

# Data Validation Package

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**April and June 2014  
Groundwater and Surface Water  
Sampling at the  
Gunnison, Colorado, Processing Site**

**September 2014**



**U.S. DEPARTMENT OF  
ENERGY**

Legacy  
Management

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# Sampling Event Summary

**Site:** Gunnison, Colorado, Processing Site

**Sampling Period:** April 14-17 & June 11, 2014

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 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*. Gunnison River location 0251 was sampled instead of 0792. In accordance with a Health and Safety management assessment for U.S. Department of Energy Office of Legacy Management Sites, 0792 was permanently replaced by 0251, which is across the river in an area with safer access. Domestic wells 0476 and 0477 were sampled in June because the homes were unoccupied in April, and the wells were not in use. Duplicate samples were collected from locations 0013, 0105, and 0476. One equipment blank was collected during this sampling event. Water levels were measured at all monitoring wells that were sampled.

Manganese and uranium are 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 concentration limit (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 milligram 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 <sup>a</sup>	DWEL <sup>b</sup>	Location	Concentration <sup>c</sup>
Uranium	0.044		0006	0.71
			0012R	0.26
			0013	0.075
			0112	0.047
			0113	0.23
			0183	0.061
Manganese		1.6	0105	2.9
			0106	4.6
			0112	4.6
			0113	2.5
			0135	2.8
			0136	2.1

<sup>a</sup> Uranium standard is listed in 40 CFR 192.04 Table 1 to Subpart A; units are in mg/L.

<sup>b</sup> DWEL from EPA's 2011 Edition of the Drinking Water Standards and Health Advisories.

<sup>c</sup> Units are in mg/L.

Surface water uranium concentrations were compared to a statistical background threshold value (BTV) derived from locations 0251 and 0792 data, which are located on the Gunnison River upstream from the site. The uranium concentration at the Gunnison River downstream location 0795 and the south fork location 0250 were less than the BTV, indicating minimal impact to the Gunnison River from site activities. Uranium concentration at the gravel pit pond (0780) is elevated compared to the BTV, 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 BTV because Tomichi Creek receives discharge from the gravel pit pond.

Table 2. Comparison of Surface Water Uranium Concentrations to the BTV

Description	Location	Uranium Concentration (mg/L)	BTV (mg/L)
Tomichi Creek	0248	0.011	0.0012 <sup>a</sup>
Gunnison River	0250	0.00098	
Tomichi Creek	0777	0.0053	
Valco Pond	0780	0.037	
Gunnison River	0795	0.00086	

<sup>a</sup> BTV values are calculated using ProUCL version 5.0 as provided by EPA. The BTV was calculated using the 95% upper simultaneous limit (USL) for normally distributed data. All observations from the background data set are less than or equal to the BTV with a confidence coefficient of 95%.

  
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 Sam Campbell, Site Lead  
 The S.M. Stoller Corporation,  
 a wholly owned subsidiary of  
 Huntington Ingalls Industries

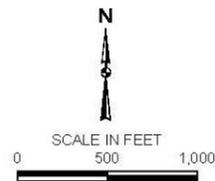
9/15/2014  
 Date



**LEGEND**

- MONITORING WELL
- DOMESTIC WELL
- SURFACE LOCATION
- FORMER SURFACE LOCATION - NO LONGER SAMPLED

FORMER MILLSITE BOUNDARY



U.S. DEPARTMENT OF ENERGY GRAND JUNCTION, COLORADO	Work Performed by <b>S.M. Stoller Corporation</b> Under DOE Contract No. DE-AM01-07LM00060
Planned Sampling Map Gunnison, CO, Processing Site April 2014	
DATE PREPARED: September 4, 2014	FILENAME: S1155300

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*Gunnison, Colorado, Processing Site Planned Sampling Map*

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# **Data Assessment Summary**

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### Water Sampling Field Activities Verification Checklist

<b>Project</b>	Gunnison, Colorado	<b>Date(s) of Water Sampling</b>	April 14-17 & June 11, 2014
<b>Date(s) of Verification</b>	July 8, 2014	<b>Name of Verifier</b>	Gretchen Baer

	<b>Response (Yes, No, NA)</b>	<b>Comments</b>
1. Is the SAP the primary document directing field procedures? List any Program Directives or other documents, SOPs, instructions.	Yes	Work Order letter dated March 28, 2014. Two samples that could not be sampled in April were sampled in June. The river location 0792 was not sampled: this sampling location was moved across the river for safer access per Health and Safety recommendation. The new sampling location ID is 0251.
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Were calibrations conducted as specified in the above-named documents?	Yes	Calibrations were performed April 10 & 14 and June 10, 2014.
4. Was an operational check of the field equipment conducted daily? Did the operational checks meet criteria?	Yes 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? Did the water level stabilize prior to sampling? Did pH, specific conductance, and turbidity measurements meet criteria prior to sampling? Was the flow rate less than 500 mL/min?	Yes Yes Yes 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? Was one pump/tubing volume removed prior to sampling?	NA	All wells were Category I.
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	Duplicate samples were collected from locations 0013, 0105, & 0476.
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	Water levels were measured in all sampled wells.

## Laboratory Performance Assessment

### General Information

Report Number (RIN): 14046058  
Sample Event: April 14-17, 2014  
Site(s): Gunnison, Colorado, Processing Site  
Laboratory: ALS Laboratory Group, Fort Collins, Colorado  
Work Order No.: 1404333  
Analysis: Metals  
Validator: Gretchen Baer  
Review Date: July 8, 2014

This validation was performed according to the *Environmental Procedures Catalog* (LMS/POL/S04325, continually updated), "Standard Practice for Validation of Environmental Data." The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation 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	LMM-01	SW-846 3005A	SW-846 6010B
Uranium	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
1404333-5	0013	Manganese	J	Field duplicate RPD > 20%
1404333-25	0186	Manganese	J	Negative calibration blank
1404333-32	0667	Manganese	J	Negative calibration blank
1404333-33	0683	Manganese	J	Negative calibration blank
1404333-38	0013 Duplicate	Manganese	J	Field duplicate RPD > 20%

### Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 40 water samples associated with the Gunnison Processing Site on April 18, 2014, accompanied by a Chain of Custody form. The Chain of Custody form was checked to confirm that all of the samples were listed with sample

collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The Chain of Custody form was complete with no errors or omissions. Copies of the air waybill labels were included with the receiving documentation.

### Preservation and Holding Times

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

### Detection and Quantitation Limits

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

### Laboratory Instrument Calibration

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

#### *Method SW-846 6010B, Manganese*

Calibrations were performed on April 23 and 24, 2014, using three calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results were within the acceptance range.

#### *Method SW-846 6020A, Uranium*

Calibrations were performed on April 23 and 24, 2014, using two calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results were within the acceptance range. Mass calibration and resolution verifications were performed at the beginning of each analytical run in

accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

#### Method and Calibration Blanks

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

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

#### Matrix Spike Analysis

Matrix spike and matrix spike duplicate (MS/MSD) samples are used to measure method performance in the sample matrix. The MS/MSD data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike. The spike recoveries met the acceptance criteria for all analytes.

#### Laboratory Replicate Analysis

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

#### Laboratory Control Samples

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

#### Metals Serial Dilution

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

## Completeness

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

## Electronic Data Deliverable (EDD) File

The EDD file arrived on April 28, 2014. 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.

The EDD includes the results for location 0792. This location identifier was changed to 0251 upon entry into the environmental database. (The associated samples were collected across the river from location 0792. A new location number was not available at the time of sampling, so the samples were identified as 0792. After the sampling event, identifier 0251 was created for the new location.)

# SAMPLE MANAGEMENT SYSTEM

## General Data Validation Report

RIN: 14046058    Lab Code: PAR    Validator: Gretchen Baer    Validation Date: 6/27/2014  
Project: Gunnison    Analysis Type:  Metals     General Chem     Rad     Organics  
# of Samples: 41    Matrix: WATER    Requested Analysis Completed: Yes

### Chain of Custody

Present: OK    Signed: OK    Dated: OK

### Sample

Integrity: OK    Preservation: OK    Temperature: OK

### Select Quality Parameters

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

All analyses were completed within the applicable holding times.

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

There was 1 trip/equipment blank evaluated.

There were 2 duplicates evaluated.

**SAMPLE MANAGEMENT SYSTEM  
Metals Data Validation Worksheet**

RIN: 14046058      Lab Code: PAR      Date Due: 5/16/2014  
 Matrix: Water      Site Code: GUN01      Date Completed: 4/29/2014

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	04/23/2014	-0.9000	1.0000	OK	OK	OK	110.0	110.0	110.0	0.0	98.0	1.0	102.0
Manganese	ICP/ES	04/23/2014									3.0	97.0		109.0
Manganese	ICP/ES	04/23/2014									6.0			
Manganese	ICP/ES	04/24/2014	0.0000	1.0000	OK	OK	OK	98.0	107.0	105.0	1.0	95.0	1.0	100.0
Manganese	ICP/ES	04/24/2014					OK	97.0	86.0	94.0	7.0	96.0		108.0
Uranium	ICP/MS	04/23/2014	0.0000	1.0000	OK	OK	OK	101.0	110.0	109.0	1.0	101.0	4.0	90.0
Uranium	ICP/MS	04/23/2014									5.0			
Uranium	ICP/MS	04/23/2014									0.0			
Uranium	ICP/MS	04/24/2014	-0.0010	1.0000	OK	OK	OK	106.0			4.0	104.0		90.0
Uranium	ICP/MS	04/24/2014					OK	109.0	106.0	117.0	3.0		4.0	101.0

## General Information

Report Number (RIN): 14066262  
Sample Event: June 11, 2014  
Site(s): Gunnison, Colorado, Processing Site  
Laboratory: ALS Laboratory Group, Fort Collins, Colorado  
Work Order No.: 1406300  
Analysis: Metals  
Validator: Gretchen Baer  
Review Date: July 8, 2014

This validation was performed according to the *Environmental Procedures Catalog* (LMS/POL/S04325, continually updated), "Standard Practice for Validation of Environmental Data." The procedure was applied at Level 3, Data Validation. See attached Data Validation Worksheets for supporting documentation 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	LMM-01	SW-846 3005A	SW-846 6010B
Uranium	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
1406300-1	0476	Manganese	U	Less than 5 times the calibration blank
1406300-3	0476 Duplicate	Manganese	U	Less than 5 times the calibration blank

## Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received three water samples on June 13, 2014, accompanied by a Chain of Custody form. The Chain of Custody form was checked to confirm that all of the samples were listed with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt. The Chain of Custody form was complete with no errors or omissions. Copies of the air waybill labels were included with the receiving documentation.

### Preservation and Holding Times

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

### Detection and Quantitation Limits

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

### Laboratory Instrument Calibration

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

#### *Method SW-846 6010B, Manganese*

Calibrations were performed on June 17, 2014, using three calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results were within the acceptance range.

#### *Method SW-846 6020A, Uranium*

Calibrations were performed on June 17, 2014, using two calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency. All calibration checks met the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results were within the acceptance range. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

### Method and Calibration Blanks

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

### Inductively Coupled Plasma Interference Check Sample Analysis

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

### Matrix Spike Analysis

Matrix spike and matrix spike duplicate (MS/MSD) samples are used to measure method performance in the sample matrix. The MS/MSD data are not evaluated when the concentration of the unspiked sample is greater than 4 times the spike. The spike recoveries met the acceptance criteria for all analytes.

### Laboratory Replicate Analysis

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

### Laboratory Control Samples

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

### Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Serial dilution data are evaluated when the concentration of the undiluted sample is greater than 50 times the MDL. No serial dilution data required evaluation.

### 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 23, 2014. 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: 14066262    Lab Code: PAR    Validator: Gretchen Baer    Validation Date: 7/8/2014  
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.

There was 1 duplicate evaluated.

**SAMPLE MANAGEMENT SYSTEM  
Metals Data Validation Worksheet**

RIN: 14066262      Lab Code: PAR      Date Due: 7/11/2014  
 Matrix: Water      Site Code: GUN01      Date Completed: 6/24/2014

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	06/17/2014	-1.1000	1.0000	OK	OK	OK	106.0	107.0	106.0	1.0	91.0		99.0
Manganese	ICP/ES	06/17/2014										100.0		109.0
Uranium	ICP/MS	06/17/2014	0.0000	1.0000	OK	OK	OK	106.0	114.0	111.0	2.0	101.0		90.0
Uranium	ICP/MS	06/17/2014									2.0			

## Sampling Quality Control Assessment

The following information summarizes and assesses quality control for the April and June 2014 sampling events (RINs 14046058 and 14066262).

### 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. All private wells were Category IV locations: no purging during sampling or qualification of results is required.

### Equipment Blanks

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

### Field Duplicate Analysis

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 RPD 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 monitoring wells 0013 and 0105 and private well 0476. The duplicate results met these criteria, with the exception of the manganese RPD from location 0013, which was above the criteria at 58 percent. There were no analytical errors identified during the review of the data. Specifically, the raw data were carefully examined for a dilution factor error. The method 6010 results for uranium in the sample (which were reported in the raw data) had an RPD of 16 percent, which indicates that no dilution error was made. The manganese results for this location are qualified with a “J” flag as estimated values.

**SAMPLE MANAGEMENT SYSTEM**  
**Validation Report: Field Duplicates**

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RIN: 14046058    Lab Code: PAR    Project: Gunnison    Validation Date: 6/27/2014

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Duplicate: 2597

Sample: 0013

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Manganese	420			1	230			1	58.46		UG/L
Uranium	75			50	79			10	5.19		UG/L

Duplicate: 2748

Sample: 0105

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Manganese	2900			1	2700			1	7.14		UG/L
Uranium	8.8			10	9			10	2.25		UG/L

**SAMPLE MANAGEMENT SYSTEM**  
**Validation Report: Field Duplicates**

Page 1 of 1

RIN: 14066262    Lab Code: PAR    Project: Gunnison    Validation Date: 7/8/2014

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Duplicate: 2646

Sample: 0476

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Manganese	0.67	B		1	0.24	B		1			UG/L
Uranium	1.7			10	1.9			10	11.11		UG/L

## Certification

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

Laboratory Coordinator:	 _____ Stephen Donovan	Stephen E. Donovan 2014.09.15 07:14:45 -06'00' _____ Date
Data Validation Lead:	 _____ Gretchen Baer	Gretchen Baer 2014.09.14 08:21:20 -06'00' _____ Date

**Attachment 1**  
**Assessment of Anomalous Data**

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# Potential Outliers Report

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## Potential Outliers Report

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

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

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

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

The laboratory results for manganese from locations 0013, 0136, and 0188 were identified as potential outliers. The data associated with these results were further reviewed.

- The high value at 0013 was confirmed by the field duplicate.
- The result at 0136 of 2,100 µg/L was confirmed by the laboratory with a reanalysis performed on July 8, 2014.
- No errors were found for the result at 0188.

Potential anomalies in the field parameters were also examined for patterns of repeated high or low bias, which suggest a systematic error due to instrument malfunction. No such patterns were found and the data for these RINs are acceptable as qualified.

**Data Validation Outliers Report - No Field Parameters**

**Comparison: All historical Data Beginning 1/1/2004**

Laboratory: ALS Laboratory Group

RINs: 14046058 & 14066262

Report Date: 7/21/2014

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Historical Maximum			Historical Minimum			Number of Data Points		Statistical Outlier		
					Result	Qualifiers		Result	Qualifiers		Result	Qualifiers			N	N Below Detect
						Lab	Data		Lab	Data		Lab	Data			
GUN01	0013	N002	04/15/2014	Manganese	0.230		JF	0.200		F	0.00008	B	UF	10	3	Yes
GUN01	0013	N001	04/15/2014	Manganese	0.420		JF	0.200		F	0.00008	B	UF	10	3	Yes
GUN01	0065	N001	04/15/2014	Manganese	0.0130		F	0.620		FQ	0.0170		F	9	0	No
GUN01	0066	N001	04/15/2014	Uranium	0.0250		F	0.0240		F	0.0230		F	9	0	NA
GUN01	0106	N001	04/14/2014	Manganese	4.60		F	9.60		F	4.80		F	10	0	No
GUN01	0106	N001	04/14/2014	Uranium	0.0320		F	0.0190		F	0.00110		F	10	0	No
GUN01	0113	N001	04/15/2014	Uranium	0.230		F	0.200		F	0.0800		F	13	0	No
GUN01	0125	N001	04/14/2014	Uranium	0.0130		F	0.0110		F	0.00700		F	10	0	No
GUN01	0135	N001	04/14/2014	Uranium	0.00390		F	0.00270		F	0.00059		F	8	0	No
GUN01	0136	N001	04/14/2014	Manganese	2.10		F	0.170		FQ	0.00053	U	FG	9	1	Yes
GUN01	0160	N001	04/16/2014	Uranium	0.0270		F	0.0260		F	0.0190		F	10	0	No
GUN01	0187	N001	04/15/2014	Manganese	0.540		F	2.20		FQ	0.990		F	9	0	NA
GUN01	0188	N001	04/15/2014	Manganese	0.0210		F	0.00600		F	0.000077	U	F	11	7	Yes
GUN01	0477	N001	06/11/2014	Manganese	0.00540			0.0300			0.00670			7	0	No
GUN01	0478	N001	04/15/2014	Uranium	0.00340			0.00330			0.00220			6	0	No
GUN01	0683	N001	04/15/2014	Uranium	0.00410			0.00350			0.0007			12	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.

NA: Data are not normally or lognormally distributed.

# **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: 7/9/2014

Location: 0002 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	10	-	15	0.003	B	F	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	10	-	15	150		F	#		
pH	s.u.	04/15/2014	N001	10	-	15	7.31		F	#		
Specific Conductance	umhos/cm	04/15/2014	N001	10	-	15	450		F	#		
Temperature	C	04/15/2014	N001	10	-	15	7.29		F	#		
Turbidity	NTU	04/15/2014	N001	10	-	15	0.92		F	#		
Uranium	mg/L	04/15/2014	N001	10	-	15	0.0026		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0005 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/14/2014	N001	10	-	15	0.35		F	#	0.00024	
Oxidation Reduction Potential	mV	04/14/2014	N001	10	-	15	98		F	#		
pH	s.u.	04/14/2014	N001	10	-	15	7.2		F	#		
Specific Conductance	umhos/cm	04/14/2014	N001	10	-	15	493		F	#		
Temperature	C	04/14/2014	N001	10	-	15	5.55		F	#		
Turbidity	NTU	04/14/2014	N001	10	-	15	8.87		F	#		
Uranium	mg/L	04/14/2014	N001	10	-	15	0.043		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0006 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/14/2014	N001	10	-	15	0.012		F	#	0.00024	
Oxidation Reduction Potential	mV	04/14/2014	N001	10	-	15	141		F	#		
pH	s.u.	04/14/2014	N001	10	-	15	7.05		F	#		
Specific Conductance	umhos/cm	04/14/2014	N001	10	-	15	2148		F	#		
Temperature	C	04/14/2014	N001	10	-	15	5.67		F	#		
Turbidity	NTU	04/14/2014	N001	10	-	15	4.93		F	#		
Uranium	mg/L	04/14/2014	N001	10	-	15	0.71		F	#	0.00029	

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

REPORT DATE: 7/9/2014

Location: 0012R WELL Replacement well for 0012

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/14/2014	N001	6.03	-	16	0.36		F	#	0.00024	
Oxidation Reduction Potential	mV	04/14/2014	N001	6.03	-	16	171		F	#		
pH	s.u.	04/14/2014	N001	6.03	-	16	6.91		F	#		
Specific Conductance	umhos/cm	04/14/2014	N001	6.03	-	16	1060		F	#		
Temperature	C	04/14/2014	N001	6.03	-	16	9.03		F	#		
Turbidity	NTU	04/14/2014	N001	6.03	-	16	1.7		F	#		
Uranium	mg/L	04/14/2014	N001	6.03	-	16	0.26		F	#	0.00029	

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

REPORT DATE: 7/9/2014

Location: 0013 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data QA		
Manganese	mg/L	04/15/2014	N001	11	-	16	0.42	JF	#	0.00024	
Manganese	mg/L	04/15/2014	N002	11	-	16	0.23	JF	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	11	-	16	151.8	F	#		
pH	s.u.	04/15/2014	N001	11	-	16	7.13	F	#		
Specific Conductance	umhos/cm	04/15/2014	N001	11	-	16	797	F	#		
Temperature	C	04/15/2014	N001	11	-	16	7.55	F	#		
Turbidity	NTU	04/15/2014	N001	11	-	16	6.62	F	#		
Uranium	mg/L	04/15/2014	N001	11	-	16	0.075	F	#	0.00015	
Uranium	mg/L	04/15/2014	N002	11	-	16	0.079	F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0062 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	47.9 - 57.9	0.0048	B	F	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	47.9 - 57.9	147.7		F	#		
pH	s.u.	04/15/2014	N001	47.9 - 57.9	7.43		F	#		
Specific Conductance	umhos /cm	04/15/2014	N001	47.9 - 57.9	498		F	#		
Temperature	C	04/15/2014	N001	47.9 - 57.9	7.28		F	#		
Turbidity	NTU	04/15/2014	N001	47.9 - 57.9	4.91		F	#		
Uranium	mg/L	04/15/2014	N001	47.9 - 57.9	0.0083		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0063 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	87.9 - 97.9	0.023		F	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	87.9 - 97.9	144.5		F	#		
pH	s.u.	04/15/2014	N001	87.9 - 97.9	7.44		F	#		
Specific Conductance	umhos /cm	04/15/2014	N001	87.9 - 97.9	505		F	#		
Temperature	C	04/15/2014	N001	87.9 - 97.9	9.66		F	#		
Turbidity	NTU	04/15/2014	N001	87.9 - 97.9	6.58		F	#		
Uranium	mg/L	04/15/2014	N001	87.9 - 97.9	0.014		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0064 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	86.7	-	96.7	0.038		F	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	86.7	-	96.7	146.3		F	#		
pH	s.u.	04/15/2014	N001	86.7	-	96.7	7.36		F	#		
Specific Conductance	umhos/cm	04/15/2014	N001	86.7	-	96.7	469		F	#		
Temperature	C	04/15/2014	N001	86.7	-	96.7	8.26		F	#		
Turbidity	NTU	04/15/2014	N001	86.7	-	96.7	6.14		F	#		
Uranium	mg/L	04/15/2014	N001	86.7	-	96.7	0.011		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0065 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	49.7	-	59.7	0.013		F	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	49.7	-	59.7	87		F	#		
pH	s.u.	04/15/2014	N001	49.7	-	59.7	7.24		F	#		
Specific Conductance	umhos/cm	04/15/2014	N001	49.7	-	59.7	622		F	#		
Temperature	C	04/15/2014	N001	49.7	-	59.7	8.85		F	#		
Turbidity	NTU	04/15/2014	N001	49.7	-	59.7	8.66		F	#		
Uranium	mg/L	04/15/2014	N001	49.7	-	59.7	0.025		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0066 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	40.2 - 50.2	0.1		F	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	40.2 - 50.2	124		F	#		
pH	s.u.	04/15/2014	N001	40.2 - 50.2	7.1		F	#		
Specific Conductance	umhos/cm	04/15/2014	N001	40.2 - 50.2	630		F	#		
Temperature	C	04/15/2014	N001	40.2 - 50.2	8.41		F	#		
Turbidity	NTU	04/15/2014	N001	40.2 - 50.2	9.52		F	#		
Uranium	mg/L	04/15/2014	N001	40.2 - 50.2	0.025		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0102 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	42	-	47	0.0023	B	F	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	42	-	47	149		F	#		
pH	s.u.	04/15/2014	N001	42	-	47	7.55		F	#		
Specific Conductance	umhos /cm	04/15/2014	N001	42	-	47	467		F	#		
Temperature	C	04/15/2014	N001	42	-	47	9.27		F	#		
Turbidity	NTU	04/15/2014	N001	42	-	47	1.32		F	#		
Uranium	mg/L	04/15/2014	N001	42	-	47	0.0039		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0105 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	42	-	47	2.9		F	#	0.00024	
Manganese	mg/L	04/15/2014	N002	42	-	47	2.7		F	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	42	-	47	124		F	#		
pH	s.u.	04/15/2014	N001	42	-	47	6.97		F	#		
Specific Conductance	umhos/cm	04/15/2014	N001	42	-	47	428		F	#		
Temperature	C	04/15/2014	N001	42	-	47	8.31		F	#		
Turbidity	NTU	04/15/2014	N001	42	-	47	0.62		F	#		
Uranium	mg/L	04/15/2014	N001	42	-	47	0.0088		F	#	0.000029	
Uranium	mg/L	04/15/2014	N002	42	-	47	0.009		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0106 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Manganese	mg/L	04/14/2014	N001	34 - 39	4.6		F	#	0.00024	
Oxidation Reduction Potential	mV	04/14/2014	N001	34 - 39	129		F	#		
pH	s.u.	04/14/2014	N001	34 - 39	6		F	#		
Specific Conductance	umhos /cm	04/14/2014	N001	34 - 39	1764		F	#		
Temperature	C	04/14/2014	N001	34 - 39	8.36		F	#		
Turbidity	NTU	04/14/2014	N001	34 - 39	3.01		F	#		
Uranium	mg/L	04/14/2014	N001	34 - 39	0.032		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0112 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Manganese	mg/L	04/14/2014	N001	40 - 45	4.6		F	#	0.00024	
Oxidation Reduction Potential	mV	04/14/2014	N001	40 - 45	109		F	#		
pH	s.u.	04/14/2014	N001	40 - 45	6.36		F	#		
Specific Conductance	umhos /cm	04/14/2014	N001	40 - 45	875		F	#		
Temperature	C	04/14/2014	N001	40 - 45	9.79		F	#		
Turbidity	NTU	04/14/2014	N001	40 - 45	4.32		F	#		
Uranium	mg/L	04/14/2014	N001	40 - 45	0.047		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0113 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	41	-	46	2.5		F	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	41	-	46	157.1		F	#		
pH	s.u.	04/15/2014	N001	41	-	46	6.87		F	#		
Specific Conductance	umhos/cm	04/15/2014	N001	41	-	46	809		F	#		
Temperature	C	04/15/2014	N001	41	-	46	8.78		F	#		
Turbidity	NTU	04/15/2014	N001	41	-	46	6.57		F	#		
Uranium	mg/L	04/15/2014	N001	41	-	46	0.23		F	#	0.00015	

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

REPORT DATE: 7/9/2014

Location: 0125 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Manganese	mg/L	04/14/2014	N001	17.8 - 22.8	0.038		F	#	0.00024	
Oxidation Reduction Potential	mV	04/14/2014	N001	17.8 - 22.8	136		F	#		
pH	s.u.	04/14/2014	N001	17.8 - 22.8	7.22		F	#		
Specific Conductance	umhos /cm	04/14/2014	N001	17.8 - 22.8	529		F	#		
Temperature	C	04/14/2014	N001	17.8 - 22.8	6.39		F	#		
Turbidity	NTU	04/14/2014	N001	17.8 - 22.8	1.3		F	#		
Uranium	mg/L	04/14/2014	N001	17.8 - 22.8	0.013		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0126 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Manganese	mg/L	04/14/2014	N001	54 - 59	0.014		F	#	0.00024	
Oxidation Reduction Potential	mV	04/14/2014	N001	54 - 59	140.5		F	#		
pH	s.u.	04/14/2014	N001	54 - 59	7.24		F	#		
Specific Conductance	umhos /cm	04/14/2014	N001	54 - 59	686		F	#		
Temperature	C	04/14/2014	N001	54 - 59	7.81		F	#		
Turbidity	NTU	04/14/2014	N001	54 - 59	7.31		F	#		
Uranium	mg/L	04/14/2014	N001	54 - 59	0.012		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0127 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/14/2014	N001	94	-	99	0.018		F	#	0.00024	
Oxidation Reduction Potential	mV	04/14/2014	N001	94	-	99	145.4		F	#		
pH	s.u.	04/14/2014	N001	94	-	99	7.3		F	#		
Specific Conductance	umhos/cm	04/14/2014	N001	94	-	99	735		F	#		
Temperature	C	04/14/2014	N001	94	-	99	7.71		F	#		
Turbidity	NTU	04/14/2014	N001	94	-	99	0.85		F	#		
Uranium	mg/L	04/14/2014	N001	94	-	99	0.015		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0135 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Manganese	mg/L	04/14/2014	N001	18 - 23	2.8		F	#	0.00024	
Oxidation Reduction Potential	mV	04/14/2014	N001	18 - 23	-30		F	#		
pH	s.u.	04/14/2014	N001	18 - 23	6.75		F	#		
Specific Conductance	umhos /cm	04/14/2014	N001	18 - 23	495		F	#		
Temperature	C	04/14/2014	N001	18 - 23	4.63		F	#		
Turbidity	NTU	04/14/2014	N001	18 - 23	2.68		F	#		
Uranium	mg/L	04/14/2014	N001	18 - 23	0.0039		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0136 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/14/2014	N001	53	-	58	2.1		F	#	0.00024	
Oxidation Reduction Potential	mV	04/14/2014	N001	53	-	58	-62		F	#		
pH	s.u.	04/14/2014	N001	53	-	58	6.96		F	#		
Specific Conductance	umhos/cm	04/14/2014	N001	53	-	58	456		F	#		
Temperature	C	04/14/2014	N001	53	-	58	6.07		F	#		
Turbidity	NTU	04/14/2014	N001	53	-	58	6.19		F	#		
Uranium	mg/L	04/14/2014	N001	53	-	58	0.0044		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0160 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/16/2014	N001	51	-	56	0.087		F	#	0.00024	
Oxidation Reduction Potential	mV	04/16/2014	N001	51	-	56	179.7		F	#		
pH	s.u.	04/16/2014	N001	51	-	56	6.55		F	#		
Specific Conductance	umhos/cm	04/16/2014	N001	51	-	56	847		F	#		
Temperature	C	04/16/2014	N001	51	-	56	7.39		F	#		
Turbidity	NTU	04/16/2014	N001	51	-	56	5.17		F	#		
Uranium	mg/L	04/16/2014	N001	51	-	56	0.027		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0161 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/16/2014	N001	93	-	98	0.0068		F	#	0.00024	
Oxidation Reduction Potential	mV	04/16/2014	N001	93	-	98	175.4		F	#		
pH	s.u.	04/16/2014	N001	93	-	98	6.58		F	#		
Specific Conductance	umhos/cm	04/16/2014	N001	93	-	98	862		F	#		
Temperature	C	04/16/2014	N001	93	-	98	7.63		F	#		
Turbidity	NTU	04/16/2014	N001	93	-	98	5.22		F	#		
Uranium	mg/L	04/16/2014	N001	93	-	98	0.02		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0181 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	18 - 23	0.6		F	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	18 - 23	132.1		F	#		
pH	s.u.	04/15/2014	N001	18 - 23	6.89		F	#		
Specific Conductance	umhos /cm	04/15/2014	N001	18 - 23	487		F	#		
Temperature	C	04/15/2014	N001	18 - 23	5.93		F	#		
Turbidity	NTU	04/15/2014	N001	18 - 23	6.23		F	#		
Uranium	mg/L	04/15/2014	N001	18 - 23	0.008		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0183 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	93	-	98	0.012		F	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	93	-	98	156.7		F	#		
pH	s.u.	04/15/2014	N001	93	-	98	6.74		F	#		
Specific Conductance	umhos/cm	04/15/2014	N001	93	-	98	1092		F	#		
Temperature	C	04/15/2014	N001	93	-	98	8.04		F	#		
Turbidity	NTU	04/15/2014	N001	93	-	98	5.59		F	#		
Uranium	mg/L	04/15/2014	N001	93	-	98	0.061		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0186 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	53	-	58	0.00078	B	JF	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	53	-	58	135		F	#		
pH	s.u.	04/15/2014	N001	53	-	58	7.76		F	#		
Specific Conductance	umhos/cm	04/15/2014	N001	53	-	58	523		F	#		
Temperature	C	04/15/2014	N001	53	-	58	7.11		F	#		
Turbidity	NTU	04/15/2014	N001	53	-	58	1.04		F	#		
Uranium	mg/L	04/15/2014	N001	53	-	58	0.02		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0187 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	93 - 98	0.54		F	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	93 - 98	49		F	#		
pH	s.u.	04/15/2014	N001	93 - 98	6.55		F	#		
Specific Conductance	umhos /cm	04/15/2014	N001	93 - 98	802		F	#		
Temperature	C	04/15/2014	N001	93 - 98	7.57		F	#		
Turbidity	NTU	04/15/2014	N001	93 - 98	3.92		F	#		
Uranium	mg/L	04/15/2014	N001	93 - 98	0.027		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0188 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	53	-	58	0.021		F	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	53	-	58	1		F	#		
pH	s.u.	04/15/2014	N001	53	-	58	7.16		F	#		
Specific Conductance	umhos/cm	04/15/2014	N001	53	-	58	721		F	#		
Temperature	C	04/15/2014	N001	53	-	58	7.34		F	#		
Turbidity	NTU	04/15/2014	N001	53	-	58	4.29		F	#		
Uranium	mg/L	04/15/2014	N001	53	-	58	0.037		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0189 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	93	-	98	0.81		F	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	93	-	98	-10		F	#		
pH	s.u.	04/15/2014	N001	93	-	98	6.32		F	#		
Specific Conductance	umhos/cm	04/15/2014	N001	93	-	98	1823		F	#		
Temperature	C	04/15/2014	N001	93	-	98	7.28		F	#		
Turbidity	NTU	04/15/2014	N001	93	-	98	3.92		F	#		
Uranium	mg/L	04/15/2014	N001	93	-	98	0.016		F	#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0476 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Manganese	mg/L	06/11/2014	N001	-	0.00067	B	U	#	0.00011	
Manganese	mg/L	06/11/2014	N002	-	0.00024	B	U	#	0.00011	
pH	s.u.	06/11/2014	N001	-	6.58			#		
Specific Conductance	umhos /cm	06/11/2014	N001	-	295			#		
Temperature	C	06/11/2014	N001	-	17.54			#		
Turbidity	NTU	06/11/2014	N001	-	0.63			#		
Uranium	mg/L	06/11/2014	N001	-	0.0017			#	0.000029	
Uranium	mg/L	06/11/2014	N002	-	0.0019			#	0.000029	

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

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REPORT DATE: 7/9/2014

Location: 0477 WELL

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Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Manganese	mg/L	06/11/2014	N001	-	0.0054			#	0.00011	
pH	s.u.	06/11/2014	N001	-	6.75			#		
Specific Conductance	umhos /cm	06/11/2014	N001	-	274			#		
Temperature	C	06/11/2014	N001	-	14.48			#		
Turbidity	NTU	06/11/2014	N001	-	2.32			#		
Uranium	mg/L	06/11/2014	N001	-	0.0013			#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0478 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	-	0.96			#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	-	85.6			#		
pH	s.u.	04/15/2014	N001	-	7.32			#		
Specific Conductance	umhos /cm	04/15/2014	N001	-	297			#		
Temperature	C	04/15/2014	N001	-	12.98			#		
Turbidity	NTU	04/15/2014	N001	-	2.6			#		
Uranium	mg/L	04/15/2014	N001	-	0.0034			#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0667 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	-	0.00085	B	J	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	-	99.2			#		
pH	s.u.	04/15/2014	N001	-	7.63			#		
Specific Conductance	umhos /cm	04/15/2014	N001	-	241			#		
Temperature	C	04/15/2014	N001	-	7.41			#		
Turbidity	NTU	04/15/2014	N001	-	8.07			#		
Uranium	mg/L	04/15/2014	N001	-	0.0026			#	0.000029	

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

REPORT DATE: 7/9/2014

Location: 0683 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	-	0.00042	B	J	#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	-	185			#		
pH	s.u.	04/15/2014	N001	-	7.21			#		
Specific Conductance	umhos/cm	04/15/2014	N001	-	326			#		
Temperature	C	04/15/2014	N001	-	15.41			#		
Turbidity	NTU	04/15/2014	N001	-	4.95			#		
Uranium	mg/L	04/15/2014	N001	-	0.0041			#	0.000029	

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

LAB QUALIFIERS:

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

DATA QUALIFIERS:

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

QA QUALIFIER:

- # Validated according to quality assurance guidelines.

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## **Surface Water Quality Data**

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**Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site**

REPORT DATE: 7/9/2014

Location: 0248 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Manganese	mg/L	04/15/2014	0001	0.14			#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	152.7			#		
pH	s.u.	04/15/2014	N001	7.85			#		
Specific Conductance	umhos/cm	04/15/2014	N001	320			#		
Temperature	C	04/15/2014	N001	4.66			#		
Turbidity	NTU	04/15/2014	N001	11.4			#		
Uranium	mg/L	04/15/2014	0001	0.011			#	0.000029	

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**Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site**

REPORT DATE: 7/9/2014

Location: 0250 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	0.049			#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	112			#		
pH	s.u.	04/15/2014	N001	8.23			#		
Specific Conductance	umhos/cm	04/15/2014	N001	210			#		
Temperature	C	04/15/2014	N001	7.62			#		
Turbidity	NTU	04/15/2014	N001	6.33			#		
Uranium	mg/L	04/15/2014	N001	0.00098			#	0.000029	

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**Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site**

REPORT DATE: 7/9/2014

Location: 0251 SURFACE LOCATION Replaced location 0792 starting April 2014

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	0.044			#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	135			#		
pH	s.u.	04/15/2014	N001	8.27			#		
Specific Conductance	umhos/cm	04/15/2014	N001	266			#		
Temperature	C	04/15/2014	N001	7.34			#		
Turbidity	NTU	04/15/2014	N001	6.62			#		
Uranium	mg/L	04/15/2014	N001	0.00094			#	0.000029	

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**Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site**

REPORT DATE: 7/9/2014

Location: 0777 SURFACE LOCATION Tomichi Creek SSE of well 0058

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Manganese	mg/L	04/15/2014	0001	0.076			#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	126			#		
pH	s.u.	04/15/2014	N001	8.1			#		
Specific Conductance	umhos/cm	04/15/2014	N001	298			#		
Temperature	C	04/15/2014	N001	6.81			#		
Turbidity	NTU	04/15/2014	N001	18.2			#		
Uranium	mg/L	04/15/2014	0001	0.0053			#	0.000029	

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**Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site**

REPORT DATE: 7/9/2014

Location: 0780 SURFACE LOCATION NE CORNER VALCO PIT

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Manganese	mg/L	04/15/2014	N001	0.06			#	0.00024	
Oxidation Reduction Potential	mV	04/15/2014	N001	150.5			#		
pH	s.u.	04/15/2014	N001	7.91			#		
Specific Conductance	umhos/cm	04/15/2014	N001	561			#		
Temperature	C	04/15/2014	N001	6.27			#		
Turbidity	NTU	04/15/2014	N001	3.06			#		
Uranium	mg/L	04/15/2014	N001	0.037			#	0.000029	

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**Surface Water Quality Data by Location (USEE102) FOR SITE GUN01, Gunnison Processing Site**

REPORT DATE: 7/9/2014

Location: 0795 SURFACE LOCATION KMONKS, SURFACE LOCATION, 8/11/94

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Manganese	mg/L	04/16/2014	N001	0.036			#	0.00024	
Oxidation Reduction Potential	mV	04/16/2014	N001	131			#		
pH	s.u.	04/16/2014	N001	7.72			#		
Specific Conductance	umhos/cm	04/16/2014	N001	224			#		
Temperature	C	04/16/2014	N001	4.37			#		
Turbidity	NTU	04/16/2014	N001	7.53			#		
Uranium	mg/L	04/16/2014	N001	0.00086			#	0.000029	

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

**LAB QUALIFIERS:**

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

**DATA QUALIFIERS:**

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

**QA QUALIFIER:**

- # Validated according to quality assurance guidelines.

## **Equipment Blank Data**

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**BLANKS REPORT**

LAB: PARAGON/ALS LABORATORY GROUP (Fort Collins, CO)

RIN: 14046058

Report Date: 7/9/2014

Parameter	Site Code	Location ID	Sample		Units	Result	Qualifiers		Detection Limit	Uncertainty	Sample Type
			Date	ID			Lab	Data			
Manganese	GUN01	0999	04/15/2014	N001	mg/L	0.00011	U		0.00011		E
Uranium	GUN01	0999	04/15/2014	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.
- 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.

## 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: 7/9/2014**

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Time	Date	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0002	U	7646.75	04/15/2014	09:00:37	4.74	7642.01	
0005	O	7644.66	04/14/2014	18:00:57	5.56	7639.10	
0006	O	7647.23	04/14/2014	16:50:26	10.52	7636.71	
0012R	O	7645.95	04/14/2014	15:55:18	11.26	7634.69	
0013	D	7643.75	04/15/2014	09:30:07	11.59	7632.16	
0062	O	7630.61	04/15/2014	10:25:07	5.79	7624.82	
0063	O	7630.34	04/15/2014	11:05:17	7.00	7623.34	
0064	O	7620.76	04/15/2014	12:25:31	6.18	7614.58	
0065	O	7610.27	04/15/2014	13:30:16	1.98	7608.29	
0066	O	7606.22	04/15/2014	14:55:11	1.78	7604.44	
0102	U	7647.30	04/15/2014	09:25:19	5.50	7641.80	
0105	O	7646.11	04/15/2014	10:00:39	7.71	7638.40	
0106	O	7647.22	04/14/2014	17:15:35	10.70	7636.52	
0112	O	7645.74	04/14/2014	16:15:42	11.69	7634.05	
0113	D	7643.83	04/15/2014	09:05:06	11.65	7632.18	
0125	D	7633.52	04/14/2014	16:30:57	6.27	7627.25	
0126	D	7634.14	04/14/2014	16:10:45	6.12	7628.02	
0127	D	7634.64	04/14/2014	15:50:26	7.90	7626.74	
0135	D	7627.03	04/14/2014	17:40:40	4.17	7622.86	
0136	D	7626.24	04/14/2014	17:05:49	3.19	7623.05	
0160	D	7604.39	04/16/2014	09:30:22	5.40	7598.99	
0161	D	7605.63	04/16/2014	09:50:48	6.88	7598.75	
0181	D	7616.38	04/15/2014	15:30:29	2.39	7613.99	
0183	D	7616.27	04/15/2014	15:10:41	4.19	7612.08	
0186	D	7627.21	04/15/2014	11:00:00	5.73	7621.48	
0187	D	7625.91	04/15/2014	11:45:48	5.37	7620.54	
0188	D	7613.65	04/15/2014	17:10:06	6.45	7607.20	
0189	D	7613.56	04/15/2014	16:45:30	7.13	7606.43	

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

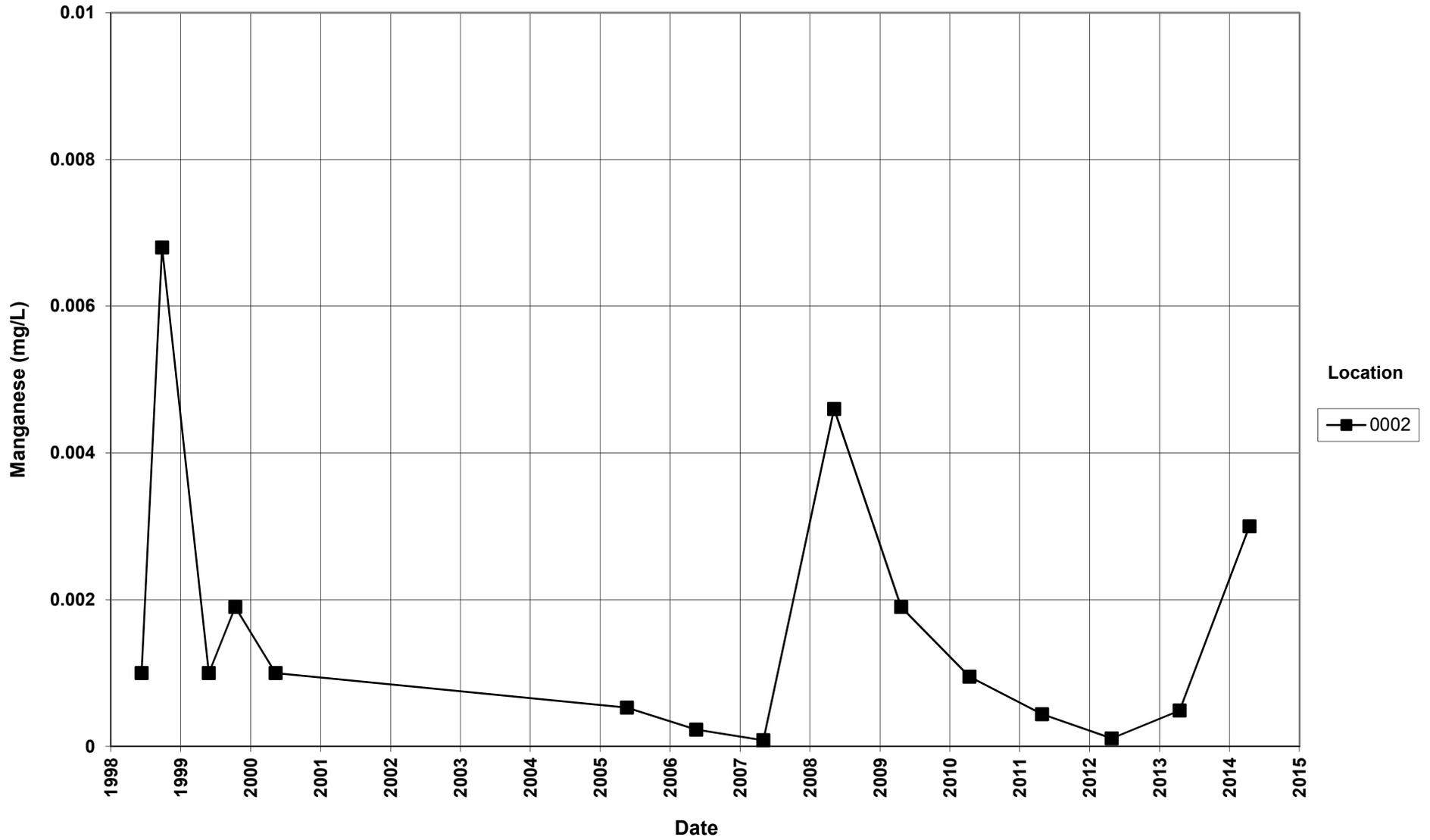
WATER LEVEL FLAGS: D Dry F Flowing B Below top of pump

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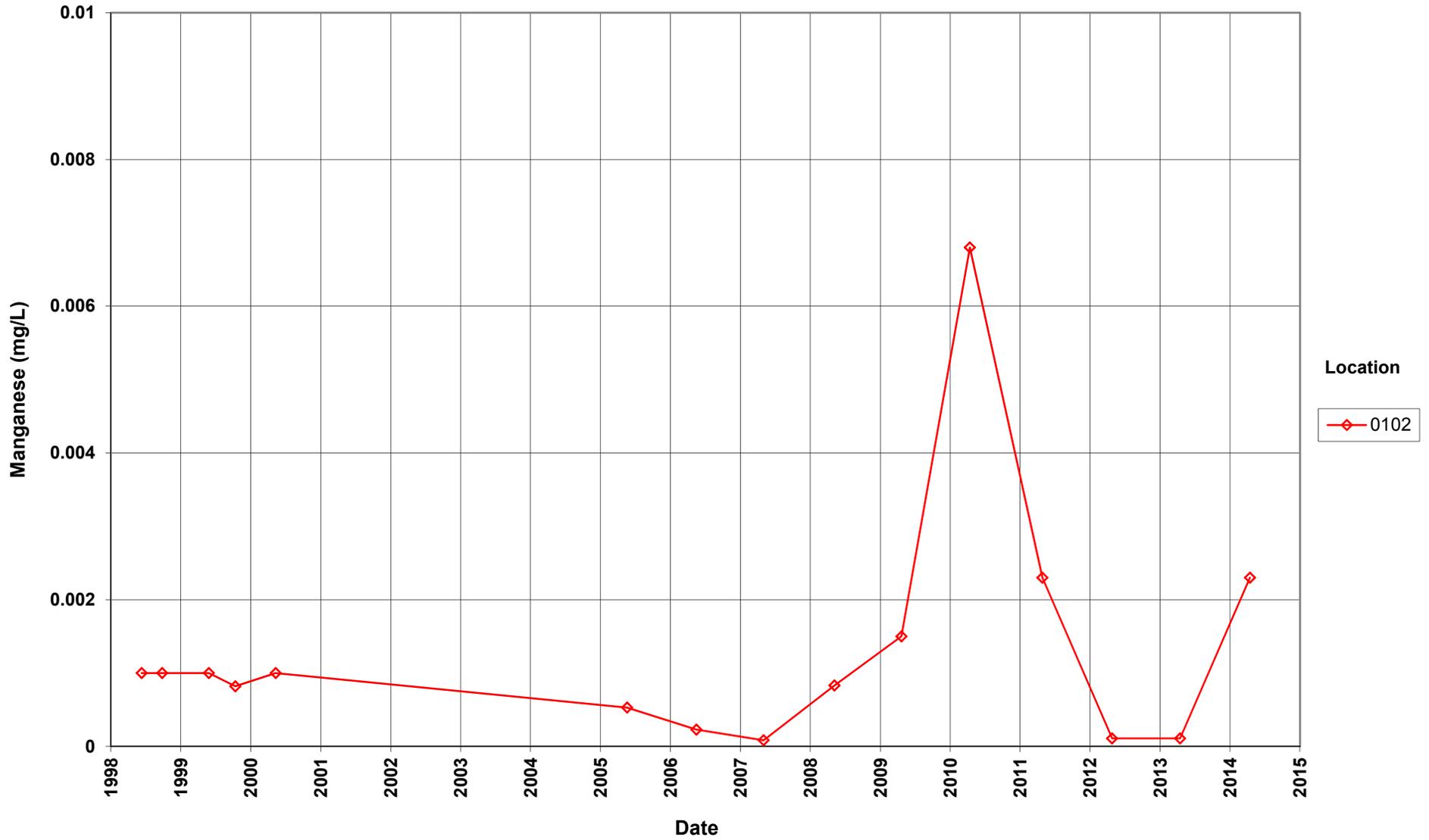
## **Time-Concentration Graphs**

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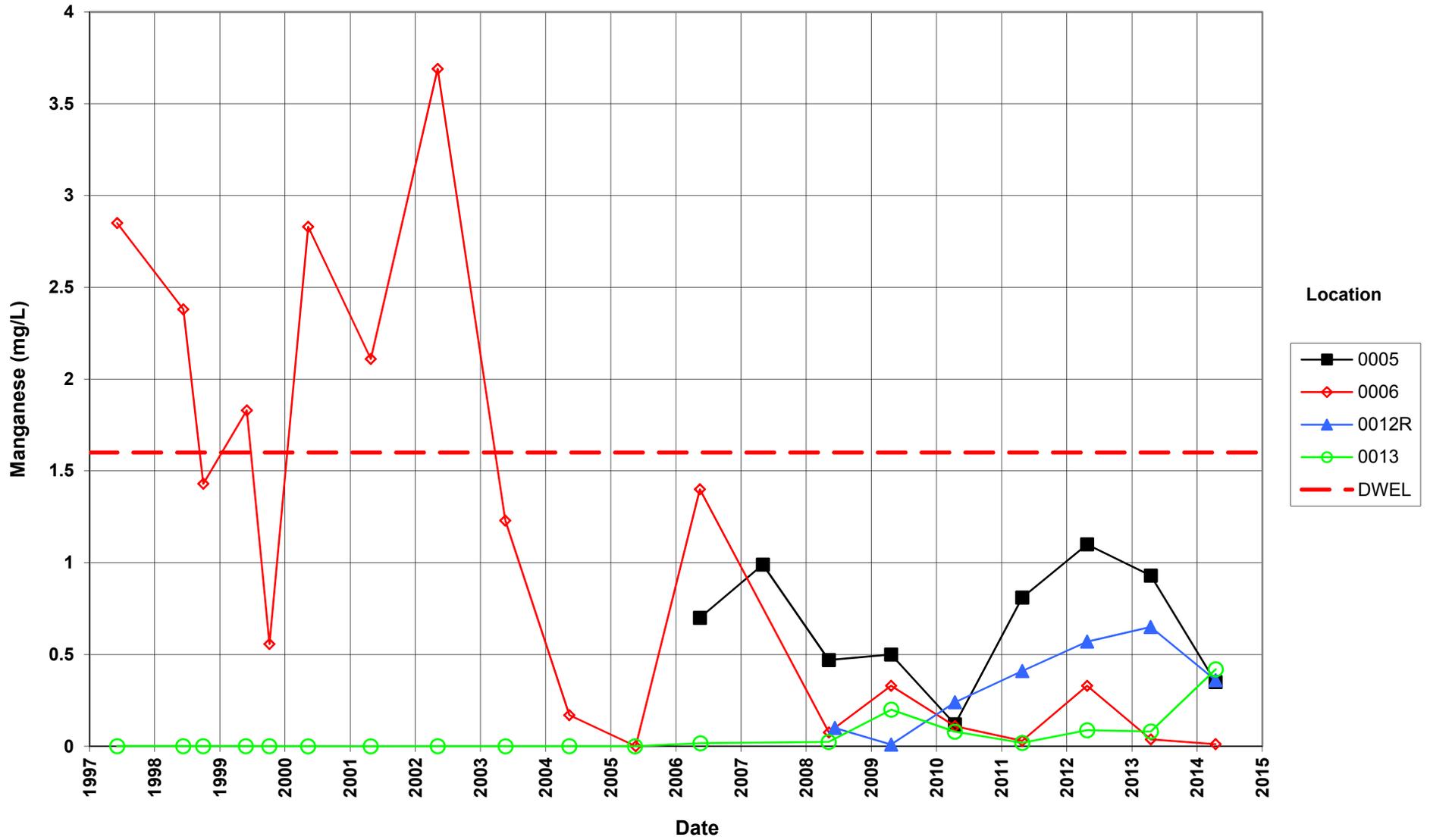
**Gunnison Processing Site  
Manganese Concentration  
Upgradient, Shallow**  
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



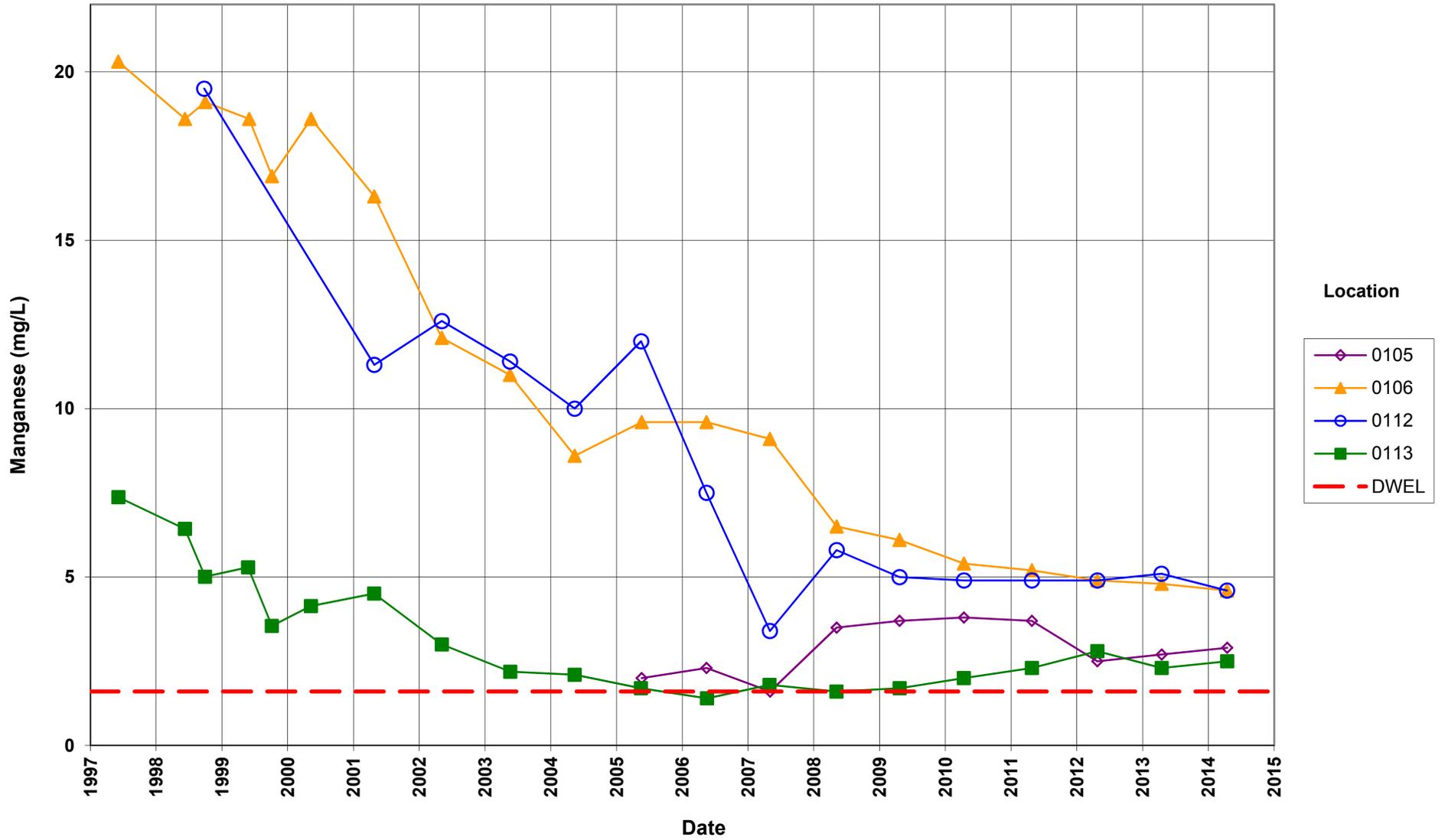
**Gunnison Processing Site  
Manganese Concentration  
Upgradient, Intermediate**  
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



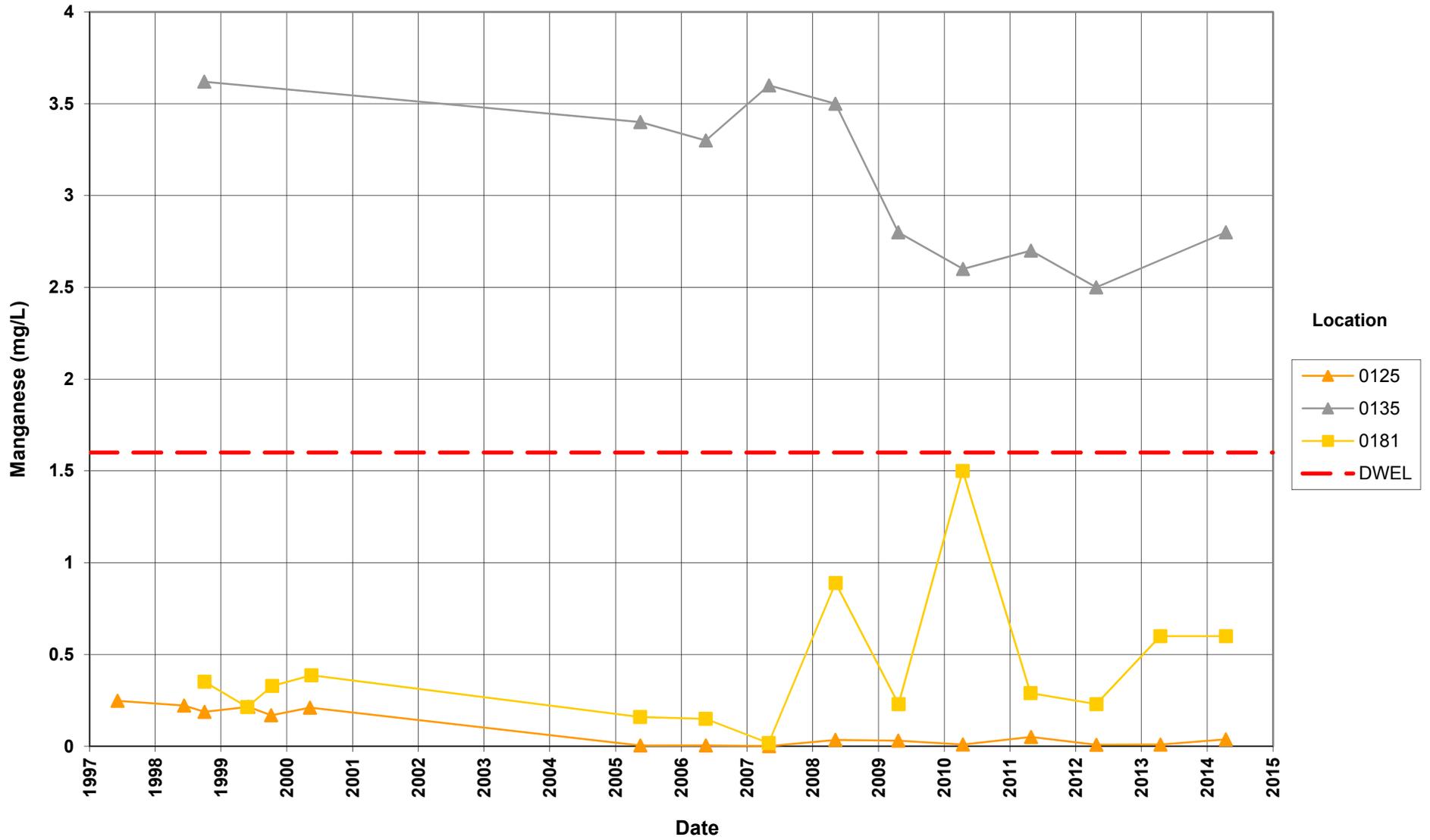
**Gunnison Processing Site  
Manganese Concentration  
Onsite and Just Offsite, Shallow**  
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



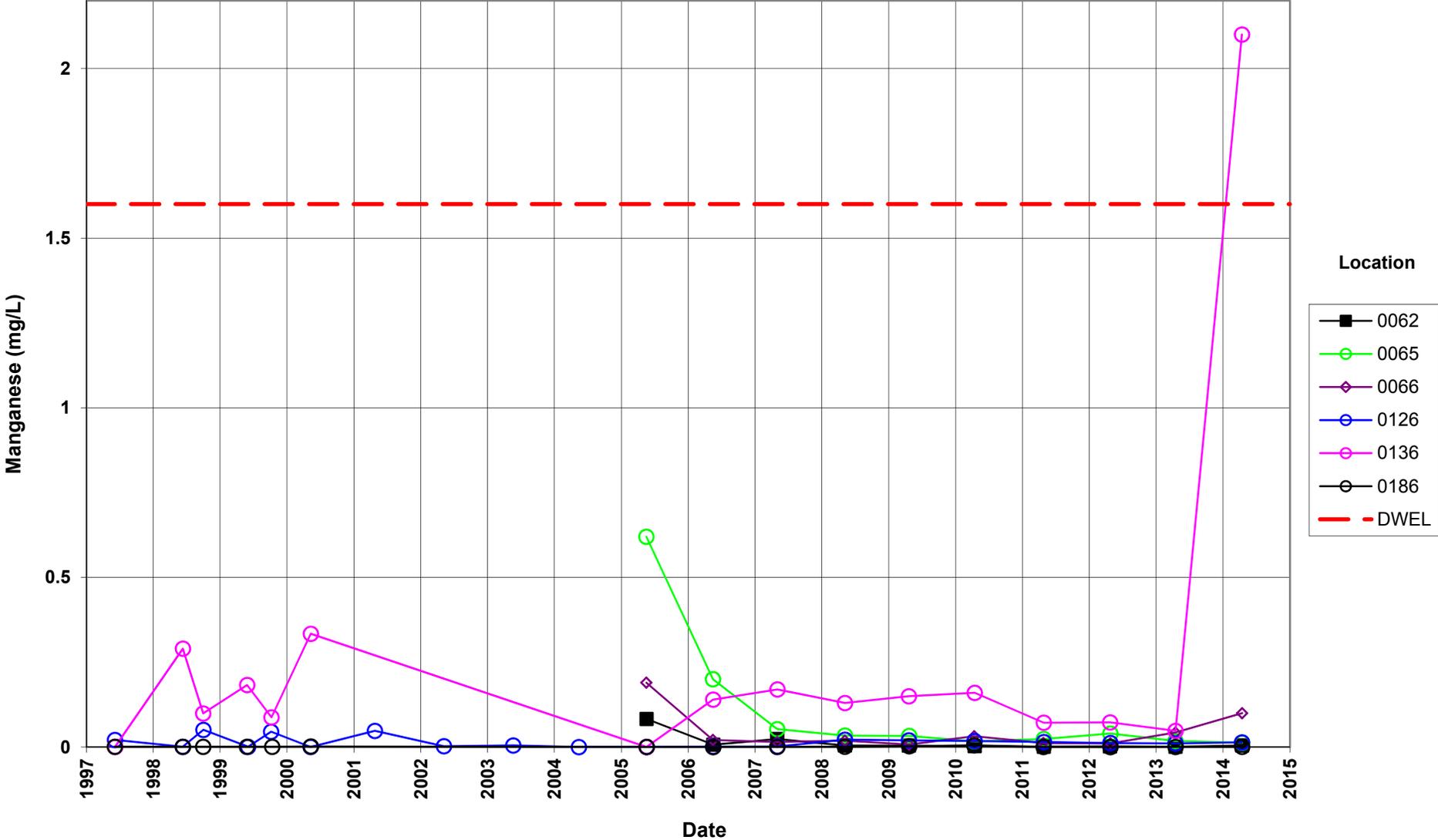
**Gunnison Processing Site  
Manganese Concentration  
Onsite and Just Offsite, Intermediate**  
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



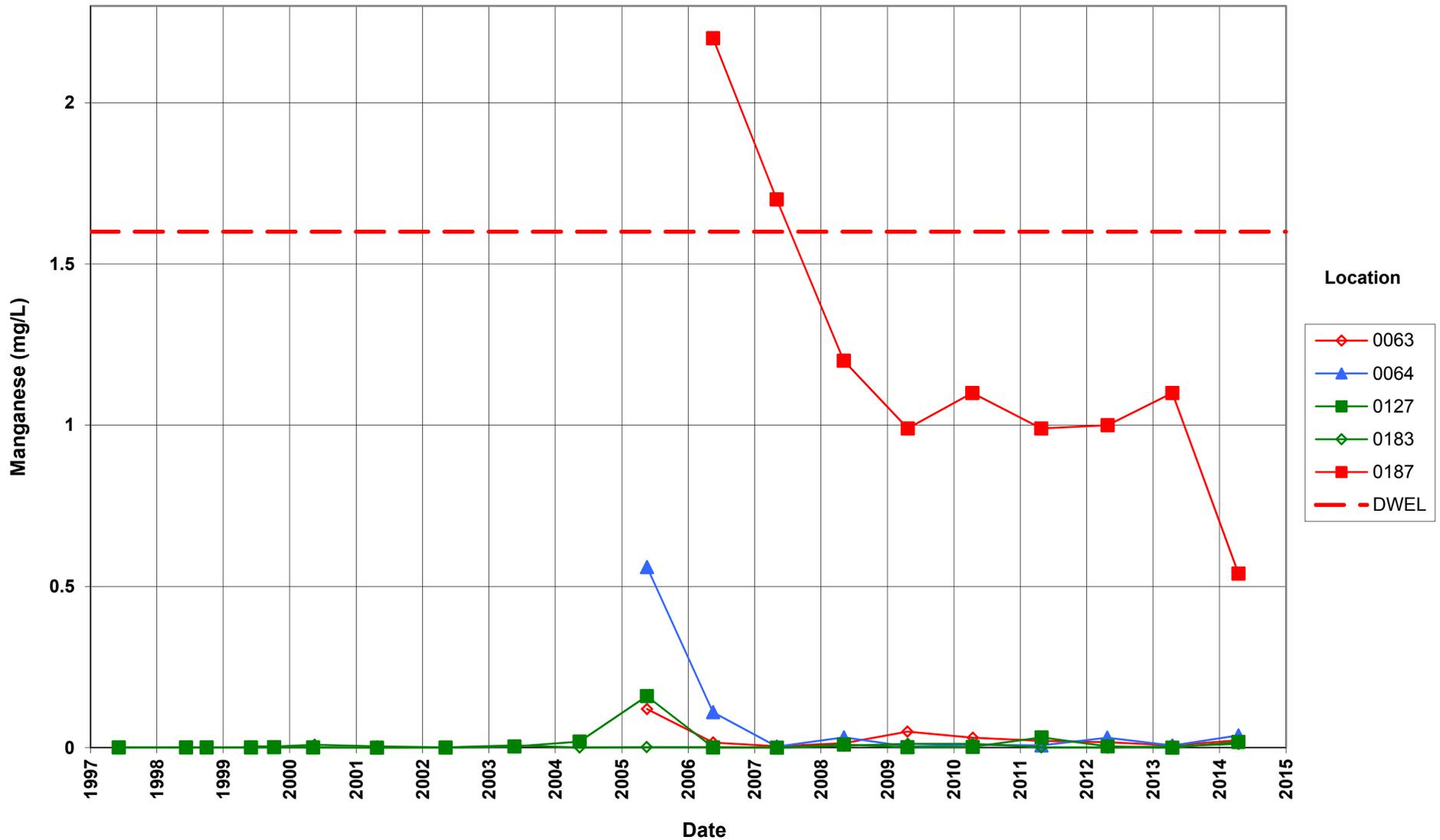
**Gunnison Processing Site  
Manganese Concentration  
Downgradient (East of Gunnison River), Shallow**  
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



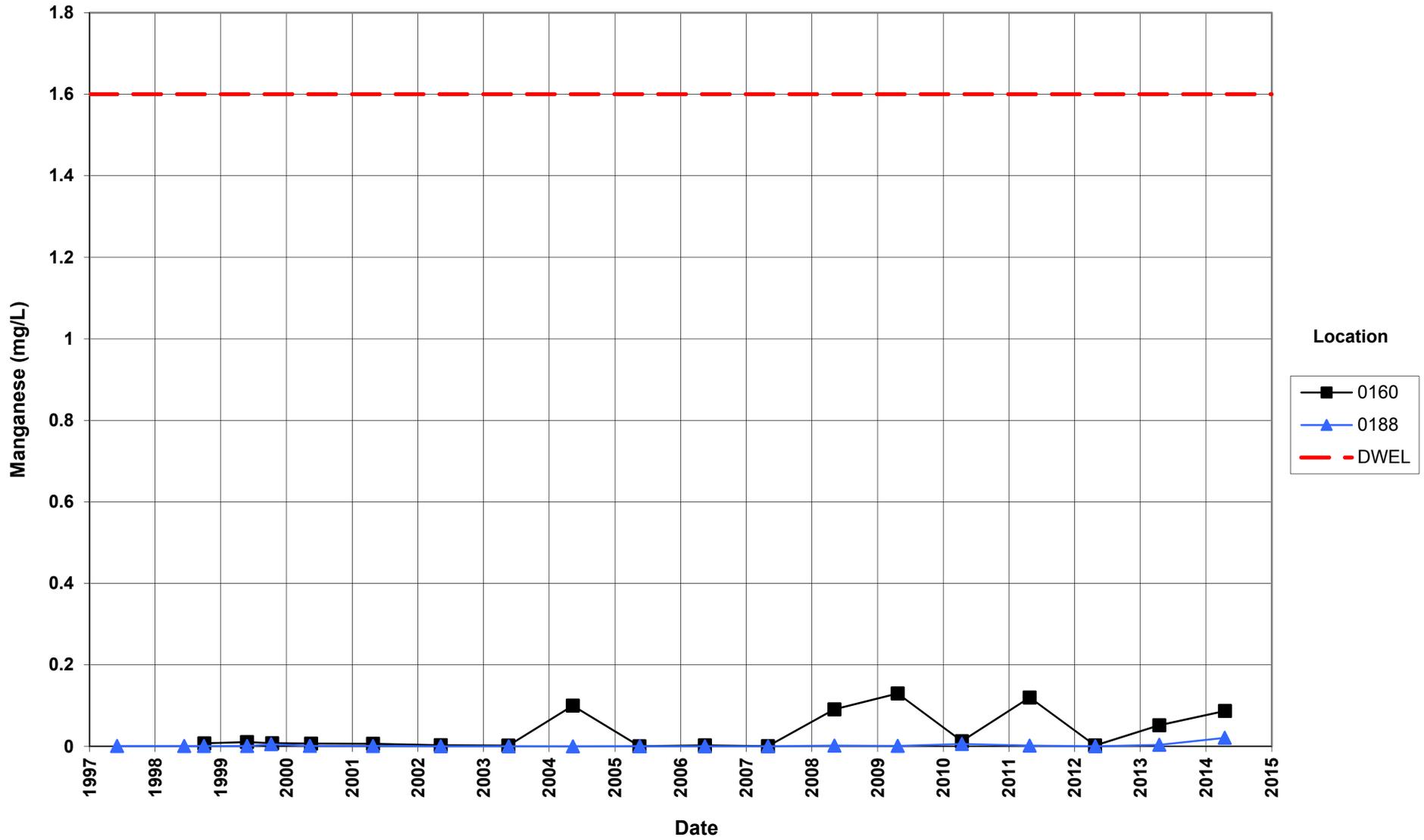
**Gunnison Processing Site  
Manganese Concentration  
Downgradient (East of Gunnison River), Intermediate**  
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



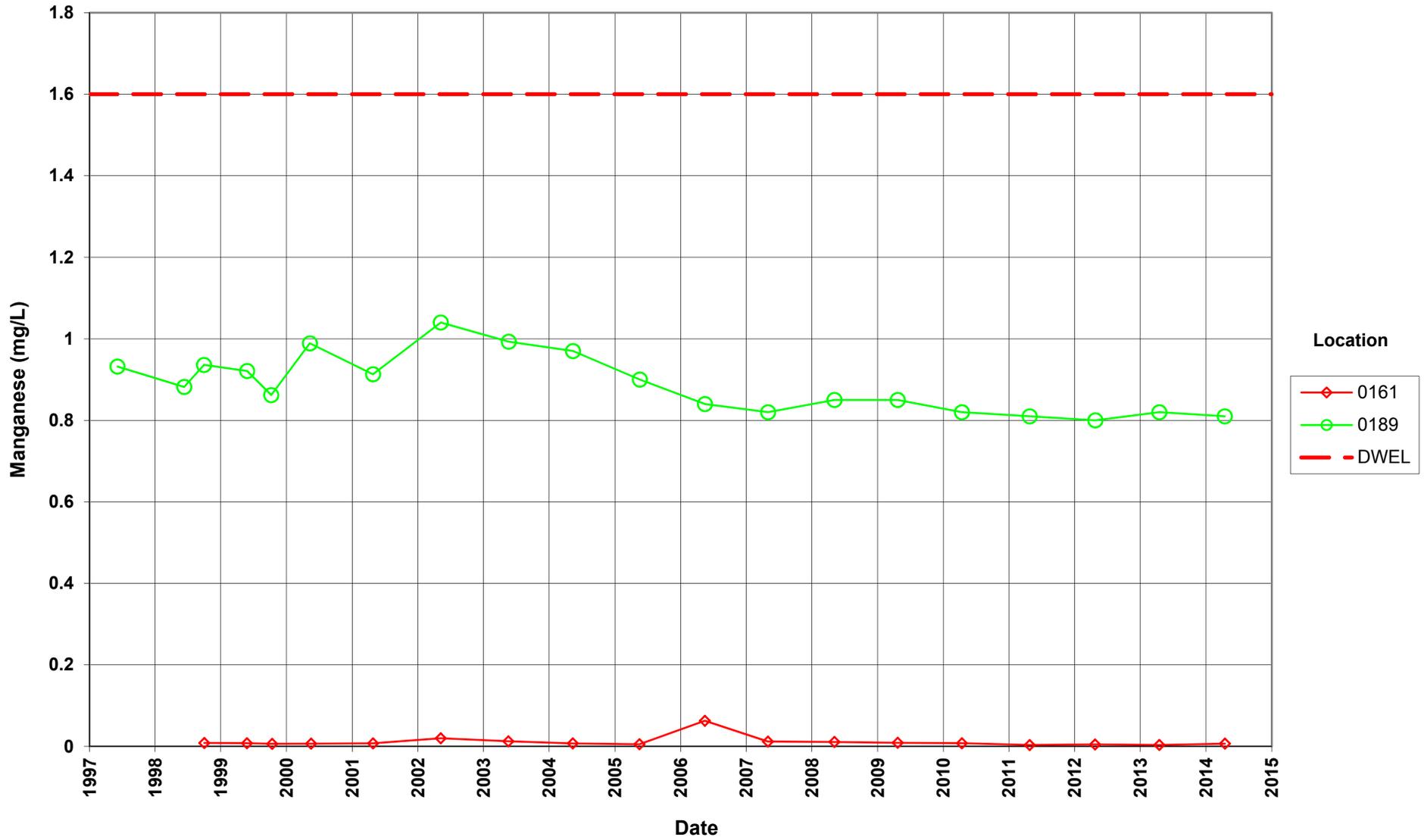
**Gunnison Processing Site  
Manganese Concentration  
Downgradient (East of Gunnison River), Deep**  
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



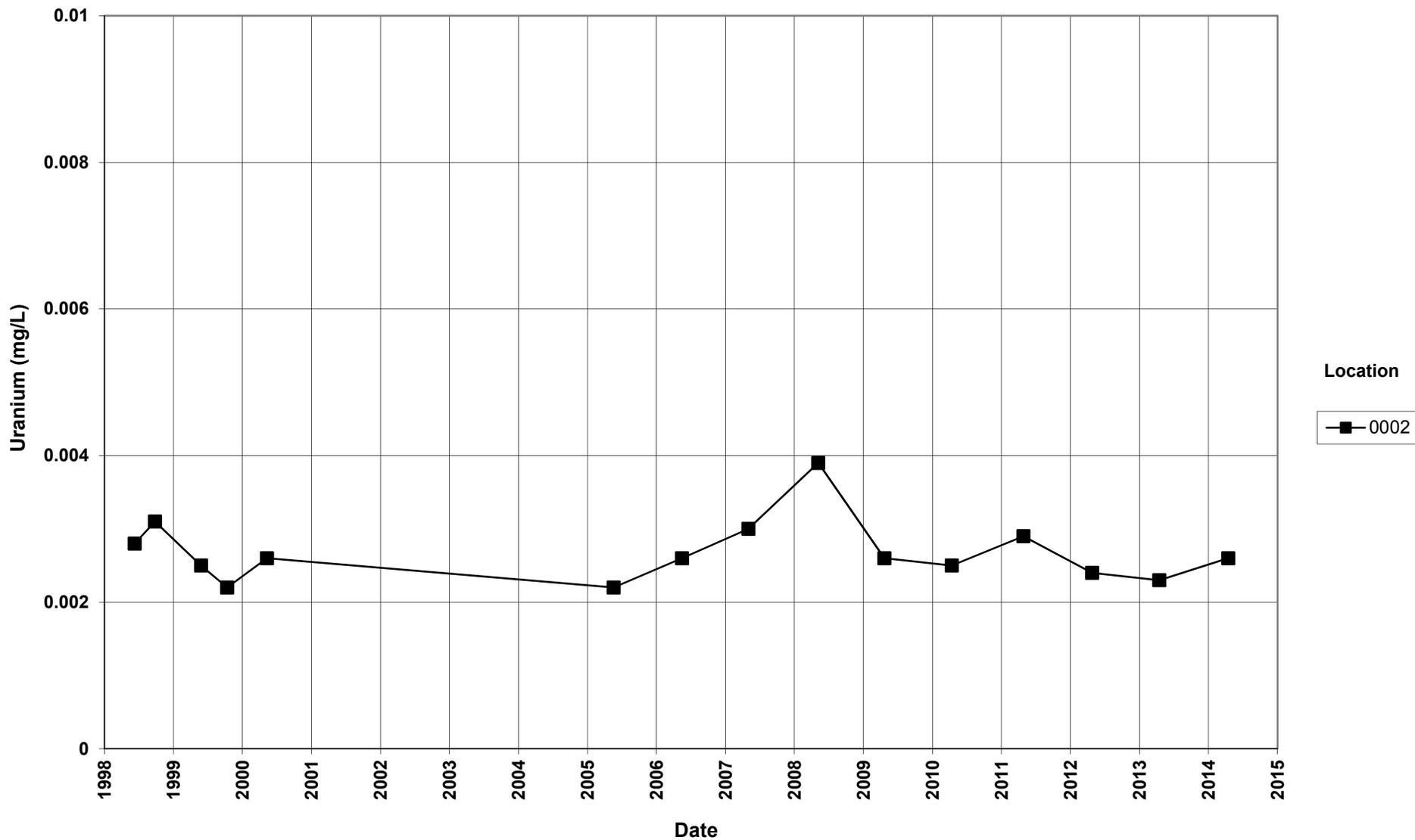
**Gunnison Processing Site  
Manganese Concentration  
Downgradient (West of Gunnison River), Intermediate**  
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



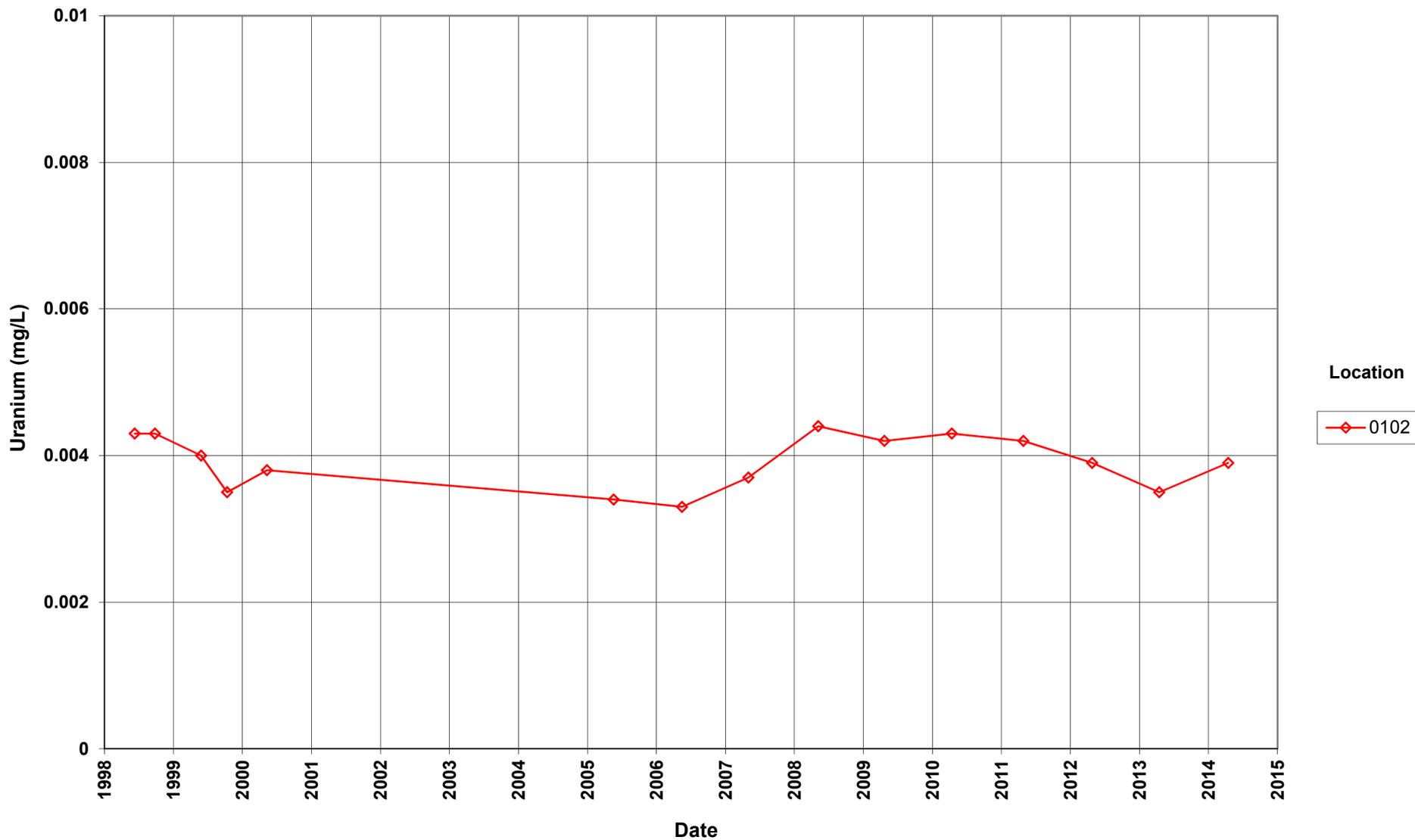
**Gunnison Processing Site  
Manganese Concentration  
Downgradient (West of Gunnison River), Deep**  
Drinking Water Equivalent Level (DWEL) = 1.6 mg/L



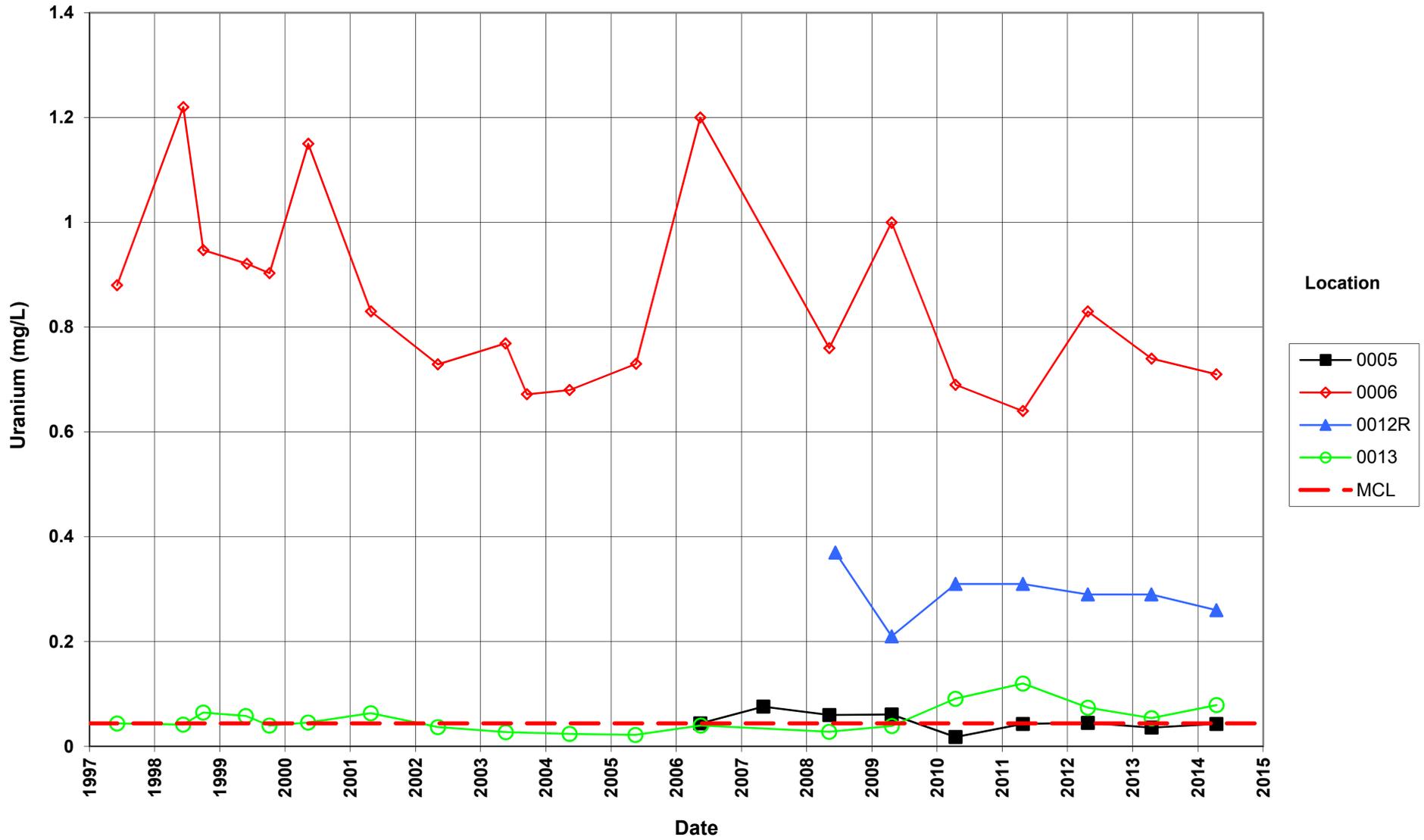
**Gunnison Processing Site  
Uranium Concentration  
Upgradient, Shallow**  
Maximum Concentration Limit (MCL) = 0.044 mg/L



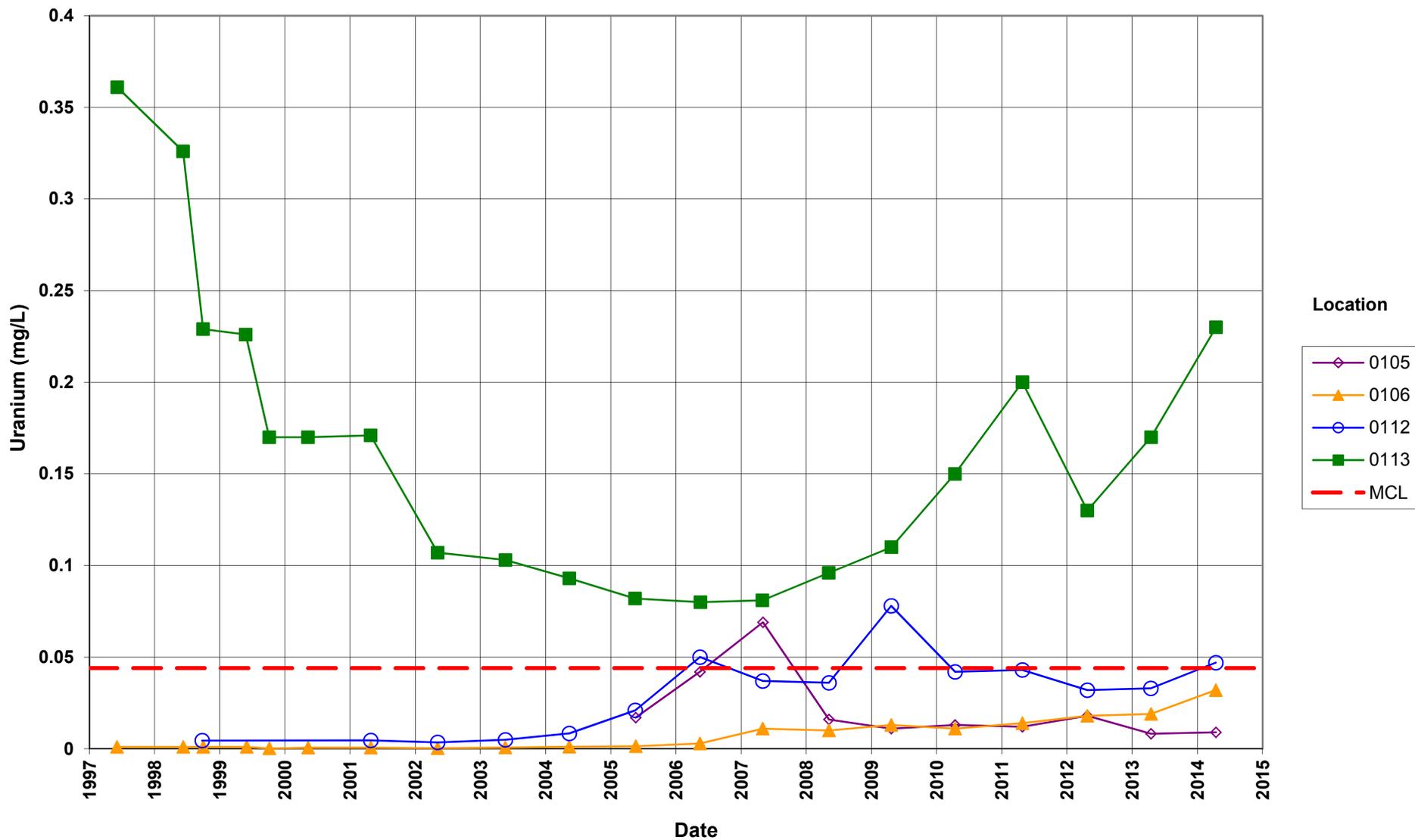
**Gunnison Processing Site  
Uranium Concentration  
Upgradient, Intermediate**  
Maximum Concentration Limit (MCL) = 0.044 mg/L



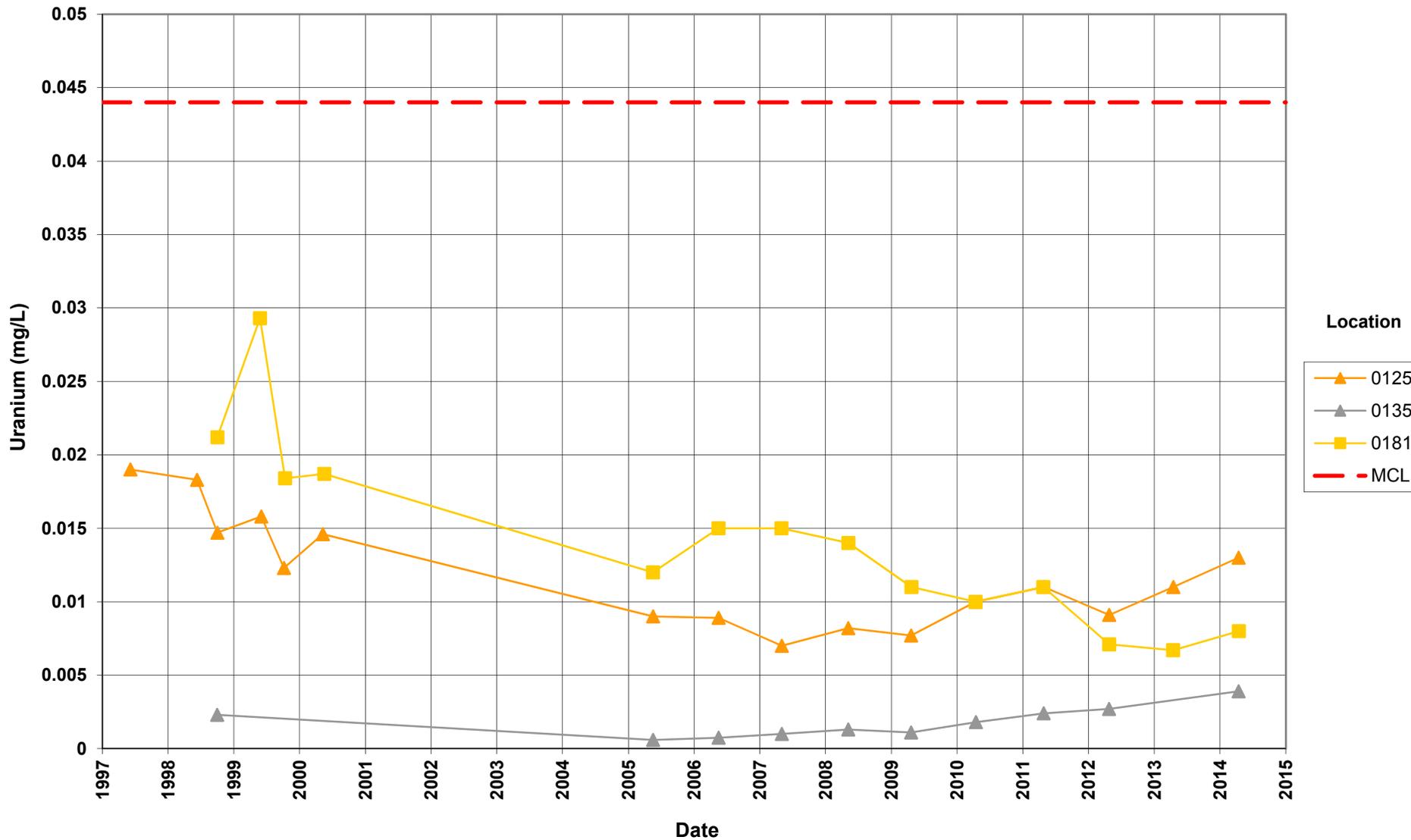
**Gunnison Processing Site  
Uranium Concentration  
Onsite and Just Offsite, Shallow**  
Maximum Concentration Limit (MCL) = 0.044 mg/L



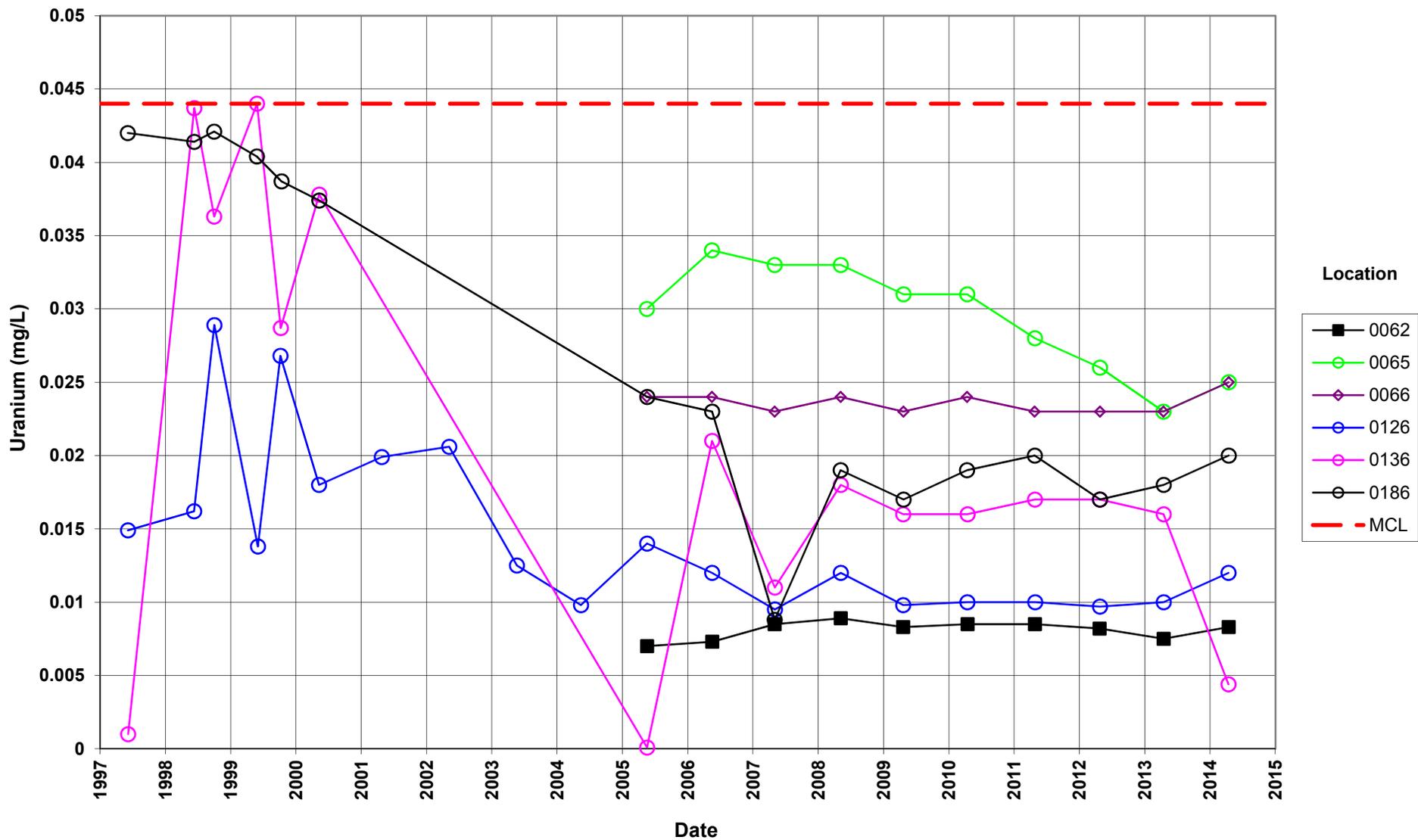
**Gunnison Processing Site  
Uranium Concentration  
Onsite and Just Offsite, Intermediate**  
Maximum Concentration Limit (MCL) = 0.044 mg/L



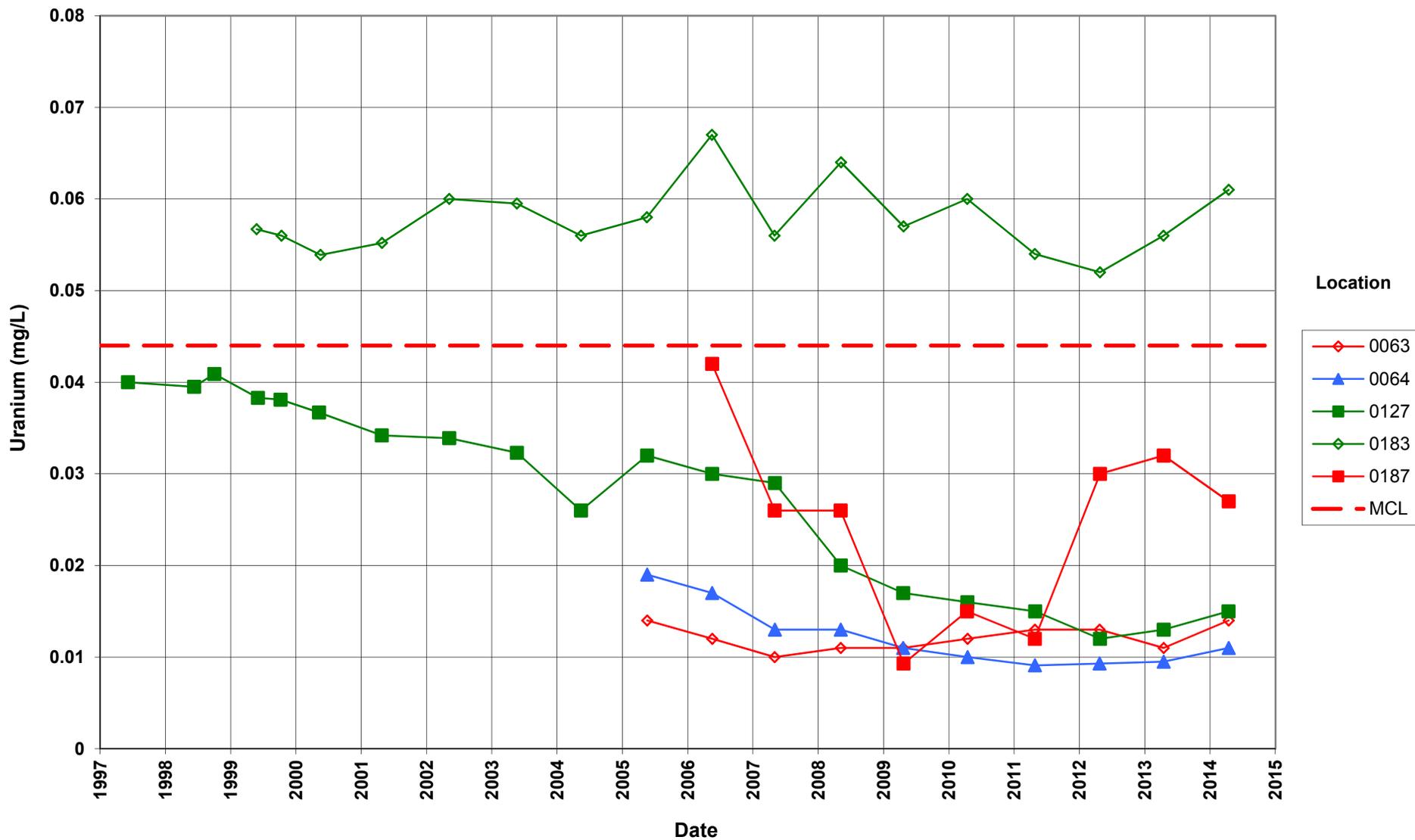
**Gunnison Processing Site  
Uranium Concentration  
Downgradient (East of Gunnison River), Shallow**  
Maximum Concentration Limit (MCL) = 0.044 mg/L



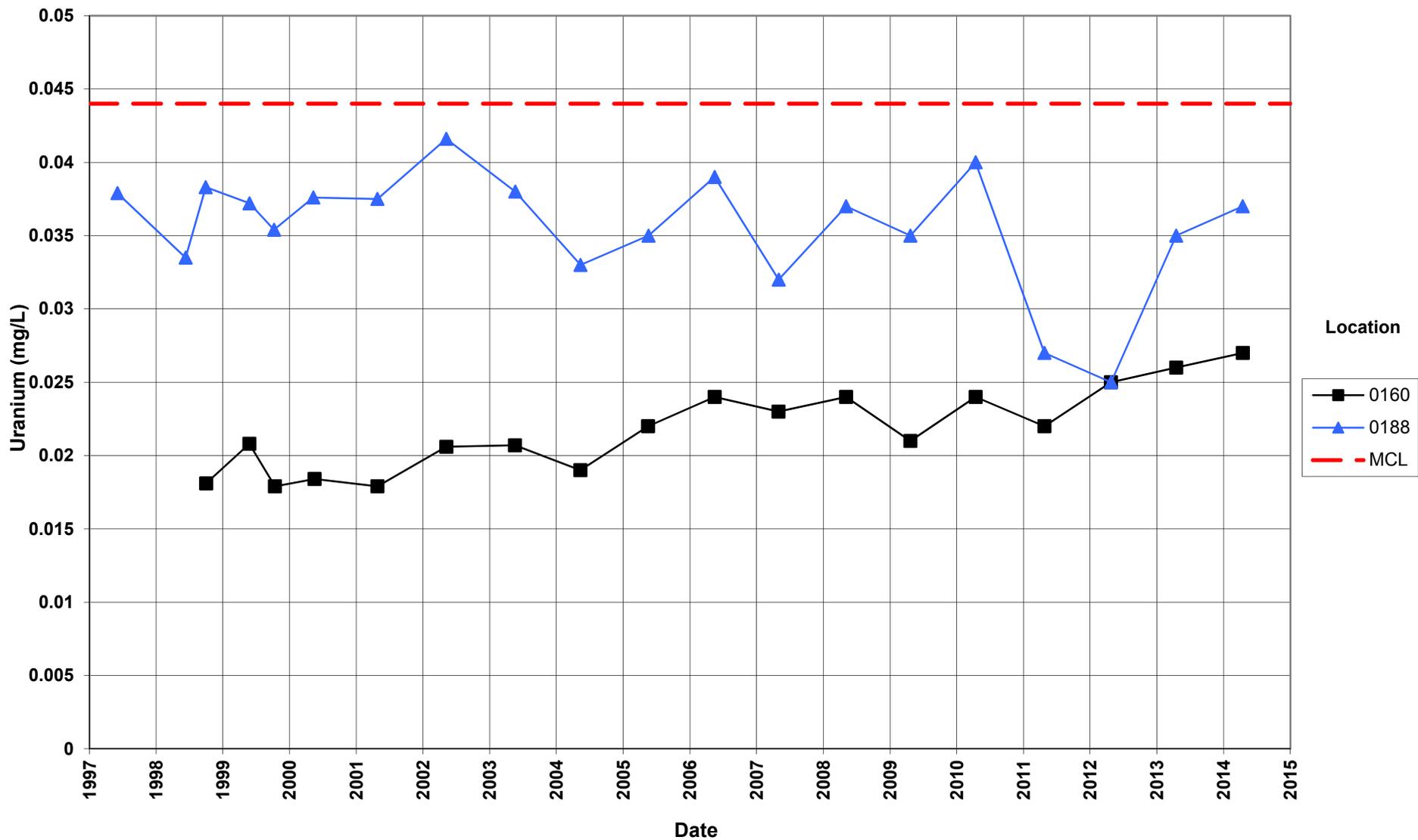
**Gunnison Processing Site  
Uranium Concentration  
Downgradient (East of Gunnison River), Intermediate**  
Maximum Concentration Limit (MCL) = 0.044 mg/L



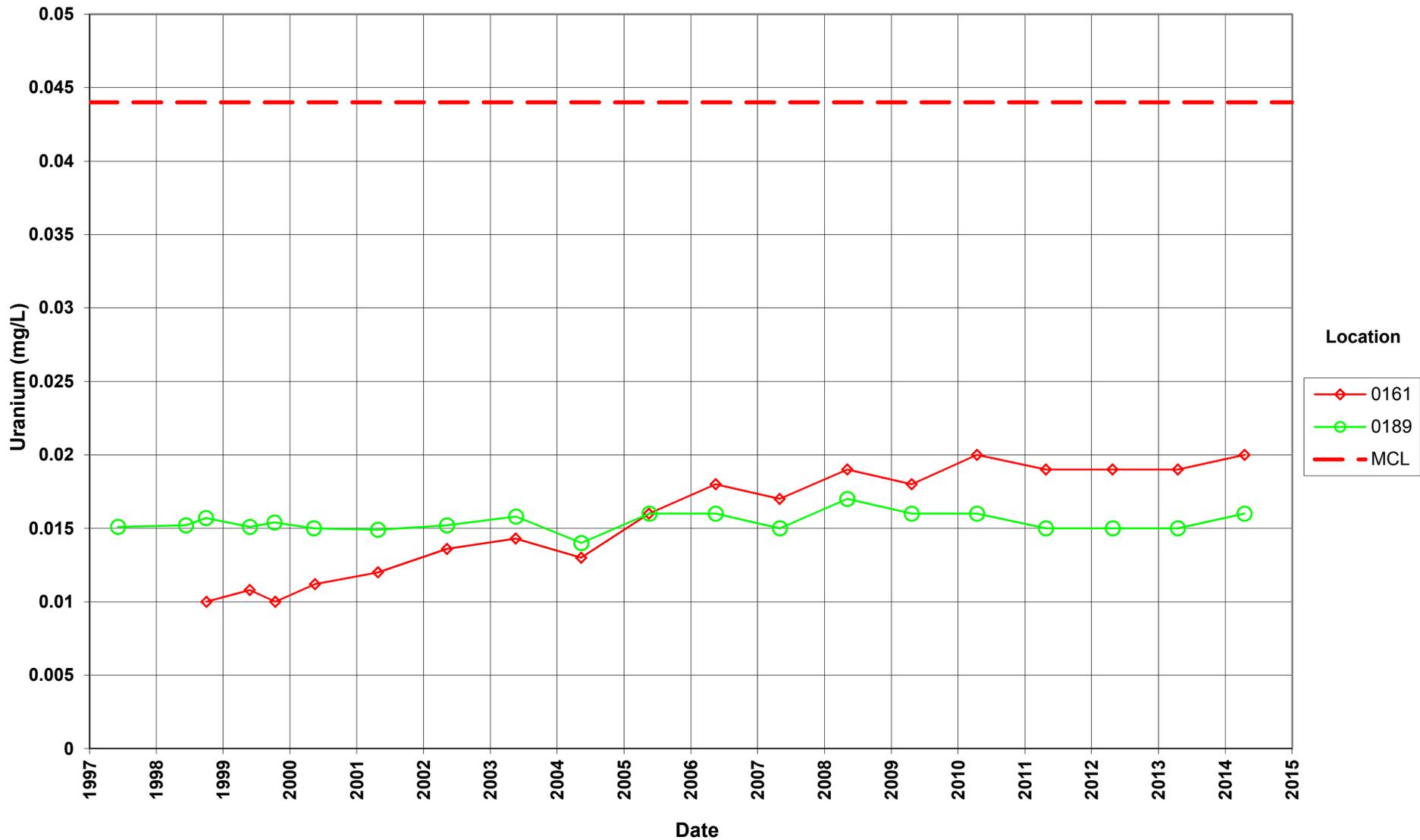
**Gunnison Processing Site  
Uranium Concentration  
Downgradient (East of Gunnison River), Deep**  
Maximum Concentration Limit (MCL) = 0.044 mg/L



**Gunnison Processing Site  
Uranium Concentration  
Downgradient (West of Gunnison River), Intermediate**  
Maximum Concentration Limit (MCL) = 0.044 mg/L



**Gunnison Processing Site  
Uranium Concentration  
Downgradient (West of Gunnison River), Deep**  
Maximum Concentration Limit (MCL) = 0.044 mg/L



**Attachment 3**  
**Sampling and Analysis Work Order**

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March 28, 2014

Task Order LM00-501  
Control Number 14-0480

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, The S.M. Stoller Corporation, a wholly owned subsidiary of Huntington Ingalls Industries (Stoller)  
Task Order LM00-501 Long-Term Surveillance and Maintenance – LM  
April 2014 Environmental Sampling at the Gunnison, Colorado, Processing Site – Revised

REFERENCE: Task Order LM00-501-02-108, Gunnison, Colorado, Processing 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 processing site. Water quality data will be collected at this site as part of the routine environmental sampling scheduled to begin the week of April 14, 2014.

The constituents spreadsheet was revised to delineate between the Gunnison processing and disposal sites. The map was revised to correct the site boundary.

The following lists show the monitoring wells, along with zone of completion, surface locations, and private wells scheduled for sampling during this event.

**Processing Site (GUN01) Monitoring Wells\***

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

**Processing Site (GUN01) Domestic Wells\***

476 Nr	477 Nr	478 Nr	667 AI	683 Nr
--------	--------	--------	--------	--------

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

Deborah Steckley  
Control Number 14-0480  
Page 2

**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.

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

Sincerely,



Sam Campbell  
Site Lead

SC/lcg/lb

Enclosures (3)

cc: (electronic)  
Christina Pennal, DOE  
Sam Campbell, Stoller  
Steve Donovan, Stoller  
Bev Gallagher, Stoller  
Lauren Goodknight, Stoller  
EDD Delivery  
rc-grand.junction  
File: GUD/GUP 410.02 (A)

### Constituent Sampling Breakdown

Analyte	Gunnison			Required Detection Limit (mg/L)	Analytical Method	Line Item Code
	Groundwater	Surface Water				
<b>Approx. No. Samples/yr</b>	33 (41 every 5th year)		6			
<b>Field Measurements</b>						
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			
<b>Laboratory Measurements</b>						
	<i>GUN01*</i>	<i>GUN08**</i>	<i>GUN01</i>			
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 N (NO3+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						
<b>Total No. of Analytes</b>	2	10	2			

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

\*GUN01 = Gunnison Processing Site

\*\* GUN08 = Gunnison Disposal Site

**Sampling Frequencies for Locations at  
Gunnison, Colorado**

Location ID	Quarterly	Semiannually	Annually	Every 5 years	Not Sampled	Notes
<b>Monitoring Wells</b>						
<i>GUN01</i>						
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			
<b>Surface Locations</b>						
<i>GUN01</i>						
248			X			
250			X			
777			X			
780			X			
792			X			
795			X			
<b>Domestic Wells</b>						
<i>GUN01</i>						
476			X			
477			X			
478			X			
667			X			
683			X			

GUN01 (Processing site) Sampling conducted in April

# **Attachment 4**

## **Trip Reports**

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*Memorandum*

DATE: April 29, 2014  
 TO: Sam Campbell  
 FROM: Tashina Jasso  
 SUBJECT: Trip Report

**Site:** Gunnison, Colorado, Processing Site

**Dates of Sampling Event:** April 14-16, 2014

**Team Members:** Sam Campbell, Gretchen Baer, Jeff Price, and Tashina Jasso

**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 and the pumps were turned off and winterized.

**Location Specific Information:**

Location IDs	Comments
0248	This surface water sample was filtered because turbidity exceeded 10 NTU. A 0.45 µm pore size filter was used.
0683	Initial water contained a black residue and approximately 7 gallons of water was flushed prior to sampling. Sample was taken from exterior tap located on the backside of the home.
0478, 0667	Collection of these samples came from the exterior tap on the backside of the homes.
0792	Location was moved across the river for safer access per Health and Safety recommendation

**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	MFV 587	0105	Duplicate	Groundwater
2598	MFV 585	Associated with 0248, 0250, 0792, 0795	Rinst/EQBlank	Surface Water
2597	MFV 584	0013	Duplicate	Groundwater
2599	MFY 847	NA	Field Blank- sample was taken from the DI system tap location in bldg. 32	Surface Water

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**Report Identification Number (RIN) Assigned:** Samples were assigned to RIN 14046058. Field data sheets can be found in Crow\sms\14046058 in the FieldData folder.

**Sample Shipment:** Samples were shipped from Grand Junction to ALS Laboratory Group on April 17, 2014.

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

**Well Inspection Summary:** All wells were in good condition with the exception of monitoring well 0183, which had a damaged flush-mount protective-casing cover.

**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/PLN/S04351, continually updated).

**Field Variance:** No variances occurred from the standard procedures.

**Equipment:** All equipment functioned properly during this sampling event.

**Stakeholder/Regulatory:** Nothing to note.

**Institutional Controls:**

**Fences, Gates, and Locks:** All landowner gates were left as found.

**Signs:** N/A

**Trespassing/Site Disturbances:** N/A

**Site Issues:**

**Disposal Cell/Drainage Structure Integrity:** N/A

**Vegetation/Noxious Weed Concerns:** None observed.

**Maintenance Requirements:** None.

**Safety Issues:** SM Stoller health and safety lead Andria Dutcher was present on April 15, 2014 to assess the safety of selected sampling locations. A trip report will be issued with her recommendations, which will be incorporated into a final Management Assessment Report after all site visits are complete.

**Access Issues:**

- Gunnison County Airport personnel Charlie Caldwell was present on April 15, 2014 to monitor activities while on airport grounds.
- Tracey Hildreth was contacted prior to accessing wells in the pasture south of the gravel company. Tracey leases the land from the gravel company and operates a cattle ranch on the property.
- Golf course personnel were contacted prior to accessing wells on the golf course. A golf cart was utilized to access monitoring wells 0181 and 0183.

Sam Campbell  
April 29, 2014  
Page 3

**Corrective Action Required/Taken:**

Well abandonment activities for well 0067 will be rescheduled at a later date due to a layer of frost that prevented excavation around the well.

The flush-mount protective-casing cover on monitoring 0183 needs replacement.

Collect coordinates with GPS instrumentation for surface water location 0792 and update the environmental database.

(TJ/lcg)

cc: (electronic)  
Deb Steckley, DOE  
Sam Campbell, Stoller  
Steve Donovan, Stoller  
Bev Gallagher, Stoller  
EDD Delivery

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## *Memorandum*

DATE: June 19, 2014  
TO: Distribution  
FROM: Sam Campbell  
SUBJECT: Trip Report-REVISED

**Site:** Gunnison, Colorado, Processing Site.

**Dates of Sampling Event:** June 11, 2014

**Team Members:** Sam Campbell

**Number of Locations Sampled:** Two domestic wells (0476 and 0477) were sampled; these wells were not sampled in April because the homes were vacant. This event was conducted in conjunction with the annual inspection of the Gunnison disposal cell.

**Locations Not Sampled/Reason:** None. This completes the sampling of all locations scheduled for the 2014 event.

**Location Specific Information:** Wells were sampled using Category IV protocol. Survey coordinates were collected with global positioning satellite instrumentation at new surface water location 0251 on the Gunnison River.

**Field Variance:** None.

**Quality Control Samples:** One duplicate sample was collected at location 0476. The false location number assigned to the duplicate was 2646 and ticket number MHT-760.

**Requisition Numbers Assigned:** Samples were assigned to requisition index number (RIN) 14066262.

**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:** M. Cosby (CDPHE) and D. Johnson (Stoller) observed sampling activities.

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Distribution  
June 19, 2014  
Page 2

**Site Issues:** None

**Access Issues:** None

**Corrective Action Required/Taken:** Coordinates for surface water location 0251 need to be loaded into the environmental database.

(SEC/lcg)

cc: (electronic)  
Deb Steckley, DOE  
Sam Campbell, Stoller  
Steve Donovan, Stoller  
EDD Delivery

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