.u.	04/16/2013	N001	17.8	-	22.8	6.93		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	17.8	-	22.8	518		F	#		
Temperature	C	04/16/2013	N001	17.8	-	22.8	5.41		F	#		
Turbidity	NTU	04/16/2013	N001	17.8	-	22.8	1.94		F	#		
Uranium	mg/L	04/16/2013	N001	17.8	-	22.8	0.011		F	#	0.000029	
Uranium	mg/L	04/16/2013	N002	17.8	-	22.8	0.011		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	54	-	59	0.011		F	#	0.00011	
Manganese	mg/L	04/16/2013	N002	54	-	59	0.011		F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	54	-	59	158.5		F	#		
pH	s.u.	04/16/2013	N001	54	-	59	7.2		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	54	-	59	680		F	#		
Temperature	C	04/16/2013	N001	54	-	59	7.35		F	#		
Turbidity	NTU	04/16/2013	N001	54	-	59	5.4		F	#		
Uranium	mg/L	04/16/2013	N001	54	-	59	0.01		F	#	0.000029	
Uranium	mg/L	04/16/2013	N002	54	-	59	0.01		F	#	0.00029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	94	-	99	0.00011	U	F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	94	-	99	167.1		F	#		
pH	s.u.	04/16/2013	N001	94	-	99	7.27		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	94	-	99	729		F	#		
Temperature	C	04/16/2013	N001	94	-	99	7.41		F	#		
Turbidity	NTU	04/16/2013	N001	94	-	99	0.81		F	#		
Uranium	mg/L	04/16/2013	N001	94	-	99	0.013		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	53	-	58	0.048		F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	53	-	58	-3.2		F	#		
pH	s.u.	04/16/2013	N001	53	-	58	7.22		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	53	-	58	707		F	#		
Temperature	C	04/16/2013	N001	53	-	58	8.17		F	#		
Turbidity	NTU	04/16/2013	N001	53	-	58	5.95		F	#		
Uranium	mg/L	04/16/2013	N001	53	-	58	0.016		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	51	-	56	0.052		F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	51	-	56	152.8		F	#		
pH	s.u.	04/16/2013	N001	51	-	56	6.44		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	51	-	56	856		F	#		
Temperature	C	04/16/2013	N001	51	-	56	8.33		F	#		
Turbidity	NTU	04/16/2013	N001	51	-	56	5.51		F	#		
Uranium	mg/L	04/16/2013	N001	51	-	56	0.026		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	93	-	98	0.0036	B	F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	93	-	98	164.4		F	#		
pH	s.u.	04/16/2013	N001	93	-	98	6.49		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	93	-	98	876		F	#		
Temperature	C	04/16/2013	N001	93	-	98	8.4		F	#		
Turbidity	NTU	04/16/2013	N001	93	-	98	2.85		F	#		
Uranium	mg/L	04/16/2013	N001	93	-	98	0.019		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/15/2013	N001	18	-	23	0.6		F	#	0.00011	
Oxidation Reduction Potential	mV	04/15/2013	N001	18	-	23	190.8		F	#		
pH	s.u.	04/15/2013	N001	18	-	23	6.68		F	#		
Specific Conductance	umhos /cm	04/15/2013	N001	18	-	23	482		F	#		
Temperature	C	04/15/2013	N001	18	-	23	6.12		F	#		
Turbidity	NTU	04/15/2013	N001	18	-	23	4.02		F	#		
Uranium	mg/L	04/15/2013	N001	18	-	23	0.0067		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/15/2013	N001	93	-	98	0.004	B	F	#	0.00011	
Oxidation Reduction Potential	mV	04/15/2013	N001	93	-	98	201.9		F	#		
pH	s.u.	04/15/2013	N001	93	-	98	6.55		F	#		
Specific Conductance	umhos /cm	04/15/2013	N001	93	-	98	1089		F	#		
Temperature	C	04/15/2013	N001	93	-	98	8.22		F	#		
Turbidity	NTU	04/15/2013	N001	93	-	98	5.67		F	#		
Uranium	mg/L	04/15/2013	N001	93	-	98	0.056		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	53	-	58	0.00062	B	F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	53	-	58	70.2		F	#		
pH	s.u.	04/16/2013	N001	53	-	58	7.83		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	53	-	58	568		F	#		
Temperature	C	04/16/2013	N001	53	-	58	8.45		F	#		
Turbidity	NTU	04/16/2013	N001	53	-	58	1.56		F	#		
Uranium	mg/L	04/16/2013	N001	53	-	58	0.018		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	93	-	98	1.1		F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	93	-	98	74.8		F	#		
pH	s.u.	04/16/2013	N001	93	-	98	6.31		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	93	-	98	1258		F	#		
Temperature	C	04/16/2013	N001	93	-	98	8.49		F	#		
Turbidity	NTU	04/16/2013	N001	93	-	98	9.93		F	#		
Uranium	mg/L	04/16/2013	N001	93	-	98	0.032		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	53	-	58	0.0039	B	F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	53	-	58	71.1		F	#		
pH	s.u.	04/16/2013	N001	53	-	58	7.04		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	53	-	58	802		F	#		
Temperature	C	04/16/2013	N001	53	-	58	7.24		F	#		
Turbidity	NTU	04/16/2013	N001	53	-	58	7.93		F	#		
Uranium	mg/L	04/16/2013	N001	53	-	58	0.035		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	93	-	98	0.82		F	#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	93	-	98	9.1		F	#		
pH	s.u.	04/16/2013	N001	93	-	98	6.23		F	#		
Specific Conductance	umhos /cm	04/16/2013	N001	93	-	98	2026		F	#		
Temperature	C	04/16/2013	N001	93	-	98	7.35		F	#		
Turbidity	NTU	04/16/2013	N001	93	-	98	2.45		F	#		
Uranium	mg/L	04/16/2013	N001	93	-	98	0.015		F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	06/03/2013	N001	-	0.0022	B	U	#	0.00011	
Oxidation Reduction Potential	mV	06/03/2013	N001	-	50			#		
pH	s.u.	06/03/2013	N001	-	6.44			#		
Specific Conductance	umhos /cm	06/03/2013	N001	-	258			#		
Temperature	C	06/03/2013	N001	-	10.41			#		
Turbidity	NTU	06/03/2013	N001	-	2.85			#		
Uranium	mg/L	06/03/2013	N001	-	0.0019			#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	06/03/2013	N001	-	0.0097	E	J	#	0.00011	
Oxidation Reduction Potential	mV	06/03/2013	N001	-	76			#		
pH	s.u.	06/03/2013	N001	-	6.31			#		
Specific Conductance	umhos /cm	06/03/2013	N001	-	255			#		
Temperature	C	06/03/2013	N001	-	8.13			#		
Turbidity	NTU	06/03/2013	N001	-	2.65			#		
Uranium	mg/L	06/03/2013	N001	-	0.0015			#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/17/2013	N001	-	1			#	0.00011	
Oxidation Reduction Potential	mV	04/17/2013	N001	-	233.2			#		
pH	s.u.	04/17/2013	N001	-	6.6			#		
Specific Conductance	umhos /cm	04/17/2013	N001	-	349			#		
Temperature	C	04/17/2013	N001	-	15.37			#		
Turbidity	NTU	04/17/2013	N001	-	1.05			#		
Uranium	mg/L	04/17/2013	N001	-	0.0033			#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	-	0.00011	U		#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	-	115.2			#		
pH	s.u.	04/16/2013	N001	-	7.28			#		
Specific Conductance	umhos /cm	04/16/2013	N001	-	264			#		
Temperature	C	04/16/2013	N001	-	11.77			#		
Turbidity	NTU	04/16/2013	N001	-	3.71			#		
Uranium	mg/L	04/16/2013	N001	-	0.0026			#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
Location: 0683 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers Lab	Qualifiers Data	QA	Detection Limit	Uncertainty
Manganese	mg/L	06/03/2013	N001	-	0.0065			#	0.00011	
Oxidation Reduction Potential	mV	06/03/2013	N001	-	81			#		
pH	s.u.	06/03/2013	N001	-	6.88			#		
Specific Conductance	umhos /cm	06/03/2013	N001	-	289			#		
Temperature	C	06/03/2013	N001	-	10.4			#		
Turbidity	NTU	06/03/2013	N001	-	1.77			#		
Uranium	mg/L	06/03/2013	N001	-	0.0027			#	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).
- U Analytical result below detection limit.
- X,Y,Z Laboratory defined qualifier, see case narrative.

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

QA QUALIFIER:
#Validated according to quality assurance guidelines.

Surface Water Quality Data

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Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
Location: 0248 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/16/2013	0001	0.12			#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	188.2			#		
pH	s.u.	04/16/2013	N001	7.78			#		
Specific Conductance	umhos/cm	04/16/2013	N001	330			#		
Temperature	C	04/16/2013	N001	5.89			#		
Turbidity	NTU	04/16/2013	N001	12.6			#		
Uranium	mg/L	04/16/2013	0001	0.0055			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
Location: 0250 SURFACE LOCATION

Parameter	Units	Sample Date	Sample ID	Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	04/16/2013	N001	0.054			#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	135.6			#		
pH	s.u.	04/16/2013	N001	8.27			#		
Specific Conductance	umhos/cm	04/16/2013	N001	262			#		
Temperature	C	04/16/2013	N001	11.29			#		
Turbidity	NTU	04/16/2013	N001	2.61			#		
Uranium	mg/L	04/16/2013	N001	0.0012			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	0.17			#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	151.9			#		
pH	s.u.	04/16/2013	N001	7.49			#		
Specific Conductance	umhos/cm	04/16/2013	N001	307			#		
Temperature	C	04/16/2013	N001	12.27			#		
Turbidity	NTU	04/16/2013	N001	8.87			#		
Uranium	mg/L	04/16/2013	N001	0.0045			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	0.08			#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	152.8			#		
pH	s.u.	04/16/2013	N001	6.97			#		
Specific Conductance	umhos/cm	04/16/2013	N001	607			#		
Temperature	C	04/16/2013	N001	9.95			#		
Turbidity	NTU	04/16/2013	N001	3.95			#		
Uranium	mg/L	04/16/2013	N001	0.033			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	0.034			#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	124.8			#		
pH	s.u.	04/16/2013	N001	8.3			#		
Specific Conductance	umhos/cm	04/16/2013	N001	260			#		
Temperature	C	04/16/2013	N001	11.32			#		
Turbidity	NTU	04/16/2013	N001	2.33			#		
Uranium	mg/L	04/16/2013	N001	0.0012			#	0.000029	

Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site
REPORT DATE: 07/12/2013
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	04/16/2013	N001	0.03			#	0.00011	
Oxidation Reduction Potential	mV	04/16/2013	N001	139			#		
pH	s.u.	04/16/2013	N001	8.31			#		
Specific Conductance	umhos/cm	04/16/2013	N001	258			#		
Temperature	C	04/16/2013	N001	10.5			#		
Turbidity	NTU	04/16/2013	N001	2.01			#		
Uranium	mg/L	04/16/2013	N001	0.0012			#	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).
- U Analytical result below detection limit.
- X,Y,Z Laboratory defined qualifier, see case narrative.

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

QA QUALIFIER:
#Validated according to quality assurance guidelines.

Equipment Blank Data

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BLANKS REPORT

LAB: PARAGON/ALS LABORATORY GROUP (Fort Collins, CO)
RIN: 13045222
Report Date: 07/12/2013

Parameter	Site Code	Location ID	Sample Date	Sample ID	Units	Result	Qualifiers Lab	Qualifiers Data	Detection Limit	Uncertainty	Sample Type
Manganese	GUN01	0999	04/16/2013	N001	mg/L	0.00011	U		0.00011		E
Uranium	GUN01	0999	04/16/2013	N001	mg/L	0.00015	U		0.00015		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: 07/12/2013

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0002	U	7646.75	04/15/2013	14:15:26	3.95	7642.8	
0005	O	7644.66	04/16/2013	14:55:45	3.91	7640.75	
0006	O	7647.23	04/16/2013	13:40:46	9.65	7637.58	
0012R	O	7645.95	04/15/2013	15:50:21	10.81	7635.14	
0013	D	7643.75	04/16/2013	13:10:57	10.83	7632.92	
0062	O	7630.61	04/16/2013	09:15:35	5.6	7625.01	
0063	O	7630.34	04/16/2013	09:00:13	6.93	7623.41	
0064	O	7620.76	04/16/2013	10:05:02	6.31	7614.45	
0065	O	7610.27	04/15/2013	18:00:43	1.92	7608.35	
0066	O	7606.22	04/15/2013	17:15:51	2.23	7603.99	
0102	U	7647.3	04/15/2013	14:30:32	4.68	7642.62	
0105	O	7646.11	04/16/2013	14:45:16	6.06	7640.05	
0106	O	7647.22	04/16/2013	14:00:01	9.82	7637.4	
0112	O	7645.74	04/15/2013	16:20:40	11.29	7634.45	
0113	D	7643.83	04/16/2013	12:55:03	10.99	7632.84	
0125	D	7633.52	04/16/2013	07:45:05	5.54	7627.98	
0126	D	7634.14	04/16/2013	08:05:41	5.69	7628.45	
0127	D	7634.64	04/16/2013	08:25:46	7.7	7626.94	
0136	D	7626.24	04/16/2013	11:10:39	4.61	7621.63	
0160	D	7604.39	04/16/2013	17:45:43	6.12	7598.27	
0161	D	7605.63	04/16/2013	18:00:21	7.54	7598.09	
0181	D	7616.38	04/15/2013	15:20:15	1.78	7614.6	
0183	D	7616.27	04/15/2013	15:05:52	4.02	7612.25	
0186	D	7627.21	04/16/2013	16:10:48	5.32	7621.89	
0187	D	7625.91	04/16/2013	15:50:30	5.05	7620.86	
0188	D	7613.65	04/16/2013	17:10:24	7	7606.65	
0189	D	7613.56	04/16/2013	16:55:56	7.84	7605.72	

FLOW CODES: B BACKGROUND C CROSS GRADIENT D DOWN GRADIENT F OFF SITE
N UNKNOWN O ON SITE U UPGRADIENT
WATER LEVEL FLAGS: D Dry F Flowing B Below top of pump

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Time-Concentration Graphs

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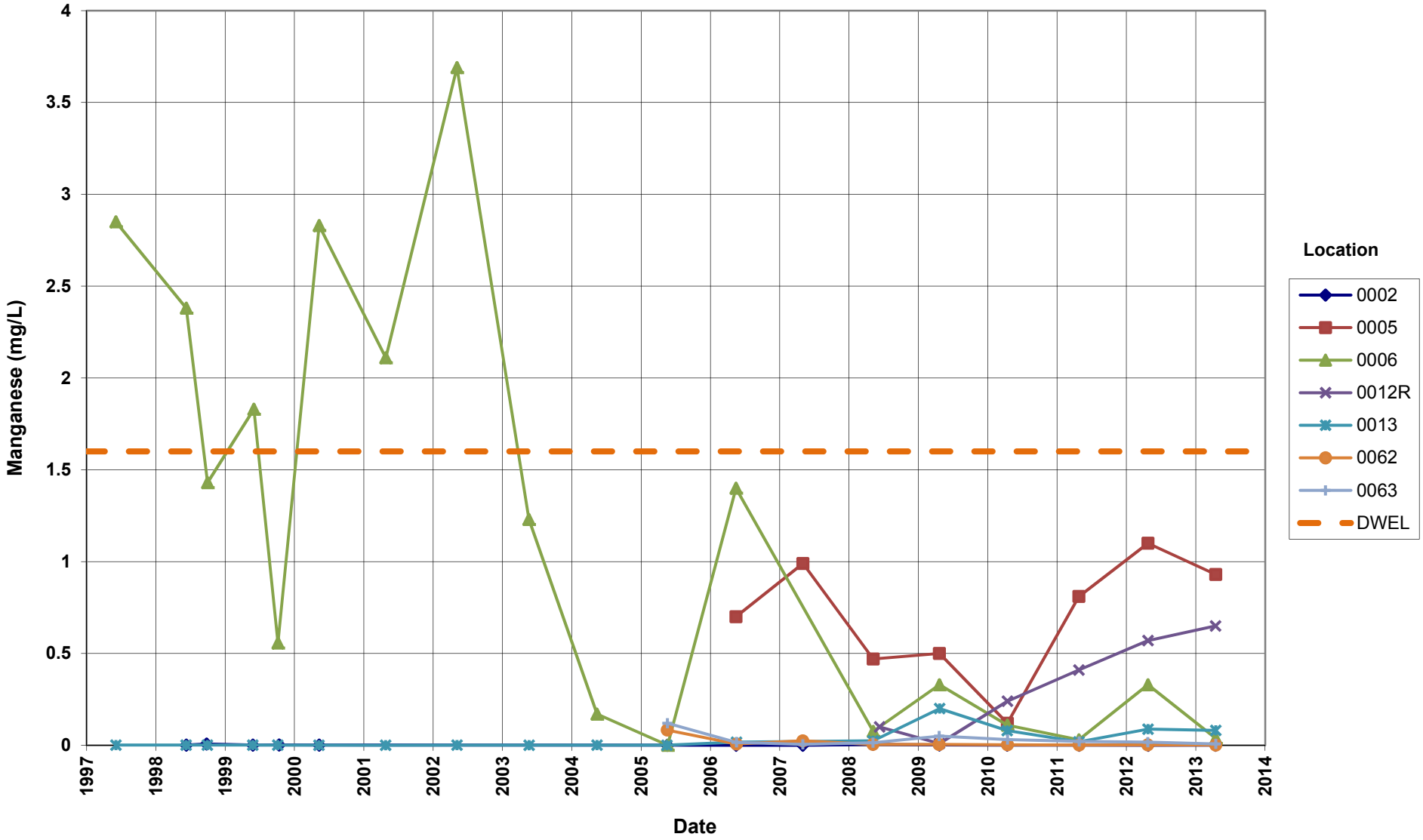
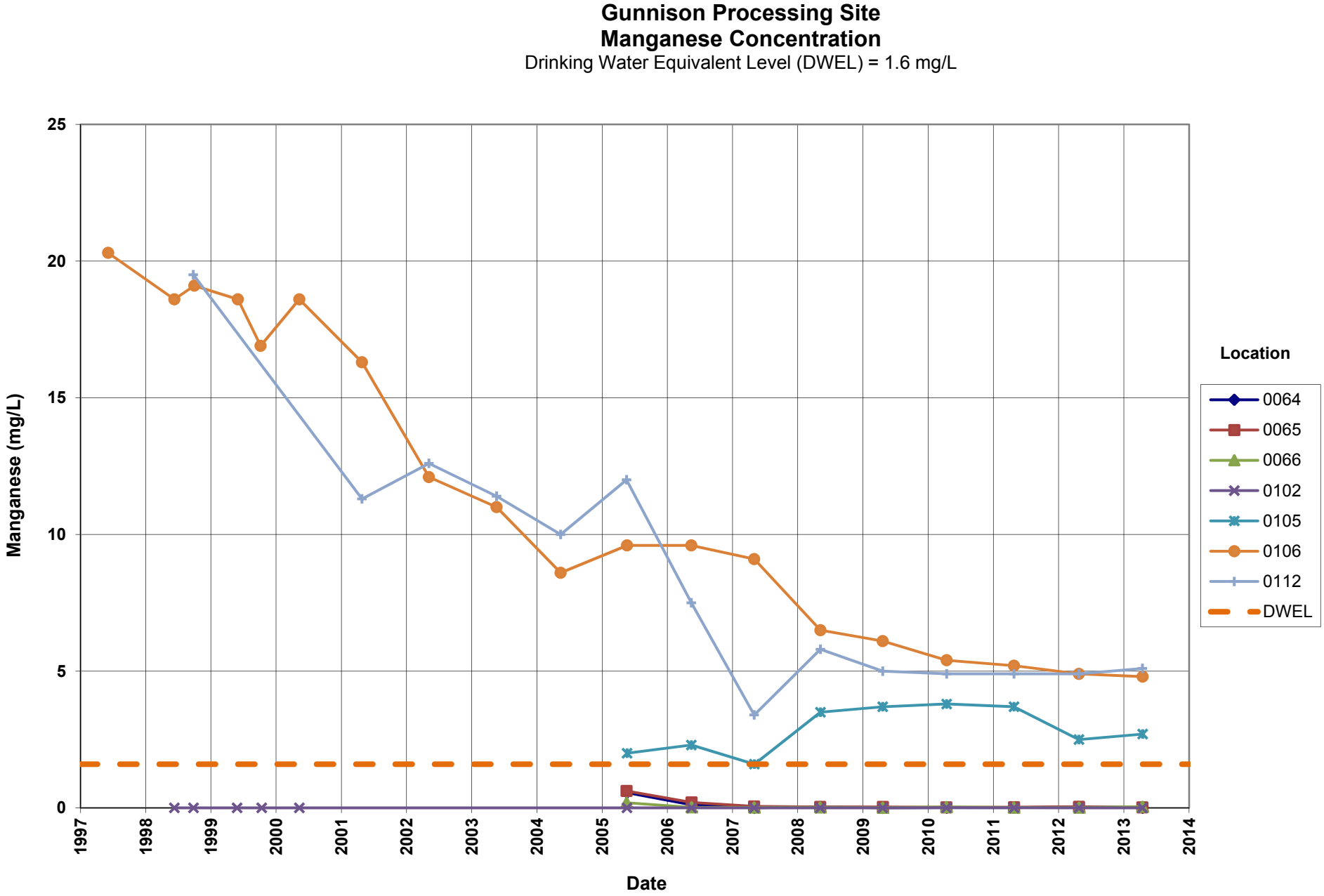
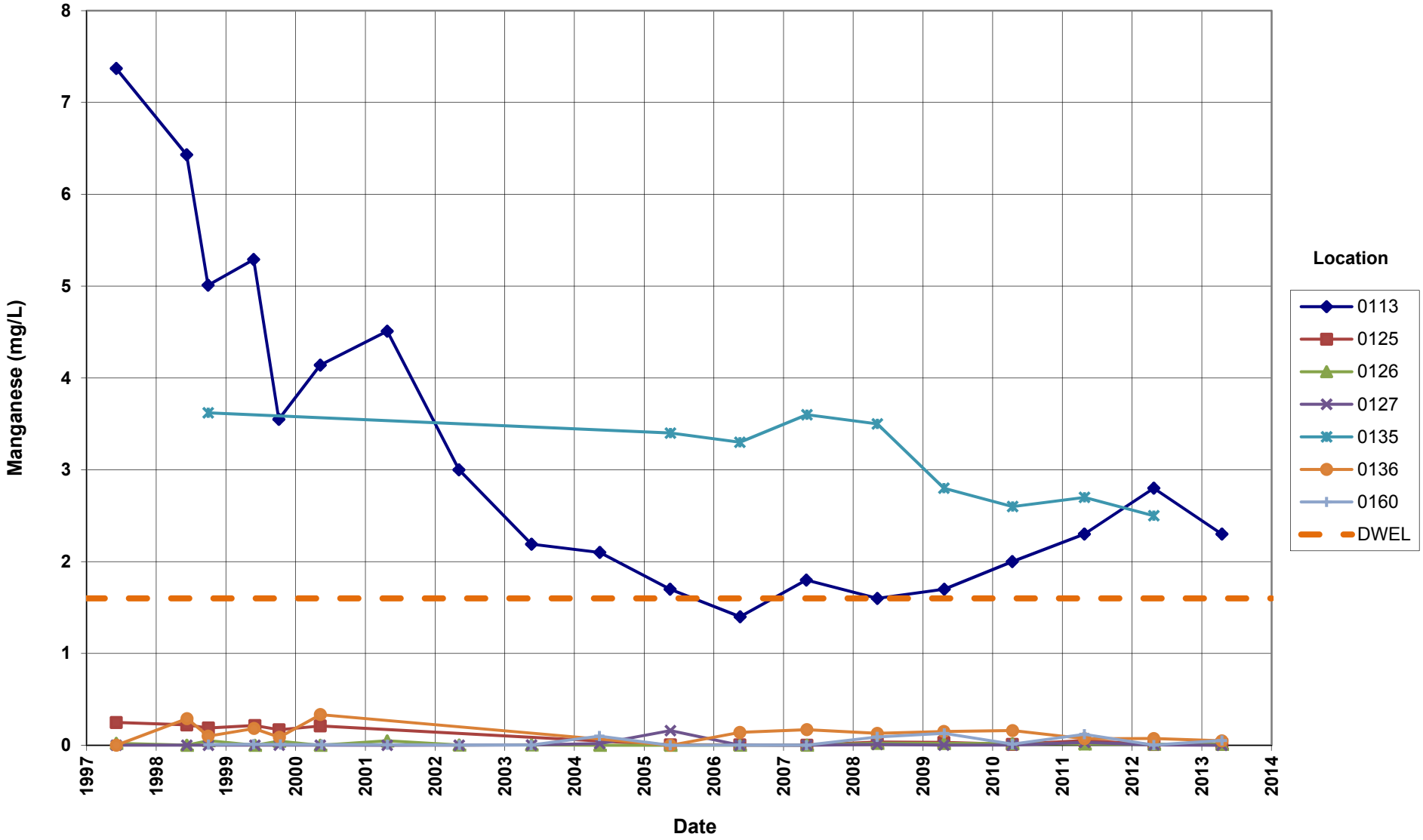
Gunnison Processing Site
Manganese Concentration
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L




Gunnison Processing Site
Manganese Concentration
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L
Manganese (mg/L)
25
20
15
10
5
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date
Location
0064
0065
0066
0102
0105
0106
0112
DWEL

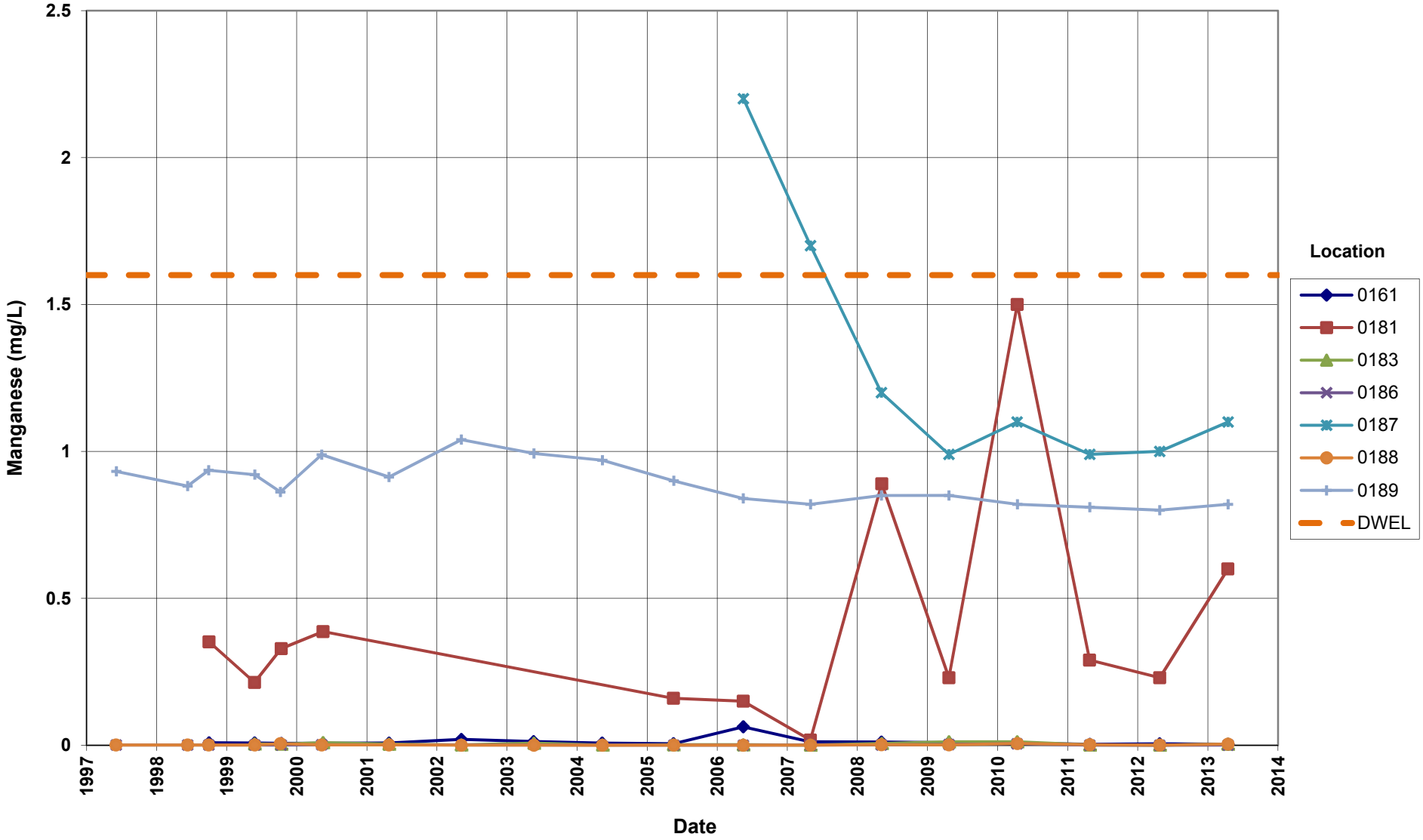
Gunnison Processing Site
Manganese Concentration

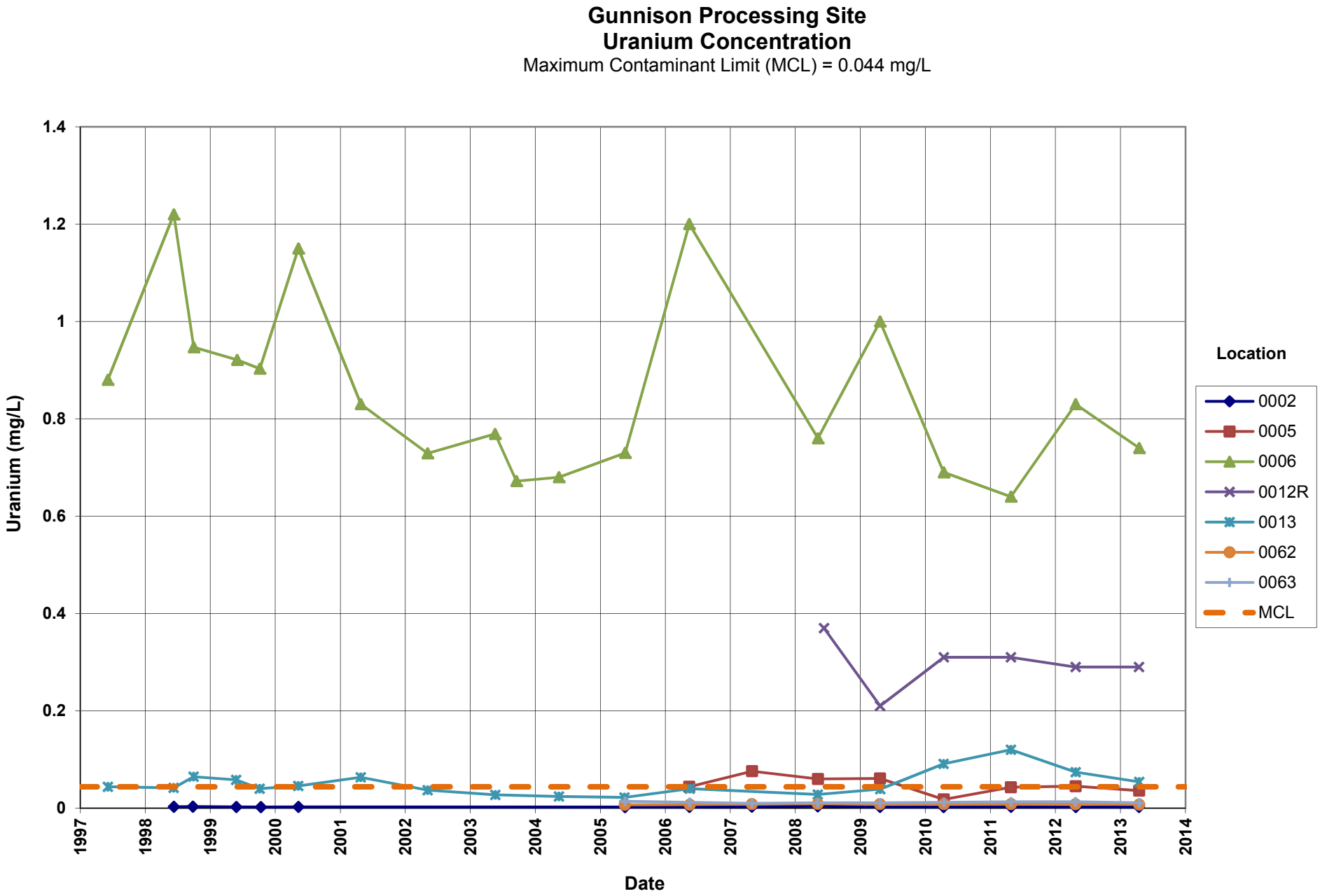
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L

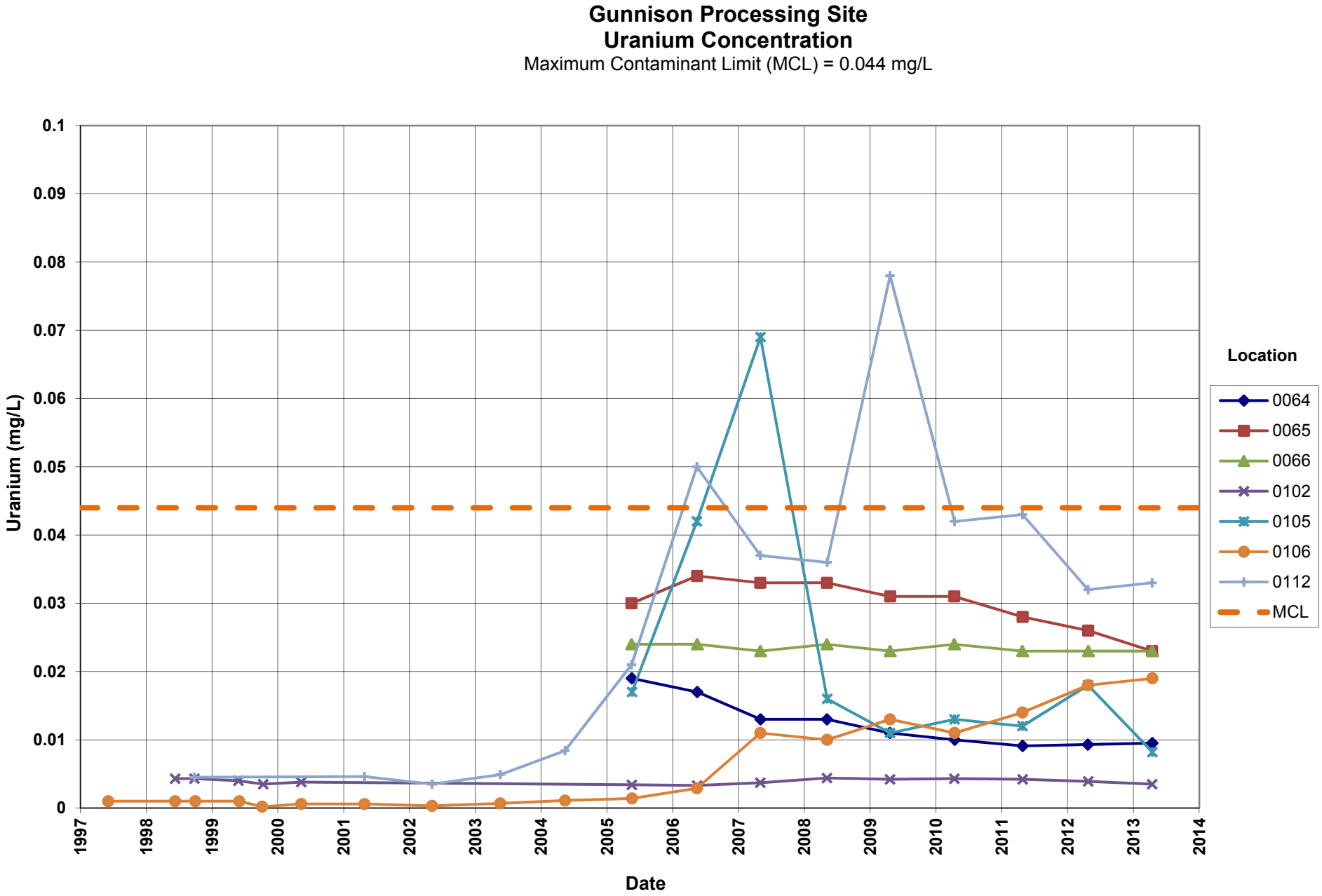


Gunnison Processing Site
Manganese Concentration

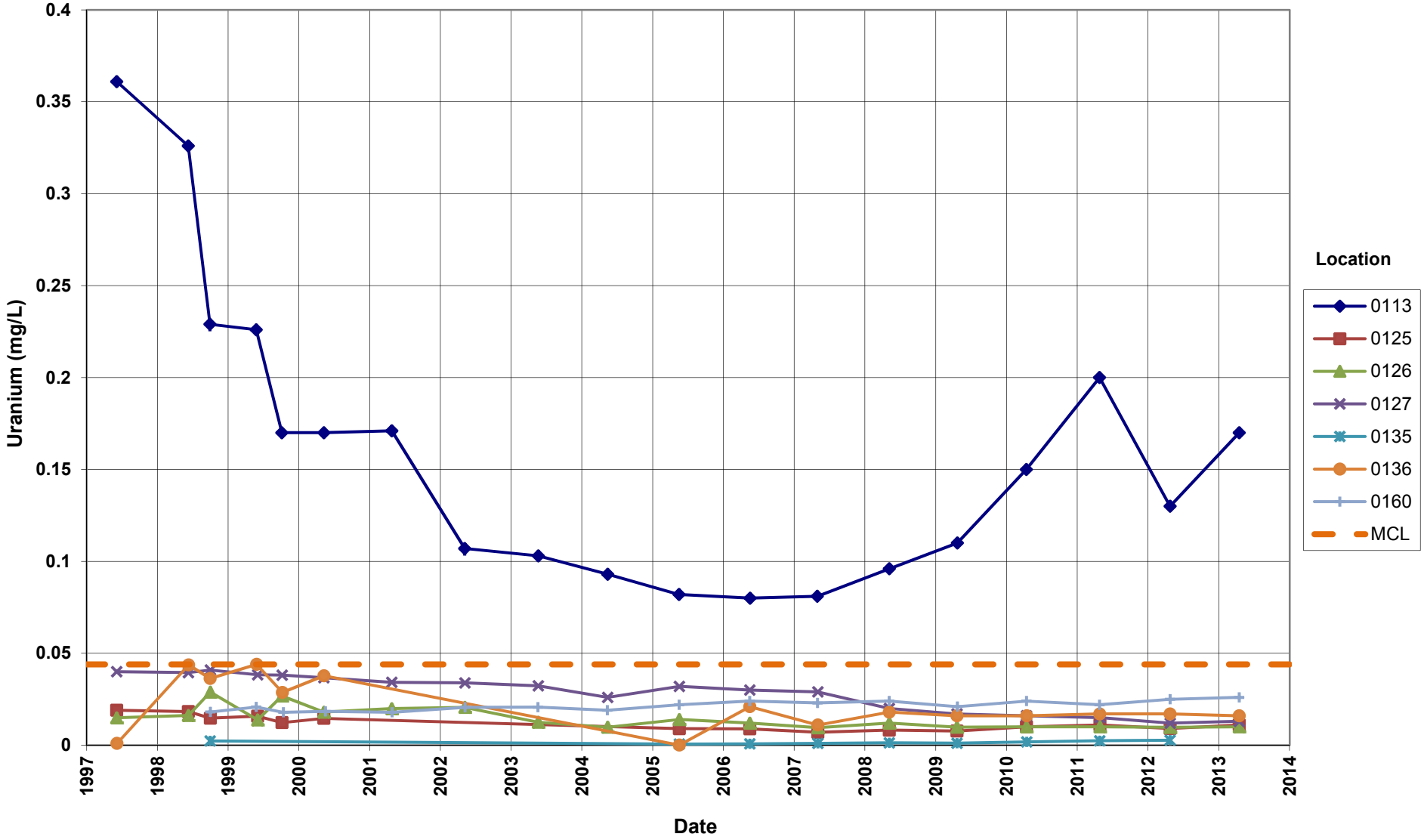
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



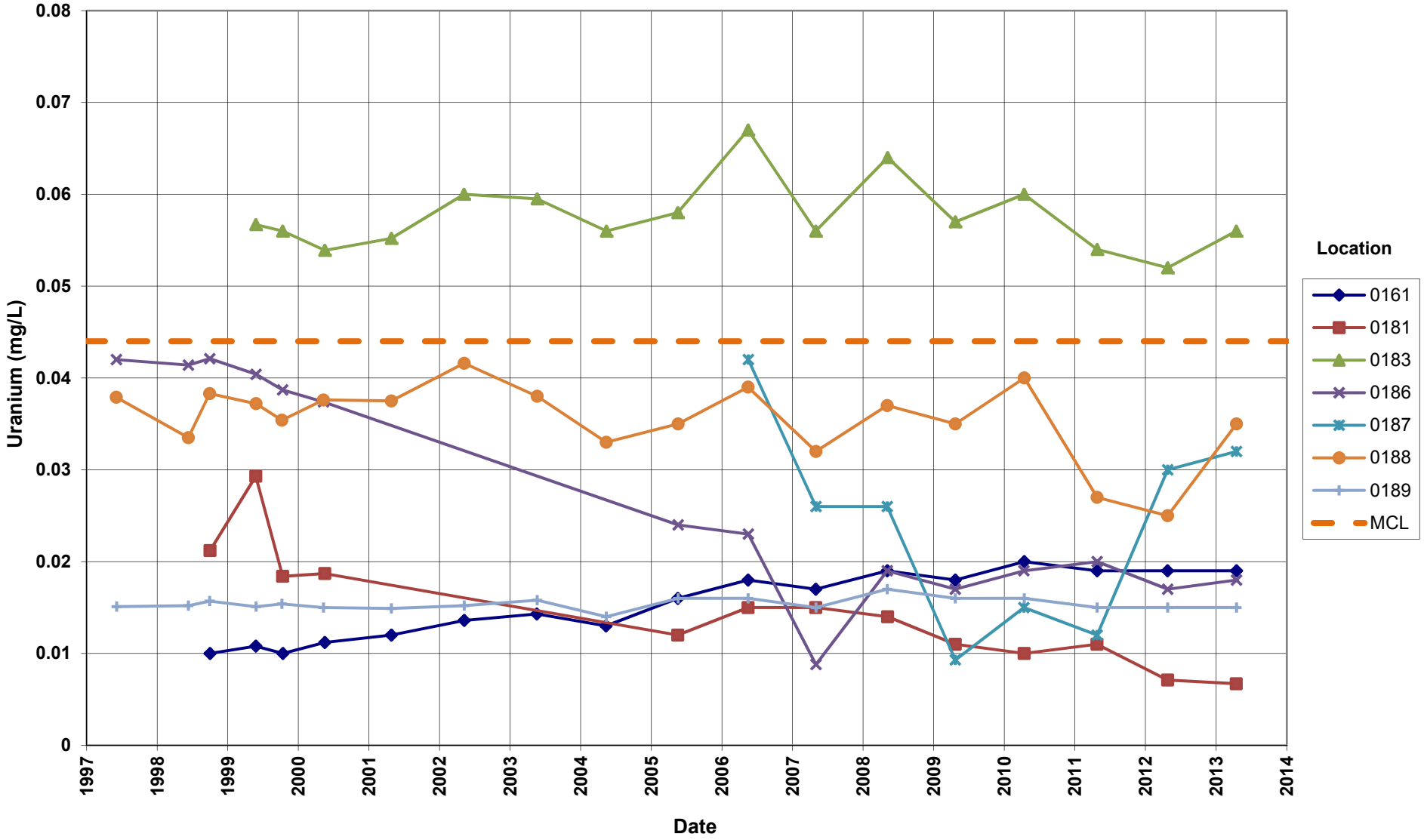

Gunnison Processing Site
Uranium Concentration
Maximum Contaminant Limit (MCL) = 0.044 mg/L
Uranium (mg/L)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date
Location
0002
0005
0006
0012R
0013
0062
0063
MCL


Gunnison Processing Site
Uranium Concentration
Maximum Contaminant Limit (MCL) = 0.044 mg/L
Uranium (mg/L)
0.1
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Date
Location
0064
0065
0066
0102
0105
0106
0112
MCL

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



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



Attachment 3
Sampling and Analysis Work Order

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Task Order LM-501
Control Number: 13-0393

March 13, 2013

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

SUBJECT: Contract No. DE-AM01-07LM00060, S.M. Stoller Corporation (Stoller)
April 2013 Environmental Sampling at Gunnison, Colorado, Processing Site

REFERENCE: Task Order LM00-501-02-108-402, Gunnison, Colorado, Disposal Site

Dear Ms. Steckley:

The purpose of this letter is to inform you of the upcoming sampling at Gunnison, Colorado. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Gunnison 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 8, 2013.

The following list shows 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	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
Site Lead

SC/lcg/lb

Enclosures (3)

cc: (electronic)
Karl Stoeckle, DOE
Sam Campbell, Stoller
Steve Donivan, Stoller
Bev Gallagher, Stoller
Lauren Goodknight, 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			
667			X			
683			X			

GUN01 (Processing site) 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	33 (41 every 5th year)		6			
Field Measurements						
Alkalinity						
Dissolved Oxygen						
Redox Potential	X	X	X			
pH	X	X	X			
Specific Conductance	X	X	X			
Turbidity	X	X	X			
Temperature	X	X	X			
Laboratory Measurements	*GUN01*	*GUN08*	*GUN01*			
Aluminum						
Ammonia as N (NH3-N)						
Calcium		X		5	SW-846 6010	LMM-01
Chloride		X		0.5	SW-846 9056	WCH-A-039
Chromium						
Gross Alpha						
Gross Beta						
Iron		X		0.05	SW-846 6020	LMM-02
Lead						
Magnesium		X		5	SW-846 6010	LMM-01
Manganese	X	X	X	0.005	SW-846 6010	LMM-01
Molybdenum						
Nickel						
Nickel-63						
Nitrate + Nitrite as NNO3+NO2) N						
Potassium		X		1	SW-846 6010	LMM-01
Radium-226						
Radium-228						
Selenium						
Silica						
Sodium		X		1	SW-846 6010	LMM-01
Strontium						
Sulfate		X		0.5	SW-846 9056	MIS-A-044
Sulfide						
Total Dissolved Solids		X		10	SM2540 C	WCH-A-033
Total Organic Carbon						
Uranium	X	X	X	0.0001	SW-846 6020	LMM-02
Vanadium						
Zinc						
Total No. of Analytes	2	10	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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Memorandum

DATE: May 2, 2013

TO: Sam Campbell

FROM: Jeff Price

SUBJECT: Trip Report

Site: Gunnison, Colorado, Processing Site

Dates of Sampling Event: April 15-17, 2013

Team Members: David Atkinson and Jeff Price.

Number of Locations Sampled: 27 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 later in the spring when the wells are in use. Monitoring well 0135 was not sampled because the PVC well casing appears to be broken about two feet below ground surface. The well will be repaired and possibly sampled later this year after the flooded hay field dries.

Location Specific Information: Photographs were taken of all wells**.** Photos can be found at \\Gull\Sites_Prod\Sites\CO\GUNNISONPROCESSING\Images\2013\04162013_Price_Wells.

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
2748	LFZ 244	N/A	Equipment Blank collected on tubing reel after sampling 0248.	Water
2597	LFZ 241	0125	Duplicate	Groundwater
2598	LFZ 242	0126	Duplicate	Groundwater

Report Identification Number (RIN) Assigned: Samples were assigned to RIN 13045222. Field data sheets can be found in Crow\sms\13045222 in the FieldData folder.

Sample Shipment: Samples were shipped from Grand Junction to ALS Laboratory Group on April 17, 2013.

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

Well Inspection Summary: With the exception of well 0135, no issues were identified.

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

Field Variance: None.

Equipment: All equipment functioned properly.

Stakeholder/Regulatory: No interaction.

Institutional Controls:

Fences, Gates, and Locks: All landowner gates were left as found.
Signs: N/A
Trespassing/Site Disturbances: N/A

Site Issues: None.

Disposal Cell/Drainage Structure Integrity: N/A
Vegetation/Noxious Weed Concerns: None observed.
Maintenance Requirements: None.
Safety Issues: None.
Access Issues: None.

Corrective Action Required/Taken: Sampling of domestic wells 0476 and 0477 will be conducted later this spring. Well 0135 will be repaired and possibly sampled later this year.

(JP/lcg)

cc: cc: (electronic)
Deborah Steckley, DOE
Sam Campbell, Stoller
Steve Donivan, Stoller
EDD Delivery

Stoller
Grand Junction Office
established 1959

Memorandum

Control Number N/A

DATE: June 13, 2013

TO: Distribution

FROM: Sam Campbell

SUBJECT: Trip Report

Site: Gunnison, Colorado, Processing Site.

Dates of Sampling Event: June 3, 2013

Team Members: Sam Campbell

Number of Locations Sampled: Three domestic wells (0476, 0477, and 0683) were sampled; wells 0476 and 0477 were not sampled in April because the homes were vacant, and well 0683 was resampled because of an anomalously high manganese result from the April sampling

Locations Not Sampled/Reason: None. This completes the sampling of all locations scheduled for 2013 event.

Location Specific Information: Wells were sampled using Category IV protocol.

Field Variance: None.

Quality Control Samples: No quality control samples were collected – sampling of these wells was considered an extension of the sampling event conducted in April, and the required number of quality control samples has already been collected.

Requisition Numbers Assigned: Samples were assigned to requisition identification number (RIN) 13055372.

Water Level Measurements: None collected.

Well Inspection Summary: No inspections conducted

Equipment: Pre-trip calibration, daily operational check, and post-trip operational checks were conducted. All equipment functioned properly.

Stakeholder/Regulatory: D. Steckley (DOE) and M. Cosby (CDPHE) observed sampling activities.

Institutional Controls: Not applicable

Site Issues: None

Access Issues: None

Corrective Action Required/Taken: None

(SEC/lcg)

cc: cc: (electronic)
Deb Steckley, DOE
Steve Donivan, Stoller
Bev Gallagher, Stoller
EDD Delivery