

Data Validation Package

**February 2014
Groundwater and Surface Water
Sampling at the
Grand Junction, Colorado, Site**

April 2014

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Sampling Event Summary

Site: Grand Junction, Colorado, Site

Sampling Period: February 19–20, 2014

This event consisted of sampling seven monitoring wells and six surface water locations at the Grand Junction, Colorado, Site (Grand Junction site). Long-term monitoring at the Grand Junction site is prescribed in the 2006 *Long-Term Surveillance and Maintenance Plan for the Grand Junction, Colorado, Site*. Groundwater and surface water samples were analyzed for manganese (groundwater only), molybdenum, selenium, sulfate, and uranium. These constituents were selected on the basis of historical data and consideration of groundwater standards (molybdenum, selenium, and uranium), secondary drinking water standards (sulfate and manganese), human health risk (manganese), and Colorado Department of Public Health and the Environment input.

Although groundwater quality at the Grand Junction site has improved, analyte concentrations in the alluvial aquifer still exceed U.S. Environmental Protection Agency (EPA) groundwater standards (40 CFR 192), with the uranium standard exceeded in six of the seven wells in the monitoring network (Table 1).

Table 1. Locations with Samples that Equaled or Exceeded EPA Groundwater Standards in February 2014

Analyte	Standard ^a	Groundwater		Surface Water	
		Location	Concentration	Location	Concentration
Selenium	0.01	6-2N	0.027	-----	-----
		GJ01-01	0.031		
Uranium	0.044	10-19N	0.25	South Pond	0.085
		14-13NA	0.35	Wetland Area	0.41
		6-2N	0.049		
		8-4S	0.19		
		GJ01-01	0.30		
		GJ84-04	0.29		

^a Standards are listed in 40 CFR 192.02 Table 1 to Subpart A; concentrations are in milligrams per liter (mg/L).

Surface water features located at the Grand Junction site, which include the North Pond, the South Pond, and the Wetland Area, receive discharge of contaminated alluvial groundwater; therefore, elevated concentrations of groundwater contaminants are expected in these ponds. Because these locations are recharged by groundwater, results from these locations were evaluated by comparing them to groundwater standards. Surface water locations with sample concentrations that exceeded groundwater standards are listed in Table 1.

Surface water results from Gunnison River locations adjacent to and downstream of the site were compared to statistical benchmark values derived using historical data from the Upper Gunnison sampling location, which is located upstream of the site on the Gunnison River. As shown in

Table 2, the molybdenum and uranium benchmark values were exceeded during this event which is indicative of groundwater discharge to the river. Although the uranium and molybdenum concentrations were elevated in the samples from the Upper Mid and Lower Gunnison locations, the uranium concentrations are still below the State of Colorado basic uranium standard of 0.0168–0.03 mg/L for the Gunnison and Lower Dolores River Basins, and the molybdenum concentrations are two orders of magnitude below the EPA groundwater standard.

Table 2. Comparison of 2014 Gunnison River Concentrations to Benchmarks

Analyte	Benchmark ^a	Upper Gunnison (Benchmark Location)	Upper Mid Gunnison	Lower Gunnison
Molybdenum	0.0042	0.0034	0.0045	0.0048
Selenium	0.013	0.0092	0.0063	0.0089
Sulfate	533	480	450	530
Uranium	0.0111	0.0095	0.013	0.016

^a Results from 1996–present were used to calculate benchmark values; concentrations are in milligrams per liter (mg/L).



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

4/24/2014
 Date



Legend ● Well to be Sampled ■ Surface Location to be Sampled - - Site Boundary		U.S. DEPARTMENT OF ENERGY <small>GRAND JUNCTION, COLORADO</small>	<small>Work Performed by</small> S.M. Stoller Corporation <small>Under DOE Contract No. DE-AM01-07LM00080</small>
		Planned Sampling Map Grand Junction, CO, Site February 2014	
		<small>DATE PREPARED:</small> January 13, 2014	<small>FILENAME:</small> S1142600

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Grand Junction, Colorado, Site Sample Location Map

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Data Assessment Summary

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Water Sampling Field Activities Verification Checklist

Project	Grand Junction, Colorado	Date(s) of Water Sampling	February 19–20, 2014
Date(s) of Verification	March 24, 2014	Name of Verifier	Stephen Donovan

	Response (Yes, No, NA)	Comments
1. Is the SAP the primary document directing field procedures? List any Program Directives or other documents, SOPs, instructions.	Yes	Work Order letter dated January 17, 2014.
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 on February 19, 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	A duplicate sample was collected at location GJ84-04.
10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	Yes	
11. Were trip blanks prepared and included with each shipment of VOC samples?	NA	
12. Were the true identities of the QC samples documented?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	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?	Yes	
19. Were water levels measured at the locations specified in the planning documents?	Yes	

Laboratory Performance Assessment

General Information

Report Number (RIN): 14025928
Sample Event: February 19–20, 2014
Site(s): Grand Junction Office, Colorado
Laboratory: ALS Laboratory Group, Fort Collins, Colorado
Work Order No.: 1402377
Analysis: Metals and Wet Chemistry
Validator: Stephen Donovan
Review Date: March 19, 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
Molybdenum	LMM-02	SW-846 3005A	SW-846 6020A
Selenium	LMM-02	SW-846 3005A	SW-846 6020A
Sulfate	MIS-A-044	SW-846 9056	SW-846 9056
Uranium	LMM-02	SW-846 3005A	SW-846 6020A

Data Qualifier Summary

Analytical results were qualified as listed in Table 4. Refer to the attached validation worksheets and the sections below for an explanation of the data qualifiers applied.

Table 4. Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
1402377-1	10-19N	Uranium	J	Serial dilution result
1402377-5	Equipment Blank	Manganese	U	Less than 5 times the calibration blank
1402377-5	Equipment Blank	Molybdenum	U	Less than 5 times the calibration blank

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 15 water samples on February 25, 2014, accompanied by a Chain of Custody (COC) form. A copy of the air bill was included in the receiving documentation. The COC 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 COC form was complete with no errors or omissions.

Preservation and Holding Times

The sample shipment was received intact with the temperature in the iced cooler at 3 °C, 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 February 27, 2014, using three calibration standards. The correlation coefficient value was greater than 0.995. The absolute value of the intercept was only slightly above 3 times the MDL, which is acceptable. Initial and continuing calibration verification checks were made at the required frequency with all calibration checks meeting the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results were within the acceptance range.

Method SW-846 6020A, Molybdenum, Selenium, and Uranium

Calibrations were performed on February 27, 2014, using four calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency with all calibration checks associated with the samples meeting the acceptance criteria. Reporting limit verification checks were made at the required frequency to verify the linearity of the calibration curve near the PQL and all results

were within the acceptance range. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure. Internal standard recoveries associated with requested analytes were stable and within acceptable ranges.

Method SW-846 9056, Sulfate

Calibrations were performed on December 16, 2013, using five calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 3 times the MDL. Initial and continuing calibration verification checks were made at the required frequency with all calibration checks meeting the acceptance criteria.

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 blank results associated with the samples were below the PQLs for all analytes.

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

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

Matrix Spike Analysis

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

Laboratory Replicate Analysis

Laboratory replicate analyses are used to determine laboratory precision. The relative percent difference for replicate results that are greater than 5 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. The replicate results met these criteria, demonstrating acceptable laboratory precision.

Laboratory Control Sample

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

Metals Serial Dilution

Serial dilutions were prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix. Serial dilution data are evaluated when the

concentration of the undiluted sample is greater than 50 times the MDL. All evaluated serial dilution results were acceptable with the exception of the uranium result for sample 10-19N. The associated sample uranium result is qualified with a “J” flag as an estimated value.

Completeness

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

Chromatography Peak Integration

The integration of analytes peaks was reviewed for all sulfate data. There were no manual integrations performed for sulfate and all peak integrations were satisfactory.

Electronic Data Deliverable (EDD) File

The EDD file arrived on March 3, 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: 14025928 Lab Code: PAR Validator: Stephen Donovan Validation Date: 03/19/2014

Project: Grand Junction Office(GJO) Analysis Type: Metals General Chem Rad Organics

of Samples: 15 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 was 1 duplicate evaluated.

SAMPLE MANAGEMENT SYSTEM

Metals Data Validation Worksheet

RIN: 14025928

Lab Code: PAR

Date Due: 03/25/2014

Matrix: Water

Site Code: GJO01

Date Completed: 03/04/2014

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	02/27/2014	0.0000	1.0000	OK	OK	OK	109.0	92.0	94.0	1.0	93.0	8.0	101.0
Manganese	ICP/ES	02/27/2014										99.0		109.0
Molybdenum	ICP/MS	02/27/2014	0.0000	1.0000	OK	OK	OK	105.0	104.0	112.0	6.0	97.0	10.0	110.0
Selenium	ICP/MS	02/27/2014	0.0000	1.0000	OK	OK	OK	115.0	114.0	121.0	6.0	99.0		107.0
Uranium	ICP/MS	02/27/2014	0.0000	1.0000	OK	OK	OK	118.0			4.0	103.0	11.0	90.0

SAMPLE MANAGEMENT SYSTEM
Wet Chemistry Data Validation Worksheet

RIN: 14025928 **Lab Code:** PAR **Date Due:** 03/25/2014
Matrix: Water **Site Code:** GJO01 **Date Completed:** 03/04/2014

Analyte	Date Analyzed	CALIBRATION				Method Blank	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	CCV	CCB						
SULFATE	02/27/2014	0.000	0.9999	OK	OK	OK	97.00	96.0	97.0	0	

Sampling Quality Control Assessment

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

Sampling Protocol

All monitoring wells met the Category I low-flow sampling criteria. Sample results for these wells were qualified with an “F” flag in the database, indicating the wells were purged and sampled using the low-flow sampling method. Surface water locations were sampled using a peristaltic pump and tubing reel.

Equipment Blank

An equipment blank (field ID 2311) was collected after decontamination of the hose reel used to collect the surface water samples. Uranium was detected in this blank at concentrations below the PQL. The associated sample results for uranium were greater than 10 times the blank concentration, not requiring qualification. The equipment blank results indicate adequate decontamination of the sampling equipment.

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 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 5 times the PQL, the range should be no greater than the PQL. Duplicate samples were collected from location GJ84-04 (field duplicate ID 2310). The duplicate results met the criteria, demonstrating acceptable overall precision.

SAMPLE MANAGEMENT SYSTEM

Validation Report: Equipment/Trip Blanks

RIN: 14025928 Lab Code: PAR Project: Grand Junction Office(GJO) Validation Date: 03/19/2014

Blank Data

Blank Type	Lab Sample ID	Lab Method	Analyte Name	Result	Qualifier	MDL	Units
Equipment Blank	1402377-5	SW6020	Uranium	0.041		0.0029	UG/L

Sample ID	Sample Ticket	Location	Result	Dilution Factor	Lab Qualifier	Validation Qualifier
1402377-10	MDR 172	Lower Gunnison	16	5		
1402377-11	MDR 171	North Pond	32	5		
1402377-12	MDR 169	South Pond	85	5		
1402377-13	MDR 168	Upper Gunnison	9.5	5		
1402377-14	MDR 170	Upper Mid Gunnison	13	5		
1402377-15	MDR 173	Wetland Area	410	5		

SAMPLE MANAGEMENT SYSTEM
Validation Report: Field Duplicates

RIN: 14025928 Lab Code: PAR Project: Grand Junction Office(GJO) Validation Date: 03/19/2014

Duplicate: 2310

Sample: GJ84-04

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Manganese	3900			1	3900			1	0		UG/L
Molybdenum	66			10	65			10	1.53		UG/L
Selenium	0.23			1	0.23			1	0		UG/L
SULFATE	1400			25	1400			25	0		MG/L
Uranium	290			10	290			10	0		UG/L

Certification

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

Laboratory Coordinator: Stephen Donovan 4-14-2014
Stephen Donovan Date

Data Validation Lead: Stephen Donovan 4-14-2014
Stephen Donovan Date

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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.

Four results were identified as potential outliers. There were no errors apparent in the analysis of these samples and the data for this sampling event are acceptable as qualified.

Data Validation Outliers Report - No Field Parameters

Comparison: All Historical Data

Laboratory: ALS Laboratory Group

RIN: 14025928

Report Date: 03/24/2014

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum		Historical Minimum		Number of Data Points		Statistical Outlier		
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data		N	N Below Detect
GJO01	10-19N	N001	02/20/2014	Molybdenum	0.019		F	0.099	F	0.0196	N	F	15	0	Yes	
GJO01	11-1S	N001	02/19/2014	Sulfate	160		F	438	F	230		F	14	0	NA	
GJO01	11-1S	N001	02/19/2014	Uranium	0.03		F	0.14	F	0.034		F	14	0	NA	
GJO01	14-13NA	N001	02/19/2014	Molybdenum	0.082		F	0.229	F	0.0928	N	F	14	0	No	
GJO01	6-2N	N001	02/20/2014	Molybdenum	0.017		F	0.061	F	0.023		F	13	0	No	
GJO01	6-2N	N001	02/20/2014	Uranium	0.049		F	0.268	F	0.061		F	13	0	No	
GJO01	8-4S	N001	02/20/2014	Molybdenum	0.019		F	0.27	JF	0.026		F	17	0	NA	
GJO01	8-4S	N001	02/20/2014	Selenium	0.00082		F	0.0648	F	0.00091		F	17	0	NA	
GJO01	GJ01-01	N001	02/20/2014	Molybdenum	0.072		F	0.162	F	0.076		F	14	0	No	
GJO01	GJ01-01	N001	02/20/2014	Sulfate	500		F	762	F	530		F	14	0	NA	
GJO01	Lower Gunnison	0001	02/20/2014	Molybdenum	0.0048			0.0035	B	0.0015	U		15	2	NA	
GJO01	Lower Gunnison	0001	02/20/2014	Uranium	0.016			0.0148		0.0047			15	0	Yes	
GJO01	Upper Gunnison	0001	02/19/2014	Molybdenum	0.0034			0.003	J	0.0019		J	10	0	NA	
GJO01	Upper Mid Gunnison	0001	02/19/2014	Molybdenum	0.0045			0.0037	B	0.0015	U		14	2	NA	
GJO01	Upper Mid Gunnison	0001	02/19/2014	Uranium	0.013			0.011		0.0044			14	0	Yes	
GJO01	Wetland Area	0001	02/20/2014	Sulfate	690			34700		1910			13	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.

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 GJO01, Grand Junction Site

REPORT DATE: 03/24/2014

Location: 10-19N WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	02/20/2014	N001	0	-	0	0.68		F	#	0.00011	
Molybdenum	mg/L	02/20/2014	N001	0	-	0	0.019		F	#	0.00016	
Oxidation Reduction Potential	mV	02/20/2014	N001	0	-	0	74.1		F	#		
pH	s.u.	02/20/2014	N001	0	-	0	7.11		F	#		
Selenium	mg/L	02/20/2014	N001	0	-	0	0.0048		F	#	0.00016	
Specific Conductance	umhos/cm	02/20/2014	N001	0	-	0	5089		F	#		
Sulfate	mg/L	02/20/2014	N001	0	-	0	2600		F	#	25	
Temperature	C	02/20/2014	N001	0	-	0	10.62		F	#		
Turbidity	NTU	02/20/2014	N001	0	-	0	4.78		F	#		
Uranium	mg/L	02/20/2014	N001	0	-	0	0.25	E	FJ	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE GJO01, Grand Junction Site

REPORT DATE: 03/24/2014

Location: 11-1S WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	02/19/2014	N001	0	-	0	1	F	#	0.00011		
Molybdenum	mg/L	02/19/2014	N001	0	-	0	0.014	F	#	0.00016		
Oxidation Reduction Potential	mV	02/19/2014	N001	0	-	0	-75.3	F	#			
pH	s.u.	02/19/2014	N001	0	-	0	7.34	F	#			
Selenium	mg/L	02/19/2014	N001	0	-	0	0.00064	F	#	0.00016		
Specific Conductance	umhos/cm	02/19/2014	N001	0	-	0	557	F	#			
Sulfate	mg/L	02/19/2014	N001	0	-	0	160	F	#	2.5		
Temperature	C	02/19/2014	N001	0	-	0	13.74	F	#			
Turbidity	NTU	02/19/2014	N001	0	-	0	6.46	F	#			
Uranium	mg/L	02/19/2014	N001	0	-	0	0.03	F	#	0.000015		

Groundwater Quality Data by Location (USEE100) FOR SITE GJO01, Grand Junction Site

REPORT DATE: 03/24/2014

Location: 14-13NA WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data QA		
Manganese	mg/L	02/19/2014	N001	0	-	0	4.1	F	#	0.00011	
Molybdenum	mg/L	02/19/2014	N001	0	-	0	0.082	F	#	0.00032	
Oxidation Reduction Potential	mV	02/19/2014	N001	0	-	0	65	F	#		
pH	s.u.	02/19/2014	N001	0	-	0	7.05	F	#		
Selenium	mg/L	02/19/2014	N001	0	-	0	0.00067	F	#	0.000032	
Specific Conductance	umhos /cm	02/19/2014	N001	0	-	0	3280	F	#		
Sulfate	mg/L	02/19/2014	N001	0	-	0	1500	F	#	12	
Temperature	C	02/19/2014	N001	0	-	0	12.94	F	#		
Turbidity	NTU	02/19/2014	N001	0	-	0	0.96	F	#		
Uranium	mg/L	02/19/2014	N001	0	-	0	0.35	F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GJO01, Grand Junction Site

REPORT DATE: 03/24/2014

Location: 6-2N WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data		
Manganese	mg/L	02/20/2014	N001	0	-	0	1.2	F	#	0.00011	
Molybdenum	mg/L	02/20/2014	N001	0	-	0	0.017	F	#	0.00032	
Oxidation Reduction Potential	mV	02/20/2014	N001	0	-	0	59.3	F	#		
pH	s.u.	02/20/2014	N001	0	-	0	7.66	F	#		
Selenium	mg/L	02/20/2014	N001	0	-	0	0.027	F	#	0.00032	
Specific Conductance	umhos/cm	02/20/2014	N001	0	-	0	2835	F	#		
Sulfate	mg/L	02/20/2014	N001	0	-	0	1200	F	#	12	
Temperature	C	02/20/2014	N001	0	-	0	16.71	F	#		
Turbidity	NTU	02/20/2014	N001	0	-	0	1.43	F	#		
Uranium	mg/L	02/20/2014	N001	0	-	0	0.049	F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GJO01, Grand Junction Site

REPORT DATE: 03/24/2014

Location: 8-4S WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	02/20/2014	N001	0	-	0	0.23		F	#	0.00011	
Molybdenum	mg/L	02/20/2014	N001	0	-	0	0.019		F	#	0.00016	
Oxidation Reduction Potential	mV	02/20/2014	N001	0	-	0	-8.1		F	#		
pH	s.u.	02/20/2014	N001	0	-	0	6.94		F	#		
Selenium	mg/L	02/20/2014	N001	0	-	0	0.00082		F	#	0.00016	
Specific Conductance	umhos /cm	02/20/2014	N001	0	-	0	2436		F	#		
Sulfate	mg/L	02/20/2014	N001	0	-	0	1400		F	#	12	
Temperature	C	02/20/2014	N001	0	-	0	12.54		F	#		
Turbidity	NTU	02/20/2014	N001	0	-	0	2.01		F	#		
Uranium	mg/L	02/20/2014	N001	0	-	0	0.19		F	#	0.000015	

Groundwater Quality Data by Location (USEE100) FOR SITE GJ001, Grand Junction Site

REPORT DATE: 03/24/2014

Location: GJ01-01 WELL South of Building 20

Parameter	Units	Sample		Depth Range			Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data		
Manganese	mg/L	02/20/2014	N001	0	-	0	0.47	F	#	0.00011	
Molybdenum	mg/L	02/20/2014	N001	0	-	0	0.072	F	#	0.00032	
Oxidation Reduction Potential	mV	02/20/2014	N001	0	-	0	45.8	F	#		
pH	s.u.	02/20/2014	N001	0	-	0	7.38	F	#		
Selenium	mg/L	02/20/2014	N001	0	-	0	0.031	F	#	0.00032	
Specific Conductance	umhos/cm	02/20/2014	N001	0	-	0	1609	F	#		
Sulfate	mg/L	02/20/2014	N001	0	-	0	500	F	#	10	
Temperature	C	02/20/2014	N001	0	-	0	13.48	F	#		
Turbidity	NTU	02/20/2014	N001	0	-	0	2.08	F	#		
Uranium	mg/L	02/20/2014	N001	0	-	0	0.3	F	#	0.000029	

Groundwater Quality Data by Location (USEE100) FOR SITE GJ001, Grand Junction Site

REPORT DATE: 03/24/2014

Location: GJ84-04 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Manganese	mg/L	02/20/2014	N001	0	-	0	3.9		F	#	0.00011	
Manganese	mg/L	02/20/2014	N002	0	-	0	3.9		F	#	0.00011	
Molybdenum	mg/L	02/20/2014	N001	0	-	0	0.066		F	#	0.00032	
Molybdenum	mg/L	02/20/2014	N002	0	-	0	0.065		F	#	0.00032	
Oxidation Reduction Potential	mV	02/20/2014	N001	0	-	0	89.6		F	#		
pH	s.u.	02/20/2014	N001	0	-	0	7.17		F	#		
Selenium	mg/L	02/20/2014	N001	0	-	0	0.00023		F	#	0.000032	
Selenium	mg/L	02/20/2014	N002	0	-	0	0.00023		F	#	0.000032	
Specific Conductance	umhos /cm	02/20/2014	N001	0	-	0	3145		F	#		
Sulfate	mg/L	02/20/2014	N001	0	-	0	1400		F	#	12	
Sulfate	mg/L	02/20/2014	N002	0	-	0	1400		F	#	12	
Temperature	C	02/20/2014	N001	0	-	0	12.74		F	#		
Turbidity	NTU	02/20/2014	N001	0	-	0	0.41		F	#		
Uranium	mg/L	02/20/2014	N001	0	-	0	0.29		F	#	0.000029	
Uranium	mg/L	02/20/2014	N002	0	-	0	0.29		F	#	0.000029	

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

LAB QUALIFIERS:

- * Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.

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

DATA QUALIFIERS:

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

QA QUALIFIER:

Validated according to quality assurance guidelines.

Surface Water Quality Data

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Surface Water Quality Data by Location (USEE102) FOR SITE GJO01, Grand Junction Site

REPORT DATE: 03/24/2014

Location: Lower Gunnison SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID		Lab	Data QA		
Molybdenum	mg/L	02/20/2014	0001	0.0048		#	0.00016	
Oxidation Reduction Potential	mV	02/20/2014	N001	62.1		#		
pH	s.u.	02/20/2014	N001	8.29		#		
Selenium	mg/L	02/20/2014	0001	0.0089		#	0.00016	
Specific Conductance	umhos/cm	02/20/2014	N001	1370		#		
Sulfate	mg/L	02/20/2014	0001	530		#	5	
Temperature	C	02/20/2014	N001	6.33		#		
Turbidity	NTU	02/20/2014	N001	22.1		#		
Uranium	mg/L	02/20/2014	0001	0.016		#	0.000015	

Surface Water Quality Data by Location (USEE102) FOR SITE GJO01, Grand Junction Site

REPORT DATE: 03/24/2014

Location: North Pond SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID		Lab	Data QA		
Molybdenum	mg/L	02/20/2014	N001	0.0035		#	0.00016	
Oxidation Reduction Potential	mV	02/20/2014	N001	66.2		#		
pH	s.u.	02/20/2014	N001	8.19		#		
Selenium	mg/L	02/20/2014	N001	0.00058		#	0.00016	
Specific Conductance	umhos/cm	02/20/2014	N001	860		#		
Sulfate	mg/L	02/20/2014	N001	300		#	5	
Temperature	C	02/20/2014	N001	6.56		#		
Turbidity	NTU	02/20/2014	N001	7.39		#		
Uranium	mg/L	02/20/2014	N001	0.032		#	0.000015	

Surface Water Quality Data by Location (USEE102) FOR SITE GJO01, Grand Junction Site

REPORT DATE: 03/24/2014

Location: South Pond SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID		Lab	Data QA		
Molybdenum	mg/L	02/20/2014	N001	0.021		#	0.00016	
Oxidation Reduction Potential	mV	02/20/2014	N001	-4.6		#		
pH	s.u.	02/20/2014	N001	7.5		#		
Selenium	mg/L	02/20/2014	N001	0.00062		#	0.000032	
Specific Conductance	umhos/cm	02/20/2014	N001	1145		#		
Sulfate	mg/L	02/20/2014	N001	450		#	5	
Temperature	C	02/20/2014	N001	11.35		#		
Turbidity	NTU	02/20/2014	N001	7.45		#		
Uranium	mg/L	02/20/2014	N001	0.085		#	0.000015	

Surface Water Quality Data by Location (USEE102) FOR SITE GJO01, Grand Junction Site

REPORT DATE: 03/24/2014

Location: Upper Gunnison SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID		Lab	Data QA		
Molybdenum	mg/L	02/19/2014	0001	0.0034		#	0.00016	
Oxidation Reduction Potential	mV	02/19/2014	N001	121.6		#		
pH	s.u.	02/19/2014	N001	8.14		#		
Selenium	mg/L	02/19/2014	0001	0.0092		#	0.00016	
Specific Conductance	umhos/cm	02/19/2014	N001	1209		#		
Sulfate	mg/L	02/19/2014	0001	480		#	5	
Temperature	C	02/19/2014	N001	8.52		#		
Turbidity	NTU	02/19/2014	N001	18.1		#		
Uranium	mg/L	02/19/2014	0001	0.0095		#	0.000015	

Surface Water Quality Data by Location (USEE102) FOR SITE GJO01, Grand Junction Site

REPORT DATE: 03/24/2014

Location: Upper Mid Gunnison SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID		Lab	Data QA		
Molybdenum	mg/L	02/19/2014	0001	0.0045		#	0.00016	
Oxidation Reduction Potential	mV	02/19/2014	N001	45.2		#		
pH	s.u.	02/19/2014	N001	8.3		#		
Selenium	mg/L	02/19/2014	0001	0.0063		#	0.00016	
Specific Conductance	umhos/cm	02/19/2014	N001	1137		#		
Sulfate	mg/L	02/19/2014	0001	450		#	5	
Temperature	C	02/19/2014	N001	13.73		#		
Turbidity	NTU	02/19/2014	N001	20.7		#		
Uranium	mg/L	02/19/2014	0001	0.013		#	0.000015	

Surface Water Quality Data by Location (USEE102) FOR SITE GJO01, Grand Junction Site

REPORT DATE: 03/24/2014

Location: Wetland Area SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Molybdenum	mg/L	02/20/2014	0001	0.062			#	0.00016	
Oxidation Reduction Potential	mV	02/20/2014	N001	83.2			#		
pH	s.u.	02/20/2014	N001	7.74			#		
Selenium	mg/L	02/20/2014	0001	0.00058			#	0.00016	
Specific Conductance	umhos/cm	02/20/2014	N001	1406			#		
Sulfate	mg/L	02/20/2014	0001	690			#	5	
Temperature	C	02/20/2014	N001	8.75			#		
Turbidity	NTU	02/20/2014	N001	24.8			#		
Uranium	mg/L	02/20/2014	0001	0.41			#	0.000015	

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.
U Parameter analyzed for but was not detected.

Q Qualitative result due to sampling technique. R Unusable result.
X Location is undefined.

QA QUALIFIER:

Validated according to quality assurance guidelines.

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Equipment Blank Data

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BLANKS REPORT

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

RIN: 14025928

Report Date: 03/24/2014

Parameter	Site Code	Location ID	Sample		Units	Result	Qualifiers		Detection Limit	Uncertainty	Sample Type
			Date	ID			Lab	Data			
Manganese	GJO01	0999	02/20/2014	N001	mg/L	0.00084	B	U	0.00011		E
Molybdenum	GJO01	0999	02/20/2014	N001	mg/L	0.000052	B	U	0.000032		E
Selenium	GJO01	0999	02/20/2014	N001	mg/L	0.000032	U		0.000032		E
Sulfate	GJO01	0999	02/20/2014	N001	mg/L	0.5	U		0.5		E
Uranium	GJO01	0999	02/20/2014	N001	mg/L	0.000041			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:

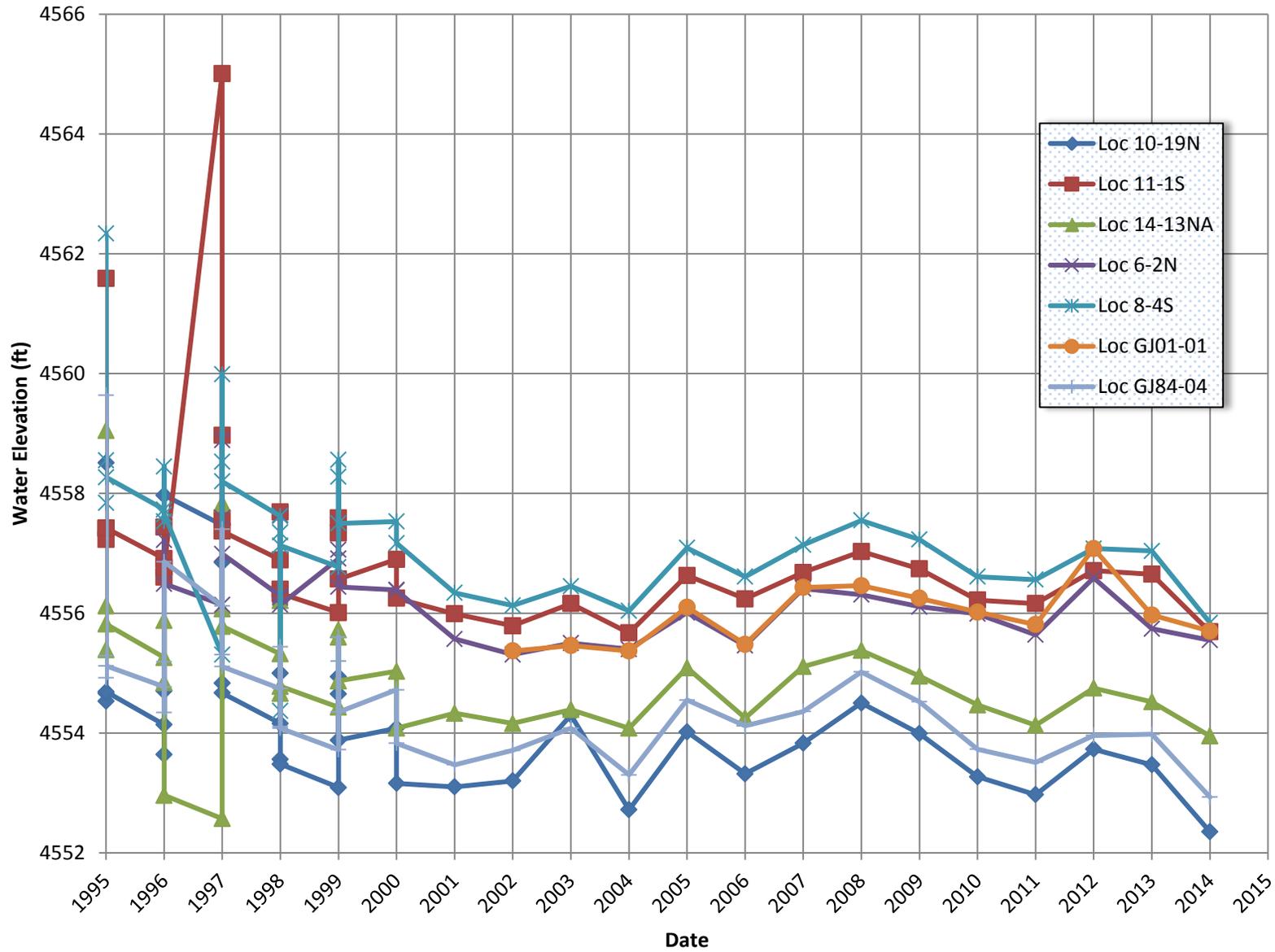
- E Equipment Blank.

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Static Water Level Data

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Grand Junction Site Hydrograph



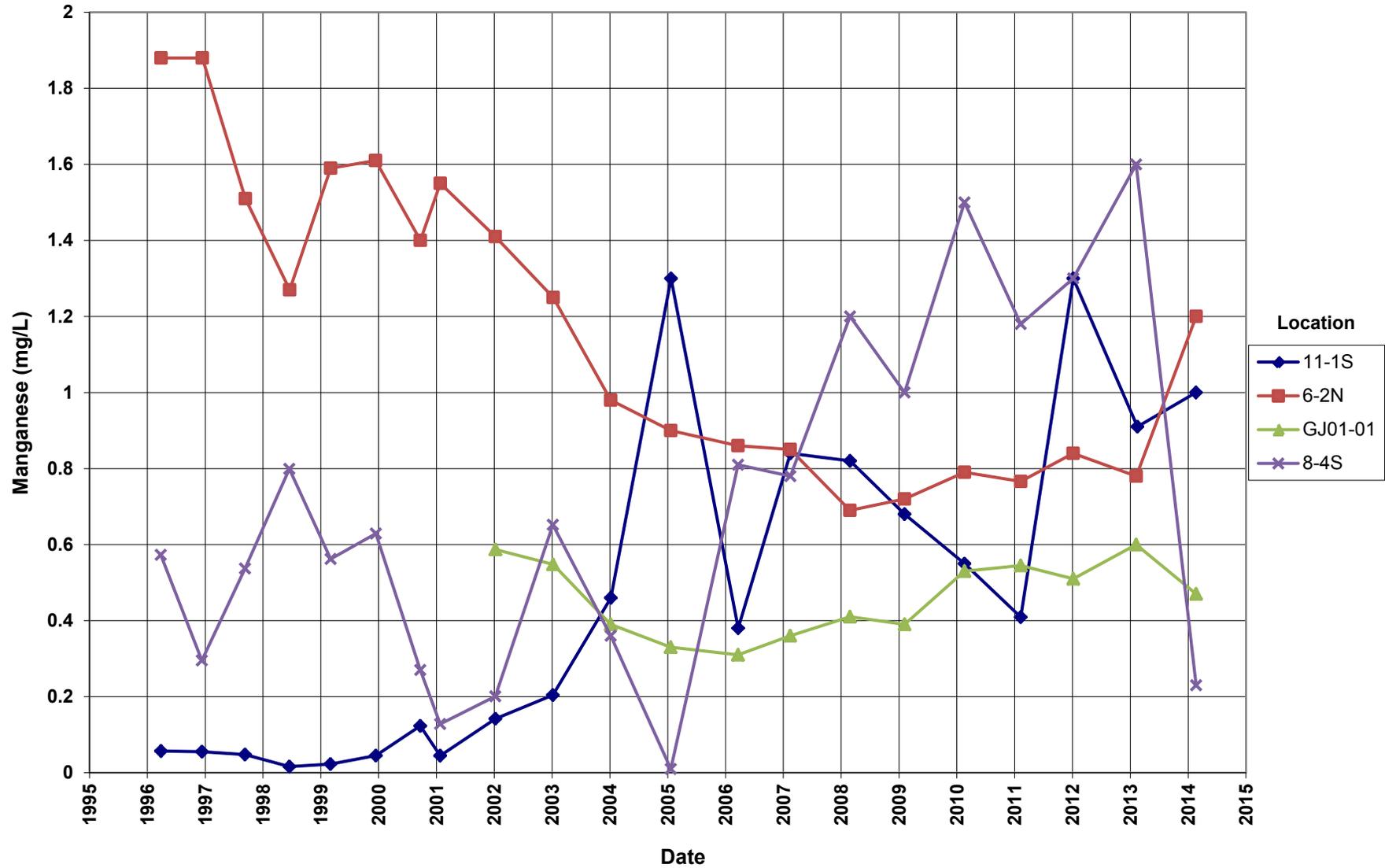
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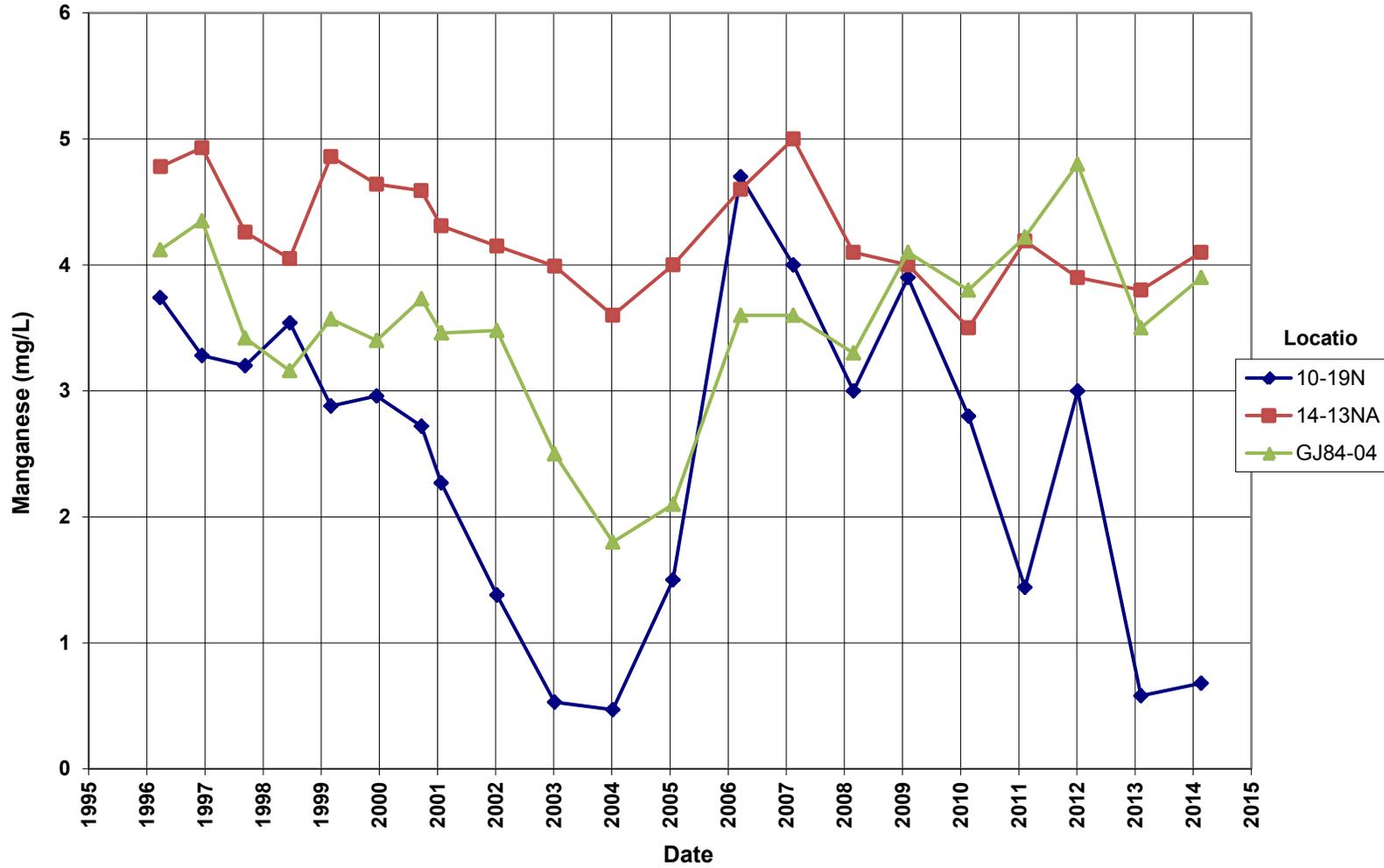
Time-Concentration Graphs Groundwater Locations

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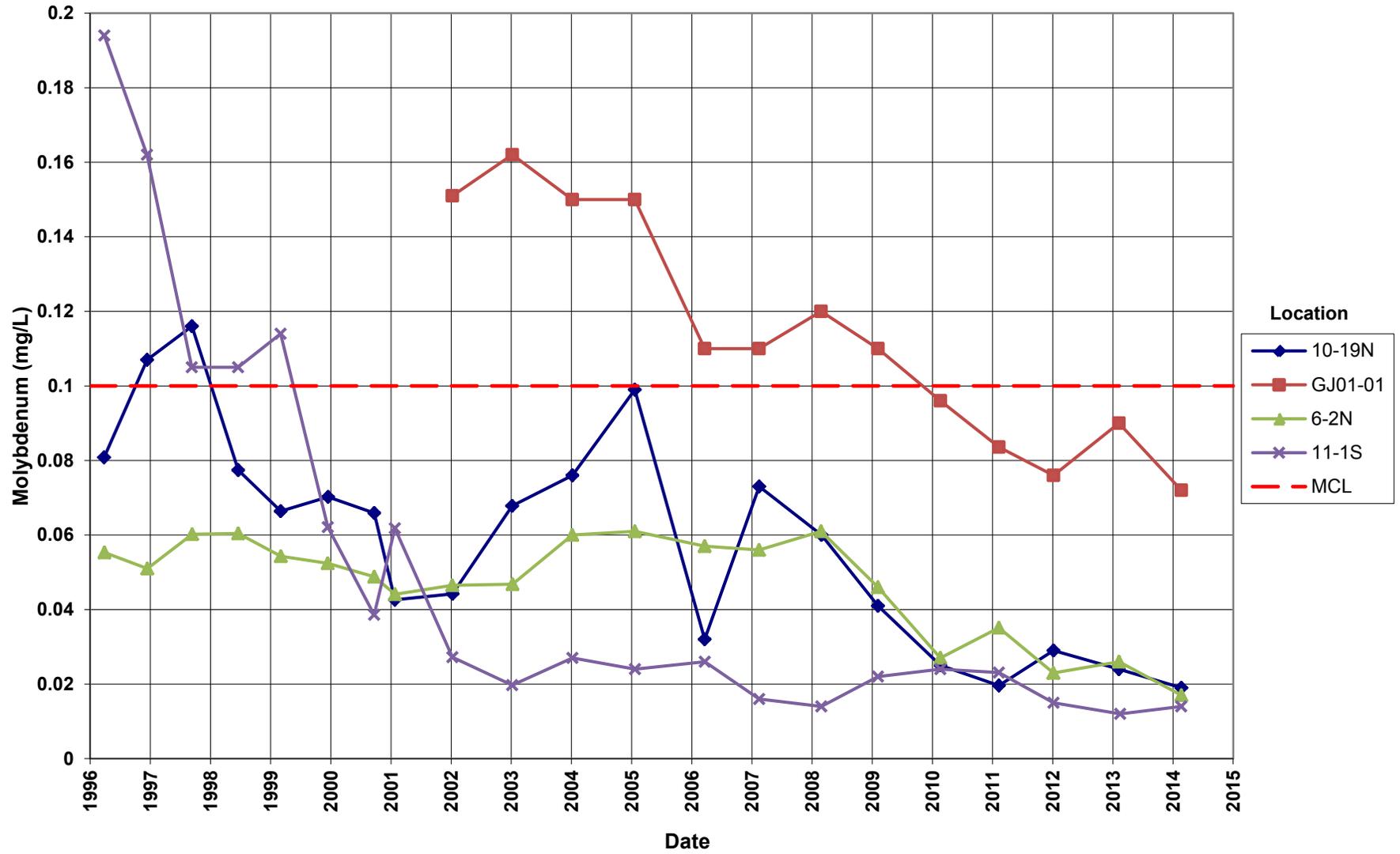
Grand Junction Site Manganese Concentration



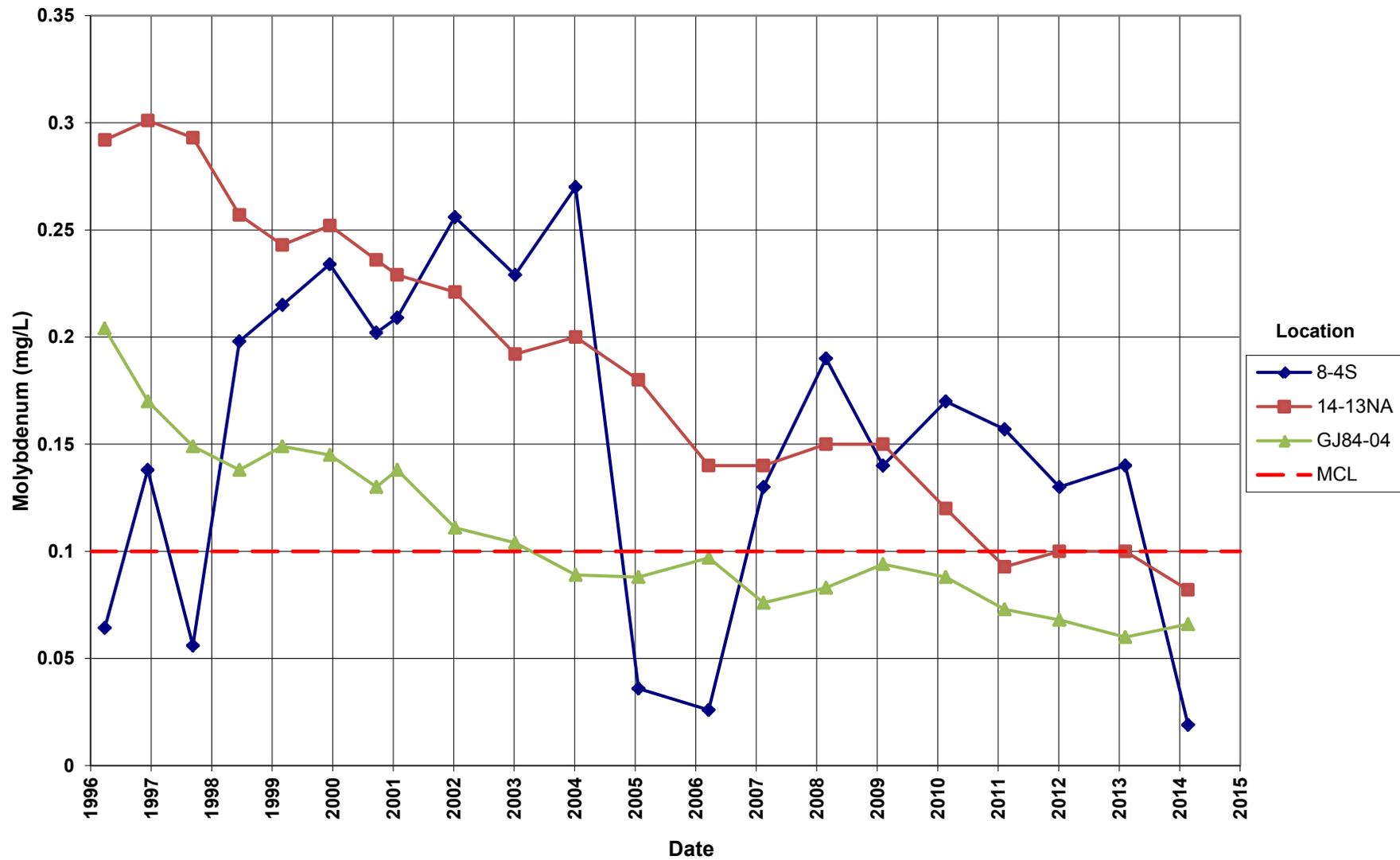
Grand Junction Site Manganese Concentration



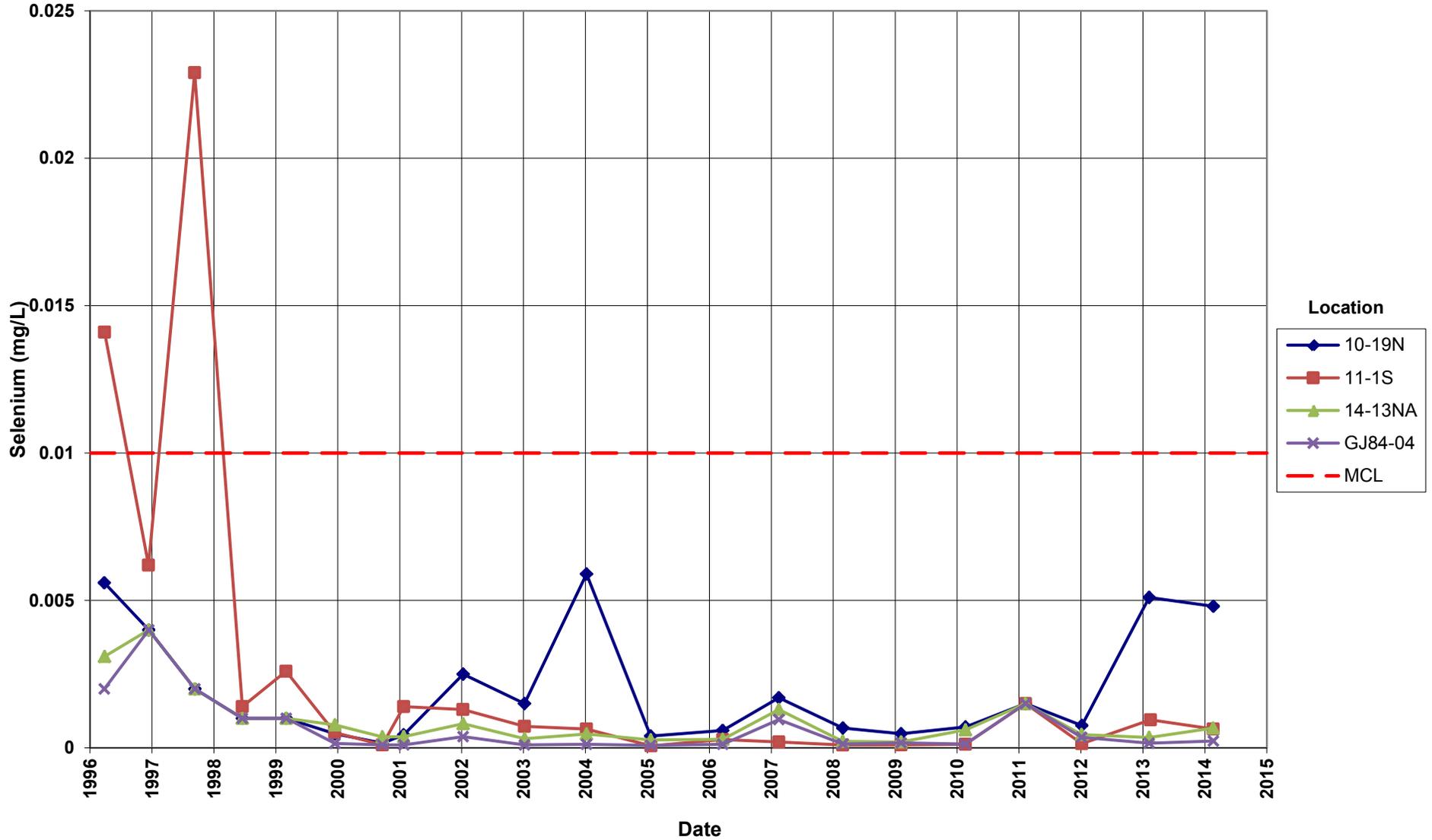
**Grand Junction Site
Molybdenum Concentration**
Maximum Concentration Limit (MCL) = 0.1 mg/L



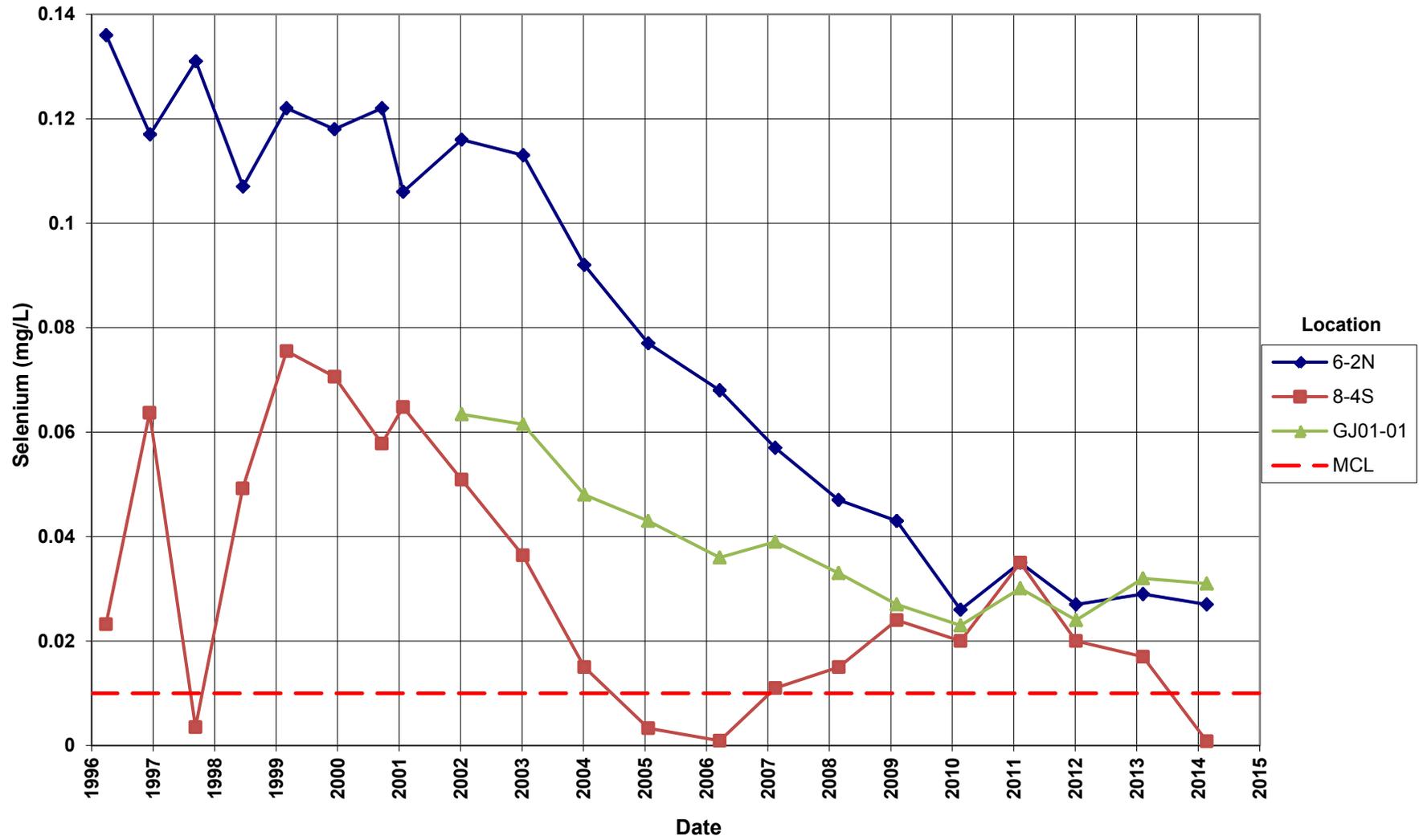
Grand Junction Site
Molybdenum Concentration
Maximum Concentration Limit (MCL) = 0.1 mg/L



**Grand Junction Site
Selenium Concentration**
Maximum Concentration Limit (MCL) = 0.01 mg/L

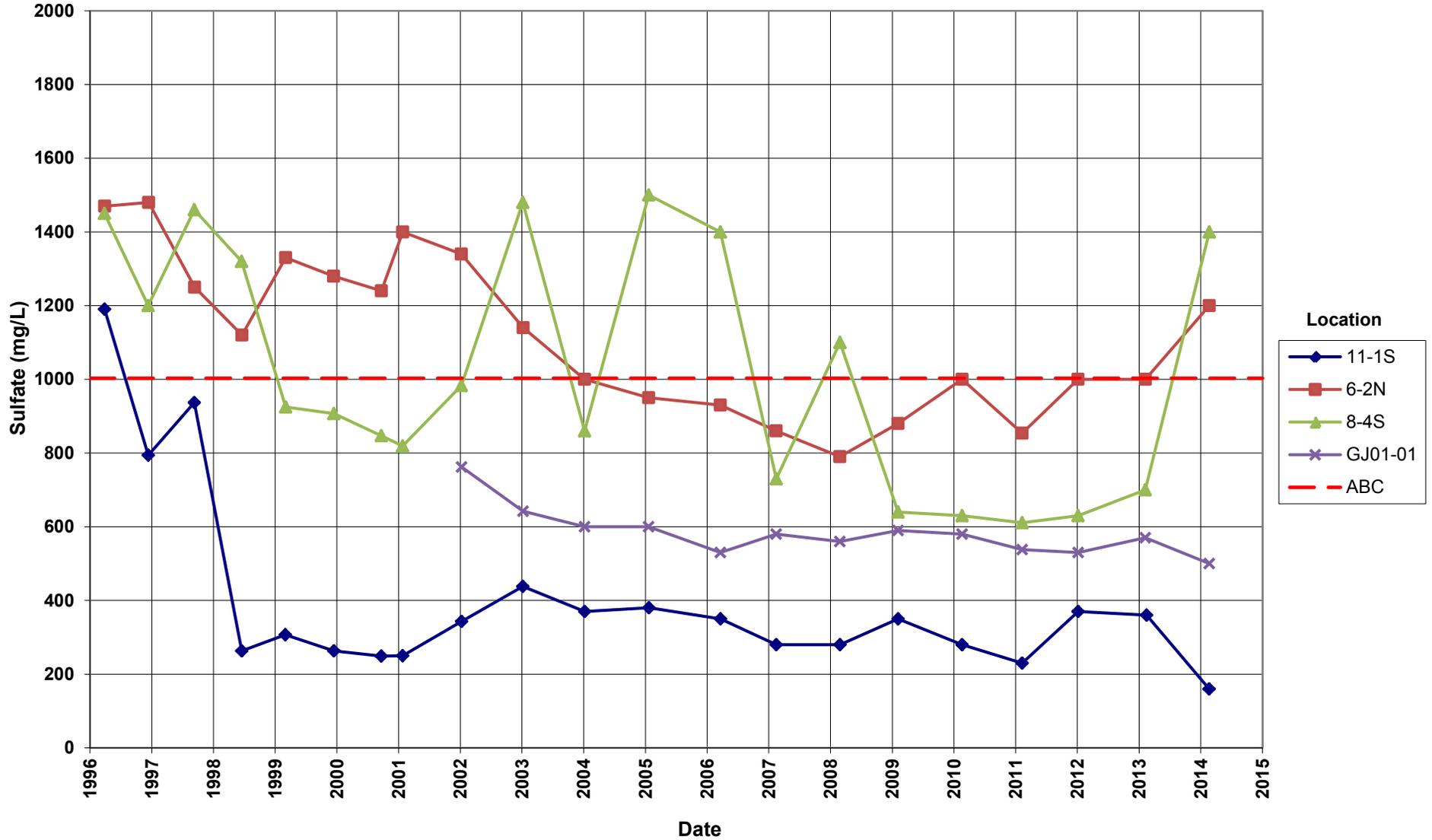


**Grand Junction Site
Selenium Concentration**
Maximum Concentration Limit (MCL) = 0.01 mg/L



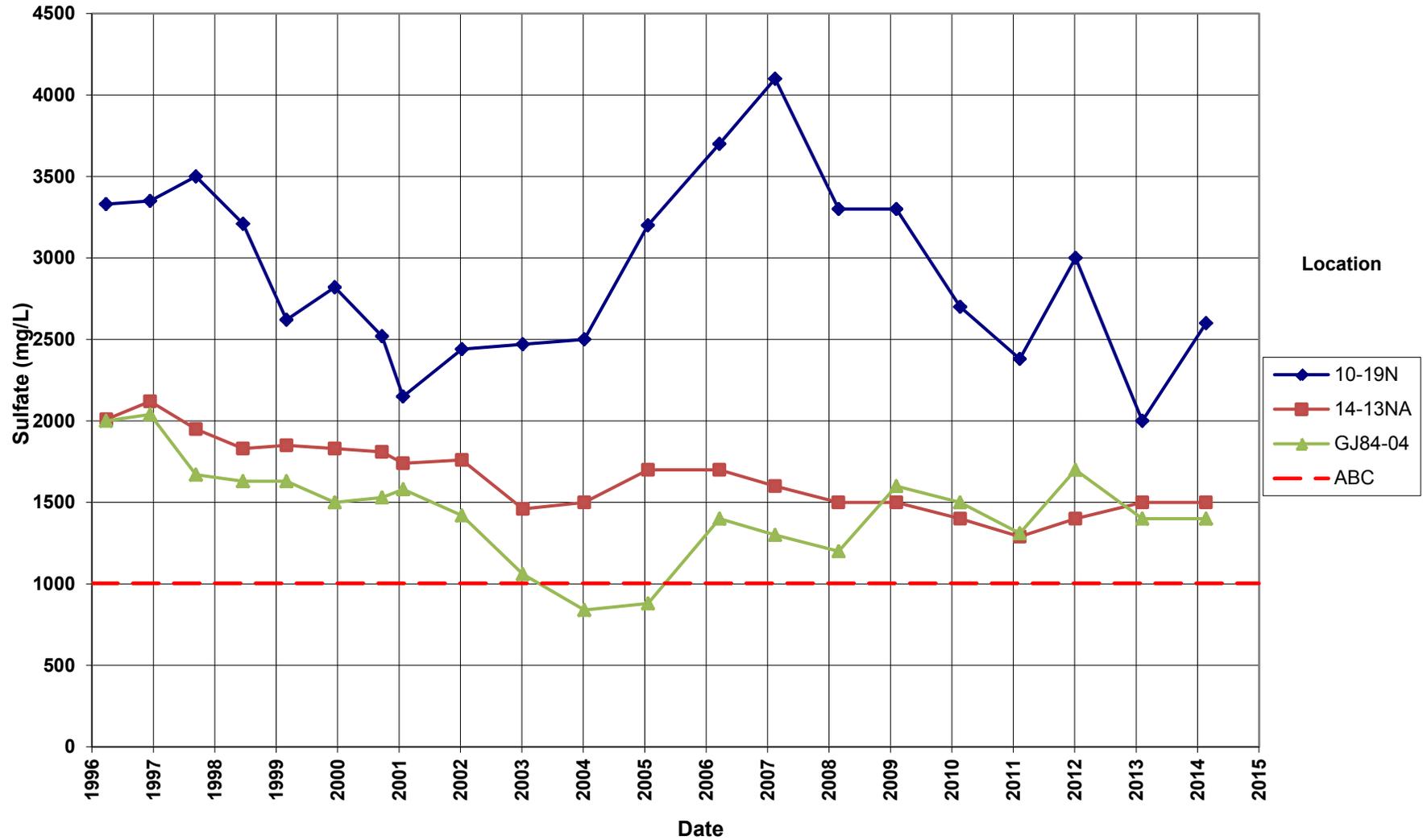
Grand Junction Site Sulfate Concentration

Average Background Concentration (ABC) in Background Wells = 1003 mg/L
(The ABC is the average sulfate result from background wells GJ84-09 and GJ84-10 from 1990 through 1995)

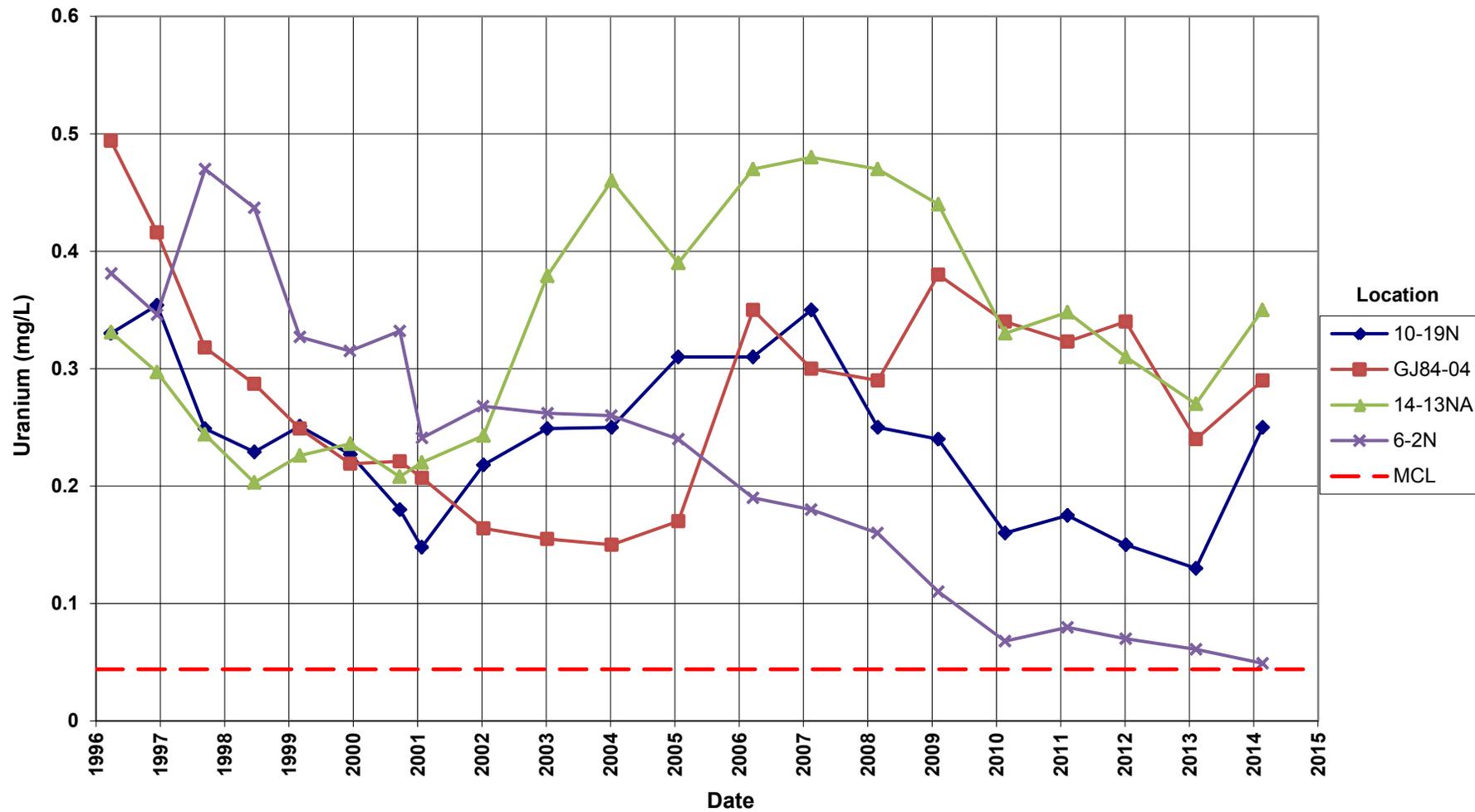


Grand Junction Site Sulfate Concentration

Average Background Concentration (ABC) in Background Wells = 1003 mg/L
(The ABC is the average sulfate result from background wells GJ84-09 and GJ84-10 from 1990 through 1995)

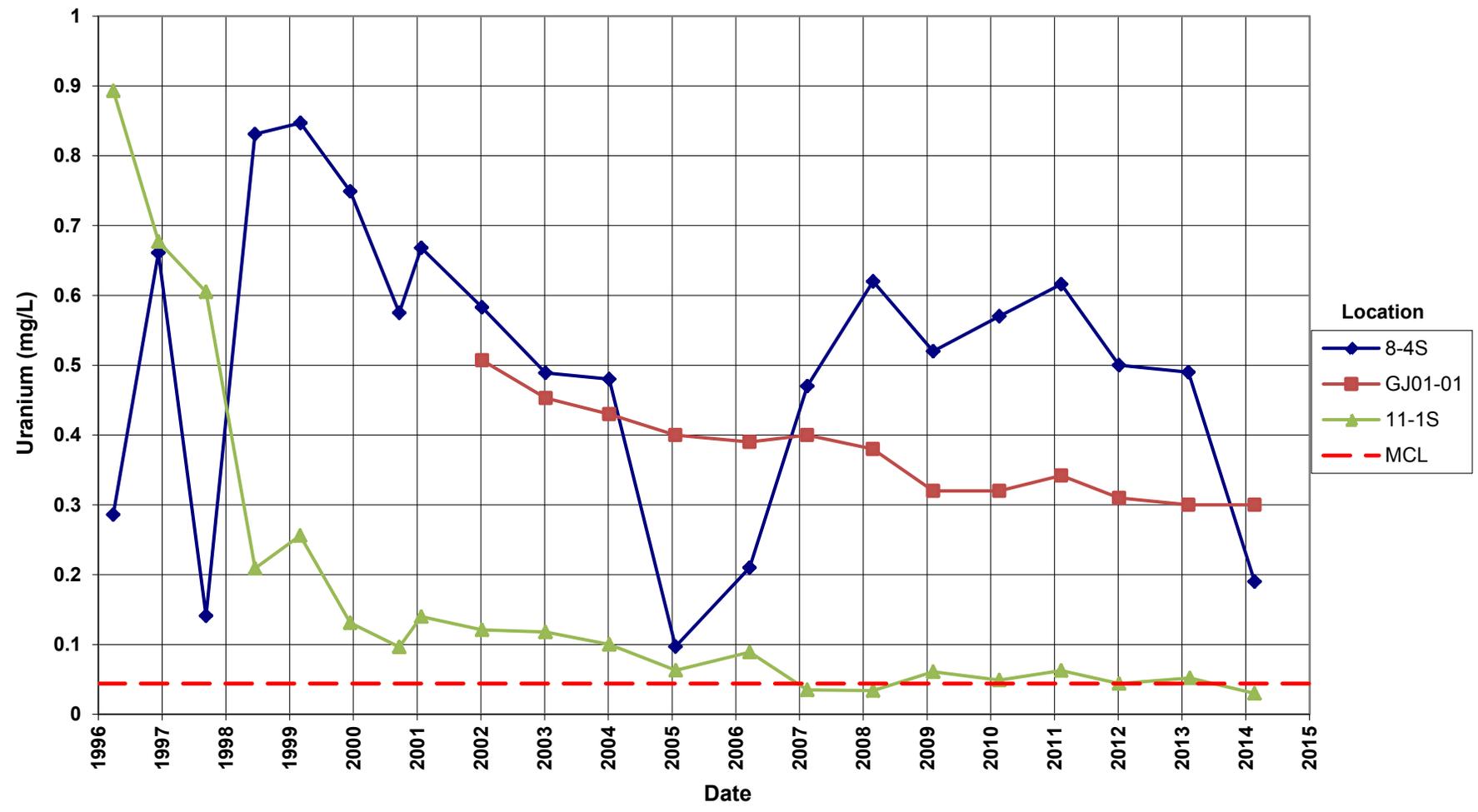


**Grand Junction Site
Uranium Concentration**
Maximum Concentration Limit (MCL) = 0.044 mg/L



Grand Junction Site Uranium Concentration

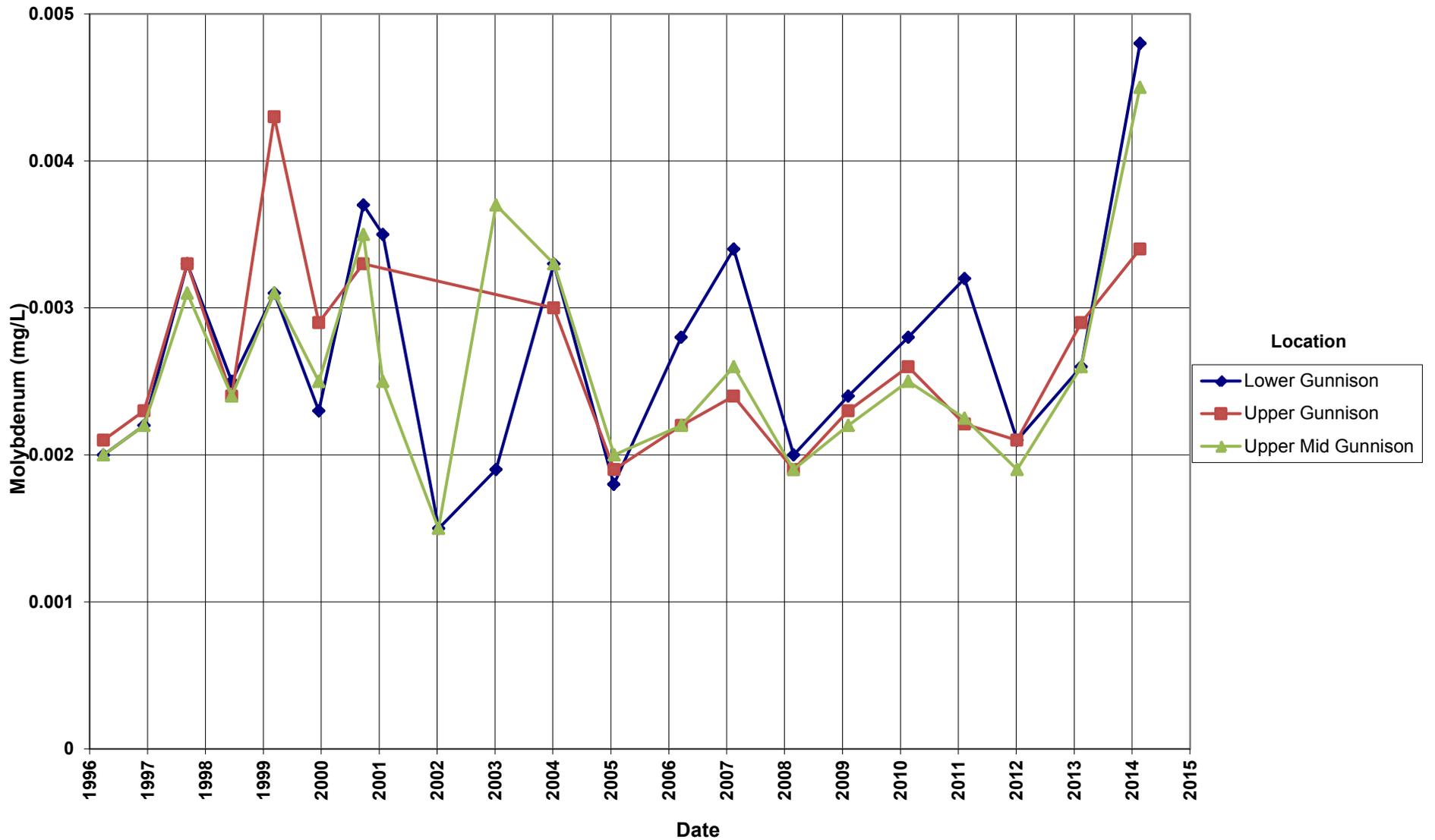
Maximum Concentration Limit (MCL) = 0.044 mg/L



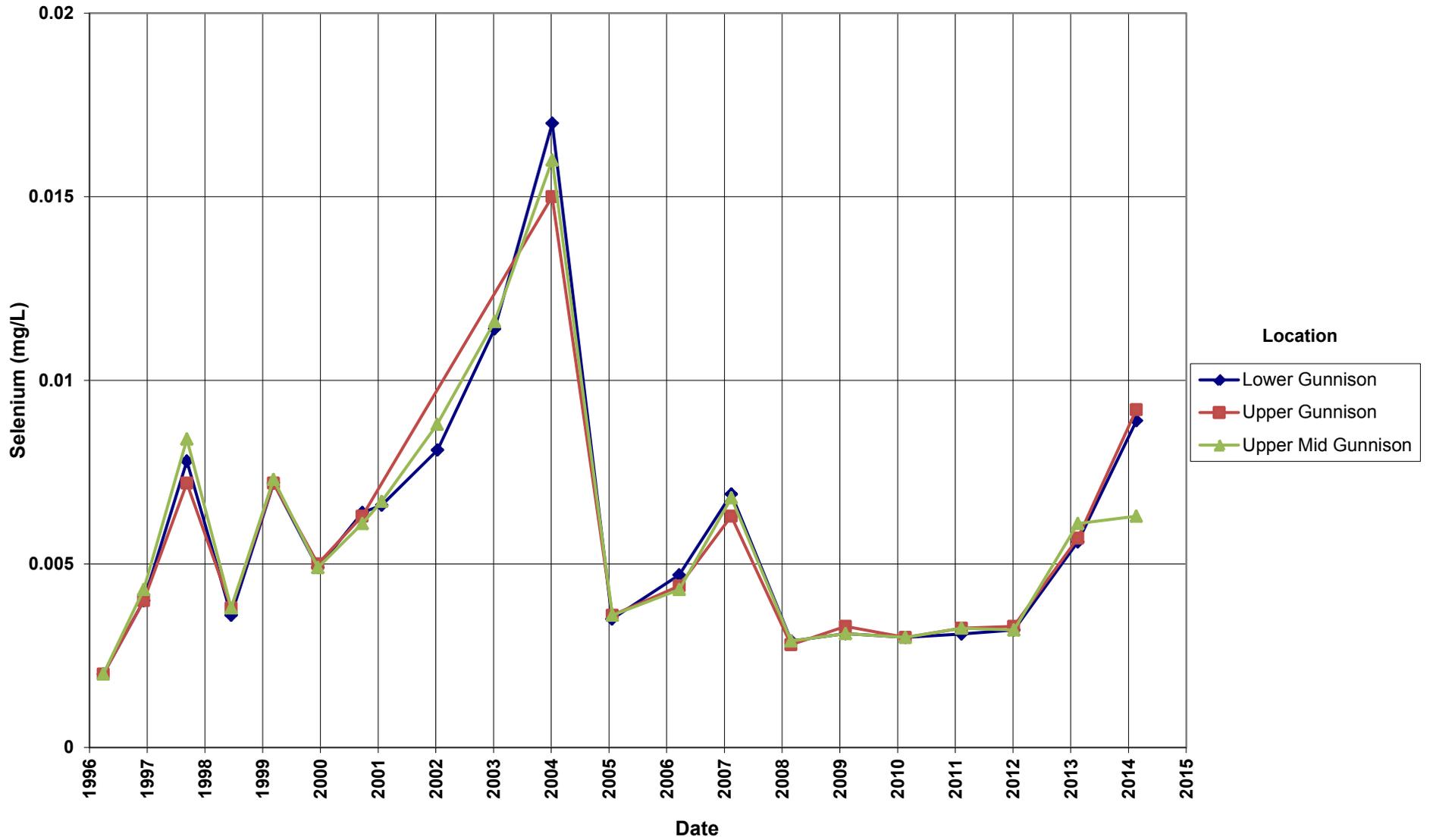
Time-Concentration Graphs Surface Water Locations

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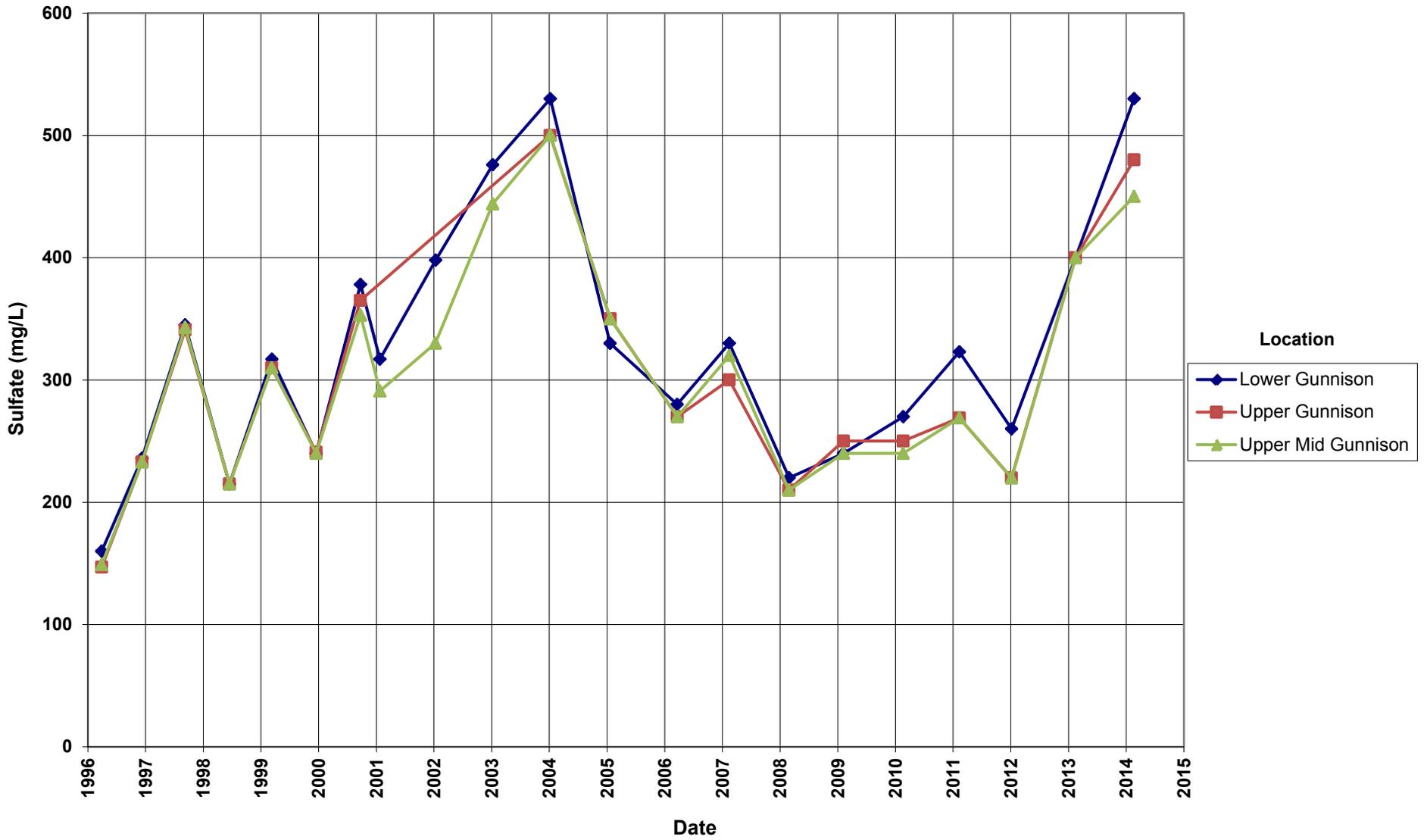
Grand Junction Site
Molybdenum Concentration
River Locations



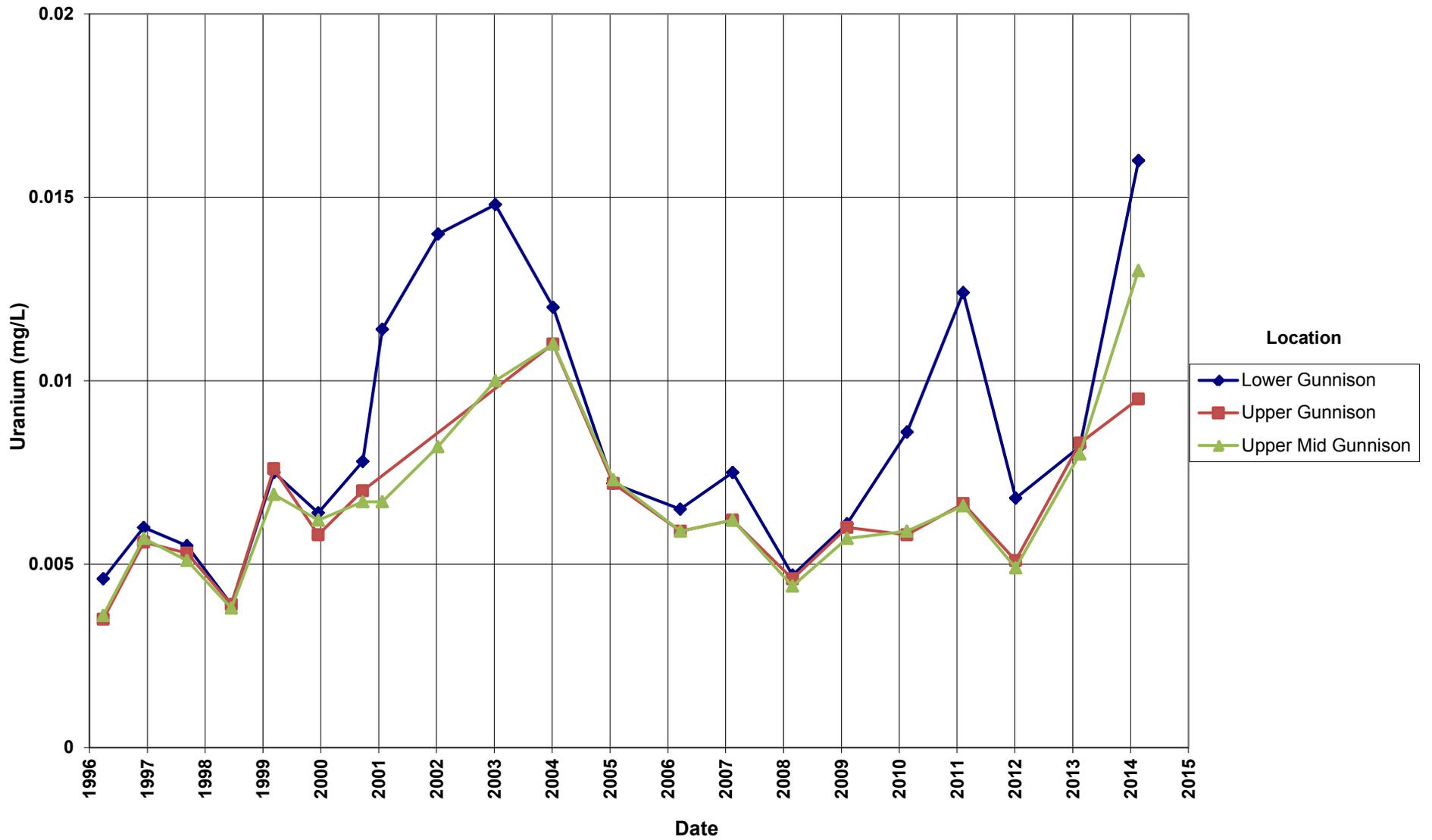
**Grand Junction Site
Selenium Concentration**
River Locations



Grand Junction Site Sulfate Concentration River Locations



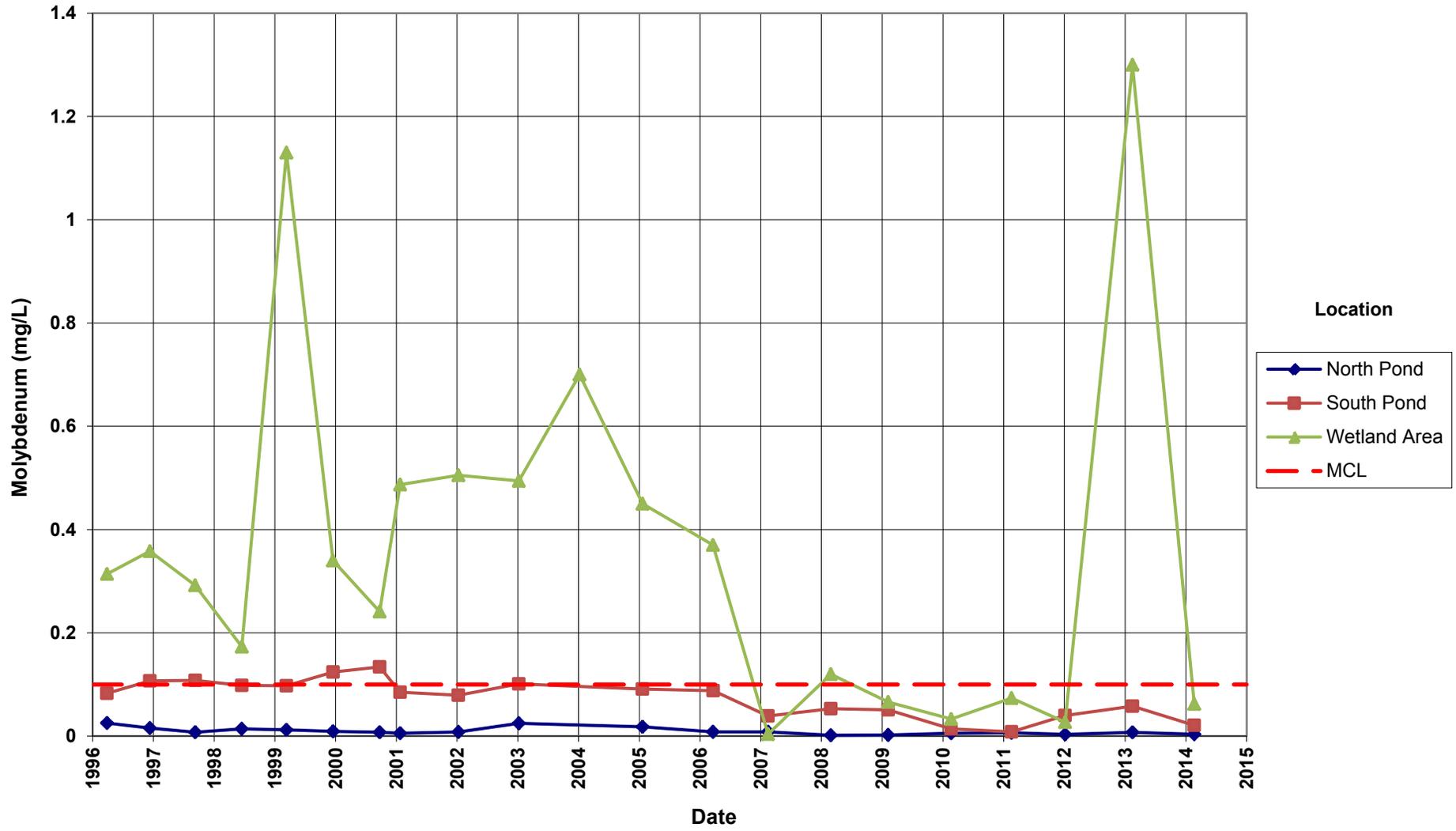
**Grand Junction Site
Uranium Concentration**
River Locations



Grand Junction Site Molybdenum Concentration

Pond and Wetland Locations

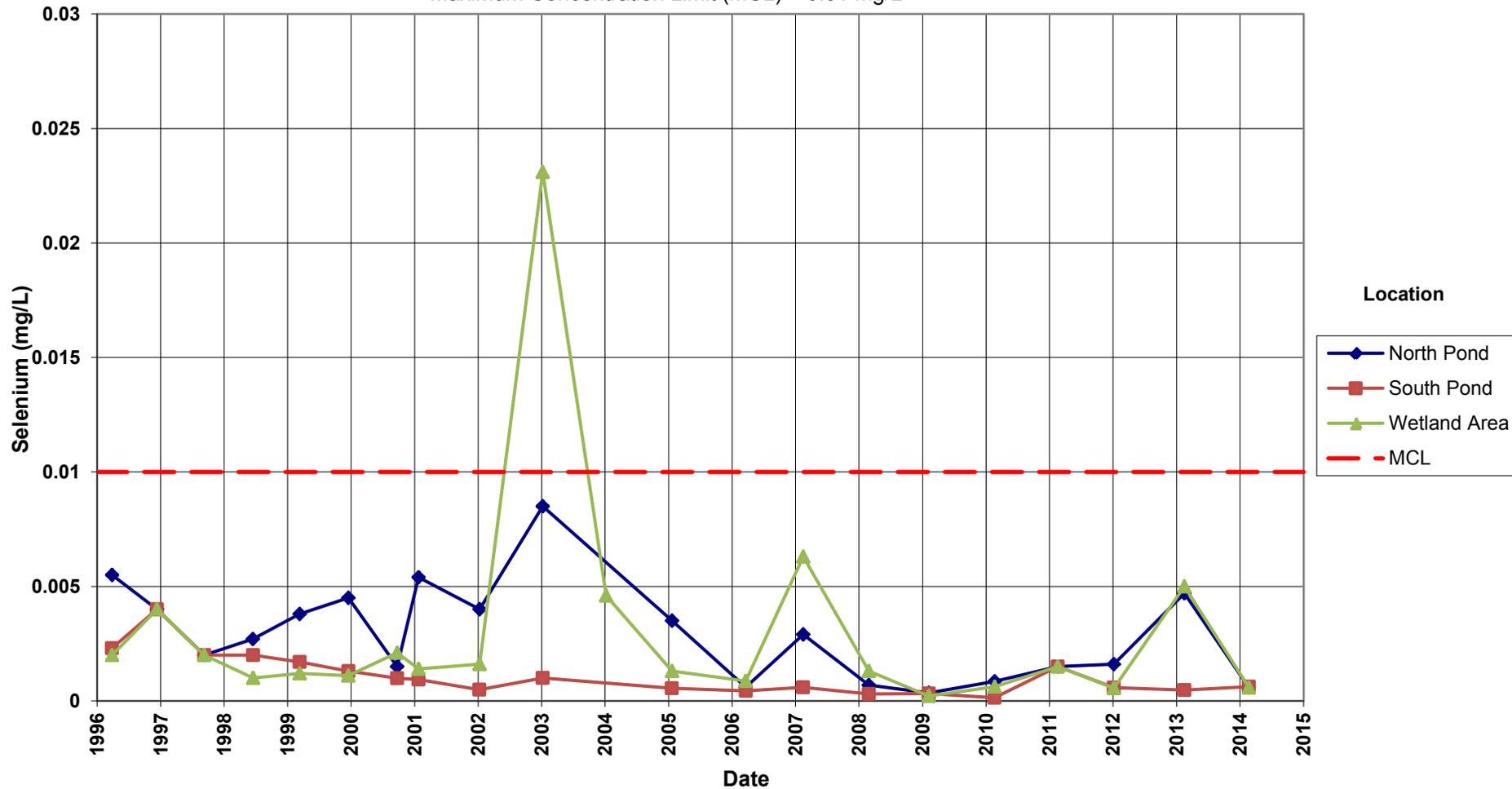
Maximum Concentration Limit (MCL) = 0.1 mg/L



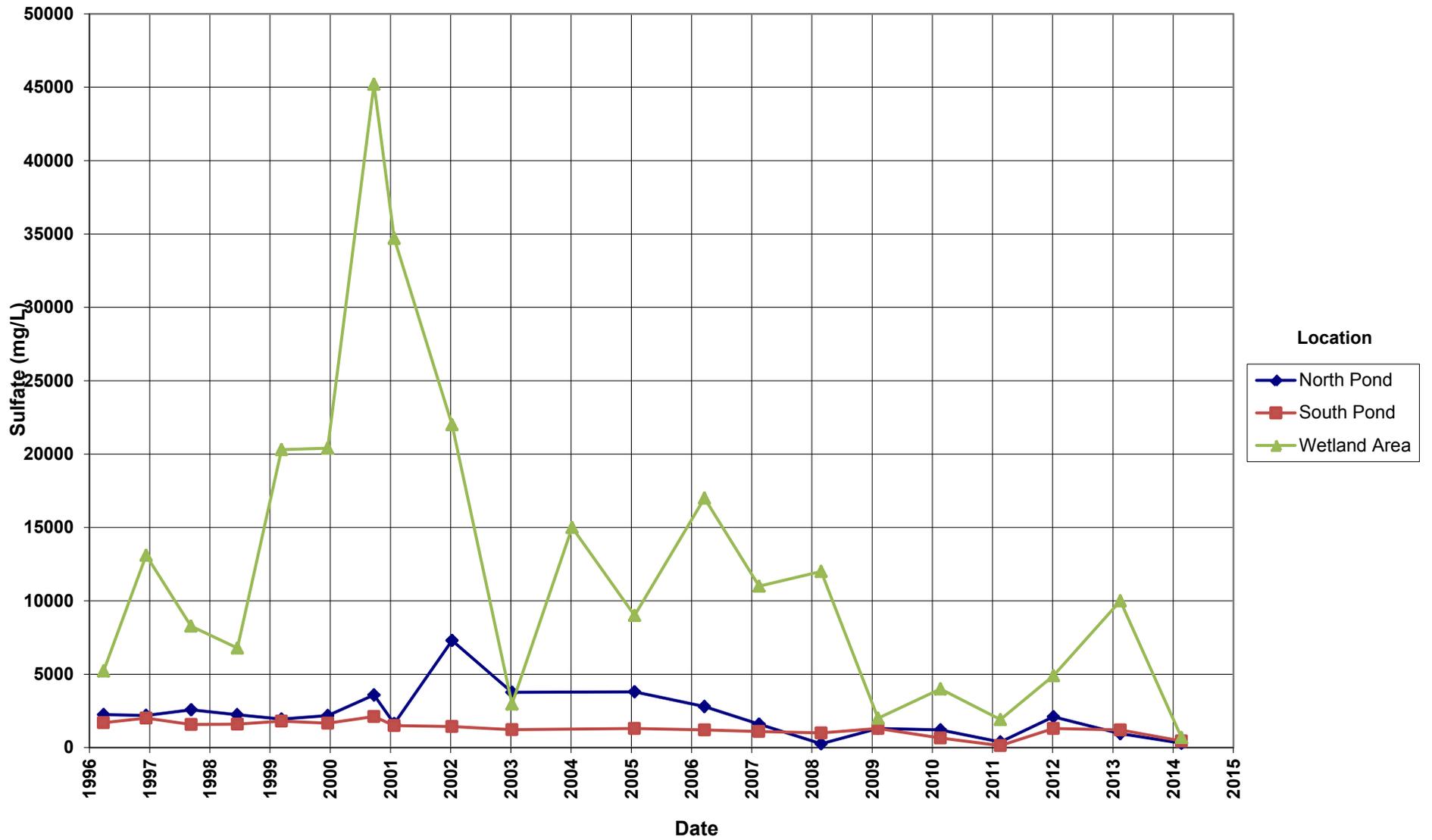
Grand Junction Site Selenium Concentration

Pond and Wetland Locations

Maximum Concentration Limit (MCL) = 0.01 mg/L



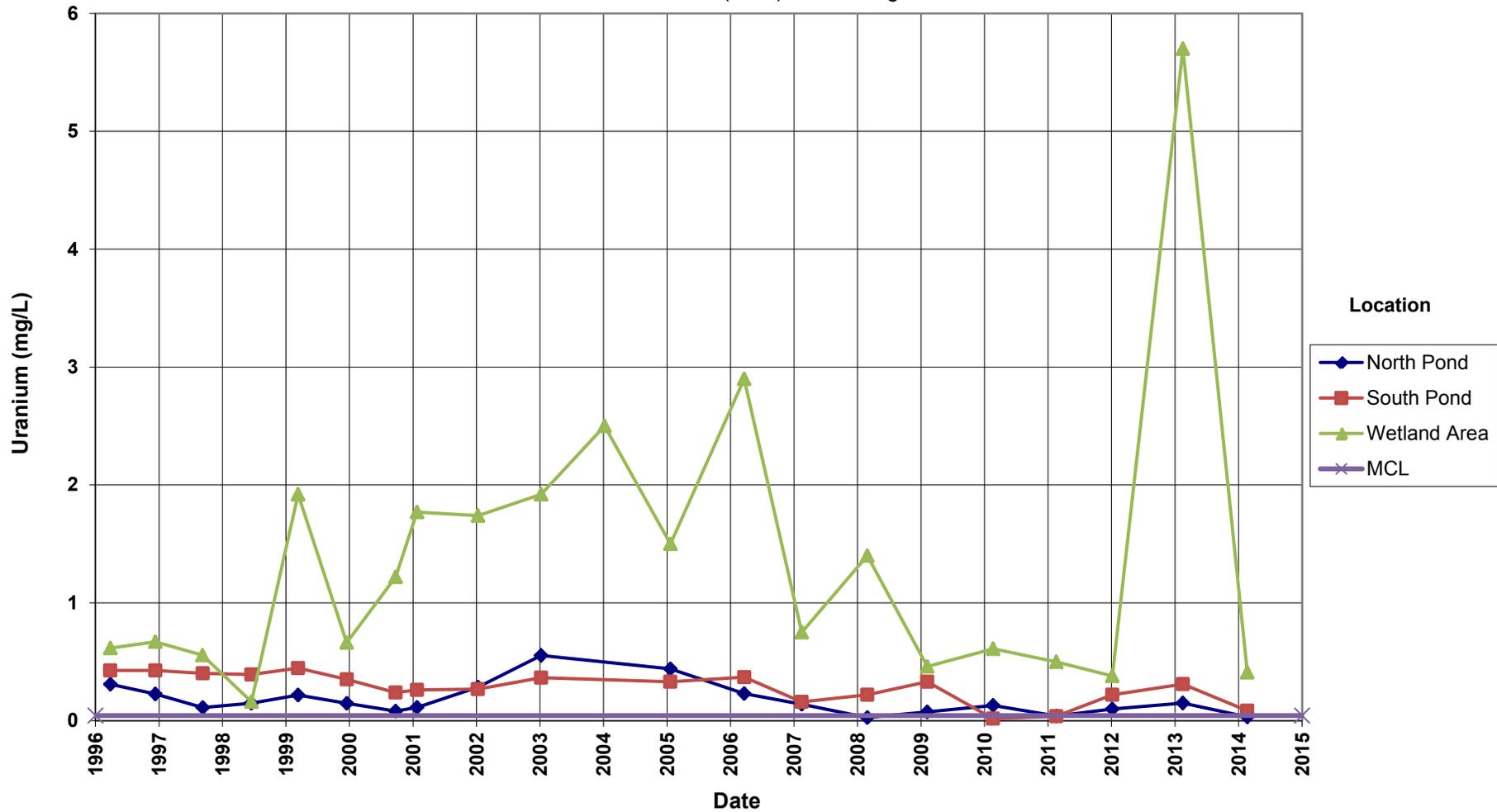
Grand Junction Site
Sulfate Concentration
Pond and Wetland Locations



Grand Junction Site Uranium Concentration

Pond and Wetland Locations

Maximum Concentration Limit (MCL) = 0.044 mg/L



Attachment 3
Sampling and Analysis Work Order

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Richard Bush
Control Number 14-0276
Page 2

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: GJO 410.02(A)

Sampling Frequencies for Locations at Grand Junction Office Site, Colorado

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
Monitoring Wells						
8-4S			X			
11-1S			X			
6-2N			X			
14-13NA			X			
GJ84-04			X			
GJ01-01			X			
10-19N			X			
Surface Locations						
Upper Gunnison			X			
Upper Middle Gunnison			X			
Lower Gunnison			X			
South Pond			X			
North Pond			X			
Wetland Area			X			

Sampling conducted in February

Constituent Sampling Breakdown

Site	Grand Junction Office Facility		Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Analyte	Groundwater	Surface Water			
Approx. No. Samples/yr	7	6			
<i>Field Measurements</i>					
Alkalinity					
Dissolved Oxygen					
Redox Potential	X	X			
pH	X	X			
Specific Conductance	X	X			
Turbidity	X	X			
Temperature	X	X			
<i>Laboratory Measurements</i>					
Aluminum					
Ammonia as N (NH3-N)					
Calcium					
Chloride					
Chromium					
Gross Alpha					
Gross Beta					
Iron					
Lead					
Magnesium					
Manganese	X		0.005	SW-846 6010	LMM-01
Molybdenum	X	X	0.003	SW-846 6020	LMM-02
Nickel					
Nickel-63					
Nitrate + Nitrite as N (NO3+NO2)-N					
Potassium					
Radium-226					
Radium-228					
Selenium	X	X	0.0001	SW-846 6020	LMM-02
Silica					
Sodium					
Strontium					
Sulfate	X	X	0.5	SW-846 9056	MIS-A-044
Sulfide					
Total Dissolved Solids					
Total Organic Carbon					

Constituent Sampling Breakdown Continued

Site	Grand Junction Office Facility		Required Detection Limit (mg/L)	Analytical Method	Line Item Code
Analyte	Groundwater	Surface Water			
Approx. No. Samples/yr	7	6			
Uranium	X	X	0.0001	SW-846 6020	LMM-02
Vanadium					
Zinc					
Total No. of Analytes	5	4			

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

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Attachment 4

Trip Report

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Memorandum

DATE: March 4, 2014

TO: Sam Campbell

FROM: David Atkinson

SUBJECT: Sampling Trip Report

Site: Grand Junction Office

Dates of Sampling Event: February 19-20, 2014

Dates of Well Development Event: January 21-22, 2014

Team Members: David Atkinson, Joe Trevino, and Allison Kuhlman.

Number of Locations Sampled: 7 monitoring well locations and 6 surface water locations were sampled. In addition, 1 duplicate sample and 1 rinsate/equipment blank sample were collected.

Locations Not Sampled/Reason: None.

Location Specific Information: The following table shows well total depths and intake depths. Intake depths that were adjusted are shown in red:

Well ID	Total Depth	Intake Depth (Ft Below TOC)
6-2N	32.88	30.90
GJ01-01	28.16	26.20
11-1S	27.70	24.65
14-13NA	19.22	16.12
GJ84-04	22.97	19.90
10-19N	27.28	21.20
8-4S	27.40	25.40

All wells were developed during the above dates with the exception of monitoring well 11-1S. Well 11-1S could not be properly developed due to a deflection of the well casing approximately 8 ft below the TOC which prevents brushes, surge-blocks, and bailers from being pushed into the screened interval. During development, approximately 30L were pumped out of 11-1S to clean the well as much as possible. The well development log is attached at the end of this report.

Samplers observed that surface water levels, particularly the river locations and the wetlands area location were lower than normal. These locations required filtration of the sample due to high turbidity.

Quality Control Sample Cross Reference: The following table shows the false identifications assigned to the quality control samples:

False ID	True ID	Sample date/time	QC Type
2310	GJ84-04	2-20-2014/1200	Duplicate
2311	South Pond	2-20-2014/1230	Rinsate/Equipment Blank

RIN Number Assigned: All samples were assigned to RIN 14025928.

Sample Shipment: Samples were shipped overnight via FedEx to ALS Laboratory Group, Fort Collins, CO, from Grand Junction, CO, on Monday, February 24, 2014.

Water Level Measurements: Water levels were measured at all wells prior to sampling.

Well Inspection Summary: None.

Field Variance: None.

Equipment: All equipment functioned properly.

Institutional Controls:

Fences, Gates, Locks: All appeared to be in working condition.

Trespassing/Site Disturbances: No issues identified.

Site Issues:

Disposal Cell/Drainage Structure Integrity: None.

Vegetation/Noxious Weed Concerns: Overgrown willows along roads have made access to locations 14-13NA and South Pond difficult.

Maintenance Requirements: Trim willows along gravel roads to the above locations.

Access Issues: None

Corrective Action Taken: None.

cc: (electronic)
Rich Bush, DOE
Sam Campbell, Stoller
Steve Donivan, Stoller
EDD Delivery

Well Development Log

Site GJO

Date 1-21-14

Well ID	Arrival Time	Initial Water Level (ft btc)	Number of Well Surges	Final Turbidity (NTUs)	Cumulative Volume (gallons)	Flow Rate (gpm)	Comments
8-45	1400	12.44	3	8.35	50		Brushed
Adjusted Intake Depth: 01-01	0925	15.66	3	9.76	40		1-22-14 "
19.9	1025		3	9.86	16		" "
21.2	6-2 N 1245	14.19		7.72	18		" "
16.12	8404 1340	10.48	3	3.61	20		" "
24.65	10-19 N 1408	14.2	3	3.04	25		" "
	14-13 NA 0950	6.79	3	4.59	20		1-23-14 "
	11-15		1		30L	7.8 LPM	no surge intake @ 24GS

Conducted by JT/OA

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