

# Data Validation Package

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## June and August 2014 Water Sampling at the Old and New Rifle, Colorado, Processing Sites

October 2014

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## **Attachment 1—Assessment of Anomalous Data**

Potential Outliers Report

## **Attachment 2—Data Presentation**

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

## **Attachment 4—Trip Report**

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# Sampling Event Summary

**Site:** Old and New Rifle, Colorado, Processing Sites

**Sampling Period:** June 9–12, August 7 and 11, 2014

Forty-three water samples were collected at New Rifle and Old Rifle, Colorado, Processing Sites. The following locations could not be sampled: New Rifle location CW12 near the City of Rifle water treatment plant could not be located and may have been paved over. Old Rifle location Clough Well 1 could not be located and may have been destroyed. New Rifle locations 0322 and 0635 were inaccessible; a new fence installed recently by the Colorado Department of Transportation prevents access to these locations. Duplicate samples were collected from New Rifle locations 0169, 0201, 0216, and 0620, and Old Rifle location 0656. One equipment blank was collected. Sampling and analysis were conducted as specified in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites* (LMS/PRO/S04351, continually updated).

## New Rifle Site

Samples were collected at the New Rifle site from 15 monitoring wells and 6 surface locations in compliance with the March 2013 *Groundwater Compliance Action Plan for the New Rifle, Colorado, Processing Site* (LMS/RFN/S01920). Seven additional wells in the center of the former millsite, which were formerly used as extraction wells by the City of Rifle, were sampled to evaluate the need for retaining the wells. Water levels were measured at each sampled well.

The contaminants of concern (COCs) measured at the New Rifle site are arsenic, molybdenum, nitrate + nitrite as nitrogen, selenium, uranium, and vanadium. Ammonia as nitrogen is analyzed as an environmental indicator. Major cations and anions were also measured per request. Total organic carbon was measured at monitoring wells 0172 and 0620. The groundwater monitoring wells were sampled to monitor plume movement and natural flushing. Alternate concentration limits (ACLs) are listed in Table 1. It should be noted that ACL values for New Rifle are specific to wells RFN-0217, -0659, -0664, and -0669 that are defined as point of compliance (POC) wells in the March 2013 *Groundwater Compliance Action Plan*. Concentrations of COCs in other onsite wells may be higher than these values but this is not considered an exceedance. No POC locations had contaminant concentrations that exceeded proposed ACLs.

Time-concentration graphs from the locations sampled are included with the analytical data. Concentrations of the COCs are stable or decreasing at most locations.

The surface water locations were sampled to monitor the impact of groundwater discharge. No large variations in the data were noted with the contaminant concentrations at the Colorado River surface water location (0324) remaining low, indicating no impact due to groundwater discharge.

## Old Rifle Site

Samples were collected at the Old Rifle site from nine monitoring wells and six surface locations in compliance with the March 2013 *Groundwater Compliance Action Plan for the Old Rifle,*

location 0571 were sampled for additional background chemistry information. Water levels were measured at each sampled well.

The COCs measured at the Old Rifle site are selenium, uranium, and vanadium. Major cations and anions were also measured per request. No Old Rifle locations had contaminant concentrations that exceeded proposed ACLs.

Time-concentration graphs from the locations sampled are included with the analytical data and indicate that the concentrations of the COCs are decreasing at many locations.

Analytical results for surface locations 0396 and 0741 that are adjacent to and downgradient of the site along the Colorado River remain low, indicating no impact due to groundwater discharge.

*Table 1. Proposed ACLs for Point of Compliance Wells at the New Rifle Site*

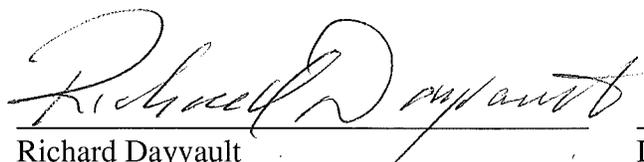
Analyte	Proposed ACL <sup>a</sup> (mg/L)
Arsenic	5.8
Molybdenum	96
Nitrate + Nitrite as Nitrogen	30,200
Selenium	96
Uranium	59
Vanadium	17

<sup>a</sup> From Table 7 of the March 2013 *Groundwater Compliance Action Plan for the New Rifle, Colorado, Processing Site* (LMS/RFN/S01920)  
mg/L = milligrams per liter

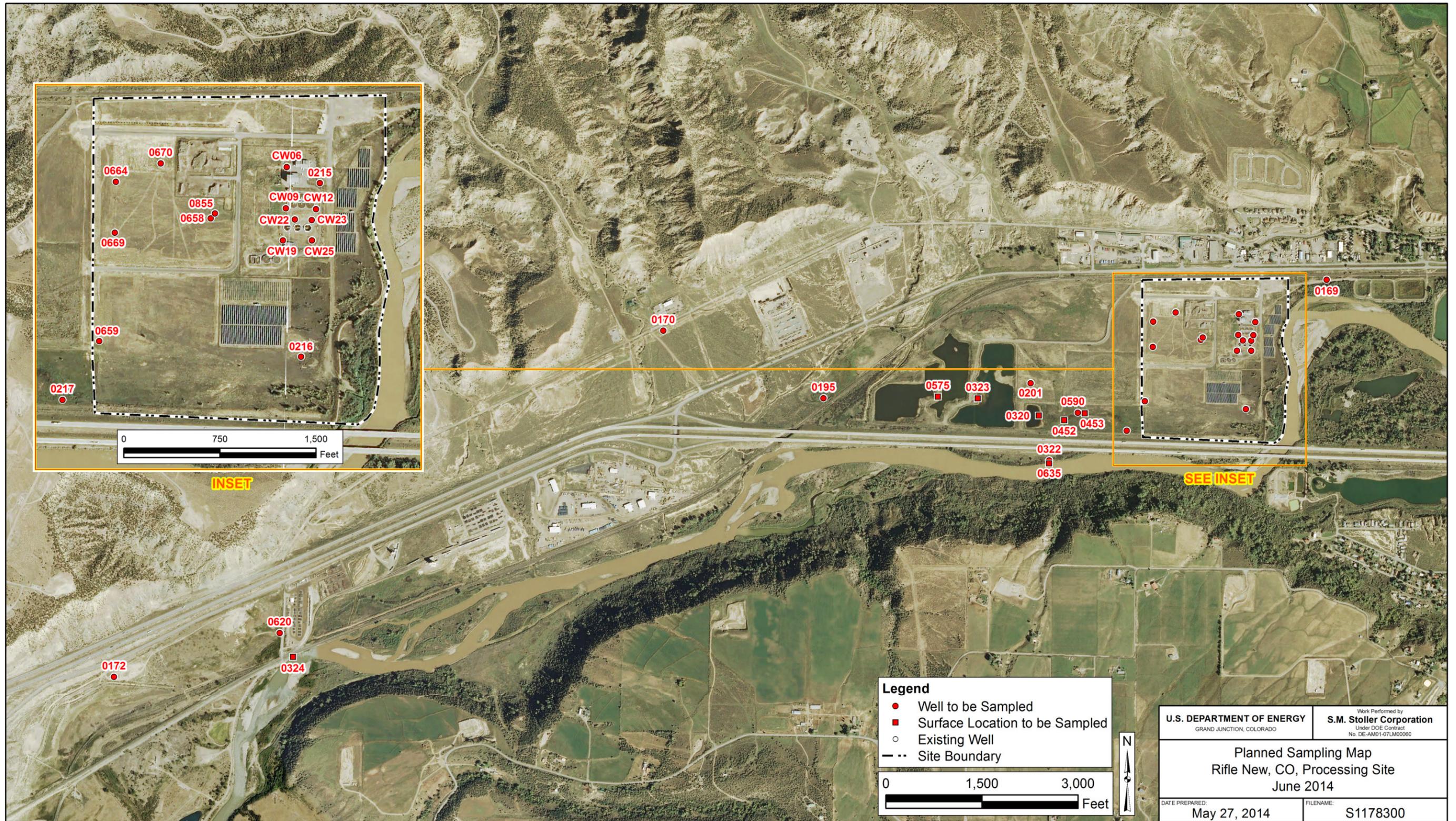
*Table 2. Proposed ACLs for Monitoring Wells at the Old Rifle Site*

Analyte	ACL <sup>a</sup> (mg/L)
Selenium	12.3
Uranium	44.4
Vanadium	126

<sup>a</sup> From Table 3 of the March 2013 *Groundwater Compliance Action Plan for the Old Rifle, Colorado, Processing Site* (LMS/RFO/S07857)  
mg/L = milligrams per liter

 \_\_\_\_\_ Date 11/28/14

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



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New Rifle, Colorado, Processing Site, Planned Sampling Map



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Old Rifle, Colorado, Processing Site, Planned Sampling Map

# Data Assessment Summary

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### Water Sampling Field Activities Verification Checklist

<b>Project</b>	Old and New Rifle, Colorado, Processing Sites	<b>Date(s) of Water Sampling</b>	June 9-12, August 7 and 11, 2014
<b>Date(s) of Verification</b>	July 24 and September 24, 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 June 2, 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	
4. Was an operational check of the field equipment conducted daily? Did the operational checks meet criteria?	Yes	pH pre-trip calibration on Aug 6, 2014: a span was slightly out of range, which is acceptable.
5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified?	No	The alkalinity at location 0216 was not recorded.
6. Were wells categorized correctly?	Yes	
7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged prior to sampling?	Yes	
Did the water level stabilize prior to sampling?	Yes	
Did pH, specific conductance, and turbidity measurements meet criteria prior to sampling?	Yes	
Was the flow rate less than 500 mL/min?	Yes	

### Water Sampling Field Activities Verification Checklist (continued)

	Response (Yes, No, NA)	Comments
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 mL/min?	Yes	
Was one pump/tubing volume removed prior to sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	
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	Water levels were measured at each sampled monitoring well.

## Laboratory Performance Assessment

### General Information

Report Number (RIN): 14066229  
 Sample Event: June 9–12, 2014  
 Site(s): Rifle Processing Sites, Colorado  
 Laboratory: ALS Laboratory Group, Fort Collins, Colorado  
 Work Order No.: 1406333  
 Analysis: Metals and Wet Chemistry  
 Validator: Gretchen Baer  
 Review Date: July 24, 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
Ammonia as N	WCH-A-005	EPA 350.1	EPA 350.1
Arsenic, Molybdenum, Selenium, Uranium, Vanadium	LMM-02	SW-846 3005A	SW-846 6020
Calcium, Magnesium, Potassium, Sodium	LMM-01	SW-846 3005A	SW-846 6010
Chloride, Sulfate	MIS-A-045	SW-846 9056	SW-846 9056
Nitrate + Nitrite as N	WCH-A-022	EPA 353.2	EPA 353.2
Total Organic Carbon	WCH-A-025	EPA 415.1	EPA 415.1

### Data Qualifier Summary

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

*Table 4. Data Qualifier Summary*

Sample Number	Location	Analyte(s)	Flag	Reason
1406333-1	0169	Vanadium	J	Field duplicate RPD > 20%
1406333-3	0172	Vanadium	J	Reporting limit verification > 130%
1406333-3	0172	Total organic carbon	J	MS recovery < lower limit
1406333-4	0201	Vanadium	J	Field duplicate RPD > 20%
1406333-4	0201	Vanadium	U	Less than 5 times the calibration blank
1406333-9	0452	Selenium	J	Serial dilution result

Table 4 (continued). Data Qualifier Summary

Sample Number	Location	Analyte(s)	Flag	Reason
1406333-10	0453	Selenium	J	Serial dilution result
1406333-12	0620	Molybdenum	J	Field duplicate RPD > 20%
1406333-19	0169 Duplicate	Vanadium	J	Field duplicate RPD > 20%
1406333-20	0201 Duplicate	Vanadium	J	Field duplicate RPD > 20%
1406333-21	0620 Duplicate	Molybdenum	J	Field duplicate RPD > 20%
1406333-28	0292A	Vanadium	J	Reporting limit verification > 130%
1406333-42	Equipment Blank	Calcium	U	Less than 5 times the calibration blank
1406333-42	Equipment Blank	Magnesium	U	Less than 5 times the calibration blank
1406333-42	Equipment Blank	Potassium	U	Less than 5 times the calibration blank
1406333-42	Equipment Blank	Sodium	U	Less than 5 times the calibration blank
1406333-42	Equipment Blank	Vanadium	U	Less than 5 times the calibration blank

### Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 44 water samples on June 17, 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 receiving documentation included copies of the air bills. The Chain of Custody form was complete with no errors or omissions.

### Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler at 2.2 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

### 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. 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 EPA 350.1 Ammonia as N*

Calibrations for ammonia as N were performed using six calibration standards on June 19, 23, and 26, 2014. 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 check results were within the acceptance criteria.

*Method EPA 353.2 Nitrate + Nitrite as N*

Calibrations for nitrate + nitrite as N were performed using seven calibration standards on June 25, 2014. 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 check results were within the acceptance criteria.

*Method EPA 415.1, Total Organic Carbon*

Calibrations for total organic carbon were performed on June 11, 2014, using seven 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 check results were within the acceptance criteria.

*Method SW-846 6010 Ca, Mg, K, Na*

Calibrations were performed on June 20, 2014, using three calibration standards. The correlation coefficient values were greater than 0.995. The absolute values of the intercepts were greater than 3 times the MDL. These intercepts were less than 3 times the reporting limits and all results were above the reporting limits. Initial and continuing calibration verification checks were made at the required frequency. All calibration checks associated with reported results 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 6020 As, Mo, Se, U, V*

Calibrations were performed on June 20, 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 or only slightly above 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, with the following exception. The vanadium check result was above the acceptance range. Affected results less than 5 times the PQL and above the MDL are qualified with a “J” flag (estimated). 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 Chloride, Sulfate*

Calibrations for chloride and sulfate were performed using six calibration standards on June 15, 2014. 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 check results were within 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 method blank and calibration blank results associated with the samples were below the PQLs. 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 concentration. The spike results met the recovery and precision criteria for all analytes evaluated, with the exception of a spike for total organic carbon, which was slightly below the laboratory acceptance range. The associated result is qualified with a “J” flag as an estimated value.

### 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 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 data were acceptable with the exception of a dilution for selenium at location 0453. Because of the possible reduced accuracy due to matrix interference, the associated result is qualified with a “J” flag as an estimated value.

The surface water sampling locations 0452 and 0453 are close to each other but are sometimes in separate small ponds; however, for this sampling event, the area was flooded and the two small ponds had joined into one larger pond. Consequently, samples taken at location 0452 are likely to have similar matrix effects as 0453. The selenium result for 0452 was also qualified.

### Completeness

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

### Electronic Data Deliverable (EDD) File

The revised EDD file arrived on August 4, 2014, in response to Request for Information #14-4373. The revision included corrections to some metals results. 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: 14066229 Lab Code: PAR Validator: Gretchen Baer Validation Date: 7/22/2014  
Project: Rifle Disposal/Processing Site (old/new) Analysis Type:  Metals  General Chem  Rad  Organics  
# of Samples: 44 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 4 duplicates evaluated.

**SAMPLE MANAGEMENT SYSTEM  
Metals Data Validation Worksheet**

RIN: 14066229      Lab Code: PAR      Date Due: 7/15/2014  
 Matrix: Water      Site Code: RFL01      Date Completed: 6/30/2014

Analyte	Method Type	Date Analyzed	CALIBRATION			Method	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R^2	CCV								
Arsenic	ICP/MS	06/20/2014	-0.0020	1.0000	OK	OK	105.0	114.0	112.0	1.0	98.0	4.0	91.0
Arsenic	ICP/MS	06/20/2014				OK	104.0	105.0	105.0	0.0			
Arsenic	ICP/MS	06/20/2014				OK	105.0	109.0	111.0	2.0			
Calcium	ICP/ES	06/20/2014				OK	102.0			1.0		1.0	
Calcium	ICP/ES	06/20/2014				OK	101.0			2.0	102.0	4.0	101.0
Calcium	ICP/ES	06/20/2014	0.1080	1.0000	OK	OK	100.0	106.0	106.0	0.0	107.0	3.0	102.0
Magnesium	ICP/ES	06/20/2014	0.1440	1.0000	OK	OK	99.0	91.0	90.0	1.0	104.0	2.0	98.0
Magnesium	ICP/ES	06/20/2014				OK	96.0	90.0	86.0	2.0		3.0	
Magnesium	ICP/ES	06/20/2014				OK	93.0	101.0	101.0	0.0	105.0	0.0	100.0
Molybdenum	ICP/MS	06/20/2014				OK	103.0			0.0		7.0	
Molybdenum	ICP/MS	06/20/2014				OK	106.0			0.0		0.0	
Molybdenum	ICP/MS	06/20/2014	-0.0030	1.0000	OK	OK	106.0	103.0	112.0	3.0	97.0	2.0	100.0
Potassium	ICP/ES	06/20/2014				OK	103.0	116.0	113.0	1.0		0.0	
Potassium	ICP/ES	06/20/2014	-0.5710	1.0000	OK	OK	101.0	102.0	99.0	2.0		1.0	85.0
Potassium	ICP/ES	06/20/2014				OK	95.0	99.0	98.0	1.0			80.0
Selenium	ICP/MS	06/20/2014				OK	109.0	119.0	113.0	4.0		0.0	
Selenium	ICP/MS	06/20/2014				OK	110.0	106.0	105.0	0.0			

**SAMPLE MANAGEMENT SYSTEM**  
**Metals Data Validation Worksheet**

RIN: 14066229      Lab Code: PAR      Date Due: 7/15/2014  
 Matrix: Water      Site Code: RFL01      Date Completed: 6/30/2014

Analyte	Method Type	Date Analyzed	CALIBRATION			Method	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R <sup>2</sup>	CCV								
Selenium	ICP/MS	06/20/2014	-0.0350	1.0000	OK	OK	108.0	109.0	124.0	3.0	103.0	30.0	98.0
Sodium	ICP/ES	06/20/2014				OK	102.0			1.0		3.0	82.0
Sodium	ICP/ES	06/20/2014	0.4590	0.9999	OK	OK	101.0			2.0		1.0	84.0
Sodium	ICP/ES	06/20/2014				OK	98.0			5.0		3.0	
Uranium	ICP/MS	06/20/2014				OK	107.0			0.0		4.0	
Uranium	ICP/MS	06/20/2014				OK	104.0			1.0		1.0	
Uranium	ICP/MS	06/20/2014	0.0000	1.0000	OK	OK	106.0			4.0	100.0	6.0	110.0
Vanadium	ICP/MS	06/20/2014				OK	96.0	111.0	114.0	1.0		5.0	
Vanadium	ICP/MS	06/20/2014				OK	104.0			1.0		1.0	
Vanadium	ICP/MS	06/20/2014	0.0680	1.0000	OK	OK	101.0			1.0	98.0	3.0	155.0

**SAMPLE MANAGEMENT SYSTEM**  
**Wet Chemistry Data Validation Worksheet**

RIN: 14066229      Lab Code: PAR      Date Due: 7/15/2014  
 Matrix: Water      Site Code: RFL01      Date Completed: 6/30/2014

Analyte	Date Analyzed	CALIBRATION			LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R <sup>2</sup>	CCV/CCB					
AMMONIA AS N	06/19/2014		OK	OK	97.00				
AMMONIA AS N	06/23/2014		OK	OK	103.00	104.0	111.0	6.00	
AMMONIA AS N	06/26/2014		OK	OK		104.0	103.0	1.00	
Chloride	06/15/2014	0.056	0.9999						
CHLORIDE	06/22/2014		OK	OK	99.00	91.0	87.0	1.00	
CHLORIDE	06/22/2014		OK	OK	99.00	95.0	101.0	2.00	
CHLORIDE	06/23/2014		OK	OK	98.00	93.0	90.0	1.00	
Nitrate+Nitrite as N	06/25/2014	0.000	0.9995	OK	105.00	120.0	121.0	1.00	
Nitrate+Nitrite as N	06/25/2014				OK	105.00	116.0	8.00	
Nitrate+Nitrite as N	06/25/2014				OK	103.00	95.0	10.00	
Sulfate	06/15/2014	0.300	0.9998						
SULFATE	06/22/2014			OK	OK	95.00	99.0	102.0	
SULFATE	06/22/2014			OK	OK	96.00	98.0	95.0	
SULFATE	06/23/2014			OK	OK	95.00	99.0	97.0	
Total Organic Carbon	06/11/2014	0.000	0.9998						

**SAMPLE MANAGEMENT SYSTEM**  
**Wet Chemistry Data Validation Worksheet**

**RIN:** 14066229      **Lab Code:** PAR      **Date Due:** 7/15/2014  
**Matrix:** Water      **Site Code:** RFL01      **Date Completed:** 6/30/2014

Analyte	Date Analyzed	CALIBRATION			Method	LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R^2	CCV/CCB						
Total Organic Carbon	06/24/2014			OK	105.0d	75.0	76.0	1.00		
Total Organic Carbon	06/24/2014					88.0	88.0	0		
Total Organic Carbon	06/24/2014					84.0	84.0	0		
Total Organic Carbon	06/24/2014				105.0d			0		

## General Information

Report Number (RIN): 14076346  
Sample Event: August 7 and 11, 2014  
Site(s): Rifle Processing Sites, Colorado  
Laboratory: ALS Laboratory Group, Fort Collins, Colorado  
Work Order No.: 1408308  
Analysis: Metals and Wet Chemistry  
Validator: Gretchen Baer  
Review Date: September 24, 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
Ammonia as N	WCH-A-005	EPA 350.1	EPA 350.1
Arsenic, Molybdenum, Selenium, Uranium, Vanadium	LMM-02	SW-846 3005A	SW-846 6020
Calcium, Magnesium, Potassium, Sodium	LMM-01	SW-846 3005A	SW-846 6010
Chloride, Sulfate	MIS-A-045	SW-846 9056	SW-846 9056
Nitrate + Nitrite as N	WCH-A-022	EPA 353.2	EPA 353.2

## Data Qualifier Summary

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(s)	Flag	Reason
1408308-1	0195	Nitrate + Nitrite as N	J	MS recovery < lower limit
1408308-2	0216	Selenium	U	Less than 5 times the calibration blank
1408308-2	0216	Potassium	J	Serial dilution result
1408308-5	0216 Duplicate	Potassium	J	Serial dilution result

## Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received five water samples on August 13, 2014, accompanied 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 receiving documentation included copies of the air bills. The Chain of Custody form was complete with no errors or omissions.

## Preservation and Holding Times

The sample shipment was received intact with the temperature inside the iced cooler at 3.2 °C, which complies with requirements. All samples were received in the correct container types and had been preserved correctly for the requested analyses. All samples were analyzed within the applicable holding times.

## 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. 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 EPA 350.1 Ammonia as N*

Calibrations for ammonia as N were performed using six calibration standards on August 14, 2014. 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 check results were within the acceptance criteria.

### *Method EPA 353.2 Nitrite + Nitrate as N*

Calibrations for nitrate + nitrite as N were performed using seven calibration standards on August 14, 2014. 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 check results were within the acceptance criteria.

#### *Method SW-846 6010 Ca, Mg, K, Na*

Calibrations were performed on August 19, 2014, using three calibration standards. The correlation coefficient values were greater than 0.995. The absolute values of the intercepts were greater than 3 times the MDL. These intercepts were less than 3 times the reporting limits and all results were above the reporting limits. Initial and continuing calibration verification checks were made at the required frequency. All calibration checks associated with reported results 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 6020 As, Mo, Se, U, V*

Calibrations were performed on August 20, 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 or only slightly above 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 SW-846 9056 Chloride, Sulfate*

Calibrations for chloride and sulfate were performed using six calibration standards on August 4, 2014. 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 check results were within 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 method blank and calibration blank results associated with the samples were below the PQLs. 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

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 results met the recovery and precision criteria for all analytes evaluated, with the exception of a spike for nitrate + nitrite as N, which was slightly below the laboratory acceptance range. The associated result is qualified with a “J” flag as an estimated value.

#### 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 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 data were acceptable with the exception of a dilution for potassium at location 0216. Because of the possible reduced accuracy due to matrix interference, the associated 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.

#### Electronic Data Deliverable (EDD) File

The EDD file arrived on August 21, 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: 14076346    Lab Code: PAR    Validator: Gretchen Baer    Validation Date: 9/24/2014  
Project: Rifle Disposal/Processing Site (old/new)    Analysis Type:  Metals     General Chem     Rad     Organics  
# of Samples: 5    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: 14076346      Lab Code: PAR      Date Due: 9/10/2014  
 Matrix: Water      Site Code: RFL01      Date Completed: 8/25/2014

Analyte	Method Type	Date Analyzed	CALIBRATION			Method	LCS %R	MS %R	MSD %R	Dup. RPD	ICSAB %R	Serial Dil. %R	CRI %R
			Int.	R <sup>2</sup>	CCV								
Arsenic	ICP/MS	08/20/2014	-0.0860	1.0000	OK	OK	110.0	112.0	111.0	0.0		5.0	104.0
Calcium	ICP/ES	08/19/2014	0.3690	1.0000	OK	OK	106.0	108.0	109.0	0.0	111.0	2.0	99.0
Magnesium	ICP/ES	08/19/2014	0.3800	1.0000	OK	OK	101.0	99.0	99.0	0.0	106.0	1.0	95.0
Molybdenum	ICP/MS	08/20/2014	-0.0060	1.0000	OK	OK	104.0	107.0	106.0	1.0		0.0	98.0
Potassium	ICP/ES	08/19/2014	-0.9750	1.0000	OK	OK	102.0	94.0	95.0	0.0		15.0	82.0
Selenium	ICP/MS	08/20/2014	-0.1180	1.0000	OK	OK	112.0	112.0	114.0	2.0			101.0
Sodium	ICP/ES	08/19/2014	0.3430	0.9999	OK	OK	103.0	109.0	109.0	0.0		7.0	86.0
Uranium	ICP/MS	08/20/2014	0.0000	1.0000	OK	OK	98.0	110.0	96.0	5.0		3.0	100.0
Vanadium	ICP/MS	08/20/2014	-0.0700	1.0000	OK	OK	105.0	110.0	103.0	2.0		0.0	99.0

**SAMPLE MANAGEMENT SYSTEM**  
**Wet Chemistry Data Validation Worksheet**

RIN: 14076346      Lab Code: PAR      Date Due: 9/10/2014  
 Matrix: Water      Site Code: RFL01      Date Completed: 8/25/2014

Analyte	Date Analyzed	CALIBRATION			Method		LCS %R	MS %R	MSD %R	DUP RPD	Serial Dil. %R
		Int.	R <sup>2</sup>	CCV/CCB	Blank	Blank					
AMMONIA AS N	08/14/2014	-0.060	0.9999	OK	OK	OK	106.00	93.0	93.0	0	
CHLORIDE	08/18/2014	0.035	1.0000	OK	OK	OK	96.00	98.0	98.0	0	
Nitrate+Nitrite as N	08/14/2014	0.000	0.9994	OK	OK	OK	105.00	65.0	75.0	4.00	
SULFATE	08/18/2014	0.411	0.9998	OK	OK	OK	93.00	103.0	104.0	0	

## Sampling Quality Control Assessment

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

### Sampling Protocol

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

The groundwater sample results for the wells 0669 and 0670 were further qualified with a “Q” flag in the database indicating the data are considered qualitative because these are Category II wells.

### Equipment Blank Assessment

An equipment blank (field ID 2552) was collected after decontamination of the tubing reel used to collect some groundwater and surface water samples at the New Rifle site. The analyte list collected for the equipment blank was the Old Rifle analyte list. There were no target analytes detected in the equipment blank. (All analytes that were detected in the equipment blank by the laboratory have been qualified during data validation with a “U” flag as not detected). 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. Duplicate samples were collected from locations RFN01-0169, -0201, -0216, -0620, and RFO01-0656. 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 5 times the PQL, the range should be no greater than the PQL. The duplicate results met the criteria, with the exception of the vanadium results for RFN01-0169 and -0201, and the molybdenum result for RFN01-0620. There were no analytical errors identified during the review of the data. Associated results are qualified with a “J” flag as estimated values.

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

RIN: 14066229    Lab Code: PAR    Project: Rifle Disposal/Processing Site (old/new)    Validation Date: 7/23/2014

**Duplicate: 2548**                      **Sample: 0169**

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
AMMONIAAS N	0.1	U		1	0.1	U		1			MG/L
Arsenic	0.52			1	0.53			1	1.90		UG/L
Calcium	200000			5	210000			5	4.88		UG/L
CHLORIDE	80			20	77			25	3.82		MG/L
Magnesium	120000			5	120000			5	0		UG/L
Molybdenum	4.4			1	4.5			10	2.25		UG/L
Nitrate+Nitrite as N	0.15			1	0.17			1	12.50		MG/L
Potassium	6800			5	6900			5	1.46		UG/L
Selenium	1.5			1	1.8			1	18.18		UG/L
Sodium	180000			5	180000			5	0		UG/L
SULFATE	840			20	800			25	4.88		MG/L
Uranium	22			1	22			10	0		UG/L
Vanadium	0.89			1	2.2			1	84.79		UG/L

**Duplicate: 2549**                      **Sample: 0201**

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
AMMONIAAS N	72			50	72			20	0		MG/L
Arsenic	0.38	B		5	0.42			1	10.00		UG/L
Calcium	600000			5	610000			5	1.65		UG/L
CHLORIDE	170			50	170			50	0		MG/L
Magnesium	51000			5	51000			5	0		UG/L
Molybdenum	1400			100	1500			5	6.90		UG/L
Nitrate+Nitrite as N	49			50	44			50	10.75		MG/L
Potassium	13000			5	13000			5	0		UG/L
Selenium	59			5	64			1	8.13		UG/L
Sodium	260000			5	270000			5	3.77		UG/L
SULFATE	1700			50	1700			50	0		MG/L
Uranium	91			100	93			5	2.17		UG/L
Vanadium	0.5	B		5	0.86			1	52.94		UG/L

**Duplicate: 2552**                      **Sample: 0656**

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Calcium	200000			5	210000			5	4.88		UG/L
CHLORIDE	360			50	350			25	2.82		MG/L
Magnesium	94000			5	94000			5	0		UG/L

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

Page 2 of 2

RIN: 14066229    Lab Code: PAR    Project: Rifle Disposal/Processing Site (old/new)    Validation Date: 7/23/2014

Duplicate: 2552

Sample: 0656

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
Nitrate+Nitrite as N	0.17			1	0.17			1	0		MG/L
Potassium	12000			5	12000			5	0		UG/L
Selenium	5.9			5	6.3			1	6.56		UG/L
Sodium	270000			5	270000			5	0		UG/L
SULFATE	660			50	660			25	0		MG/L
Uranium	240			5	230			1	4.26		UG/L
Vanadium	32			5	33			1	3.08		UG/L

Duplicate: 2647

Sample: 0620

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
AMMONIA AS N	0.1	U		1	0.1	U		1			MG/L
Arsenic	0.56			1	0.47			1	17.48		UG/L
Calcium	380000			5	390000			5	2.60		UG/L
CHLORIDE	1100			100	1100			100	0		MG/L
Magnesium	210000			5	220000			5	4.65		UG/L
Molybdenum	7.8			1	9.8			5	22.73		UG/L
Nitrate+Nitrite as N	11			20	11			20	0		MG/L
Potassium	12000			5	13000			5	8.00		UG/L
Selenium	15			1	16			1	6.45		UG/L
Sodium	940000			50	950000			50	1.06		UG/L
SULFATE	2000			100	1900			100	5.13		MG/L
Total Organic Carbon	2.2			1	2			1			MG/L
Uranium	58			1	59			5	1.71		UG/L
Vanadium	1.6			1	1.7			1	6.06		UG/L

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

RIN: 14076346    Lab Code: PAR    Project: Rifle Disposal/Processing Site (old/new)    Validation Date: 9/24/2014

Duplicate: 2656

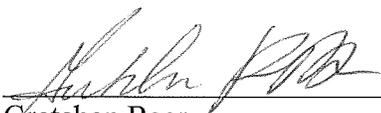
Sample: 0216

Analyte	Sample				Duplicate				RPD	RER	Units
	Result	Flag	Error	Dilution	Result	Flag	Error	Dilution			
AMMONIAAS N	5.1			2	4.9			1	4.00		MG/L
Arsenic	27			5	26			5	3.77		UG/L
Calcium	81000			1	76000			1	6.37		UG/L
CHLORIDE	130			10	130			10	0		MG/L
Magnesium	16000			1	15000			1	6.45		UG/L
Molybdenum	55			5	56			5	1.80		UG/L
Nitrate+Nitrite as N	0.01	U		1	0.01	U		1			MG/L
Potassium	7700	E		1	7600			1	1.31		UG/L
Selenium	0.56			5	0.24	B		5			UG/L
Sodium	93000			1	91000			1	2.17		UG/L
SULFATE	130			10	130			10	0		MG/L
Uranium	21			5	21			5	0		UG/L
Vanadium	210			5	210			5	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:  10-27-2014  
Stephen Donovan Date

Data Validation Lead:  10/27/14  
Gretchen Baer 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 can result from transcription errors, data-coding errors, or measurement system problems. However, outliers can also represent true extreme values of a distribution and can 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.** Do this 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 as to whether the data are normally distributed using the Shapiro-Wilk Test.
2. **Apply the appropriate statistical test.** Dixon's Test for extreme values 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.

Thirteen laboratory results from this sampling event were identified as potential outliers. The data associated with these results were reviewed in detail with no errors noted. The selenium result for location 0195 had a concentration higher than previously observed. The selenium analysis was performed concurrently with arsenic, molybdenum, uranium, and vanadium, and none of those results was anomalous, which indicates that an analytical error is unlikely. The laboratory results for this RIN are acceptable as qualified.

Potential anomalies in the field parameters were also examined for evidence which would suggest a systematic error due to instrument malfunction. No such data were found. The alkalinity result at 0590 was anomalously low. The Field Data Collection System notes did not describe any unusual conditions at this location. All field data from this event are acceptable.

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

**Comparison: All historical Data Beginning 1/1/2000**

Laboratory: ALS Laboratory Group

RIN: 14066229

Report Date: 10/5/2014

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum	Qualifiers		Historical Minimum	Qualifiers		Number of Data Points		Statistical Outlier
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
RFN01	0170	N001	06/11/2014	Ammonia Total as N	0.630		F	0.502		F	0.1000	U	F	13	3	No
RFN01	0170	N001	06/11/2014	Nitrate + Nitrite as Nitrogen	8.70		F	37.0		F	10.00		F	13	0	No
RFN01	0170	N001	06/11/2014	Selenium	0.0190		F	0.0180		F	0.00300		F	16	0	No
RFN01	0201	N002	06/09/2014	Ammonia Total as N	72.0		F	130		F	73.5		F	17	0	No
RFN01	0201	N001	06/09/2014	Ammonia Total as N	72.0		F	130		F	73.5		F	17	0	No
RFN01	0215	N001	06/09/2014	Selenium	0.00290		F	0.00210		F	0.00002	U	F	26	9	Yes
RFN01	0215	N001	06/09/2014	Sodium	120		F	110		F	89.0		F	5	0	No
RFN01	0320	N001	06/11/2014	Sulfate	1000			4200			3310			7	0	Yes
RFN01	0323	N001	06/10/2014	Nitrate + Nitrite as Nitrogen	34.0			130			41.0			18	0	No
RFN01	0324	0001	06/11/2014	Sulfate	31.0			122			45.0			6	0	No
RFN01	0452	N001	06/11/2014	Molybdenum	0.790			10.00			1.17			14	0	No
RFN01	0452	N001	06/11/2014	Sulfate	980			4300			1600			6	0	No
RFN01	0453	N001	06/11/2014	Ammonia Total as N	4.60			120			12.0			12	0	No
RFN01	0453	N001	06/11/2014	Molybdenum	1.10			12.5			1.60			14	0	NA
RFN01	0453	N001	06/11/2014	Nitrate + Nitrite as Nitrogen	0.460			210			3.00			11	0	No
RFN01	0453	N001	06/11/2014	Sulfate	1200			3120			1800			6	0	No
RFN01	0453	N001	06/11/2014	Vanadium	0.190			4.63			0.240			14	0	No
RFN01	0575	N001	06/10/2014	Sulfate	3600			3500			990			12	0	No
RFN01	0659	N001	06/11/2014	Ammonia Total as N	9.90		F	92.0		F	16.1		F	20	0	No
RFN01	0855	N001	06/09/2014	Molybdenum	0.470		F	18.0		FQ	0.520		F	23	0	NA

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

**Comparison: All historical Data Beginning 1/1/2000**

Laboratory: ALS Laboratory Group

RIN: 14066229

Report Date: 10/5/2014

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			
RFN01	0855	N001	06/09/2014	Sulfate	700		F	1500		FQ	960		F	5	0	No
RFN01	CW09	N001	06/10/2014	Uranium	0.00660		F	0.0240			0.0180			6	0	Yes
RFN01	CW09	N001	06/10/2014	Vanadium	0.0610		F	1.20			0.630			6	0	No
RFN01	CW22	N001	06/10/2014	Uranium	0.0130		F	0.0280			0.0160			5	0	No
RFN01	CW22	N001	06/10/2014	Vanadium	0.0790		F	0.710			0.140			5	0	No
RFN01	CW25	N001	06/10/2014	Uranium	0.0180		F	0.00610			0.00410			5	0	Yes
RFO01	0292A	N001	06/12/2014	Chloride	110		F	93.0		F	52.0		F	11	0	No
RFO01	0294	0001	06/12/2014	Magnesium	5.50			17.0			5.80			10	0	Yes
RFO01	0304	N001	06/12/2014	Sodium	160		F	150		F	110		F	13	0	No
RFO01	0305	N001	06/12/2014	Chloride	330		F	280		F	120		F	11	0	No
RFO01	0305	N001	06/12/2014	Selenium	0.0160		F	0.0890		F	0.0180		F	36	0	No
RFO01	0305	N001	06/12/2014	Sodium	200		F	170		F	100.0		F	11	0	o <sup>L</sup>
RFO01	0309	N001	06/11/2014	Sulfate	740		F	970		F	760		F	10	0	No
RFO01	0395	N001	06/12/2014	Nitrate + Nitrite as Nitrogen	0.01000	U		0.850			0.0390			8	0	No
RFO01	0395	N001	06/12/2014	Selenium	0.00093			0.00840			0.00213	BN		14	0	No
RFO01	0395	N001	06/12/2014	Uranium	0.0200			0.0420			0.0210			14	0	No
RFO01	0395	N001	06/12/2014	Vanadium	0.00098			0.00300	U		0.00110		J	14	1	No
RFO01	0396	0001	06/11/2014	Magnesium	5.60			14.0			5.90			10	0	Yes
RFO01	0398	N001	06/12/2014	Magnesium	42.0			99.0			44.7			11	0	NA
RFO01	0655	N001	06/12/2014	Magnesium	110		F	150		F	118		F	10	0	No

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

**Comparison: All historical Data Beginning 1/1/2000**

Laboratory: ALS Laboratory Group

RIN: 14066229

Report Date: 10/5/2014

Site Code	Location Code	Sample ID	Sample Date	Analyte	Current	Qualifiers		Historical Maximum	Qualifiers		Historical Minimum	Qualifiers		Number of Data Points		Statistical Outlier
					Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect	
RFO01	0656	N001	06/12/2014	Calcium	200		F	190		F	110		F	10	0	No
RFO01	0656	N002	06/12/2014	Calcium	210		F	190		F	110		F	10	0	No
RFO01	0656	N001	06/12/2014	Chloride	360		F	290		F	140		F	10	0	Yes
RFO01	0656	N002	06/12/2014	Chloride	350		F	290		F	140		F	10	0	Yes
RFO01	0656	N001	06/12/2014	Magnesium	94.0		F	87.0		F	55.0		F	10	0	No
RFO01	0656	N002	06/12/2014	Magnesium	94.0		F	87.0		F	55.0		F	10	0	No
RFO01	0656	N002	06/12/2014	Potassium	12.0		F	11.0		F	7.10		FJ	10	0	No
RFO01	0656	N001	06/12/2014	Potassium	12.0		F	11.0		F	7.10		FJ	10	0	No
RFO01	0656	N002	06/12/2014	Sodium	270		F	200		F	150		F	10	0	Yes
RFO01	0656	N001	06/12/2014	Sodium	270		F	200		F	150		F	10	0	Yes
RFO01	0656	N002	06/12/2014	Sulfate	660		F	590		F	280		F	10	0	No
RFO01	0656	N001	06/12/2014	Sulfate	660		F	590		F	280		F	10	0	No
RFO01	0656	N002	06/12/2014	Uranium	0.230		F	0.225		F	0.0318		F	34	0	No
RFO01	0656	N001	06/12/2014	Uranium	0.240		F	0.225		F	0.0318		F	34	0	No
RFO01	0658	N001	06/12/2014	Chloride	17.0		F	67.0		F	19.0		F	12	0	No
RFO01	0658	N001	06/12/2014	Sodium	59.0		F	150		F	61.0		F	12	0	No
RFO01	0741	0001	06/11/2014	Magnesium	5.60			14.0			6.10			11	0	Yes
RFO01	0741	0001	06/11/2014	Sodium	15.0			110			17.0			10	0	No
RFO01	0741	0001	06/11/2014	Sulfate	31.0			110			32.0			10	0	Yes

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

**Comparison: All historical Data Beginning 1/1/2000**

Laboratory: ALS Laboratory Group

RIN: 14076346

Report Date: 9/26/2014

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	
RFN01	0195	N001	08/07/2014	Molybdenum	0.0120		F	0.600		FJ	0.0140		F	22	0	No
RFN01	0195	N001	08/07/2014	Selenium	0.00580		F	0.00150	U	F	0.00012		F	20	3	Yes
RFN01	0590	N001	08/07/2014	Selenium	0.0700		F	0.0660			0.0151			23	0	No

**Data Validation Outliers Report - Field Parameters Only**

**Comparison: All historical Data Beginning 1/1/2000**

Laboratory: Field Measurements

RIN: 14076346

Report Date: 9/26/2014

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	
RFN01	0590	N001	08/07/2014	Alkalinity, Total (as CaCO <sub>3</sub> )	146		F	413		F	240		F	31	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.

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## **Attachment 2**

# **Data Presentation**

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**New Rifle  
Groundwater Quality Data**

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**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0169 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/09/2014	N001	3.13	-	18.13	470		F	#		
Ammonia Total as N	mg/L	06/09/2014	N001	3.13	-	18.13	0.1	U	F	#	0.1	
Ammonia Total as N	mg/L	06/09/2014	N002	3.13	-	18.13	0.1	U	F	#	0.1	
Arsenic	mg/L	06/09/2014	N001	3.13	-	18.13	0.00052		F	#	0.000015	
Arsenic	mg/L	06/09/2014	N002	3.13	-	18.13	0.00053		F	#	0.000015	
Calcium	mg/L	06/09/2014	N001	3.13	-	18.13	200		F	#	0.06	
Calcium	mg/L	06/09/2014	N002	3.13	-	18.13	210		F	#	0.06	
Chloride	mg/L	06/09/2014	N001	3.13	-	18.13	80		F	#	4	
Chloride	mg/L	06/09/2014	N002	3.13	-	18.13	77		F	#	5	
Magnesium	mg/L	06/09/2014	N001	3.13	-	18.13	120		F	#	0.065	
Magnesium	mg/L	06/09/2014	N002	3.13	-	18.13	120		F	#	0.065	
Molybdenum	mg/L	06/09/2014	N001	3.13	-	18.13	0.0044		F	#	0.000032	
Molybdenum	mg/L	06/09/2014	N002	3.13	-	18.13	0.0045		F	#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	06/09/2014	N001	3.13	-	18.13	0.15		F	#	0.01	
Nitrate + Nitrite as Nitrogen	mg/L	06/09/2014	N002	3.13	-	18.13	0.17		F	#	0.01	
Oxidation Reduction Potential	mV	06/09/2014	N001	3.13	-	18.13	117.9		F	#		
pH	s.u.	06/09/2014	N001	3.13	-	18.13	6.77		F	#		
Potassium	mg/L	06/09/2014	N001	3.13	-	18.13	6.8		F	#	0.54	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0169 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Potassium	mg/L	06/09/2014	N002	3.13	-	18.13	6.9		F	#	0.54	
Selenium	mg/L	06/09/2014	N001	3.13	-	18.13	0.0015		F	#	0.000032	
Selenium	mg/L	06/09/2014	N002	3.13	-	18.13	0.0018		F	#	0.000032	
Sodium	mg/L	06/09/2014	N001	3.13	-	18.13	180		F	#	0.033	
Sodium	mg/L	06/09/2014	N002	3.13	-	18.13	180		F	#	0.033	
Specific Conductance	umhos/cm	06/09/2014	N001	3.13	-	18.13	2306		F	#		
Sulfate	mg/L	06/09/2014	N001	3.13	-	18.13	840		F	#	10	
Sulfate	mg/L	06/09/2014	N002	3.13	-	18.13	800		F	#	12	
Temperature	C	06/09/2014	N001	3.13	-	18.13	15.42		F	#		
Turbidity	NTU	06/09/2014	N001	3.13	-	18.13	1.94		F	#		
Uranium	mg/L	06/09/2014	N001	3.13	-	18.13	0.022		F	#	0.000029	
Uranium	mg/L	06/09/2014	N002	3.13	-	18.13	0.022		F	#	0.000029	
Vanadium	mg/L	06/09/2014	N001	3.13	-	18.13	0.00089		JF	#	0.000015	
Vanadium	mg/L	06/09/2014	N002	3.13	-	18.13	0.0022		JF	#	0.000015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0170 WELL Ground elevation was calculated as surveyed TOC elevation minus stick up height reported in the Borehole Summary

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/11/2014	N001	92.23 - 112.23	528		F	#		
Ammonia Total as N	mg/L	06/11/2014	N001	92.23 - 112.23	0.63		F	#	0.1	
Arsenic	mg/L	06/11/2014	N001	92.23 - 112.23	0.00039		F	#	0.000015	
Calcium	mg/L	06/11/2014	N001	92.23 - 112.23	150		F	#	0.06	
Chloride	mg/L	06/11/2014	N001	92.23 - 112.23	150		F	#	5	
Magnesium	mg/L	06/11/2014	N001	92.23 - 112.23	88		F	#	0.065	
Molybdenum	mg/L	06/11/2014	N001	92.23 - 112.23	0.0032		F	#	0.000032	
Nitrate + Nitrite as Nitrogen	mg/L	06/11/2014	N001	92.23 - 112.23	8.7		F	#	0.1	
Oxidation Reduction Potential	mV	06/11/2014	N001	92.23 - 112.23	123.2		F	#		
pH	s.u.	06/11/2014	N001	92.23 - 112.23	6.97		F	#		
Potassium	mg/L	06/11/2014	N001	92.23 - 112.23	7.8		F	#	0.54	
Selenium	mg/L	06/11/2014	N001	92.23 - 112.23	0.019		F	#	0.000032	
Sodium	mg/L	06/11/2014	N001	92.23 - 112.23	460		F	#	0.033	
Specific Conductance	umhos/cm	06/11/2014	N001	92.23 - 112.23	3045		F	#		
Sulfate	mg/L	06/11/2014	N001	92.23 - 112.23	940		F	#	12	
Temperature	C	06/11/2014	N001	92.23 - 112.23	15.49		F	#		
Turbidity	NTU	06/11/2014	N001	92.23 - 112.23	8.51		F	#		
Uranium	mg/L	06/11/2014	N001	92.23 - 112.23	0.056		F	#	0.0000029	
Vanadium	mg/L	06/11/2014	N001	92.23 - 112.23	0.0015		F	#	0.000015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0172 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/10/2014	N001	6.98	- 31.98	734		F	#		
Ammonia Total as N	mg/L	06/10/2014	N001	6.98	- 31.98	0.16		F	#	0.1	
Arsenic	mg/L	06/10/2014	N001	6.98	- 31.98	0.0054		F	#	0.000015	
Calcium	mg/L	06/10/2014	N001	6.98	- 31.98	450		F	#	0.12	
Chloride	mg/L	06/10/2014	N001	6.98	- 31.98	2400		F	#	40	
Magnesium	mg/L	06/10/2014	N001	6.98	- 31.98	550		F	#	0.13	
Molybdenum	mg/L	06/10/2014	N001	6.98	- 31.98	0.0044		F	#	0.000032	
Nitrate + Nitrite as Nitrogen	mg/L	06/10/2014	N001	6.98	- 31.98	0.014		F	#	0.01	
Oxidation Reduction Potential	mV	06/10/2014	N001	6.98	- 31.98	-111.4		F	#		
pH	s.u.	06/10/2014	N001	6.98	- 31.98	6.95		F	#		
Potassium	mg/L	06/10/2014	N001	6.98	- 31.98	24		F	#	1.1	
Selenium	mg/L	06/10/2014	N001	6.98	- 31.98	0.00027		F	#	0.000032	
Sodium	mg/L	06/10/2014	N001	6.98	- 31.98	3200		F	#	0.66	
Specific Conductance	umhos/cm	06/10/2014	N001	6.98	- 31.98	16347		F	#		
Sulfate	mg/L	06/10/2014	N001	6.98	- 31.98	7000		F	#	100	
Temperature	C	06/10/2014	N001	6.98	- 31.98	16.71		F	#		
Total Organic Carbon	mg/L	06/10/2014	N001	6.98	- 31.98	4.2	N	JF	#	1	
Turbidity	NTU	06/10/2014	N001	6.98	- 31.98	2.44		F	#		
Uranium	mg/L	06/10/2014	N001	6.98	- 31.98	0.065		F	#	0.0000029	
Vanadium	mg/L	06/10/2014	N001	6.98	- 31.98	0.00032		JF	#	0.000015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0195 WELL Ground elevation was calculated as surveyed TOC elevation minus stick up height reported in the Borehole Summary

Parameter	Units	Sample		Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	08/07/2014	N001	5.29	- 25.29	369		F	#		
Ammonia Total as N	mg/L	08/07/2014	N001	5.29	- 25.29	0.2		F	#	0.1	
Arsenic	mg/L	08/07/2014	N001	5.29	- 25.29	0.0005		F	#	0.000015	
Calcium	mg/L	08/07/2014	N001	5.29	- 25.29	110		F	#	0.012	
Chloride	mg/L	08/07/2014	N001	5.29	- 25.29	27		F	#	2	
Magnesium	mg/L	08/07/2014	N001	5.29	- 25.29	62		F	#	0.013	
Molybdenum	mg/L	08/07/2014	N001	5.29	- 25.29	0.012		F	#	0.000032	
Nitrate + Nitrite as Nitrogen	mg/L	08/07/2014	N001	5.29	- 25.29	0.83	N	JF	#	0.01	
Oxidation Reduction Potential	mV	08/07/2014	N001	5.29	- 25.29	84.5		F	#		
pH	s.u.	08/07/2014	N001	5.29	- 25.29	6.9		F	#		
Potassium	mg/L	08/07/2014	N001	5.29	- 25.29	7.3		F	#	0.11	
Selenium	mg/L	08/07/2014	N001	5.29	- 25.29	0.0058		F	#	0.000032	
Sodium	mg/L	08/07/2014	N001	5.29	- 25.29	80		F	#	0.0066	
Specific Conductance	umhos/cm	08/07/2014	N001	5.29	- 25.29	1175		F	#		
Sulfate	mg/L	08/07/2014	N001	5.29	- 25.29	300		F	#	5	
Temperature	C	08/07/2014	N001	5.29	- 25.29	14.64		F	#		
Turbidity	NTU	08/07/2014	N001	5.29	- 25.29	9.85		F	#		
Uranium	mg/L	08/07/2014	N001	5.29	- 25.29	0.03		F	#	0.0000029	
Vanadium	mg/L	08/07/2014	N001	5.29	- 25.29	0.001		F	#	0.000015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0201 WELL Ground elevation was calculated as surveyed TOC elevation minus stick up height reported in the Borehole Summary

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
							Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/09/2014	N001	7.35	- 22.35	257		F	#		
Ammonia Total as N	mg/L	06/09/2014	N001	7.35	- 22.35	72		F	#	5	
Ammonia Total as N	mg/L	06/09/2014	N002	7.35	- 22.35	72		F	#	2	
Arsenic	mg/L	06/09/2014	N001	7.35	- 22.35	0.00038	B	F	#	0.000074	
Arsenic	mg/L	06/09/2014	N002	7.35	- 22.35	0.00042		F	#	0.000015	
Calcium	mg/L	06/09/2014	N001	7.35	- 22.35	600		F	#	0.06	
Calcium	mg/L	06/09/2014	N002	7.35	- 22.35	610		F	#	0.06	
Chloride	mg/L	06/09/2014	N001	7.35	- 22.35	170		F	#	10	
Chloride	mg/L	06/09/2014	N002	7.35	- 22.35	170		F	#	10	
Magnesium	mg/L	06/09/2014	N001	7.35	- 22.35	51		F	#	0.065	
Magnesium	mg/L	06/09/2014	N002	7.35	- 22.35	51		F	#	0.065	
Molybdenum	mg/L	06/09/2014	N001	7.35	- 22.35	1.4		F	#	0.0032	
Molybdenum	mg/L	06/09/2014	N002	7.35	- 22.35	1.5		F	#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	06/09/2014	N001	7.35	- 22.35	49		F	#	0.5	
Nitrate + Nitrite as Nitrogen	mg/L	06/09/2014	N002	7.35	- 22.35	44		F	#	0.5	
Oxidation Reduction Potential	mV	06/09/2014	N001	7.35	- 22.35	166.8		F	#		
pH	s.u.	06/09/2014	N001	7.35	- 22.35	6.73		F	#		
Potassium	mg/L	06/09/2014	N001	7.35	- 22.35	13		F	#	0.54	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0201 WELL Ground elevation was calculated as surveyed TOC elevation minus stick up height reported in the Borehole Summary

Parameter	Units	Sample		Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID				Lab	Data	QA		
Potassium	mg/L	06/09/2014	N002	7.35	-	22.35	13	F	#	0.54	
Selenium	mg/L	06/09/2014	N001	7.35	-	22.35	0.059	F	#	0.00016	
Selenium	mg/L	06/09/2014	N002	7.35	-	22.35	0.064	F	#	0.000032	
Sodium	mg/L	06/09/2014	N001	7.35	-	22.35	260	F	#	0.033	
Sodium	mg/L	06/09/2014	N002	7.35	-	22.35	270	F	#	0.033	
Specific Conductance	umhos /cm	06/09/2014	N001	7.35	-	22.35	3978	F	#		
Sulfate	mg/L	06/09/2014	N001	7.35	-	22.35	1700	F	#	25	
Sulfate	mg/L	06/09/2014	N002	7.35	-	22.35	1700	F	#	25	
Temperature	C	06/09/2014	N001	7.35	-	22.35	14.35	F	#		
Turbidity	NTU	06/09/2014	N001	7.35	-	22.35	1.05	F	#		
Uranium	mg/L	06/09/2014	N001	7.35	-	22.35	0.091	F	#	0.00029	
Uranium	mg/L	06/09/2014	N002	7.35	-	22.35	0.093	F	#	0.000015	
Vanadium	mg/L	06/09/2014	N001	7.35	-	22.35	0.0005	B	UJF	#	0.000076
Vanadium	mg/L	06/09/2014	N002	7.35	-	22.35	0.00086	JF	#	0.000015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0215 WELL Ground elevation was calculated as surveyed TOC elevation minus stick up height reported in the Borehole Summary

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/09/2014	N001	6.84 - 21.84	216		F	#		
Ammonia Total as N	mg/L	06/09/2014	N001	6.84 - 21.84	2.7		F	#	0.1	
Arsenic	mg/L	06/09/2014	N001	6.84 - 21.84	0.0004		F	#	0.000015	
Calcium	mg/L	06/09/2014	N001	6.84 - 21.84	81		F	#	0.012	
Chloride	mg/L	06/09/2014	N001	6.84 - 21.84	140		F	#	4	
Magnesium	mg/L	06/09/2014	N001	6.84 - 21.84	39		F	#	0.013	
Molybdenum	mg/L	06/09/2014	N001	6.84 - 21.84	0.012		F	#	0.000032	
Nitrate + Nitrite as Nitrogen	mg/L	06/09/2014	N001	6.84 - 21.84	0.063		F	#	0.01	
Oxidation Reduction Potential	mV	06/09/2014	N001	6.84 - 21.84	91.9		F	#		
pH	s.u.	06/09/2014	N001	6.84 - 21.84	7.26		F	#		
Potassium	mg/L	06/09/2014	N001	6.84 - 21.84	4.9		F	#	0.11	
Selenium	mg/L	06/09/2014	N001	6.84 - 21.84	0.0029		F	#	0.000032	
Sodium	mg/L	06/09/2014	N001	6.84 - 21.84	120		F	#	0.0066	
Specific Conductance	umhos/cm	06/09/2014	N001	6.84 - 21.84	1237		F	#		
Sulfate	mg/L	06/09/2014	N001	6.84 - 21.84	220		F	#	10	
Temperature	C	06/09/2014	N001	6.84 - 21.84	13.95		F	#		
Turbidity	NTU	06/09/2014	N001	6.84 - 21.84	0.94		F	#		
Uranium	mg/L	06/09/2014	N001	6.84 - 21.84	0.014		F	#	0.0000029	
Vanadium	mg/L	06/09/2014	N001	6.84 - 21.84	0.0015		F	#	0.000015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0216 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Ammonia Total as N	mg/L	08/07/2014	N001	5.5 - 20.5	5.1		F	#	0.2	
Ammonia Total as N	mg/L	08/07/2014	N002	5.5 - 20.5	4.9		F	#	0.1	
Arsenic	mg/L	08/07/2014	N001	5.5 - 20.5	0.027		F	#	0.000074	
Arsenic	mg/L	08/07/2014	N002	5.5 - 20.5	0.026		F	#	0.000074	
Calcium	mg/L	08/07/2014	N001	5.5 - 20.5	81		F	#	0.012	
Calcium	mg/L	08/07/2014	N002	5.5 - 20.5	76		F	#	0.012	
Chloride	mg/L	08/07/2014	N001	5.5 - 20.5	130		F	#	2	
Chloride	mg/L	08/07/2014	N002	5.5 - 20.5	130		F	#	2	
Magnesium	mg/L	08/07/2014	N001	5.5 - 20.5	16		F	#	0.013	
Magnesium	mg/L	08/07/2014	N002	5.5 - 20.5	15		F	#	0.013	
Molybdenum	mg/L	08/07/2014	N001	5.5 - 20.5	0.055		F	#	0.00016	
Molybdenum	mg/L	08/07/2014	N002	5.5 - 20.5	0.056		F	#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	08/07/2014	N001	5.5 - 20.5	0.01	U	F	#	0.01	
Nitrate + Nitrite as Nitrogen	mg/L	08/07/2014	N002	5.5 - 20.5	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	08/07/2014	N001	5.5 - 20.5	1.3		F	#		
pH	s.u.	08/07/2014	N001	5.5 - 20.5	7.24		F	#		
Potassium	mg/L	08/07/2014	N001	5.5 - 20.5	7.7	E	JF	#	0.11	
Potassium	mg/L	08/07/2014	N002	5.5 - 20.5	7.6		JF	#	0.11	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0216 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Selenium	mg/L	08/07/2014	N001	5.5 - 20.5	0.00056		UF	#	0.00016	
Selenium	mg/L	08/07/2014	N002	5.5 - 20.5	0.00024	B	F	#	0.00016	
Sodium	mg/L	08/07/2014	N001	5.5 - 20.5	93		F	#	0.0066	
Sodium	mg/L	08/07/2014	N002	5.5 - 20.5	91		F	#	0.0066	
Specific Conductance	umhos/cm	08/07/2014	N001	5.5 - 20.5	977		F	#		
Sulfate	mg/L	08/07/2014	N001	5.5 - 20.5	130		F	#	5	
Sulfate	mg/L	08/07/2014	N002	5.5 - 20.5	130		F	#	5	
Temperature	C	08/07/2014	N001	5.5 - 20.5	18.84		F	#		
Turbidity	NTU	08/07/2014	N001	5.5 - 20.5	0.86		F	#		
Uranium	mg/L	08/07/2014	N001	5.5 - 20.5	0.021		F	#	0.000015	
Uranium	mg/L	08/07/2014	N002	5.5 - 20.5	0.021		F	#	0.000015	
Vanadium	mg/L	08/07/2014	N001	5.5 - 20.5	0.21		F	#	0.000076	
Vanadium	mg/L	08/07/2014	N002	5.5 - 20.5	0.21		F	#	0.000076	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0217 WELL Ground elevation was calculated as surveyed TOC elevation minus stick up height reported in the Borehole Summary

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	08/11/2014	N001	7.4	-	22.4	182		F	#		
Ammonia Total as N	mg/L	08/11/2014	N001	7.4	-	22.4	43		F	#	2	
Arsenic	mg/L	08/11/2014	N001	7.4	-	22.4	0.00096		F	#	0.000074	
Calcium	mg/L	08/11/2014	N001	7.4	-	22.4	630		F	#	0.12	
Chloride	mg/L	08/11/2014	N001	7.4	-	22.4	290		F	#	10	
Magnesium	mg/L	08/11/2014	N001	7.4	-	22.4	20		F	#	0.013	
Molybdenum	mg/L	08/11/2014	N001	7.4	-	22.4	1.6		F	#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	08/11/2014	N001	7.4	-	22.4	0.045		F	#	0.01	
Oxidation Reduction Potential	mV	08/11/2014	N001	7.4	-	22.4	190.7		F	#		
pH	s.u.	08/11/2014	N001	7.4	-	22.4	6.62		F	#		
Potassium	mg/L	08/11/2014	N001	7.4	-	22.4	24		F	#	0.11	
Selenium	mg/L	08/11/2014	N001	7.4	-	22.4	0.026		F	#	0.00016	
Sodium	mg/L	08/11/2014	N001	7.4	-	22.4	210		F	#	0.066	
Specific Conductance	umhos/cm	08/11/2014	N001	7.4	-	22.4	3497		F	#		
Sulfate	mg/L	08/11/2014	N001	7.4	-	22.4	1600		F	#	25	
Temperature	C	08/11/2014	N001	7.4	-	22.4	15.43		F	#		
Turbidity	NTU	08/11/2014	N001	7.4	-	22.4	4.59		F	#		
Uranium	mg/L	08/11/2014	N001	7.4	-	22.4	0.15		F	#	0.000015	
Vanadium	mg/L	08/11/2014	N001	7.4	-	22.4	2.2		F	#	0.000076	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0590 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	08/07/2014	N001	5.21	-	19.21	146		F	#		
Ammonia Total as N	mg/L	08/07/2014	N001	5.21	-	19.21	160		F	#	5	
Arsenic	mg/L	08/07/2014	N001	5.21	-	19.21	0.0014		F	#	0.000074	
Calcium	mg/L	08/07/2014	N001	5.21	-	19.21	570		F	#	0.12	
Chloride	mg/L	08/07/2014	N001	5.21	-	19.21	390		F	#	10	
Magnesium	mg/L	08/07/2014	N001	5.21	-	19.21	57		F	#	0.013	
Molybdenum	mg/L	08/07/2014	N001	5.21	-	19.21	1.2		F	#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	08/07/2014	N001	5.21	-	19.21	32		F	#	0.5	
Oxidation Reduction Potential	mV	08/07/2014	N001	5.21	-	19.21	209.3		F	#		
pH	s.u.	08/07/2014	N001	5.21	-	19.21	6.59		F	#		
Potassium	mg/L	08/07/2014	N001	5.21	-	19.21	43		F	#	0.11	
Selenium	mg/L	08/07/2014	N001	5.21	-	19.21	0.07		F	#	0.00016	
Sodium	mg/L	08/07/2014	N001	5.21	-	19.21	530		F	#	0.066	
Specific Conductance	umhos/cm	08/07/2014	N001	5.21	-	19.21	5566		F	#		
Sulfate	mg/L	08/07/2014	N001	5.21	-	19.21	2400		F	#	25	
Temperature	C	08/07/2014	N001	5.21	-	19.21	19.14		F	#		
Turbidity	NTU	08/07/2014	N001	5.21	-	19.21	1.32		F	#		
Uranium	mg/L	08/07/2014	N001	5.21	-	19.21	0.08		F	#	0.000015	
Vanadium	mg/L	08/07/2014	N001	5.21	-	19.21	0.47		F	#	0.000076	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0620 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft	-	BLS)		Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/11/2014	N001	6.7	-	10.7	499		F	#		
Ammonia Total as N	mg/L	06/11/2014	N001	6.7	-	10.7	0.1	U	F	#	0.1	
Ammonia Total as N	mg/L	06/11/2014	N002	6.7	-	10.7	0.1	U	F	#	0.1	
Arsenic	mg/L	06/11/2014	N001	6.7	-	10.7	0.00056		F	#	0.000015	
Arsenic	mg/L	06/11/2014	N002	6.7	-	10.7	0.00047		F	#	0.000015	
Calcium	mg/L	06/11/2014	N001	6.7	-	10.7	380		F	#	0.06	
Calcium	mg/L	06/11/2014	N002	6.7	-	10.7	390		F	#	0.06	
Chloride	mg/L	06/11/2014	N001	6.7	-	10.7	1100		F	#	20	
Chloride	mg/L	06/11/2014	N002	6.7	-	10.7	1100		F	#	20	
Magnesium	mg/L	06/11/2014	N001	6.7	-	10.7	210		F	#	0.065	
Magnesium	mg/L	06/11/2014	N002	6.7	-	10.7	220		F	#	0.065	
Molybdenum	mg/L	06/11/2014	N001	6.7	-	10.7	0.0078		JF	#	0.000032	
Molybdenum	mg/L	06/11/2014	N002	6.7	-	10.7	0.0098		JF	#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	06/11/2014	N001	6.7	-	10.7	11		F	#	0.2	
Nitrate + Nitrite as Nitrogen	mg/L	06/11/2014	N002	6.7	-	10.7	11		F	#	0.2	
Oxidation Reduction Potential	mV	06/11/2014	N001	6.7	-	10.7	130.1		F	#		
pH	s.u.	06/11/2014	N001	6.7	-	10.7	7		F	#		
Potassium	mg/L	06/11/2014	N001	6.7	-	10.7	12		F	#	0.54	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0620 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Potassium	mg/L	06/11/2014	N002	6.7	-	10.7	13	F	#	0.54		
Selenium	mg/L	06/11/2014	N001	6.7	-	10.7	0.015	F	#	0.000032		
Selenium	mg/L	06/11/2014	N002	6.7	-	10.7	0.016	F	#	0.000032		
Sodium	mg/L	06/11/2014	N001	6.7	-	10.7	940	F	#	0.33		
Sodium	mg/L	06/11/2014	N002	6.7	-	10.7	950	F	#	0.33		
Specific Conductance	umhos/cm	06/11/2014	N001	6.7	-	10.7	6330	F	#			
Sulfate	mg/L	06/11/2014	N001	6.7	-	10.7	2000	F	#	50		
Sulfate	mg/L	06/11/2014	N002	6.7	-	10.7	1900	F	#	50		
Temperature	C	06/11/2014	N001	6.7	-	10.7	14.85	F	#			
Total Organic Carbon	mg/L	06/11/2014	N001	6.7	-	10.7	2.2	F	#	1		
Total Organic Carbon	mg/L	06/11/2014	N002	6.7	-	10.7	2	F	#	1		
Turbidity	NTU	06/11/2014	N001	6.7	-	10.7	6.68	F	#			
Uranium	mg/L	06/11/2014	N001	6.7	-	10.7	0.058	F	#	0.000029		
Uranium	mg/L	06/11/2014	N002	6.7	-	10.7	0.059	F	#	0.000015		
Vanadium	mg/L	06/11/2014	N001	6.7	-	10.7	0.0016	F	#	0.000015		
Vanadium	mg/L	06/11/2014	N002	6.7	-	10.7	0.0017	F	#	0.000015		

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0658 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)	Lab	Data		QA				
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/09/2014	N001	.5	-	5.5	232	F	#			
Ammonia Total as N	mg/L	06/09/2014	N001	.5	-	5.5	37	F	#	2		
Arsenic	mg/L	06/09/2014	N001	.5	-	5.5	0.096	F	#	0.0015		
Calcium	mg/L	06/09/2014	N001	.5	-	5.5	430	F	#	0.012		
Chloride	mg/L	06/09/2014	N001	.5	-	5.5	190	F	#	5		
Magnesium	mg/L	06/09/2014	N001	.5	-	5.5	35	F	#	0.013		
Molybdenum	mg/L	06/09/2014	N001	.5	-	5.5	0.97	F	#	0.0032		
Nitrate + Nitrite as Nitrogen	mg/L	06/09/2014	N001	.5	-	5.5	3.7	F	#	0.05		
Oxidation Reduction Potential	mV	06/09/2014	N001	.5	-	5.5	150.7	F	#			
pH	s.u.	06/09/2014	N001	.5	-	5.5	6.81	F	#			
Potassium	mg/L	06/09/2014	N001	.5	-	5.5	10	F	#	0.11		
Selenium	mg/L	06/09/2014	N001	.5	-	5.5	0.85	F	#	0.0032		
Sodium	mg/L	06/09/2014	N001	.5	-	5.5	180	F	#	0.033		
Specific Conductance	umhos/cm	06/09/2014	N001	.5	-	5.5	2796	F	#			
Sulfate	mg/L	06/09/2014	N001	.5	-	5.5	1000	F	#	12		
Temperature	C	06/09/2014	N001	.5	-	5.5	12.79	F	#			
Turbidity	NTU	06/09/2014	N001	.5	-	5.5	4.84	F	#			
Uranium	mg/L	06/09/2014	N001	.5	-	5.5	0.046	F	#	0.00029		
Vanadium	mg/L	06/09/2014	N001	.5	-	5.5	21	F	#	0.0015		

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0659 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/11/2014	N001	.5	-	10.5		F	#		
Ammonia Total as N	mg/L	06/11/2014	N001	.5	-	10.5		F	#	1	
Arsenic	mg/L	06/11/2014	N001	.5	-	10.5		F	#	0.00074	
Calcium	mg/L	06/11/2014	N001	.5	-	10.5		F	#	0.06	
Chloride	mg/L	06/11/2014	N001	.5	-	10.5		F	#	10	
Magnesium	mg/L	06/11/2014	N001	.5	-	10.5		F	#	0.065	
Molybdenum	mg/L	06/11/2014	N001	.5	-	10.5		F	#	0.0016	
Nitrate + Nitrite as Nitrogen	mg/L	06/11/2014	N001	.5	-	10.5		F	#	0.2	
Oxidation Reduction Potential	mV	06/11/2014	N001	.5	-	10.5		F	#		
pH	s.u.	06/11/2014	N001	.5	-	10.5		F	#		
Potassium	mg/L	06/11/2014	N001	.5	-	10.5		F	#	0.54	
Selenium	mg/L	06/11/2014	N001	.5	-	10.5		F	#	0.0016	
Sodium	mg/L	06/11/2014	N001	.5	-	10.5		F	#	0.033	
Specific Conductance	umhos/cm	06/11/2014	N001	.5	-	10.5		F	#		
Sulfate	mg/L	06/11/2014	N001	.5	-	10.5		F	#	25	
Temperature	C	06/11/2014	N001	.5	-	10.5		F	#		
Turbidity	NTU	06/11/2014	N001	.5	-	10.5		F	#		
Uranium	mg/L	06/11/2014	N001	.5	-	10.5		F	#	0.00015	
Vanadium	mg/L	06/11/2014	N001	.5	-	10.5		F	#	0.00076	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0664 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/11/2014	N001	7.7	-	14.7	399		F	#		
Ammonia Total as N	mg/L	06/11/2014	0001	7.7	-	14.7	29		F	#	2	
Arsenic	mg/L	06/11/2014	0001	7.7	-	14.7	0.0042		F	#	0.00015	
Calcium	mg/L	06/11/2014	0001	7.7	-	14.7	150		F	#	0.06	
Chloride	mg/L	06/11/2014	0001	7.7	-	14.7	130		F	#	4	
Magnesium	mg/L	06/11/2014	0001	7.7	-	14.7	72		F	#	0.065	
Molybdenum	mg/L	06/11/2014	0001	7.7	-	14.7	0.22		F	#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	06/11/2014	0001	7.7	-	14.7	1.5		F	#	0.05	
Oxidation Reduction Potential	mV	06/11/2014	N001	7.7	-	14.7	180.4		F	#		
pH	s.u.	06/11/2014	N001	7.7	-	14.7	6.94		F	#		
Potassium	mg/L	06/11/2014	0001	7.7	-	14.7	11		F	#	0.54	
Selenium	mg/L	06/11/2014	0001	7.7	-	14.7	0.16		F	#	0.00032	
Sodium	mg/L	06/11/2014	0001	7.7	-	14.7	200		F	#	0.033	
Specific Conductance	umhos/cm	06/11/2014	N001	7.7	-	14.7	2169		F	#		
Sulfate	mg/L	06/11/2014	0001	7.7	-	14.7	620		F	#	10	
Temperature	C	06/11/2014	N001	7.7	-	14.7	12.63		F	#		
Turbidity	NTU	06/11/2014	N001	7.7	-	14.7	51.6		F	#		
Uranium	mg/L	06/11/2014	0001	7.7	-	14.7	0.056		F	#	0.000029	
Vanadium	mg/L	06/11/2014	0001	7.7	-	14.7	2.5		F	#	0.00015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0669 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/11/2014	N001	4	-	10.6	335		FQ	#		
Ammonia Total as N	mg/L	06/11/2014	0001	4	-	10.6	89		FQ	#	2	
Arsenic	mg/L	06/11/2014	0001	4	-	10.6	0.0044		FQ	#	0.00015	
Calcium	mg/L	06/11/2014	0001	4	-	10.6	490		FQ	#	0.06	
Chloride	mg/L	06/11/2014	0001	4	-	10.6	130		FQ	#	10	
Magnesium	mg/L	06/11/2014	0001	4	-	10.6	52		FQ	#	0.065	
Molybdenum	mg/L	06/11/2014	0001	4	-	10.6	1.1		FQ	#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	06/11/2014	0001	4	-	10.6	0.44		FQ	#	0.01	
Oxidation Reduction Potential	mV	06/11/2014	N001	4	-	10.6	181		FQ	#		
pH	s.u.	06/11/2014	N001	4	-	10.6	6.1		FQ	#		
Potassium	mg/L	06/11/2014	0001	4	-	10.6	10		FQ	#	0.54	
Selenium	mg/L	06/11/2014	0001	4	-	10.6	0.0057		FQ	#	0.00032	
Sodium	mg/L	06/11/2014	0001	4	-	10.6	230		FQ	#	0.033	
Specific Conductance	umhos/cm	06/11/2014	N001	4	-	10.6	3151		FQ	#		
Sulfate	mg/L	06/11/2014	0001	4	-	10.6	1500		FQ	#	25	
Temperature	C	06/11/2014	N001	4	-	10.6	14.04		FQ	#		
Turbidity	NTU	06/11/2014	N001	4	-	10.6	27		FQ	#		
Uranium	mg/L	06/11/2014	0001	4	-	10.6	0.12		FQ	#	0.000029	
Vanadium	mg/L	06/11/2014	0001	4	-	10.6	1.7		FQ	#	0.00015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0670 WELL For Organics Study.

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/11/2014	N001	5.2	-	12.2	388		FQ	#		
Ammonia Total as N	mg/L	06/11/2014	N001	5.2	-	12.2	12		FQ	#	1	
Arsenic	mg/L	06/11/2014	N001	5.2	-	12.2	0.0045		FQ	#	0.00015	
Calcium	mg/L	06/11/2014	N001	5.2	-	12.2	130		FQ	#	0.012	
Chloride	mg/L	06/11/2014	N001	5.2	-	12.2	130		FQ	#	4	
Magnesium	mg/L	06/11/2014	N001	5.2	-	12.2	70		FQ	#	0.013	
Molybdenum	mg/L	06/11/2014	N001	5.2	-	12.2	0.22		FQ	#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	06/11/2014	N001	5.2	-	12.2	5.9		FQ	#	0.05	
Oxidation Reduction Potential	mV	06/11/2014	N001	5.2	-	12.2	188.9		FQ	#		
pH	s.u.	06/11/2014	N001	5.2	-	12.2	6.96		FQ	#		
Potassium	mg/L	06/11/2014	N001	5.2	-	12.2	11		FQ	#	0.11	
Selenium	mg/L	06/11/2014	N001	5.2	-	12.2	0.33		FQ	#	0.00032	
Sodium	mg/L	06/11/2014	N001	5.2	-	12.2	200		FQ	#	0.033	
Specific Conductance	umhos/cm	06/11/2014	N001	5.2	-	12.2	2096		FQ	#		
Sulfate	mg/L	06/11/2014	N001	5.2	-	12.2	550		FQ	#	10	
Temperature	C	06/11/2014	N001	5.2	-	12.2	13.46		FQ	#		
Turbidity	NTU	06/11/2014	N001	5.2	-	12.2	5.87		FQ	#		
Uranium	mg/L	06/11/2014	N001	5.2	-	12.2	0.11		FQ	#	0.000029	
Vanadium	mg/L	06/11/2014	N001	5.2	-	12.2	1.8		FQ	#	0.00015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0855 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/09/2014	N001	6	-	11	234		F	#		
Ammonia Total as N	mg/L	06/09/2014	N001	6	-	11	27		F	#	1	
Arsenic	mg/L	06/09/2014	N001	6	-	11	0.28		F	#	0.0015	
Calcium	mg/L	06/09/2014	N001	6	-	11	260		F	#	0.06	
Chloride	mg/L	06/09/2014	N001	6	-	11	180		F	#	5	
Magnesium	mg/L	06/09/2014	N001	6	-	11	37		F	#	0.065	
Molybdenum	mg/L	06/09/2014	N001	6	-	11	0.47		F	#	0.0032	
Nitrate + Nitrite as Nitrogen	mg/L	06/09/2014	N001	6	-	11	8.5		F	#	0.1	
Oxidation Reduction Potential	mV	06/09/2014	N001	6	-	11	131.7		F	#		
pH	s.u.	06/09/2014	N001	6	-	11	6.85		F	#		
Potassium	mg/L	06/09/2014	N001	6	-	11	11		F	#	0.54	
Selenium	mg/L	06/09/2014	N001	6	-	11	0.79		F	#	0.0032	
Sodium	mg/L	06/09/2014	N001	6	-	11	180		F	#	0.033	
Specific Conductance	umhos/cm	06/09/2014	N001	6	-	11	2309		F	#		
Sulfate	mg/L	06/09/2014	N001	6	-	11	700		F	#	12	
Temperature	C	06/09/2014	N001	6	-	11	15.03		F	#		
Turbidity	NTU	06/09/2014	N001	6	-	11	4.95		F	#		
Uranium	mg/L	06/09/2014	N001	6	-	11	0.039		F	#	0.00029	
Vanadium	mg/L	06/09/2014	N001	6	-	11	13		F	#	0.0015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: CW06 WELL City of Rifle WWTP Dewatering Wells

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/10/2014	N001	-	85		F	#		
Ammonia Total as N	mg/L	06/10/2014	N001	-	0.16		F	#	0.1	
Arsenic	mg/L	06/10/2014	N001	-	0.00067		F	#	0.000074	
Calcium	mg/L	06/10/2014	N001	-	45		F	#	0.012	
Chloride	mg/L	06/10/2014	N001	-	70		F	#	1	
Magnesium	mg/L	06/10/2014	N001	-	13		F	#	0.013	
Molybdenum	mg/L	06/10/2014	N001	-	0.0048		F	#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	06/10/2014	N001	-	0.19		F	#	0.01	
Oxidation Reduction Potential	mV	06/10/2014	N001	-	-12.9		F	#		
pH	s.u.	06/10/2014	N001	-	7.37		F	#		
Potassium	mg/L	06/10/2014	N001	-	4.4		F	#	0.11	
Selenium	mg/L	06/10/2014	N001	-	0.00074		F	#	0.00016	
Sodium	mg/L	06/10/2014	N001	-	59		F	#	0.0066	
Specific Conductance	umhos /cm	06/10/2014	N001	-	618		F	#		
Sulfate	mg/L	06/10/2014	N001	-	87		F	#	2.5	
Temperature	C	06/10/2014	N001	-	17.22		F	#		
Turbidity	NTU	06/10/2014	N001	-	6.03		F	#		
Uranium	mg/L	06/10/2014	N001	-	0.0021		F	#	0.000015	
Vanadium	mg/L	06/10/2014	N001	-	0.0039		F	#	0.000076	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: CW09 WELL City of Rifle WWTP Dewatering Wells

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/10/2014	N001	-	178		F	#		
Ammonia Total as N	mg/L	06/10/2014	N001	-	0.1	U	F	#	0.1	
Arsenic	mg/L	06/10/2014	N001	-	0.0016		F	#	0.000074	
Calcium	mg/L	06/10/2014	N001	-	70		F	#	0.012	
Chloride	mg/L	06/10/2014	N001	-	190		F	#	4	
Magnesium	mg/L	06/10/2014	N001	-	22		F	#	0.013	
Molybdenum	mg/L	06/10/2014	N001	-	0.013		F	#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	06/10/2014	N001	-	4		F	#	0.05	
Oxidation Reduction Potential	mV	06/10/2014	N001	-	37.7		F	#		
pH	s.u.	06/10/2014	N001	-	7.55		F	#		
Potassium	mg/L	06/10/2014	N001	-	12		F	#	0.11	
Selenium	mg/L	06/10/2014	N001	-	0.0068		F	#	0.00016	
Sodium	mg/L	06/10/2014	N001	-	150		F	#	0.033	
Specific Conductance	umhos /cm	06/10/2014	N001	-	1295		F	#		
Sulfate	mg/L	06/10/2014	N001	-	170		F	#	10	
Temperature	C	06/10/2014	N001	-	23.53		F	#		
Turbidity	NTU	06/10/2014	N001	-	0.92		F	#		
Uranium	mg/L	06/10/2014	N001	-	0.0066		F	#	0.000015	
Vanadium	mg/L	06/10/2014	N001	-	0.061		F	#	0.000076	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: CW19 WELL City of Rifle WWTP Dewatering Wells

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/10/2014	N001	-	219		F	#		
Ammonia Total as N	mg/L	06/10/2014	N001	-	2.6		F	#	0.1	
Arsenic	mg/L	06/10/2014	N001	-	0.0039		F	#	0.000074	
Calcium	mg/L	06/10/2014	N001	-	130		F	#	0.012	
Chloride	mg/L	06/10/2014	N001	-	230		F	#	4	
Magnesium	mg/L	06/10/2014	N001	-	41		F	#	0.013	
Molybdenum	mg/L	06/10/2014	N001	-	0.11		F	#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	06/10/2014	N001	-	2.9		F	#	0.05	
Oxidation Reduction Potential	mV	06/10/2014	N001	-	78.1		F	#		
pH	s.u.	06/10/2014	N001	-	7.2		F	#		
Potassium	mg/L	06/10/2014	N001	-	17		F	#	0.11	
Selenium	mg/L	06/10/2014	N001	-	0.18		F	#	0.00016	
Sodium	mg/L	06/10/2014	N001	-	220		F	#	0.033	
Specific Conductance	umhos /cm	06/10/2014	N001	-	1887		F	#		
Sulfate	mg/L	06/10/2014	N001	-	400		F	#	10	
Temperature	C	06/10/2014	N001	-	17.29		F	#		
Turbidity	NTU	06/10/2014	N001	-	2.13		F	#		
Uranium	mg/L	06/10/2014	N001	-	0.025		F	#	0.000015	
Vanadium	mg/L	06/10/2014	N001	-	0.97		F	#	0.000076	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: CW22 WELL City of Rifle WWTP Dewatering Wells

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/10/2014	N001	-	207		F	#		
Ammonia Total as N	mg/L	06/10/2014	N001	-	0.21		F	#	0.1	
Arsenic	mg/L	06/10/2014	N001	-	0.0018		F	#	0.000074	
Calcium	mg/L	06/10/2014	N001	-	94		F	#	0.012	
Chloride	mg/L	06/10/2014	N001	-	170		F	#	4	
Magnesium	mg/L	06/10/2014	N001	-	39		F	#	0.013	
Molybdenum	mg/L	06/10/2014	N001	-	0.024		F	#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	06/10/2014	N001	-	8.5		F	#	0.1	
Oxidation Reduction Potential	mV	06/10/2014	N001	-	73.9		F	#		
pH	s.u.	06/10/2014	N001	-	7.26		F	#		
Potassium	mg/L	06/10/2014	N001	-	20		F	#	0.11	
Selenium	mg/L	06/10/2014	N001	-	0.022		F	#	0.00016	
Sodium	mg/L	06/10/2014	N001	-	220		F	#	0.033	
Specific Conductance	umhos /cm	06/10/2014	N001	-	1705		F	#		
Sulfate	mg/L	06/10/2014	N001	-	380		F	#	10	
Temperature	C	06/10/2014	N001	-	17.78		F	#		
Turbidity	NTU	06/10/2014	N001	-	7.28		F	#		
Uranium	mg/L	06/10/2014	N001	-	0.013		F	#	0.000015	
Vanadium	mg/L	06/10/2014	N001	-	0.079		F	#	0.000076	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: CW23 WELL City of Rifle WWTP Dewatering Wells

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/10/2014	N001	-	188		F	#		
Ammonia Total as N	mg/L	06/10/2014	N001	-	1.2		F	#	0.1	
Arsenic	mg/L	06/10/2014	N001	-	0.001		F	#	0.000074	
Calcium	mg/L	06/10/2014	N001	-	73		F	#	0.012	
Chloride	mg/L	06/10/2014	N001	-	170		F	#	4	
Magnesium	mg/L	06/10/2014	N001	-	24		F	#	0.013	
Molybdenum	mg/L	06/10/2014	N001	-	0.036		F	#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	06/10/2014	N001	-	3.3		F	#	0.05	
Oxidation Reduction Potential	mV	06/10/2014	N001	-	73.6		F	#		
pH	s.u.	06/10/2014	N001	-	7.41		F	#		
Potassium	mg/L	06/10/2014	N001	-	11		F	#	0.11	
Selenium	mg/L	06/10/2014	N001	-	0.019		F	#	0.00016	
Sodium	mg/L	06/10/2014	N001	-	170		F	#	0.033	
Specific Conductance	umhos /cm	06/10/2014	N001	-	1375		F	#		
Sulfate	mg/L	06/10/2014	N001	-	230		F	#	10	
Temperature	C	06/10/2014	N001	-	14.77		F	#		
Turbidity	NTU	06/10/2014	N001	-	2.17		F	#		
Uranium	mg/L	06/10/2014	N001	-	0.019		F	#	0.000015	
Vanadium	mg/L	06/10/2014	N001	-	0.036		F	#	0.000076	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: CW25 WELL City of Rifle WWTP Dewatering Wells

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID			Lab	Data QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/10/2014	N001	-	176	F	#		
Ammonia Total as N	mg/L	06/10/2014	N001	-	0.57	F	#	0.1	
Arsenic	mg/L	06/10/2014	N001	-	0.0015	F	#	0.000074	
Calcium	mg/L	06/10/2014	N001	-	86	F	#	0.012	
Chloride	mg/L	06/10/2014	N001	-	150	F	#	4	
Magnesium	mg/L	06/10/2014	N001	-	28	F	#	0.013	
Molybdenum	mg/L	06/10/2014	N001	-	0.033	F	#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	06/10/2014	N001	-	4.9	F	#	0.05	
Oxidation Reduction Potential	mV	06/10/2014	N001	-	67.8	F	#		
pH	s.u.	06/10/2014	N001	-	7.34	F	#		
Potassium	mg/L	06/10/2014	N001	-	12	F	#	0.11	
Selenium	mg/L	06/10/2014	N001	-	0.025	F	#	0.00016	
Sodium	mg/L	06/10/2014	N001	-	150	F	#	0.033	
Specific Conductance	umhos /cm	06/10/2014	N001	-	1350	F	#		
Sulfate	mg/L	06/10/2014	N001	-	240	F	#	10	
Temperature	C	06/10/2014	N001	-	18.09	F	#		
Turbidity	NTU	06/10/2014	N001	-	2.88	F	#		
Uranium	mg/L	06/10/2014	N001	-	0.018	F	#	0.000015	
Vanadium	mg/L	06/10/2014	N001	-	0.11	F	#	0.000076	

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

LAB QUALIFIERS:

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

DATA QUALIFIERS:

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

QA QUALIFIER:

- # Validated according to quality assurance guidelines.

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**Old Rifle  
Groundwater Quality Data**

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**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: 0292A WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/12/2014	N001	10.5	-	20.5	446		F	#		
Calcium	mg/L	06/12/2014	N001	10.5	-	20.5	160		F	#	0.06	
Chloride	mg/L	06/12/2014	N001	10.5	-	20.5	110		F	#	5	
Magnesium	mg/L	06/12/2014	N001	10.5	-	20.5	92		F	#	0.065	
Nitrate + Nitrite as Nitrogen	mg/L	06/12/2014	N001	10.5	-	20.5	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	06/12/2014	N001	10.5	-	20.5	17		F	#		
pH	s.u.	06/12/2014	N001	10.5	-	20.5	7.08		F	#		
Potassium	mg/L	06/12/2014	N001	10.5	-	20.5	6.5		F	#	0.54	
Selenium	mg/L	06/12/2014	N001	10.5	-	20.5	0.00022		F	#	0.000032	
Sodium	mg/L	06/12/2014	N001	10.5	-	20.5	240		F	#	0.033	
Specific Conductance	umhos/cm	06/12/2014	N001	10.5	-	20.5	2237		F	#		
Sulfate	mg/L	06/12/2014	N001	10.5	-	20.5	660		F	#	12	
Temperature	C	06/12/2014	N001	10.5	-	20.5	12.99		F	#		
Turbidity	NTU	06/12/2014	N001	10.5	-	20.5	1.94		F	#		
Uranium	mg/L	06/12/2014	N001	10.5	-	20.5	0.025		F	#	0.0000029	
Vanadium	mg/L	06/12/2014	N001	10.5	-	20.5	0.00033		JF	#	0.000015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: 0304 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/12/2014	N001	13.2	-	18.2	284		F	#		
Calcium	mg/L	06/12/2014	N001	13.2	-	18.2	200		F	#	0.06	
Chloride	mg/L	06/12/2014	N001	13.2	-	18.2	200		F	#	5	
Magnesium	mg/L	06/12/2014	N001	13.2	-	18.2	74		F	#	0.065	
Nitrate + Nitrite as Nitrogen	mg/L	06/12/2014	N001	13.2	-	18.2	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	06/12/2014	N001	13.2	-	18.2	-9.3		F	#		
pH	s.u.	06/12/2014	N001	13.2	-	18.2	7.17		F	#		
Potassium	mg/L	06/12/2014	N001	13.2	-	18.2	8.1		F	#	0.54	
Selenium	mg/L	06/12/2014	N001	13.2	-	18.2	0.0012		F	#	0.00016	
Sodium	mg/L	06/12/2014	N001	13.2	-	18.2	160		F	#	0.033	
Specific Conductance	umhos/cm	06/12/2014	N001	13.2	-	18.2	2070		F	#		
Sulfate	mg/L	06/12/2014	N001	13.2	-	18.2	540		F	#	12	
Temperature	C	06/12/2014	N001	13.2	-	18.2	13.84		F	#		
Turbidity	NTU	06/12/2014	N001	13.2	-	18.2	7.94		F	#		
Uranium	mg/L	06/12/2014	N001	13.2	-	18.2	0.056		F	#	0.000015	
Vanadium	mg/L	06/12/2014	N001	13.2	-	18.2	0.029		F	#	0.000076	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: 0305 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/12/2014	N001	13.76	-	18.76	342		F	#		
Calcium	mg/L	06/12/2014	N001	13.76	-	18.76	220		F	#	0.06	
Chloride	mg/L	06/12/2014	N001	13.76	-	18.76	330		F	#	5	
Magnesium	mg/L	06/12/2014	N001	13.76	-	18.76	86		F	#	0.065	
Nitrate + Nitrite as Nitrogen	mg/L	06/12/2014	N001	13.76	-	18.76	0.011		F	#	0.01	
Oxidation Reduction Potential	mV	06/12/2014	N001	13.76	-	18.76	100.8		F	#		
pH	s.u.	06/12/2014	N001	13.76	-	18.76	7.17		F	#		
Potassium	mg/L	06/12/2014	N001	13.76	-	18.76	9.4		F	#	0.54	
Selenium	mg/L	06/12/2014	N001	13.76	-	18.76	0.016		F	#	0.00032	
Sodium	mg/L	06/12/2014	N001	13.76	-	18.76	200		F	#	0.033	
Specific Conductance	umhos/cm	06/12/2014	N001	13.76	-	18.76	2423		F	#		
Sulfate	mg/L	06/12/2014	N001	13.76	-	18.76	530		F	#	12	
Temperature	C	06/12/2014	N001	13.76	-	18.76	14.19		F	#		
Turbidity	NTU	06/12/2014	N001	13.76	-	18.76	2.12		F	#		
Uranium	mg/L	06/12/2014	N001	13.76	-	18.76	0.056		F	#	0.000029	
Vanadium	mg/L	06/12/2014	N001	13.76	-	18.76	0.29		F	#	0.00015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: 0309 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers			Detection Limit	Uncertainty
							Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/11/2014	N001	16.93	- 21.93	375		F	#		
Calcium	mg/L	06/11/2014	N001	16.93	- 21.93	180		F	#	0.06	
Chloride	mg/L	06/11/2014	N001	16.93	- 21.93	130		F	#	5	
Magnesium	mg/L	06/11/2014	N001	16.93	- 21.93	120		F	#	0.065	
Nitrate + Nitrite as Nitrogen	mg/L	06/11/2014	N001	16.93	- 21.93	0.01	U	F	#	0.01	
Oxidation Reduction Potential	mV	06/11/2014	N001	16.93	- 21.93	-24.9		F	#		
Potassium	mg/L	06/11/2014	N001	16.93	- 21.93	8.3		F	#	0.54	
Selenium	mg/L	06/11/2014	N001	16.93	- 21.93	0.0002		F	#	0.000032	
Sodium	mg/L	06/11/2014	N001	16.93	- 21.93	190		F	#	0.033	
Specific Conductance	umhos/cm	06/11/2014	N001	16.93	- 21.93	2270		F	#		
Sulfate	mg/L	06/11/2014	N001	16.93	- 21.93	740		F	#	12	
Temperature	C	06/11/2014	N001	16.93	- 21.93	14.42		F	#		
Turbidity	NTU	06/11/2014	N001	16.93	- 21.93	8.28		F	#		
Uranium	mg/L	06/11/2014	N001	16.93	- 21.93	0.021		F	#	0.0000029	
Vanadium	mg/L	06/11/2014	N001	16.93	- 21.93	0.00064		F	#	0.000015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: 0310 WELL

Parameter	Units	Sample		Depth Range		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)	Lab		Data	QA			
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/12/2014	N001	17.93	- 22.93	484		F	#		
Calcium	mg/L	06/12/2014	N001	17.93	- 22.93	230		F	#	0.06	
Chloride	mg/L	06/12/2014	N001	17.93	- 22.93	150		F	#	5	
Magnesium	mg/L	06/12/2014	N001	17.93	- 22.93	110		F	#	0.065	
Nitrate + Nitrite as Nitrogen	mg/L	06/12/2014	N001	17.93	- 22.93	0.011		F	#	0.01	
Oxidation Reduction Potential	mV	06/12/2014	N001	17.93	- 22.93	-49.8		F	#		
pH	s.u.	06/12/2014	N001	17.93	- 22.93	7.12		F	#		
Potassium	mg/L	06/12/2014	N001	17.93	- 22.93	10		F	#	0.54	
Selenium	mg/L	06/12/2014	N001	17.93	- 22.93	0.00048		F	#	0.000032	
Sodium	mg/L	06/12/2014	N001	17.93	- 22.93	210		F	#	0.033	
Specific Conductance	umhos/cm	06/12/2014	N001	17.93	- 22.93	2484		F	#		
Sulfate	mg/L	06/12/2014	N001	17.93	- 22.93	780		F	#	12	
Temperature	C	06/12/2014	N001	17.93	- 22.93	14.27		F	#		
Turbidity	NTU	06/12/2014	N001	17.93	- 22.93	5.65		F	#		
Uranium	mg/L	06/12/2014	N001	17.93	- 22.93	0.2		F	#	0.000029	
Vanadium	mg/L	06/12/2014	N001	17.93	- 22.93	0.011		F	#	0.000015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: 0655 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/12/2014	N001	13.6	-	23.6	456		F	#		
Calcium	mg/L	06/12/2014	N001	13.6	-	23.6	190		F	#	0.06	
Chloride	mg/L	06/12/2014	N001	13.6	-	23.6	130		F	#	5	
Magnesium	mg/L	06/12/2014	N001	13.6	-	23.6	110		F	#	0.065	
Nitrate + Nitrite as Nitrogen	mg/L	06/12/2014	N001	13.6	-	23.6	0.3		F	#	0.02	
Oxidation Reduction Potential	mV	06/12/2014	N001	13.6	-	23.6	-59.1		F	#		
pH	s.u.	06/12/2014	N001	13.6	-	23.6	7.07		F	#		
Potassium	mg/L	06/12/2014	N001	13.6	-	23.6	8.8		F	#	0.54	
Selenium	mg/L	06/12/2014	N001	13.6	-	23.6	0.041		F	#	0.00016	
Sodium	mg/L	06/12/2014	N001	13.6	-	23.6	190		F	#	0.033	
Specific Conductance	umhos/cm	06/12/2014	N001	13.6	-	23.6	2299		F	#		
Sulfate	mg/L	06/12/2014	N001	13.6	-	23.6	700		F	#	12	
Temperature	C	06/12/2014	N001	13.6	-	23.6	13.52		F	#		
Turbidity	NTU	06/12/2014	N001	13.6	-	23.6	0.75		F	#		
Uranium	mg/L	06/12/2014	N001	13.6	-	23.6	0.11		F	#	0.000015	
Vanadium	mg/L	06/12/2014	N001	13.6	-	23.6	0.34		F	#	0.000076	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: 0656 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/12/2014	N001	6.35	-	21.35	246		F	#		
Calcium	mg/L	06/12/2014	N001	6.35	-	21.35	200		F	#	0.06	
Calcium	mg/L	06/12/2014	N002	6.35	-	21.35	210		F	#	0.06	
Chloride	mg/L	06/12/2014	N001	6.35	-	21.35	360		F	#	10	
Chloride	mg/L	06/12/2014	N002	6.35	-	21.35	350		F	#	5	
Magnesium	mg/L	06/12/2014	N001	6.35	-	21.35	94		F	#	0.065	
Magnesium	mg/L	06/12/2014	N002	6.35	-	21.35	94		F	#	0.065	
Nitrate + Nitrite as Nitrogen	mg/L	06/12/2014	N001	6.35	-	21.35	0.17		F	#	0.01	
Nitrate + Nitrite as Nitrogen	mg/L	06/12/2014	N002	6.35	-	21.35	0.17		F	#	0.01	
Oxidation Reduction Potential	mV	06/12/2014	N001	6.35	-	21.35	101.5		F	#		
pH	s.u.	06/12/2014	N001	6.35	-	21.35	7.04		F	#		
Potassium	mg/L	06/12/2014	N001	6.35	-	21.35	12		F	#	0.54	
Potassium	mg/L	06/12/2014	N002	6.35	-	21.35	12		F	#	0.54	
Selenium	mg/L	06/12/2014	N001	6.35	-	21.35	0.0059		F	#	0.00016	
Selenium	mg/L	06/12/2014	N002	6.35	-	21.35	0.0063		F	#	0.000032	
Sodium	mg/L	06/12/2014	N001	6.35	-	21.35	270		F	#	0.033	
Sodium	mg/L	06/12/2014	N002	6.35	-	21.35	270		F	#	0.033	
Specific Conductance	umhos/cm	06/12/2014	N001	6.35	-	21.35	2726		F	#		

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: 0656 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Sulfate	mg/L	06/12/2014	N001	6.35 - 21.35	660		F	#	25	
Sulfate	mg/L	06/12/2014	N002	6.35 - 21.35	660		F	#	12	
Temperature	C	06/12/2014	N001	6.35 - 21.35	17.19		F	#		
Turbidity	NTU	06/12/2014	N001	6.35 - 21.35	3.89		F	#		
Uranium	mg/L	06/12/2014	N001	6.35 - 21.35	0.24		F	#	0.000015	
Uranium	mg/L	06/12/2014	N002	6.35 - 21.35	0.23		F	#	0.000029	
Vanadium	mg/L	06/12/2014	N001	6.35 - 21.35	0.032		F	#	0.000076	
Vanadium	mg/L	06/12/2014	N002	6.35 - 21.35	0.033		F	#	0.000015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: 0658 WELL

Parameter	Units	Sample		Depth Range			Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID	(Ft BLS)				Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/12/2014	N001	2.3	-	17.3	361		F	#		
Calcium	mg/L	06/12/2014	N001	2.3	-	17.3	150		F	#	0.012	
Chloride	mg/L	06/12/2014	N001	2.3	-	17.3	17		F	#	4	
Magnesium	mg/L	06/12/2014	N001	2.3	-	17.3	80		F	#	0.013	
Nitrate + Nitrite as Nitrogen	mg/L	06/12/2014	N001	2.3	-	17.3	0.043		F	#	0.01	
Oxidation Reduction Potential	mV	06/12/2014	N001	2.3	-	17.3	6.2		F	#		
pH	s.u.	06/12/2014	N001	2.3	-	17.3	7.13		F	#		
Potassium	mg/L	06/12/2014	N001	2.3	-	17.3	3.1		F	#	0.11	
Selenium	mg/L	06/12/2014	N001	2.3	-	17.3	0.0023		F	#	0.000032	
Sodium	mg/L	06/12/2014	N001	2.3	-	17.3	59		F	#	0.0066	
Specific Conductance	umhos/cm	06/12/2014	N001	2.3	-	17.3	1351		F	#		
Sulfate	mg/L	06/12/2014	N001	2.3	-	17.3	410		F	#	10	
Temperature	C	06/12/2014	N001	2.3	-	17.3	12.14		F	#		
Turbidity	NTU	06/12/2014	N001	2.3	-	17.3	8.52		F	#		
Uranium	mg/L	06/12/2014	N001	2.3	-	17.3	0.0087		F	#	0.0000029	
Vanadium	mg/L	06/12/2014	N001	2.3	-	17.3	0.00072		F	#	0.000015	

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: CLOUGH WELL 2 WELL

Parameter	Units	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID			Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/12/2014	N001	-	291		F	#		
Calcium	mg/L	06/12/2014	N001	-	91		F	#	0.012	
Chloride	mg/L	06/12/2014	N001	-	180		F	#	4	
Magnesium	mg/L	06/12/2014	N001	-	54		F	#	0.013	
Nitrate + Nitrite as Nitrogen	mg/L	06/12/2014	N001	-	0.27		F	#	0.02	
Oxidation Reduction Potential	mV	06/12/2014	N001	-	53.5		F	#		
pH	s.u.	06/12/2014	N001	-	7.39		F	#		
Potassium	mg/L	06/12/2014	N001	-	4.3		F	#	0.11	
Selenium	mg/L	06/12/2014	N001	-	0.0012		F	#	0.00016	
Sodium	mg/L	06/12/2014	N001	-	140		F	#	0.0066	
Specific Conductance	umhos /cm	06/12/2014	N001	-	1474		F	#		
Sulfate	mg/L	06/12/2014	N001	-	220		F	#	10	
Temperature	C	06/12/2014	N001	-	14.65		F	#		
Turbidity	NTU	06/12/2014	N001	-	2.28		F	#		
Uranium	mg/L	06/12/2014	N001	-	0.017		F	#	0.000015	
Vanadium	mg/L	06/12/2014	N001	-	0.0079		F	#	0.000076	

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

LAB QUALIFIERS:

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

DATA QUALIFIERS:

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

QA QUALIFIER:

- # Validated according to quality assurance guidelines.

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**New Rifle  
Surface Water Quality Data**

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**Surface Water Quality Data by Location (USEE102) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0320 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/11/2014	N001	290			#		
Ammonia Total as N	mg/L	06/11/2014	N001	3.7			#	1	
Arsenic	mg/L	06/11/2014	N001	0.019			#	0.000074	
Calcium	mg/L	06/11/2014	N001	340			#	0.06	
Chloride	mg/L	06/11/2014	N001	260			#	5	
Magnesium	mg/L	06/11/2014	N001	50			#	0.065	
Molybdenum	mg/L	06/11/2014	N001	0.78			#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	06/11/2014	N001	2.8			#	0.05	
Oxidation Reduction Potential	mV	06/11/2014	N001	98.1			#		
pH	s.u.	06/11/2014	N001	8.07			#		
Potassium	mg/L	06/11/2014	N001	33			#	0.54	
Selenium	mg/L	06/11/2014	N001	0.018			#	0.00016	
Sodium	mg/L	06/11/2014	N001	310			#	0.033	
Specific Conductance	umhos/cm	06/11/2014	N001	2916			#		
Sulfate	mg/L	06/11/2014	N001	1000			#	12	
Temperature	C	06/11/2014	N001	24.01			#		
Turbidity	NTU	06/11/2014	N001	5.32			#		
Uranium	mg/L	06/11/2014	N001	0.14			#	0.000015	
Vanadium	mg/L	06/11/2014	N001	0.24			#	0.000076	

**Surface Water Quality Data by Location (USEE102) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0323 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/10/2014	N001	174			#		
Ammonia Total as N	mg/L	06/10/2014	N001	25			#	1	
Arsenic	mg/L	06/10/2014	N001	0.0011			#	0.000074	
Calcium	mg/L	06/10/2014	N001	570			#	0.06	
Chloride	mg/L	06/10/2014	N001	480			#	20	
Magnesium	mg/L	06/10/2014	N001	150			#	0.065	
Molybdenum	mg/L	06/10/2014	N001	2.4			#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	06/10/2014	N001	34			#	0.5	
Oxidation Reduction Potential	mV	06/10/2014	N001	97.9			#		
pH	s.u.	06/10/2014	N001	8.05			#		
Potassium	mg/L	06/10/2014	N001	86			#	0.54	
Selenium	mg/L	06/10/2014	N001	0.0072			#	0.00016	
Sodium	mg/L	06/10/2014	N001	960			#	0.33	
Specific Conductance	umhos/cm	06/10/2014	N001	6888			#		
Sulfate	mg/L	06/10/2014	N001	3400			#	50	
Temperature	C	06/10/2014	N001	21.72			#		
Turbidity	NTU	06/10/2014	N001	5.74			#		
Uranium	mg/L	06/10/2014	N001	0.27			#	0.000015	
Vanadium	mg/L	06/10/2014	N001	0.0049			#	0.000076	

**Surface Water Quality Data by Location (USEE102) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0324 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/11/2014	N001	67			#		
Ammonia Total as N	mg/L	06/11/2014	0001	0.1	U		#	0.1	
Arsenic	mg/L	06/11/2014	0001	0.00036			#	0.000015	
Calcium	mg/L	06/11/2014	0001	31			#	0.012	
Chloride	mg/L	06/11/2014	0001	23			#	0.4	
Magnesium	mg/L	06/11/2014	0001	5.8			#	0.013	
Molybdenum	mg/L	06/11/2014	0001	0.0057			#	0.000032	
Nitrate + Nitrite as Nitrogen	mg/L	06/11/2014	0001	0.11			#	0.01	
Oxidation Reduction Potential	mV	06/11/2014	N001	98			#		
pH	s.u.	06/11/2014	N001	7.96			#		
Potassium	mg/L	06/11/2014	0001	1.4			#	0.11	
Selenium	mg/L	06/11/2014	0001	0.00028			#	0.000032	
Sodium	mg/L	06/11/2014	0001	16			#	0.0066	
Specific Conductance	umhos/cm	06/11/2014	N001	347			#		
Sulfate	mg/L	06/11/2014	0001	31			#	1	
Temperature	C	06/11/2014	N001	16.98			#		
Turbidity	NTU	06/11/2014	N001	31.4			#		
Uranium	mg/L	06/11/2014	0001	0.00088			#	0.0000029	
Vanadium	mg/L	06/11/2014	0001	0.00063			#	0.000015	

**Surface Water Quality Data by Location (USEE102) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0452 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/11/2014	N001	270			#		
Ammonia Total as N	mg/L	06/11/2014	N001	2.9			#	0.5	
Arsenic	mg/L	06/11/2014	N001	0.021			#	0.000074	
Calcium	mg/L	06/11/2014	N001	310			#	0.06	
Chloride	mg/L	06/11/2014	N001	250			#	5	
Magnesium	mg/L	06/11/2014	N001	45			#	0.065	
Molybdenum	mg/L	06/11/2014	N001	0.79			#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	06/11/2014	N001	2.3			#	0.05	
Oxidation Reduction Potential	mV	06/11/2014	N001	105			#		
pH	s.u.	06/11/2014	N001	8.12			#		
Potassium	mg/L	06/11/2014	N001	32			#	0.54	
Selenium	mg/L	06/11/2014	N001	0.015		J	#	0.00016	
Sodium	mg/L	06/11/2014	N001	270			#	0.033	
Specific Conductance	umhos/cm	06/11/2014	N001	2835			#		
Sulfate	mg/L	06/11/2014	N001	980			#	12	
Temperature	C	06/11/2014	N001	24.17			#		
Turbidity	NTU	06/11/2014	N001	6.36			#		
Uranium	mg/L	06/11/2014	N001	0.14			#	0.000015	
Vanadium	mg/L	06/11/2014	N001	0.23			#	0.000076	

**Surface Water Quality Data by Location (USEE102) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0453 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/11/2014	N001	335			#		
Ammonia Total as N	mg/L	06/11/2014	N001	4.6			#	1	
Arsenic	mg/L	06/11/2014	N001	0.029			#	0.00015	
Calcium	mg/L	06/11/2014	N001	440			#	0.06	
Chloride	mg/L	06/11/2014	N001	260			#	5	
Magnesium	mg/L	06/11/2014	N001	49			#	0.065	
Molybdenum	mg/L	06/11/2014	N001	1.1			#	0.00032	
Nitrate + Nitrite as Nitrogen	mg/L	06/11/2014	N001	0.46			#	0.02	
Oxidation Reduction Potential	mV	06/11/2014	N001	136.1			#		
pH	s.u.	06/11/2014	N001	8.02			#		
Potassium	mg/L	06/11/2014	N001	44			#	0.54	
Selenium	mg/L	06/11/2014	N001	0.017	E	J	#	0.00032	
Sodium	mg/L	06/11/2014	N001	290			#	0.033	
Specific Conductance	umhos/cm	06/11/2014	N001	3157			#		
Sulfate	mg/L	06/11/2014	N001	1200			#	12	
Temperature	C	06/11/2014	N001	27.45			#		
Turbidity	NTU	06/11/2014	N001	6.01			#		
Uranium	mg/L	06/11/2014	N001	0.19			#	0.000029	
Vanadium	mg/L	06/11/2014	N001	0.19			#	0.00015	

**Surface Water Quality Data by Location (USEE102) FOR SITE RFN01, Rifle New Processing Site**

REPORT DATE: 10/8/2014

Location: 0575 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID		Lab	Data QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/10/2014	N001	51		#		
Ammonia Total as N	mg/L	06/10/2014	N001	0.33		#	0.1	
Arsenic	mg/L	06/10/2014	N001	0.0019		#	0.000074	
Calcium	mg/L	06/10/2014	N001	340		#	0.06	
Chloride	mg/L	06/10/2014	N001	510		#	20	
Magnesium	mg/L	06/10/2014	N001	250		#	0.065	
Molybdenum	mg/L	06/10/2014	N001	0.82		#	0.00016	
Nitrate + Nitrite as Nitrogen	mg/L	06/10/2014	N001	1.5		#	0.1	
Oxidation Reduction Potential	mV	06/10/2014	N001	87.3		#		
pH	s.u.	06/10/2014	N001	9.12		#		
Potassium	mg/L	06/10/2014	N001	74		#	0.54	
Selenium	mg/L	06/10/2014	N001	0.00094		#	0.00016	
Sodium	mg/L	06/10/2014	N001	1000		#	0.33	
Specific Conductance	umhos/cm	06/10/2014	N001	6804		#		
Sulfate	mg/L	06/10/2014	N001	3600		#	50	
Temperature	C	06/10/2014	N001	22.14		#		
Turbidity	NTU	06/10/2014	N001	8.52		#		
Uranium	mg/L	06/10/2014	N001	0.12		#	0.000015	
Vanadium	mg/L	06/10/2014	N001	0.0023		#	0.000076	

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

LAB QUALIFIERS:

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

DATA QUALIFIERS:

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

QA QUALIFIER:

- # Validated according to quality assurance guidelines.

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**Old Rifle  
Surface Water Quality Data**

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**Surface Water Quality Data by Location (USEE102) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: 0294 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID		Lab	Data		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/12/2014	N001	62		#		
Calcium	mg/L	06/12/2014	0001	30		#	0.012	
Chloride	mg/L	06/12/2014	0001	22		#	0.4	
Magnesium	mg/L	06/12/2014	0001	5.5		#	0.013	
Nitrate + Nitrite as Nitrogen	mg/L	06/12/2014	0001	0.1		#	0.01	
Oxidation Reduction Potential	mV	06/12/2014	N001	2.5		#		
pH	s.u.	06/12/2014	N001	8.12		#		
Potassium	mg/L	06/12/2014	0001	1.4		#	0.11	
Selenium	mg/L	06/12/2014	0001	0.00032		#	0.000032	
Sodium	mg/L	06/12/2014	0001	15		#	0.0066	
Specific Conductance	umhos/cm	06/12/2014	N001	306		#		
Sulfate	mg/L	06/12/2014	0001	31		#	1	
Temperature	C	06/12/2014	N001	13.52		#		
Turbidity	NTU	06/12/2014	N001	32.4		#		
Uranium	mg/L	06/12/2014	0001	0.00088		#	0.000029	
Vanadium	mg/L	06/12/2014	0001	0.00059		#	0.000015	

**Surface Water Quality Data by Location (USEE102) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: 0395 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID		Lab	Data QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/12/2014	N001	279		#		
Calcium	mg/L	06/12/2014	N001	97		#	0.012	
Chloride	mg/L	06/12/2014	N001	32		#	4	
Magnesium	mg/L	06/12/2014	N001	60		#	0.013	
Nitrate + Nitrite as Nitrogen	mg/L	06/12/2014	N001	0.01	U	#	0.01	
Oxidation Reduction Potential	mV	06/12/2014	N001	54.6		#		
pH	s.u.	06/12/2014	N001	7.92		#		
Potassium	mg/L	06/12/2014	N001	3.3		#	0.11	
Selenium	mg/L	06/12/2014	N001	0.00093		#	0.000032	
Sodium	mg/L	06/12/2014	N001	69		#	0.0066	
Specific Conductance	umhos/cm	06/12/2014	N001	1144		#		
Sulfate	mg/L	06/12/2014	N001	300		#	10	
Temperature	C	06/12/2014	N001	24.4		#		
Turbidity	NTU	06/12/2014	N001	4.9		#		
Uranium	mg/L	06/12/2014	N001	0.02		#	0.000015	
Vanadium	mg/L	06/12/2014	N001	0.00098		#	0.000015	

**Surface Water Quality Data by Location (USEE102) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: 0396 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID		Lab	Data QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/11/2014	N001	59		#		
Calcium	mg/L	06/11/2014	0001	30		#	0.012	
Chloride	mg/L	06/11/2014	0001	22		#	0.4	
Magnesium	mg/L	06/11/2014	0001	5.6		#	0.013	
Nitrate + Nitrite as Nitrogen	mg/L	06/11/2014	0001	0.11		#	0.01	
Oxidation Reduction Potential	mV	06/11/2014	N001	91.3		#		
pH	s.u.	06/11/2014	N001	8.02		#		
Potassium	mg/L	06/11/2014	0001	1.4		#	0.11	
Selenium	mg/L	06/11/2014	0001	0.00022		#	0.000032	
Sodium	mg/L	06/11/2014	0001	15		#	0.0066	
Specific Conductance	umhos/cm	06/11/2014	N001	285		#		
Sulfate	mg/L	06/11/2014	0001	30		#	1	
Temperature	C	06/11/2014	N001	16.24		#		
Turbidity	NTU	06/11/2014	N001	22.1		#		
Uranium	mg/L	06/11/2014	0001	0.00091		#	0.000029	
Vanadium	mg/L	06/11/2014	0001	0.00069		#	0.000015	

**Surface Water Quality Data by Location (USEE102) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: 0398 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID		Lab	Data QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/12/2014	N001	231		#		
Calcium	mg/L	06/12/2014	N001	120		#	0.012	
Chloride	mg/L	06/12/2014	N001	110		#	4	
Magnesium	mg/L	06/12/2014	N001	42		#	0.013	
Nitrate + Nitrite as Nitrogen	mg/L	06/12/2014	N001	0.22		#	0.01	
Oxidation Reduction Potential	mV	06/12/2014	N001	75		#		
pH	s.u.	06/12/2014	N001	8.18		#		
Potassium	mg/L	06/12/2014	N001	3.7		#	0.11	
Selenium	mg/L	06/12/2014	N001	0.0018		#	0.00016	
Sodium	mg/L	06/12/2014	N001	120		#	0.0066	
Specific Conductance	umhos/cm	06/12/2014	N001	1280		#		
Sulfate	mg/L	06/12/2014	N001	280		#	10	
Temperature	C	06/12/2014	N001	18.91		#		
Turbidity	NTU	06/12/2014	N001	4.29		#		
Uranium	mg/L	06/12/2014	N001	0.012		#	0.000015	
Vanadium	mg/L	06/12/2014	N001	0.0037		#	0.000076	

**Surface Water Quality Data by Location (USEE102) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: 0571 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers			Detection Limit	Uncertainty
		Date	ID		Lab	Data	QA		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/12/2014	N001	192			#		
Calcium	mg/L	06/12/2014	0001	88			#	0.012	
Chloride	mg/L	06/12/2014	0001	11			#	1	
Magnesium	mg/L	06/12/2014	0001	31			#	0.013	
Nitrate + Nitrite as Nitrogen	mg/L	06/12/2014	0001	0.15			#	0.01	
Oxidation Reduction Potential	mV	06/12/2014	N001	42.2			#		
pH	s.u.	06/12/2014	N001	8.26			#		
Potassium	mg/L	06/12/2014	0001	2.3			#	0.11	
Selenium	mg/L	06/12/2014	0001	0.0012			#	0.000032	
Sodium	mg/L	06/12/2014	0001	18			#	0.0066	
Specific Conductance	umhos/cm	06/12/2014	N001	698			#		
Sulfate	mg/L	06/12/2014	0001	170			#	2.5	
Temperature	C	06/12/2014	N001	18.51			#		
Turbidity	NTU	06/12/2014	N001	38.6			#		
Uranium	mg/L	06/12/2014	0001	0.0034			#	0.000015	
Vanadium	mg/L	06/12/2014	0001	0.0013			#	0.000015	

**Surface Water Quality Data by Location (USEE102) FOR SITE RFO01, Rifle Old Processing Site**

REPORT DATE: 10/8/2014

Location: 0741 SURFACE LOCATION

Parameter	Units	Sample		Result	Qualifiers		Detection Limit	Uncertainty
		Date	ID		Lab	Data		
Alkalinity, Total (as CaCO <sub>3</sub> )	mg/L	06/11/2014	N001	51		#		
Calcium	mg/L	06/11/2014	0001	31		#	0.012	
Chloride	mg/L	06/11/2014	0001	23		#	0.4	
Magnesium	mg/L	06/11/2014	0001	5.6		#	0.013	
Nitrate + Nitrite as Nitrogen	mg/L	06/11/2014	0001	0.11		#	0.01	
Oxidation Reduction Potential	mV	06/11/2014	N001	90.4		#		
pH	s.u.	06/11/2014	N001	7.95		#		
Potassium	mg/L	06/11/2014	0001	1.3		#	0.11	
Selenium	mg/L	06/11/2014	0001	0.00032		#	0.000032	
Sodium	mg/L	06/11/2014	0001	15		#	0.0066	
Specific Conductance	umhos/cm	06/11/2014	N001	341		#		
Sulfate	mg/L	06/11/2014	0001	31		#	1	
Temperature	C	06/11/2014	N001	16.04		#		
Turbidity	NTU	06/11/2014	N001	27.8		#		
Uranium	mg/L	06/11/2014	0001	0.00089		#	0.000029	
Vanadium	mg/L	06/11/2014	0001	0.00062		#	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. | Q | Qualitative result due to sampling technique. | R | Unusable result. |
| U | Parameter analyzed for but was not detected.       | X | Location is undefined.                        |   |                  |

QA QUALIFIER:

- # Validated according to quality assurance guidelines.

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## **Equipment Blank Data**

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**BLANKS REPORT**

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

RIN: 14066229

Report Date: 10/8/2014

Parameter	Site Code	Location ID	Sample		Units	Result	Qualifiers		Detection Limit	Uncertainty	Sample Type
			Date	ID			Lab	Data			
Calcium	RFN01	0999	06/12/2014	N001	mg/L	0.14	B	U	0.012		E
Chloride	RFN01	0999	06/12/2014	N001	mg/L	0.2	U		0.2		E
Magnesium	RFN01	0999	06/12/2014	N001	mg/L	0.071	B	U	0.013		E
Nitrate + Nitrite as Nitrogen	RFN01	0999	06/12/2014	N001	mg/L	0.01	U		0.01		E
Potassium	RFN01	0999	06/12/2014	N001	mg/L	0.2	B	U	0.11		E
Selenium	RFN01	0999	06/12/2014	N001	mg/L	0.000032	U		0.000032		E
Sodium	RFN01	0999	06/12/2014	N001	mg/L	0.18	B	U	0.0066		E
Sulfate	RFN01	0999	06/12/2014	N001	mg/L	0.5	U		0.5		E
Uranium	RFN01	0999	06/12/2014	N001	mg/L	0.0000029	U		0.0000029		E
Vanadium	RFN01	0999	06/12/2014	N001	mg/L	0.000076	B	U	0.000015		E

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

## LAB QUALIFIERS:

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

DATA QUALIFIERS:

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

SAMPLE TYPES:

- |   |                  |
|---|------------------|
| E | Equipment Blank. |
|---|------------------|

## **Static Water Level Data**

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**STATIC WATER LEVELS (USEE700) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 10/8/2014**

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0169	U	5275.47	06/09/2014	13:30:00	5.58	5269.89	
0170	D	5332.97	06/11/2014	16:15:40	94.79	5238.18	
0172	D	5229.45	06/10/2014	11:40:16	14.41	5215.04	
0195	D	5253.1	08/07/2014	11:20:07	14.08	5239.02	
0201	D	5261.07	06/09/2014	14:35:02	12.86	5248.21	
0215	O	5271.42	06/09/2014	15:25:46	7.16	5264.26	
0216	O	5265.41	08/07/2014	14:40:12	6.76	5258.65	
0217	D	5256.98	08/11/2014	13:15:08	4.80	5252.18	
0590	D	5256.37	08/07/2014	13:05:28	6.73	5249.64	
0620	D	5231.22	06/11/2014	16:50:15	7.59	5223.63	
0658	O	5265.91	06/09/2014	16:20:00	4.05	5261.86	
0659	O	5261.33	06/11/2014	10:30:40	5.75	5255.58	
0664	O	5270.17	06/11/2014	09:45:10	12.09	5258.08	
0669	O	5266.56	06/11/2014	10:05:26	8.39	5258.17	
0670	O	5270.94	06/11/2014	09:05:03	11.25	5259.69	
0855	O	5267.24	06/09/2014	16:05:09	5.28	5261.96	
CW06			06/10/2014	13:45:48	7.49		
CW09			06/10/2014	14:10:32	6.95		
CW19			06/10/2014	14:45:40	5.95		
CW22			06/10/2014	16:00:27	3.73		
CW23			06/10/2014	15:35:56	4.65		
CW25			06/10/2014	15:05:08	3.40		

FLOW CODES:            D DOWNGRADIENT            O ONSITE            U UPGRADIENT

**STATIC WATER LEVELS (USEE700) FOR SITE RFO01, Rifle Old Processing Site**  
**REPORT DATE: 10/8/2014**

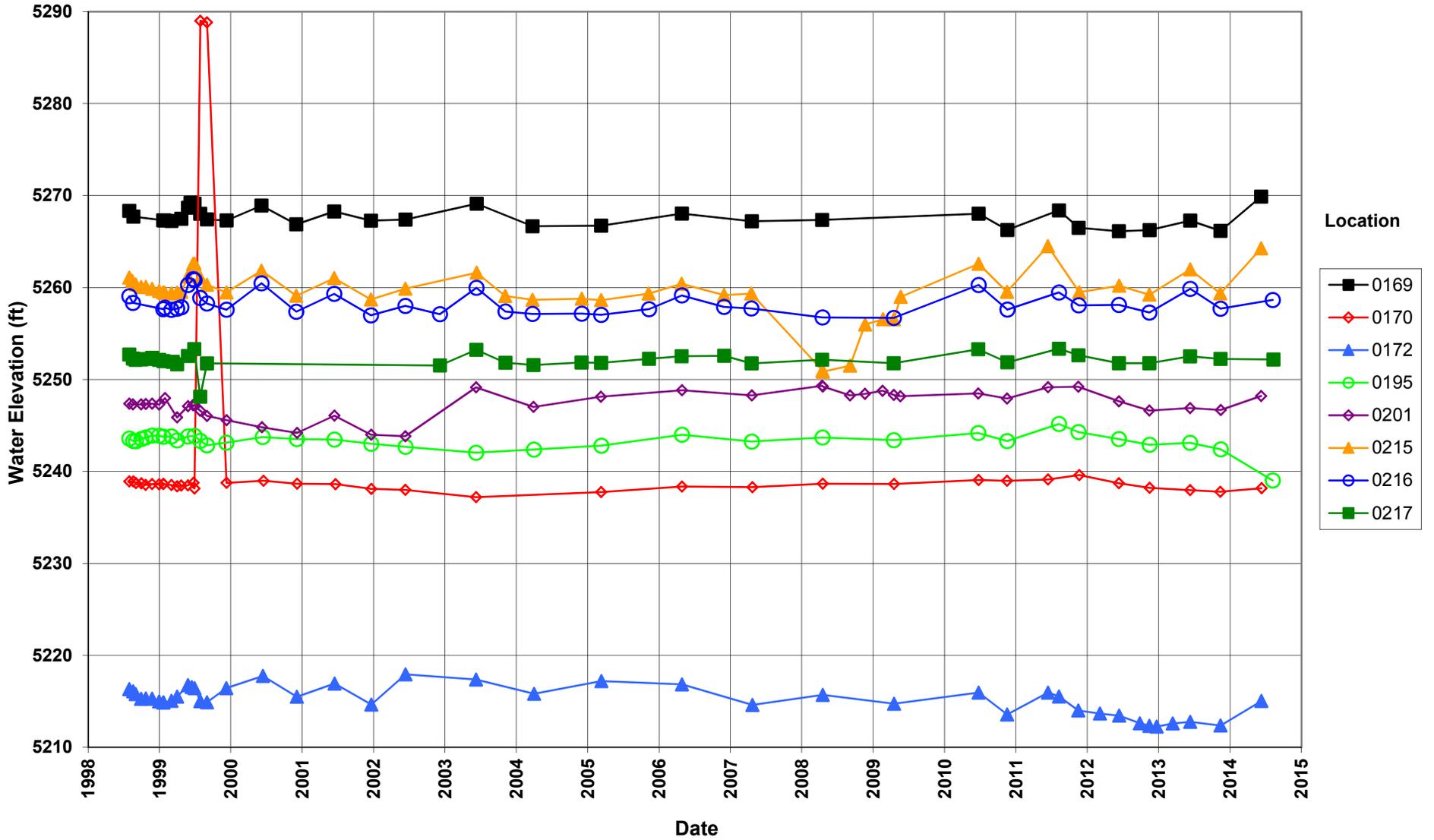
Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date	Measurement Time	Depth From Top of Casing (Ft)	Water Elevation (Ft)	Water Level Flag
0292A		5323.08	06/12/2014	10:35:38	9.73	5313.35	
0304	O	5310.63	06/12/2014	14:20:12	6.25	5304.38	
0305	O	5312.08	06/12/2014	13:55:35	7.71	5304.37	
0309	O	5313.37	06/11/2014	12:45:06	11.06	5302.31	
0310	O	5311.64	06/12/2014	14:40:53	8.16	5303.48	
0655	O	5312.87	06/12/2014	14:55:28	8.75	5304.12	
0656	O	5313.28	06/12/2014	13:30:39	8.31	5304.97	
0658	U	5323.07	06/12/2014	10:10:20	6.62	5316.45	
CLOUGH WELL 2			06/12/2014	11:25:54	1.20		

FLOW CODES:            O ONSITE                    U UPGRADIENT

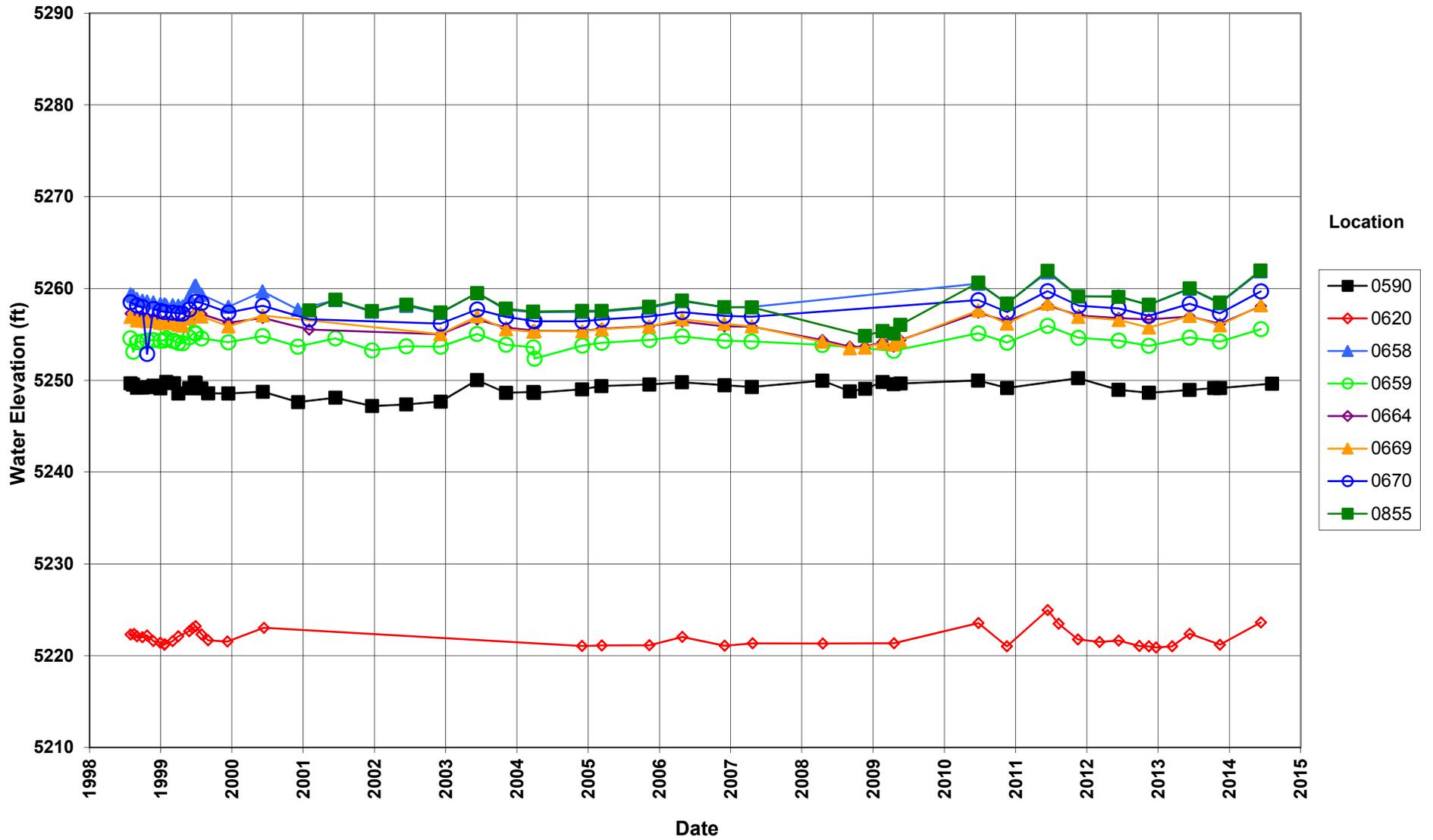
# **New Rifle Hydrographs**

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# Rifle New Processing Site Hydrograph



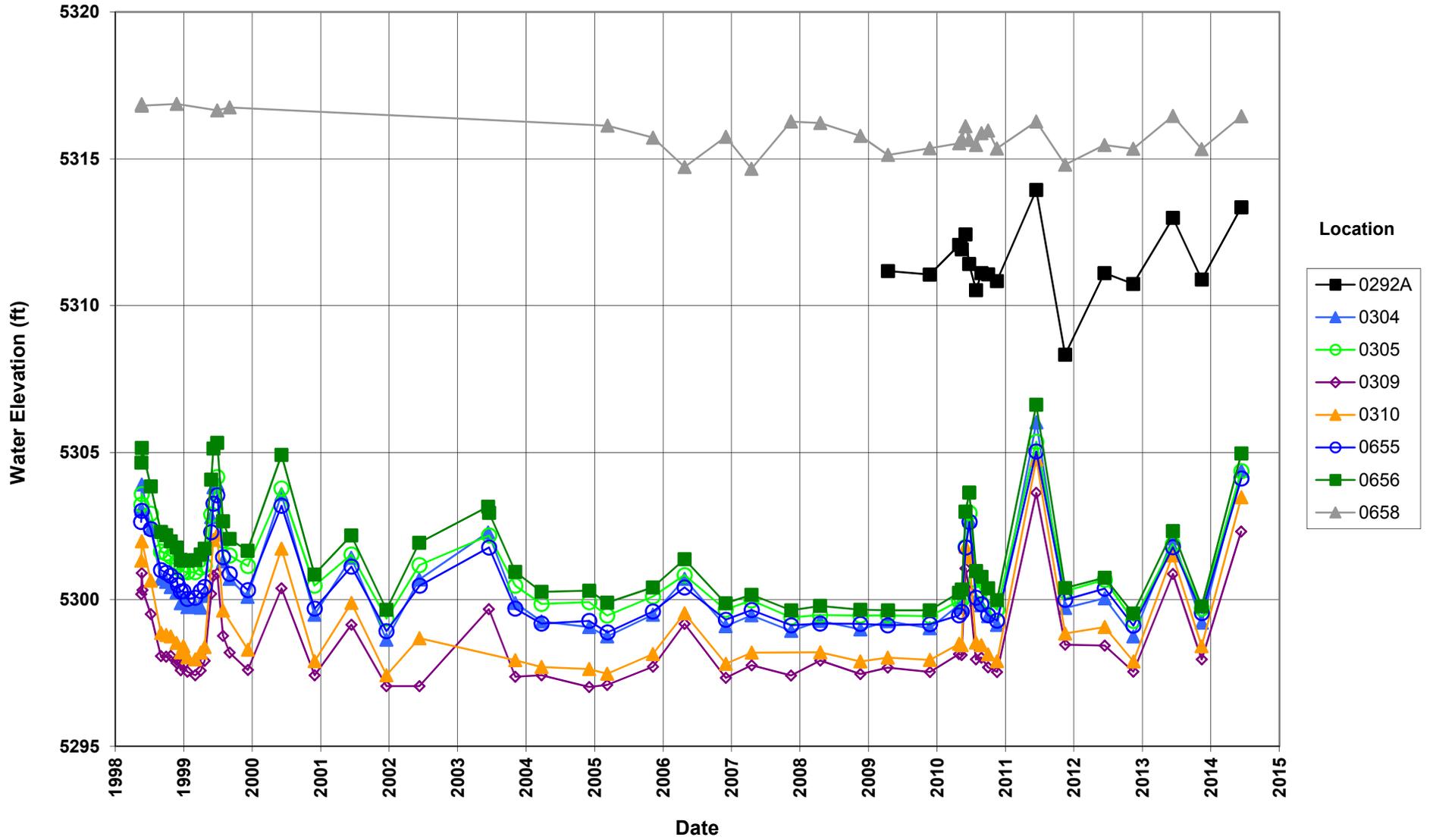
# Rifle New Processing Site Hydrograph



# **Old Rifle Hydrograph**

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# Rifle Old Processing Site Hydrograph

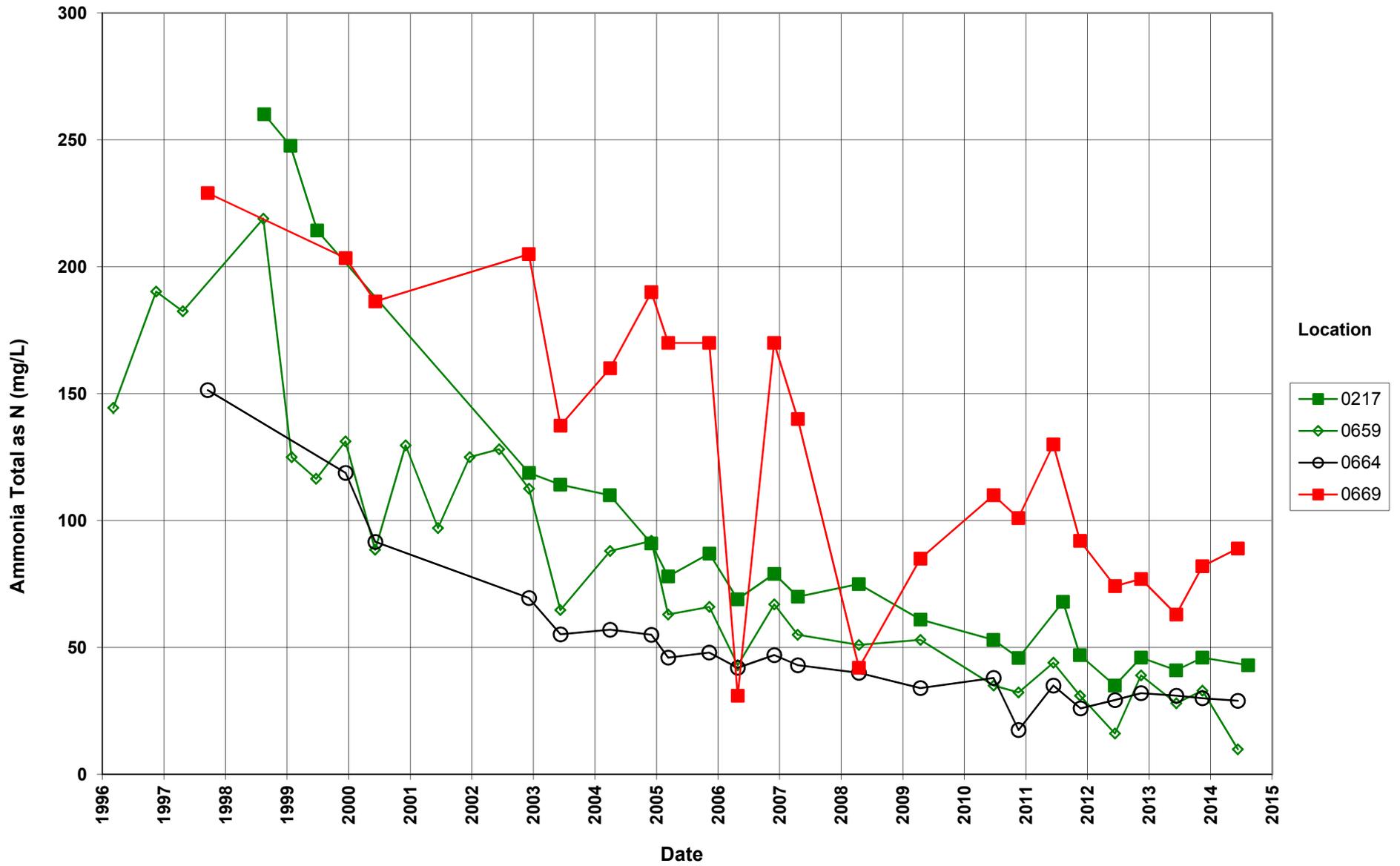


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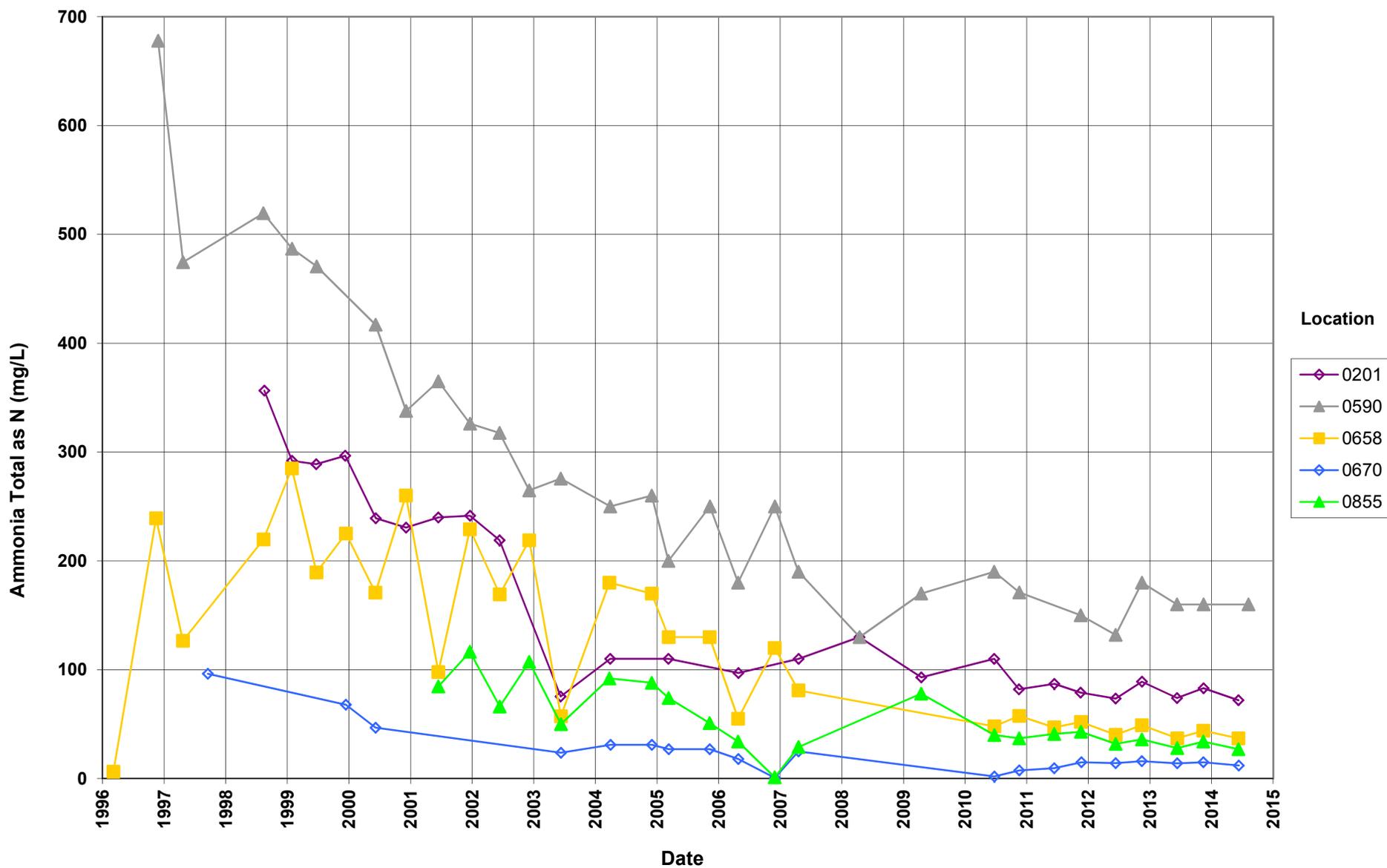
# **New Rifle Groundwater Time-Concentration Graphs**

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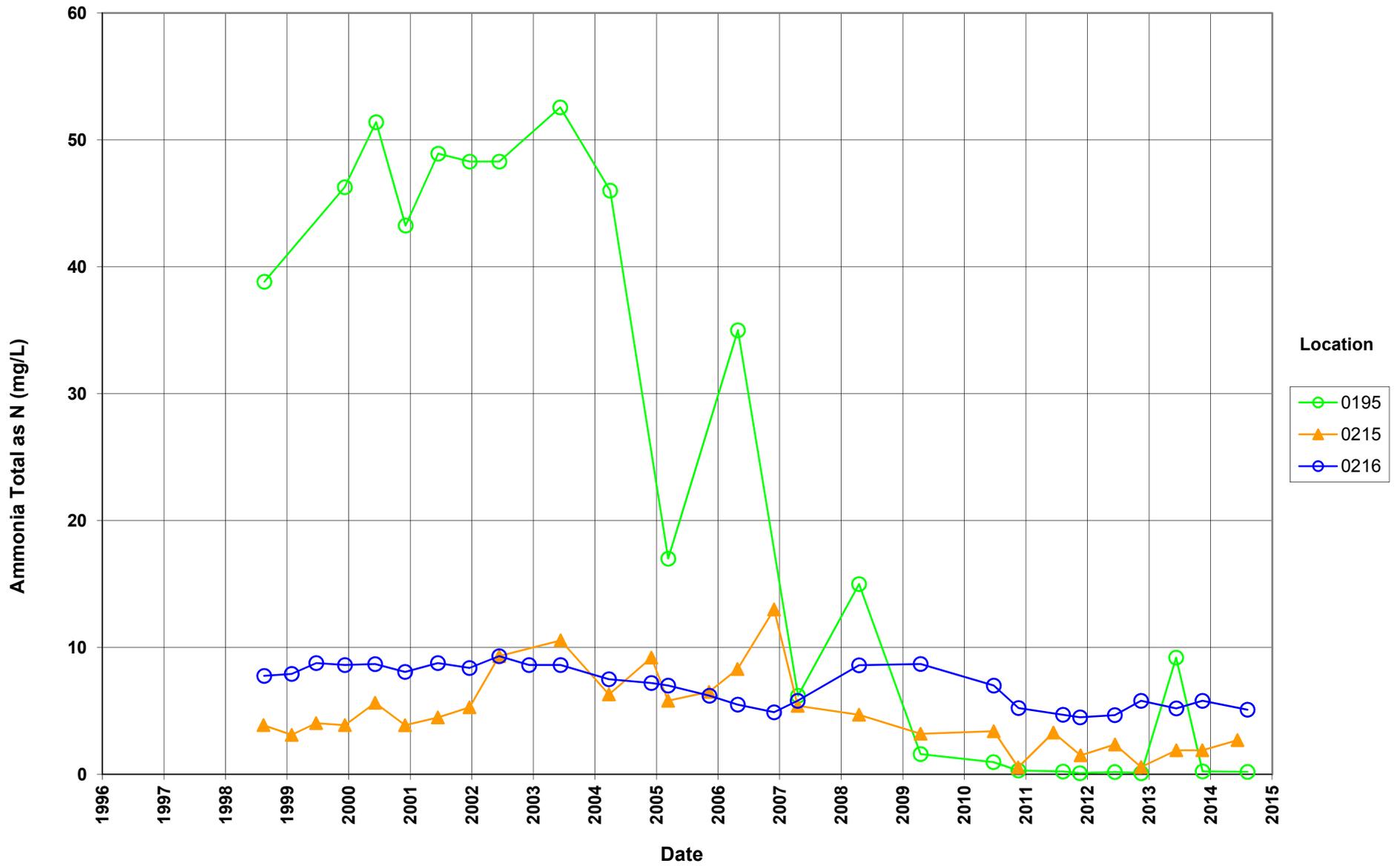
**Rifle New Processing Site  
Ammonia Total as N Concentration  
Point of Compliance Wells**



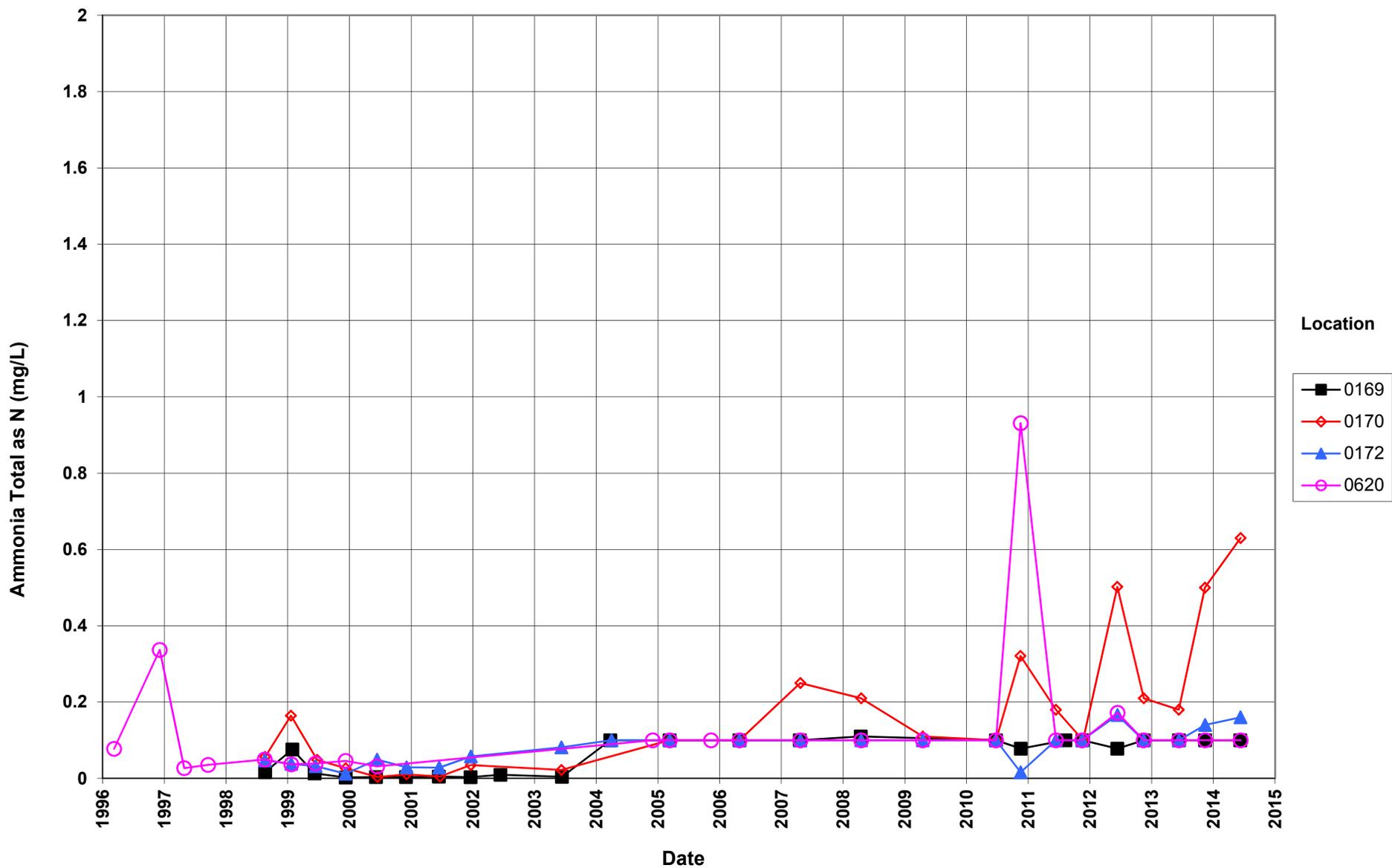
### Rifle New Processing Site Ammonia Total as N Concentration



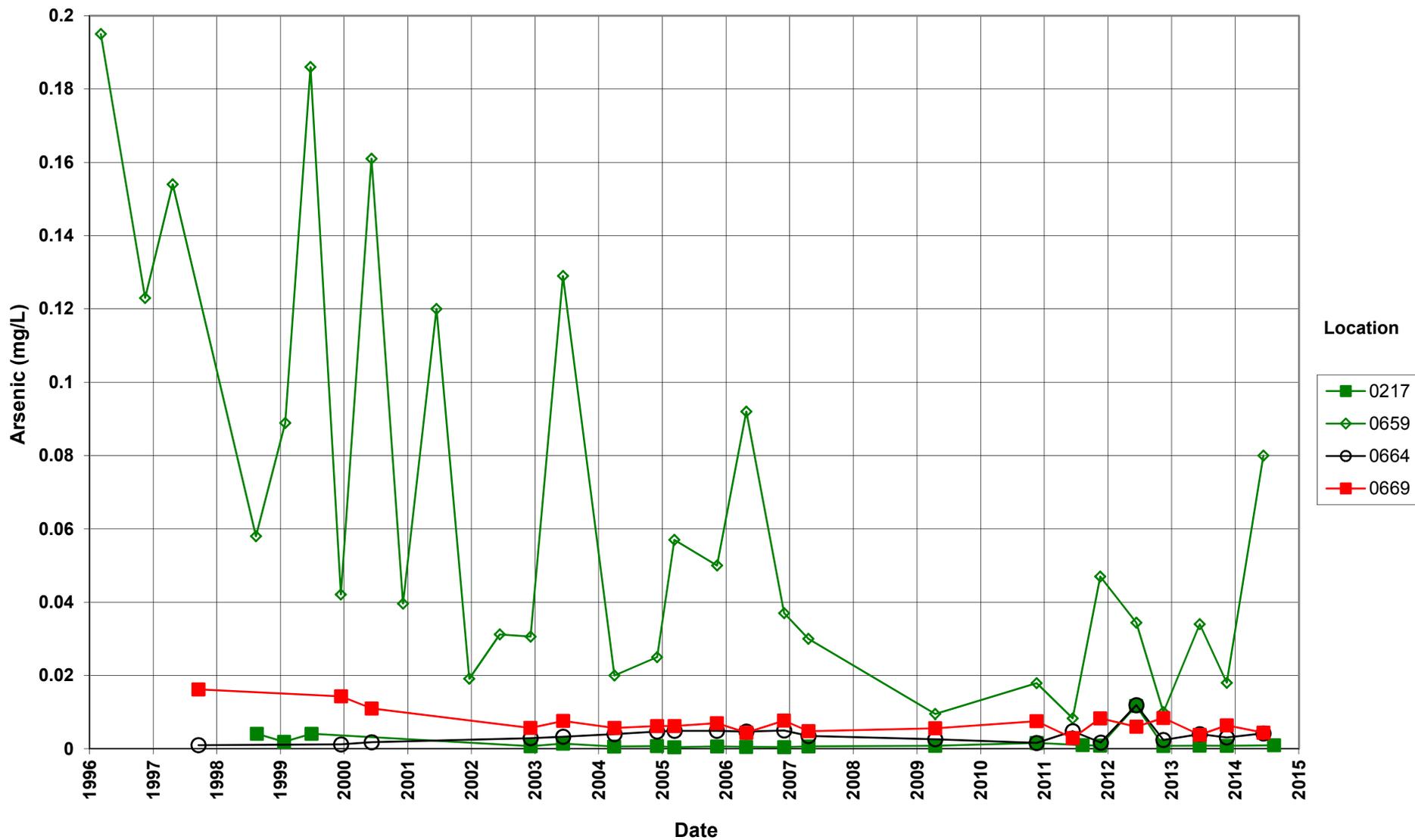
### Rifle New Processing Site Ammonia Total as N Concentration



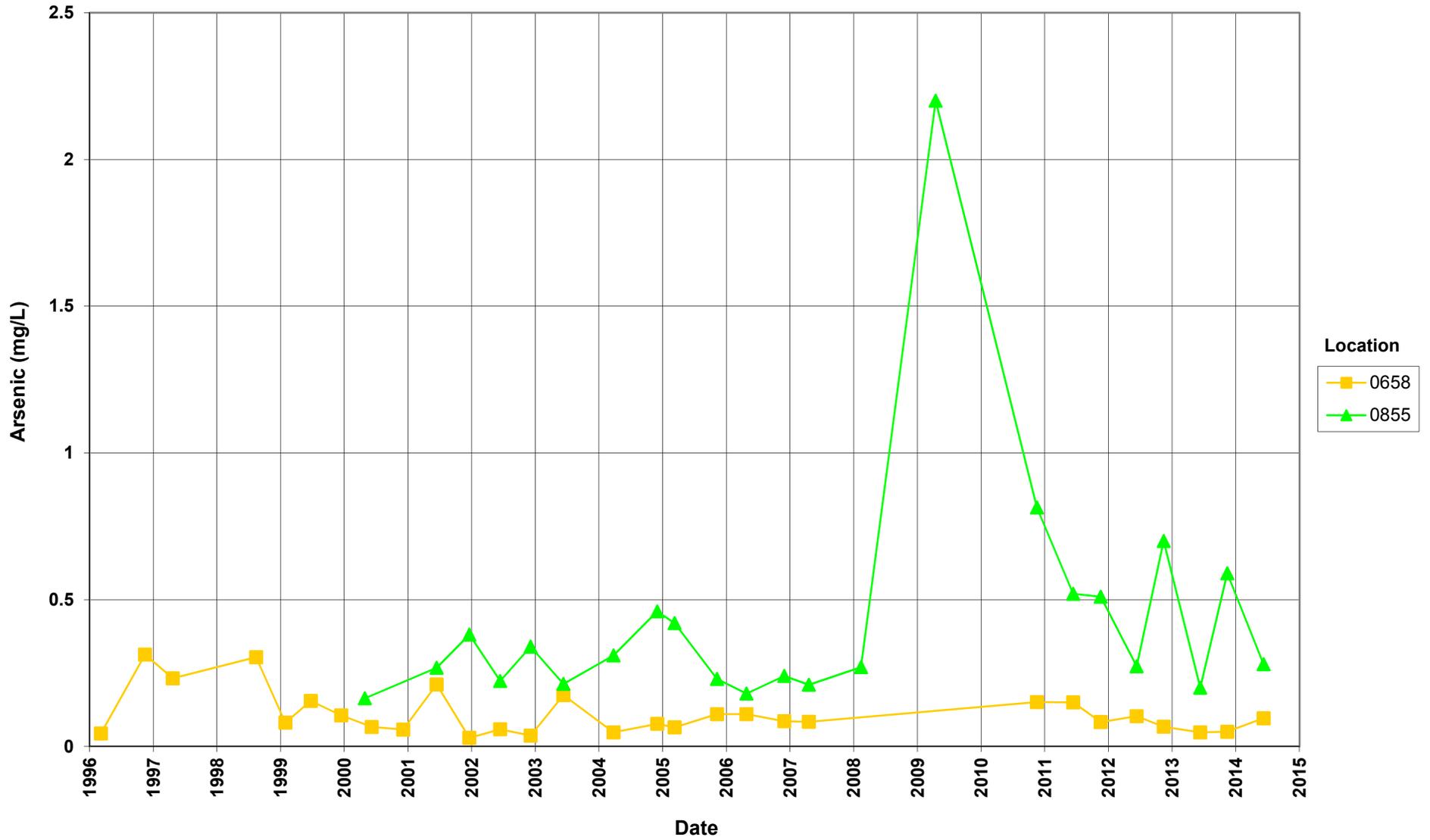
### Rifle New Processing Site Ammonia Total as N Concentration



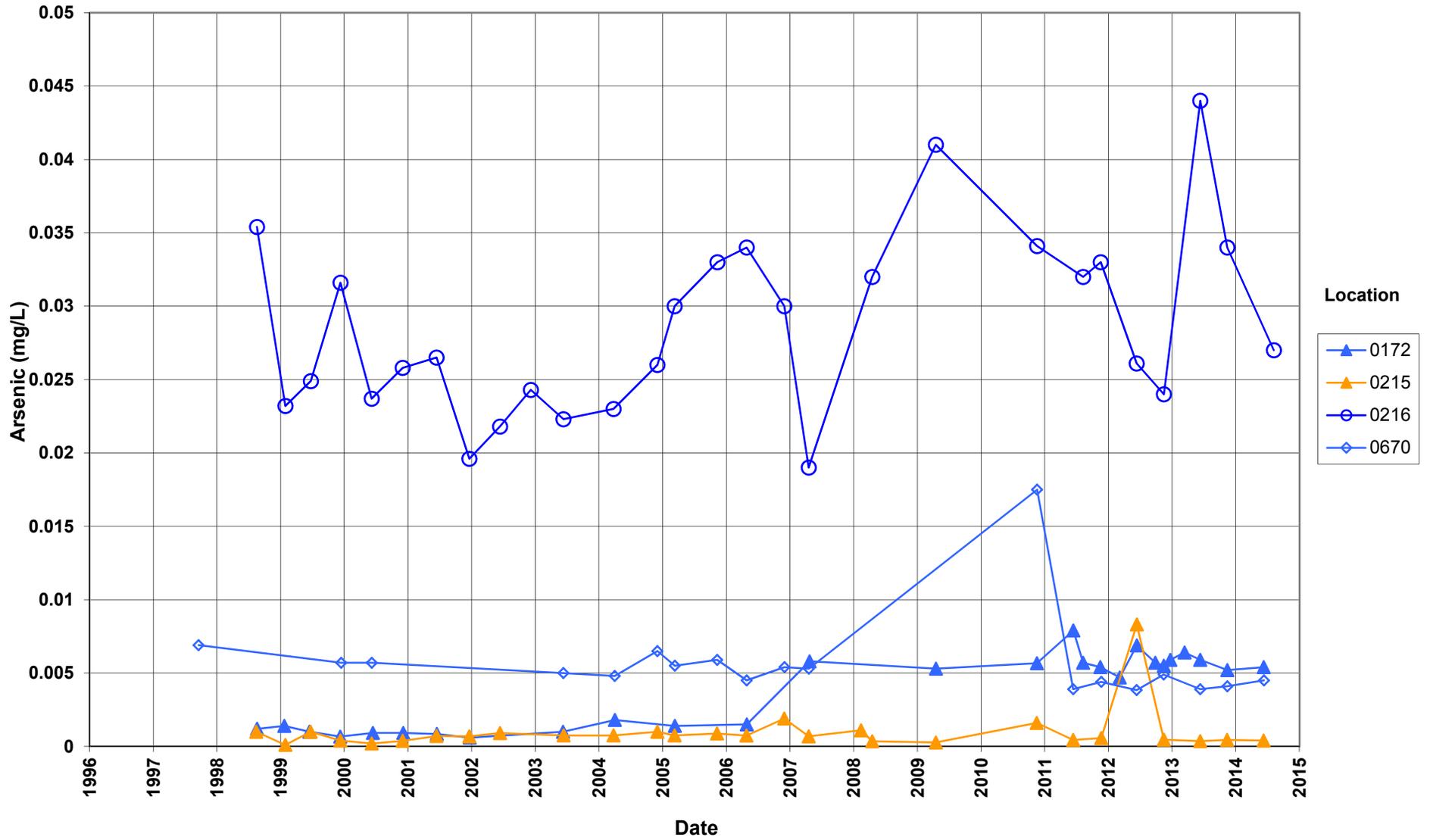
**Rifle New Processing Site  
Arsenic Concentration  
Point of Compliance Wells**  
Alternate Concentration Limit (ACL) = 5.8 mg/L



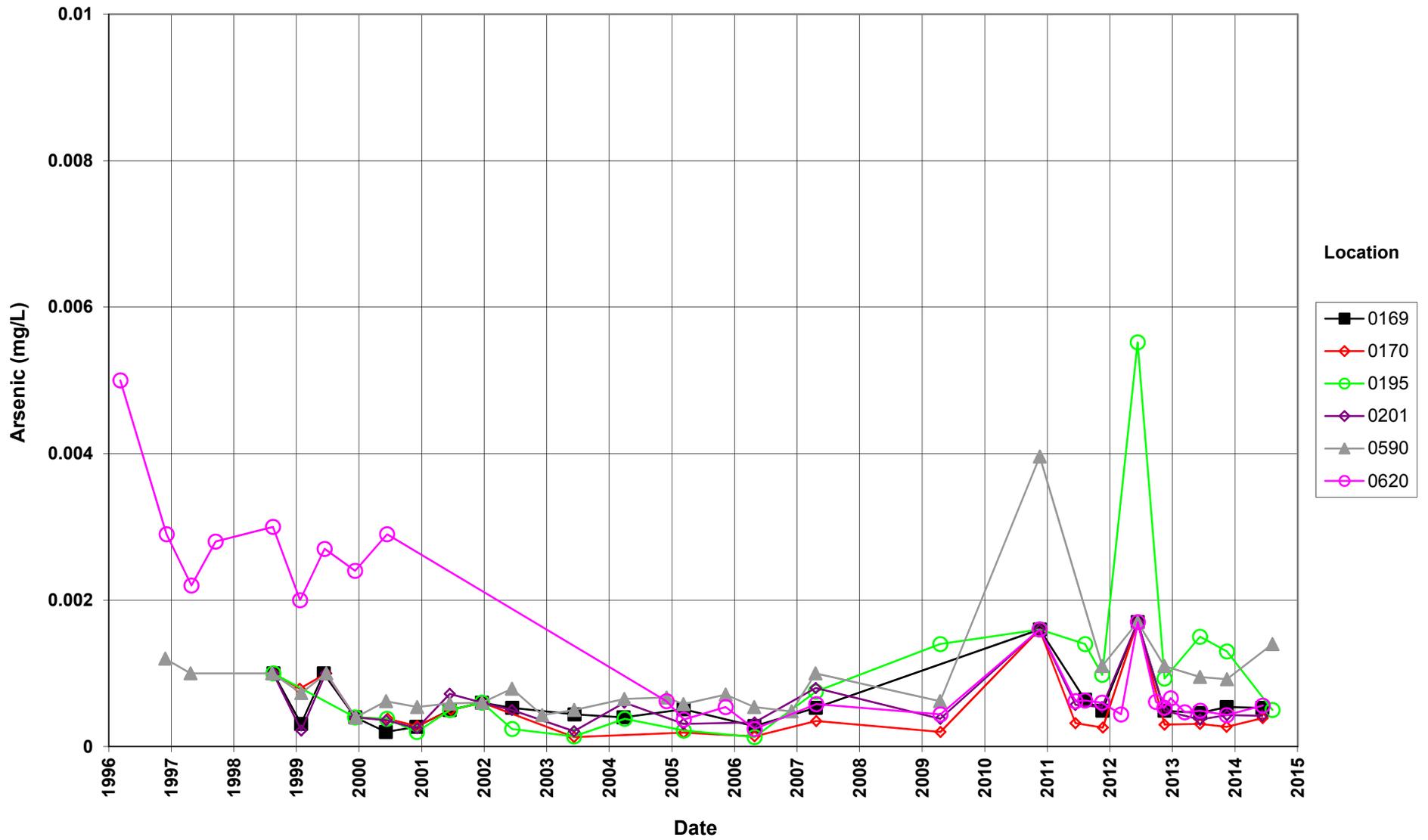
### Rifle New Processing Site Arsenic Concentration



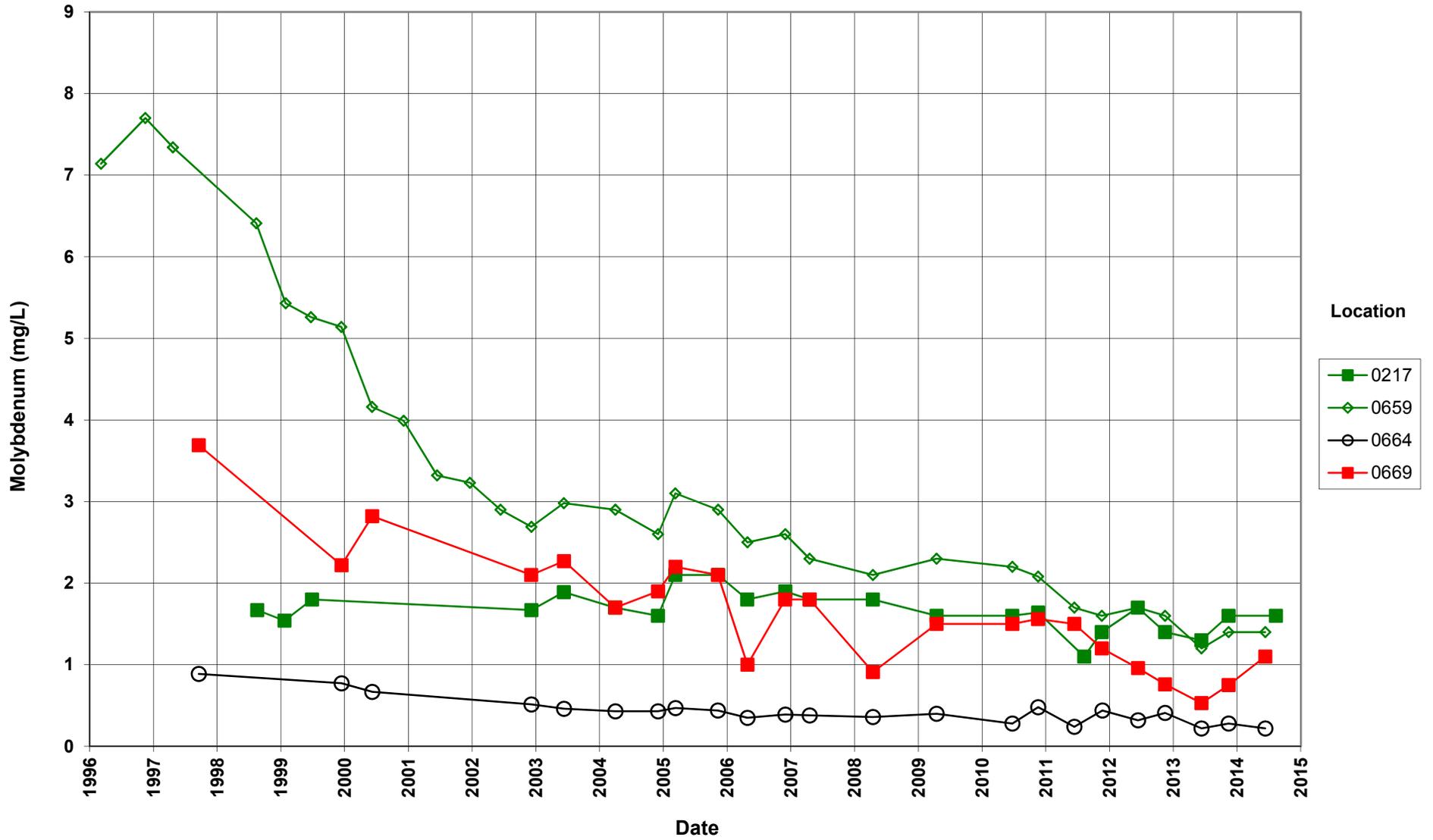
### Rifle New Processing Site Arsenic Concentration



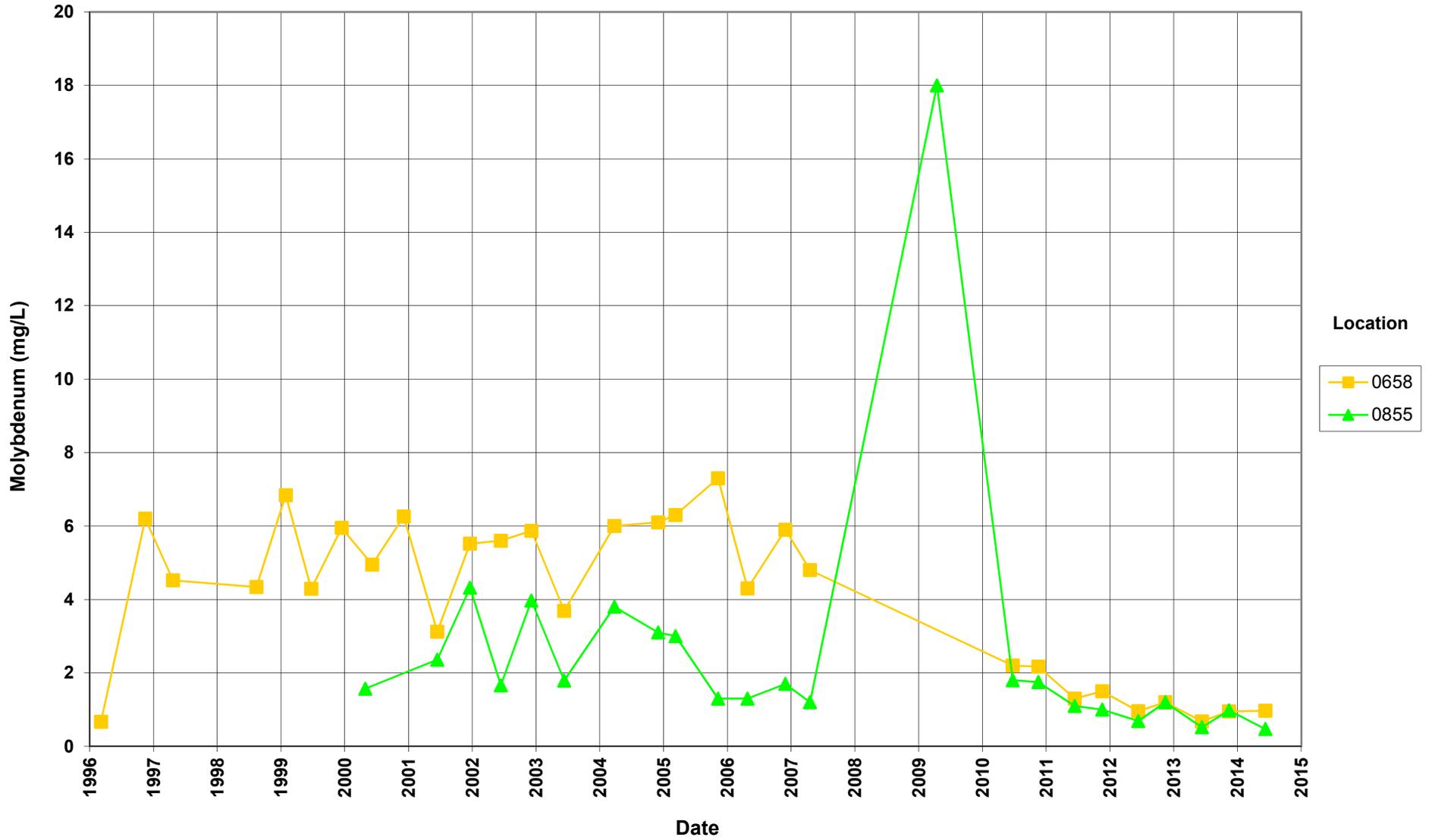
# Rifle New Processing Site Arsenic Concentration



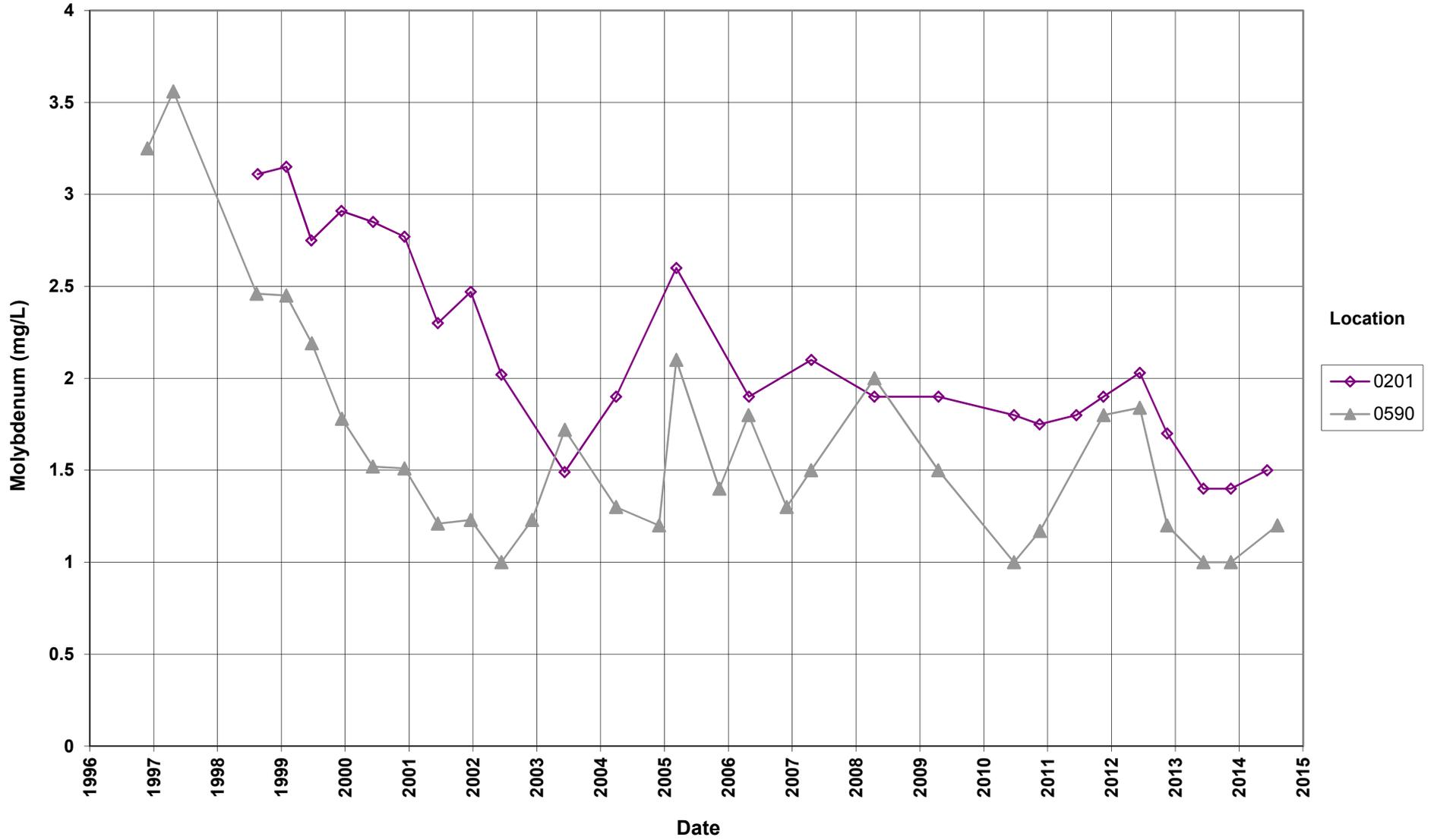
**Rifle New Processing Site  
Molybdenum Concentration  
Point of Compliance Wells  
Alternate Concentration Limit (ACL) = 96 mg/L**



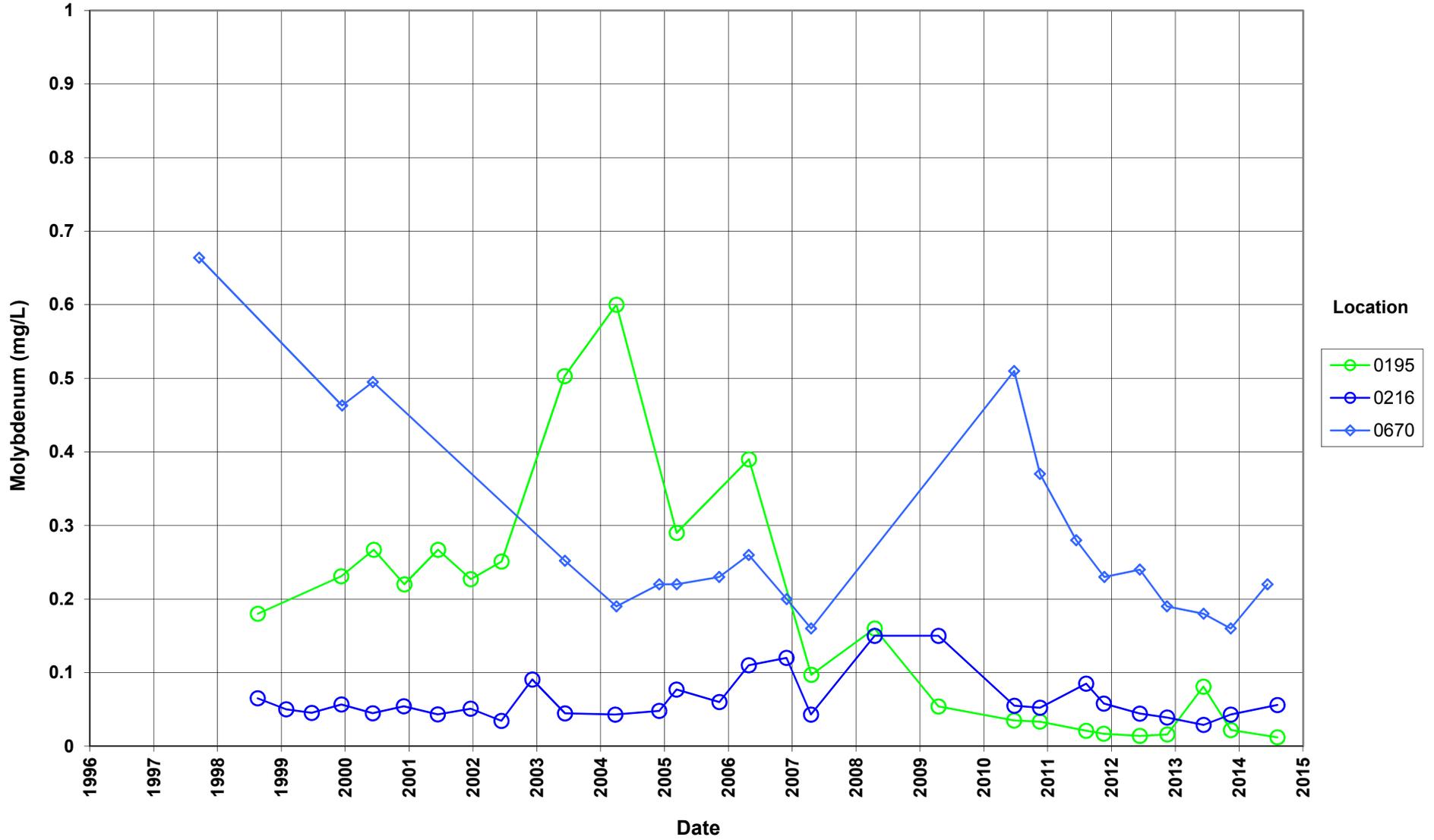
# Rifle New Processing Site Molybdenum Concentration



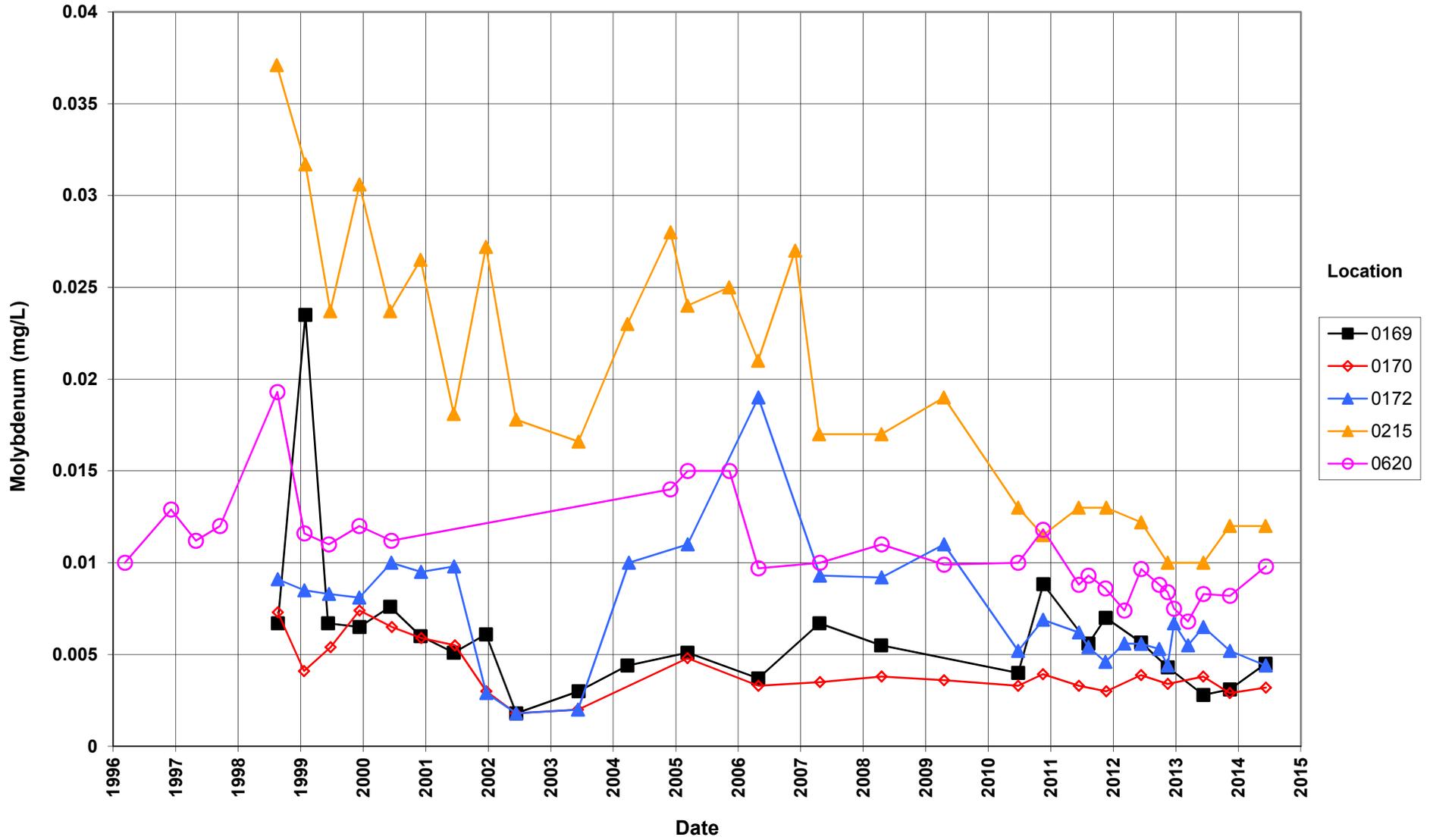
### Rifle New Processing Site Molybdenum Concentration



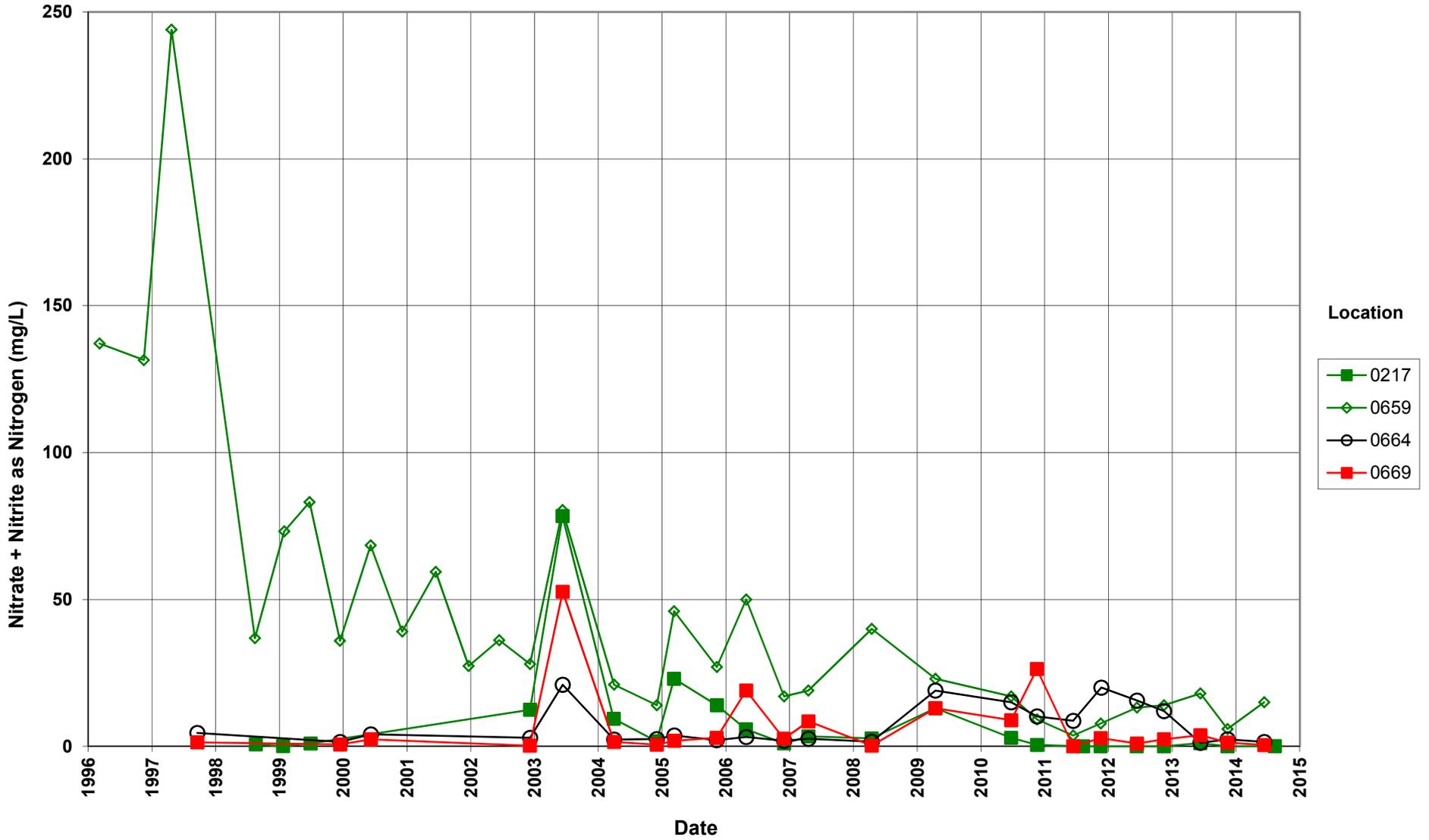
# Rifle New Processing Site Molybdenum Concentration



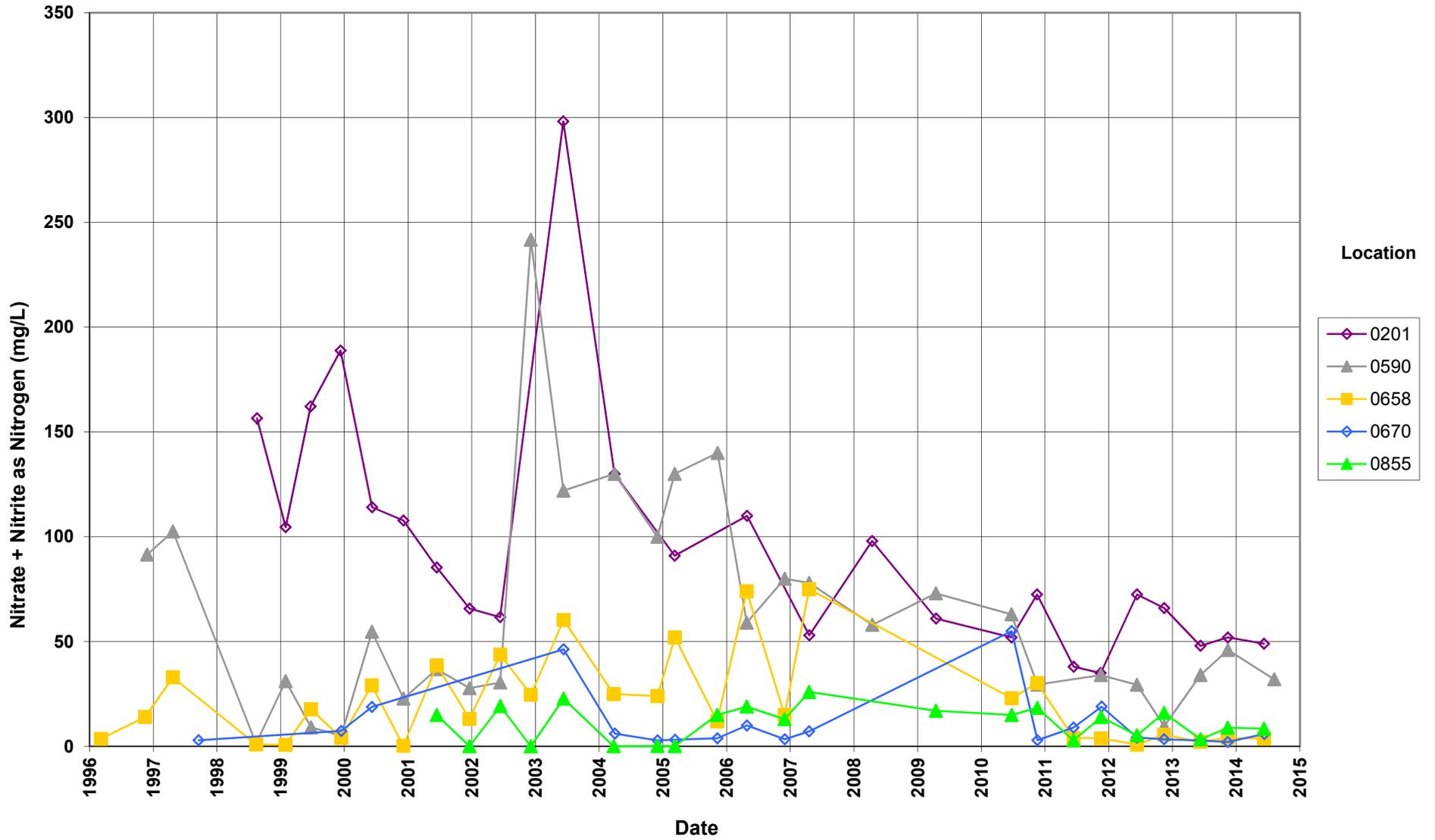
# Rifle New Processing Site Molybdenum Concentration



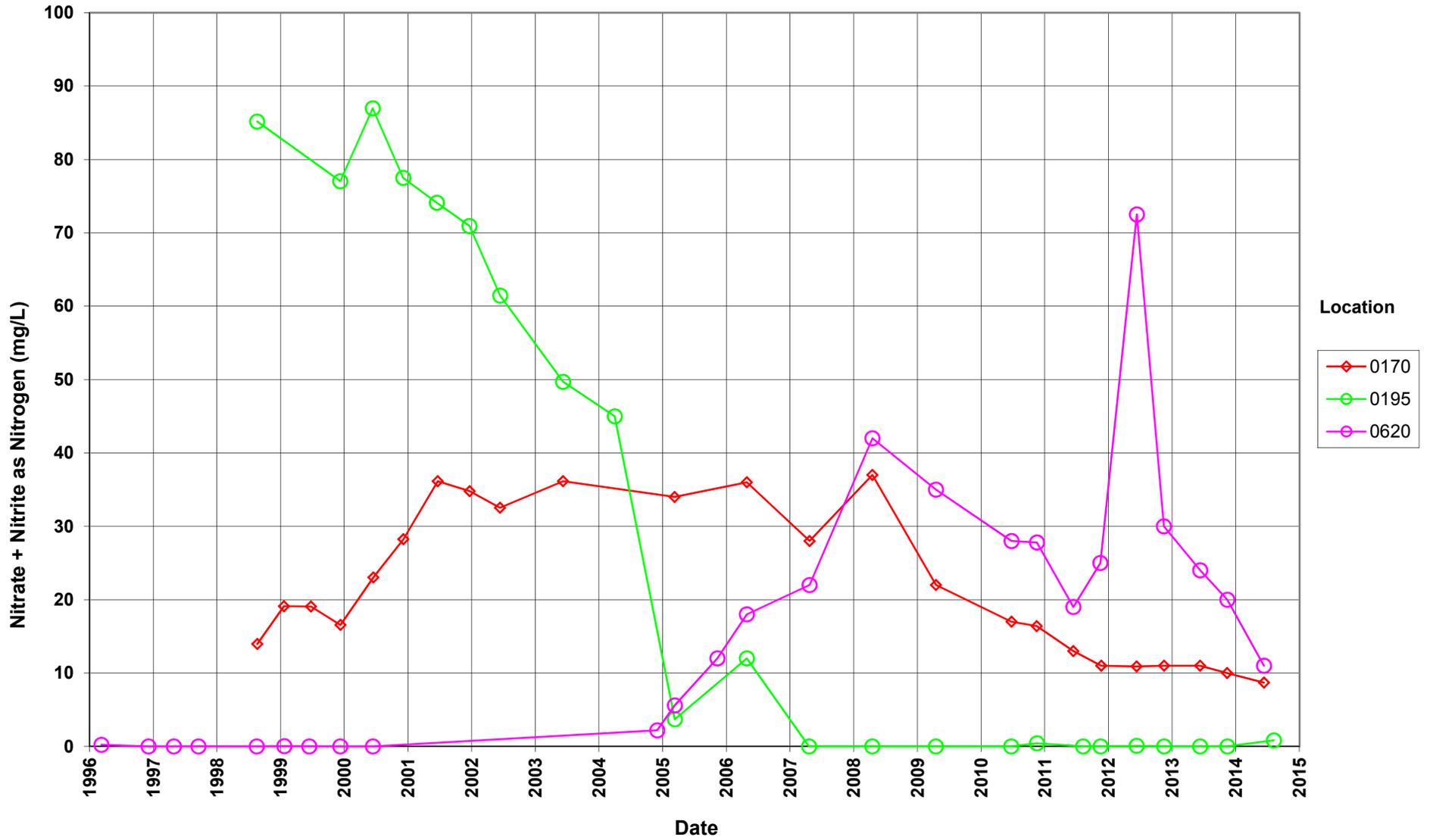
**Rifle New Processing Site**  
**Nitrate + Nitrite as Nitrogen Concentration**  
**Point of Compliance Wells**  
Alternate Concentration Limit (ACL) = 30,200 mg/L



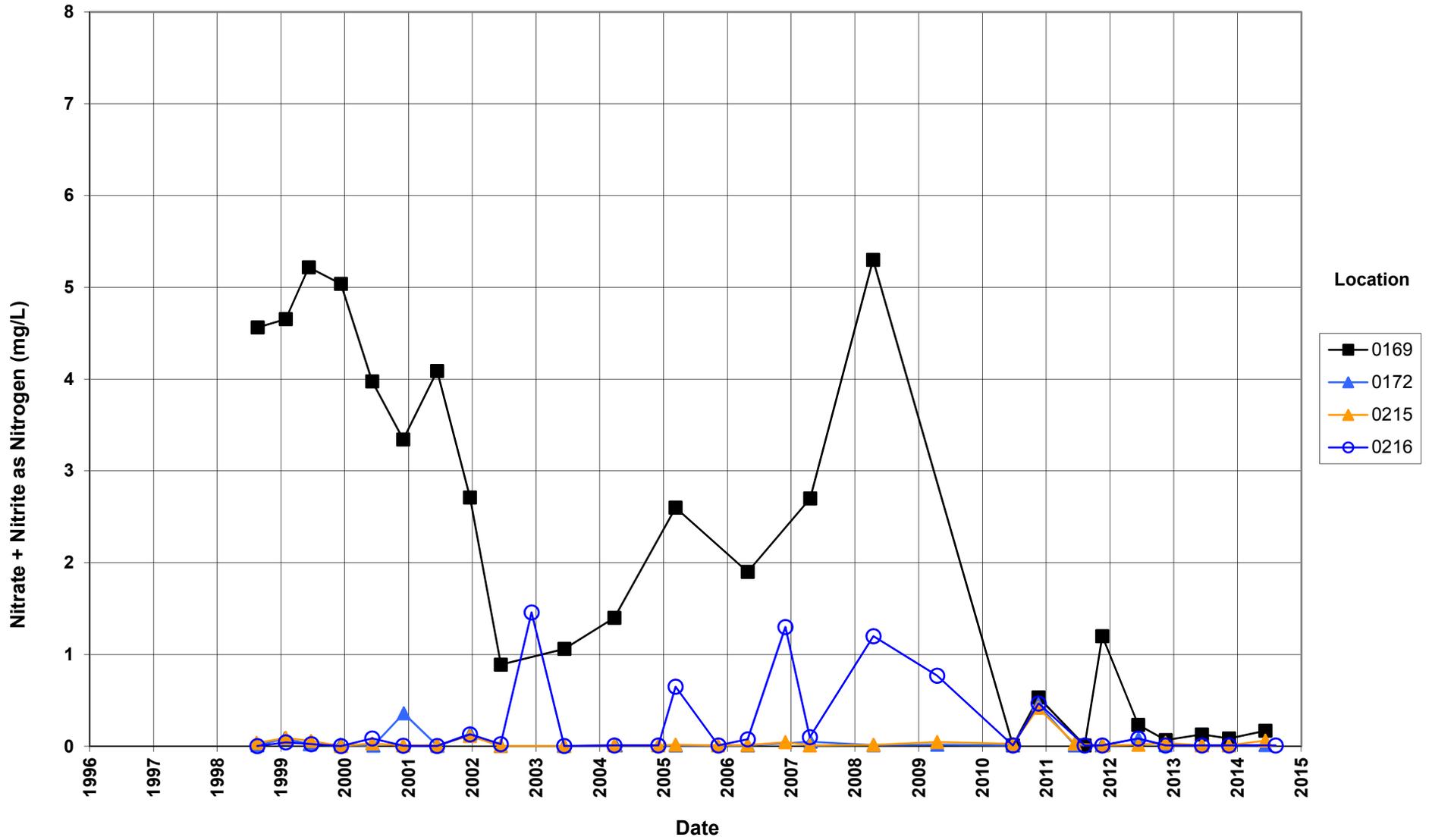
# Rifle New Processing Site Nitrate + Nitrite as Nitrogen Concentration



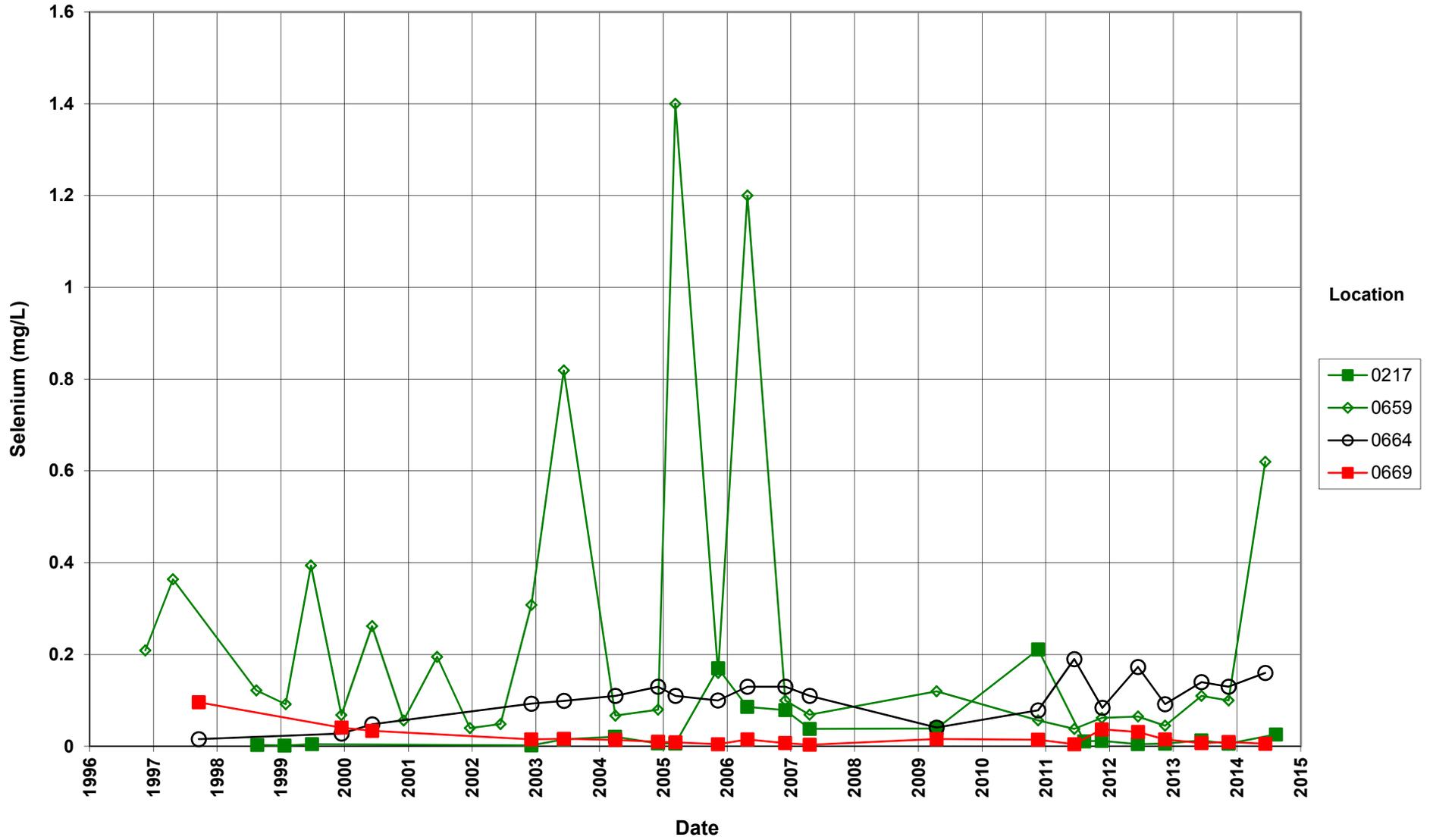
### Rifle New Processing Site Nitrate + Nitrite as Nitrogen Concentration



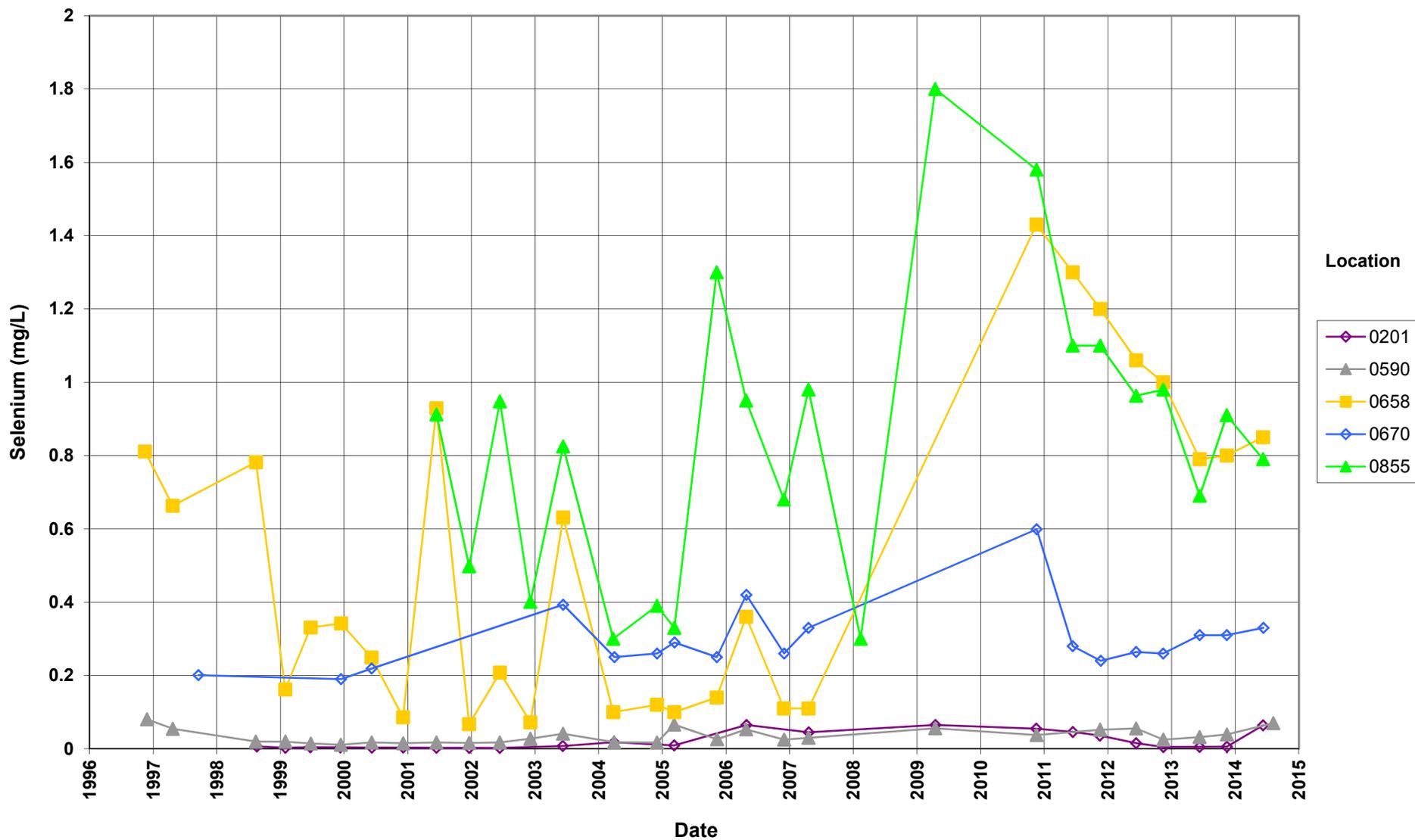
### Rifle New Processing Site Nitrate + Nitrite as Nitrogen Concentration



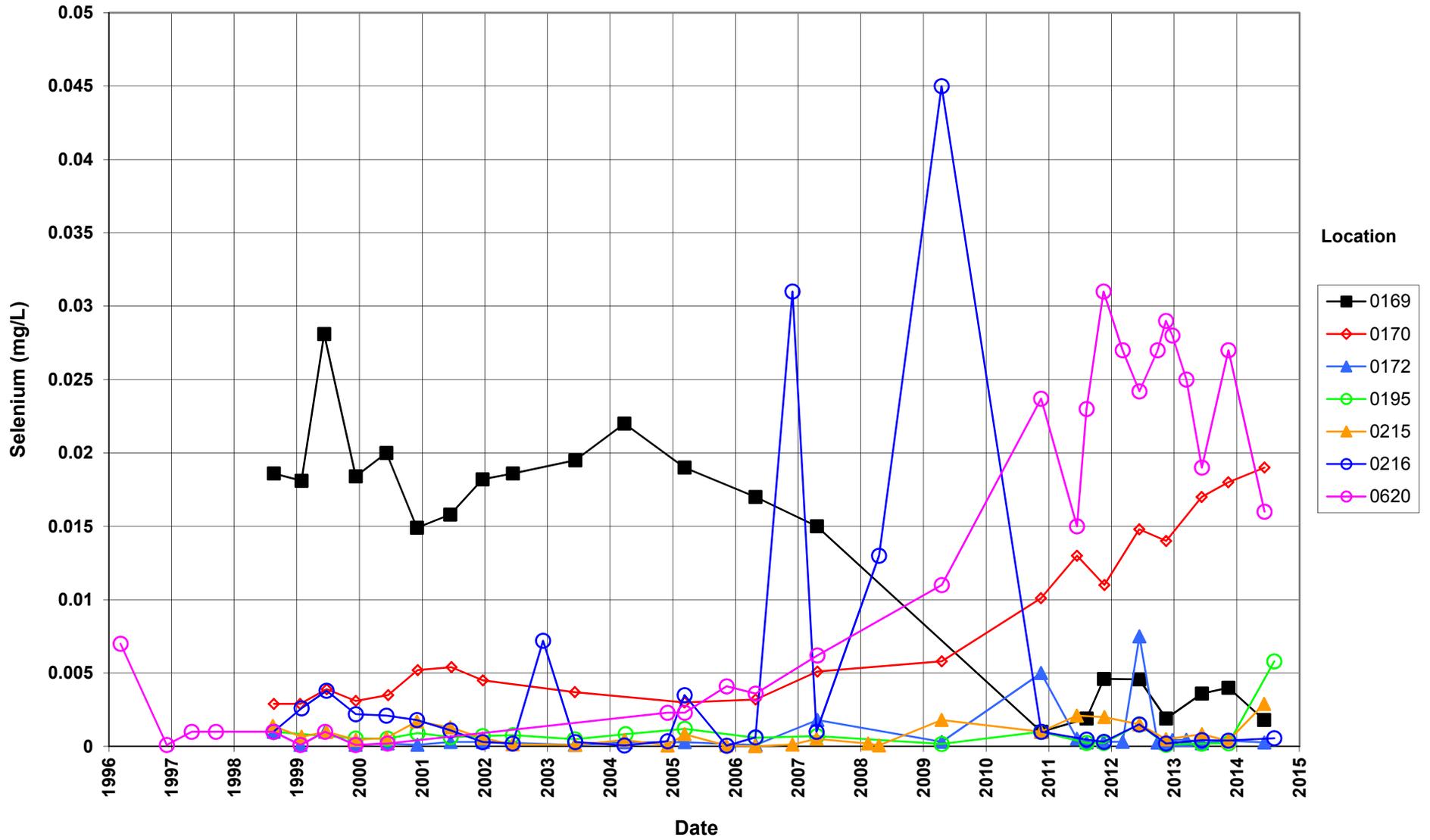
**Rifle New Processing Site  
Selenium Concentration  
Point of Compliance Wells  
Alternate Concentration Limit (ACL) = 96 mg/L**



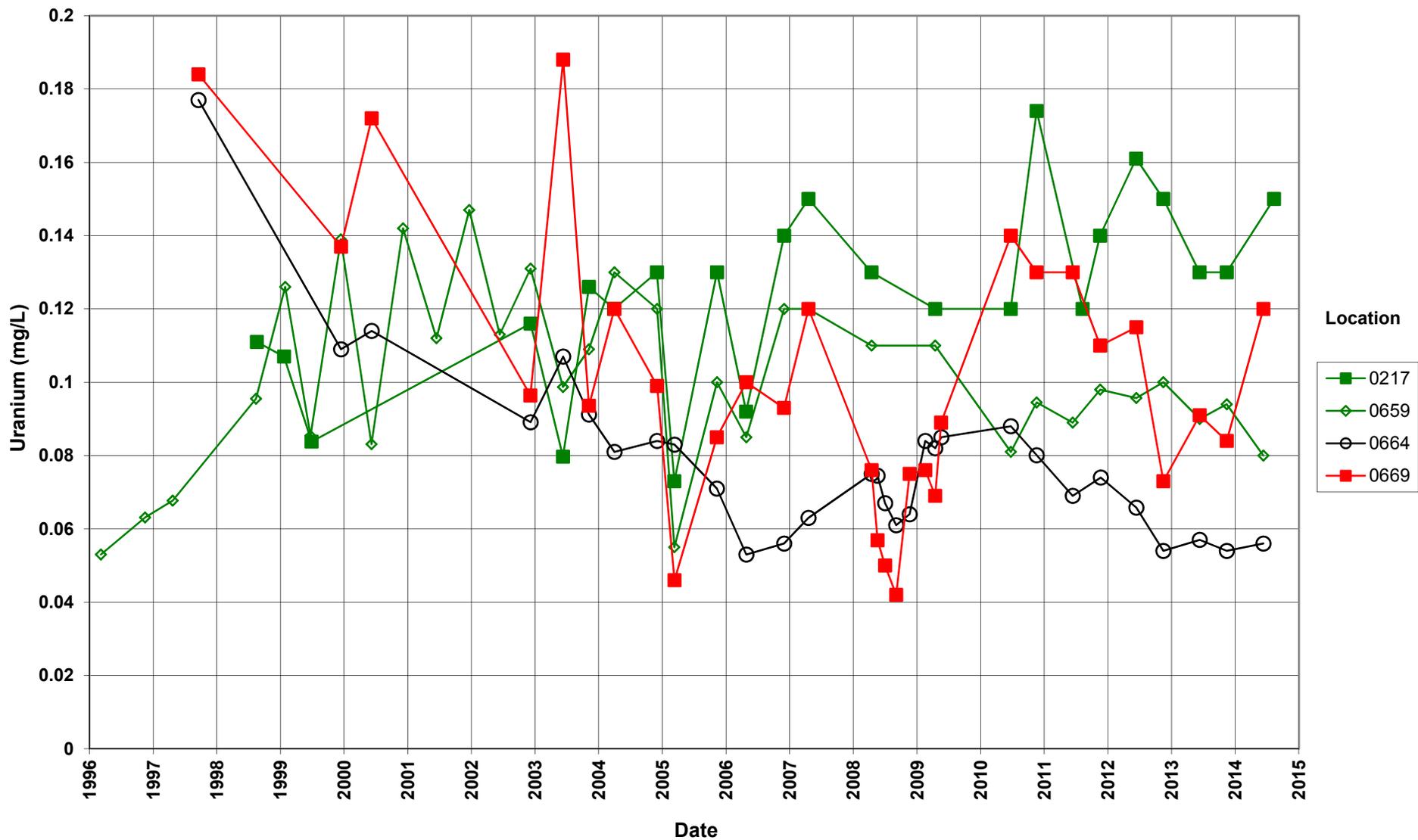
## Rifle New Processing Site Selenium Concentration



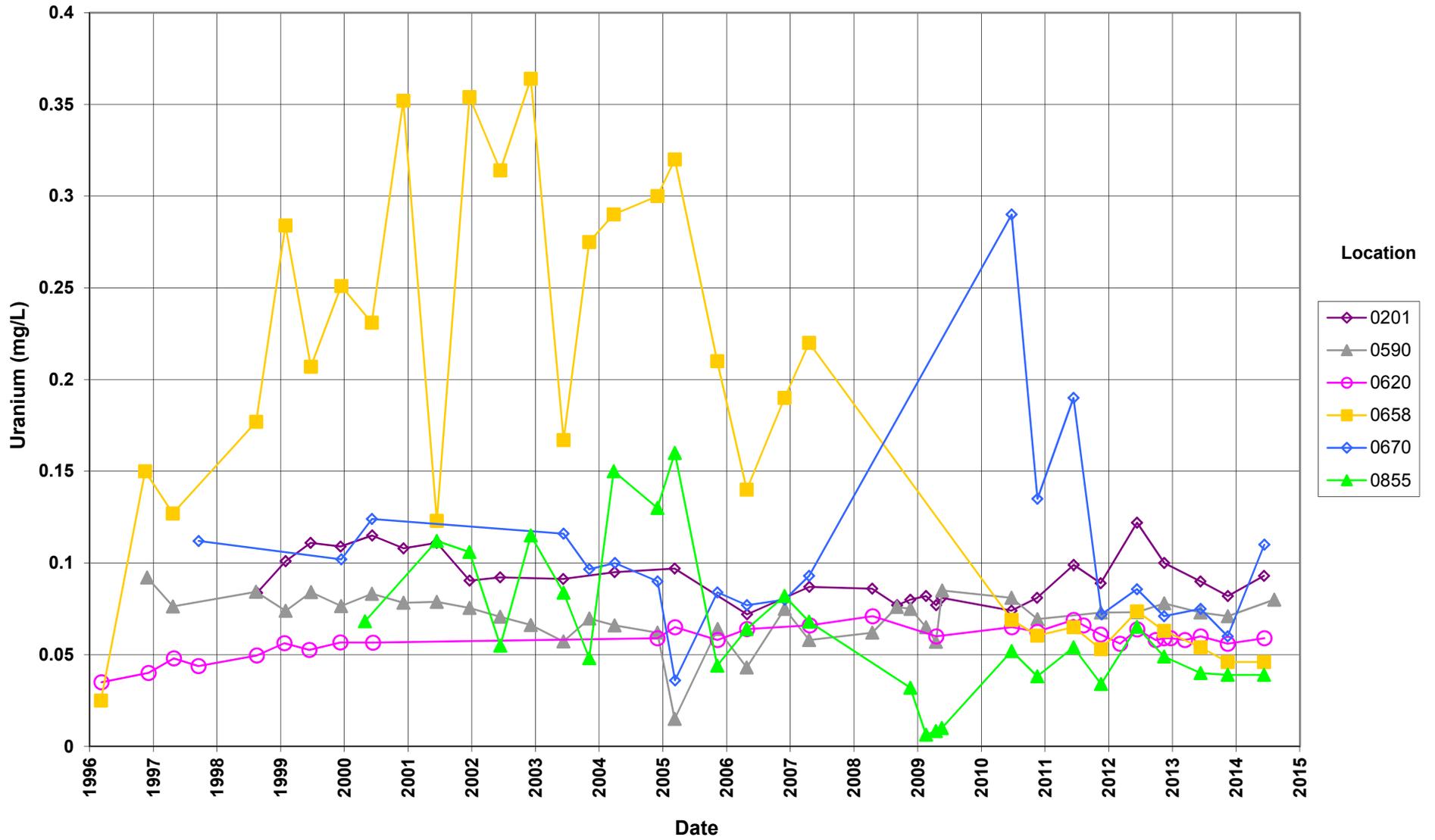
### Rifle New Processing Site Selenium Concentration



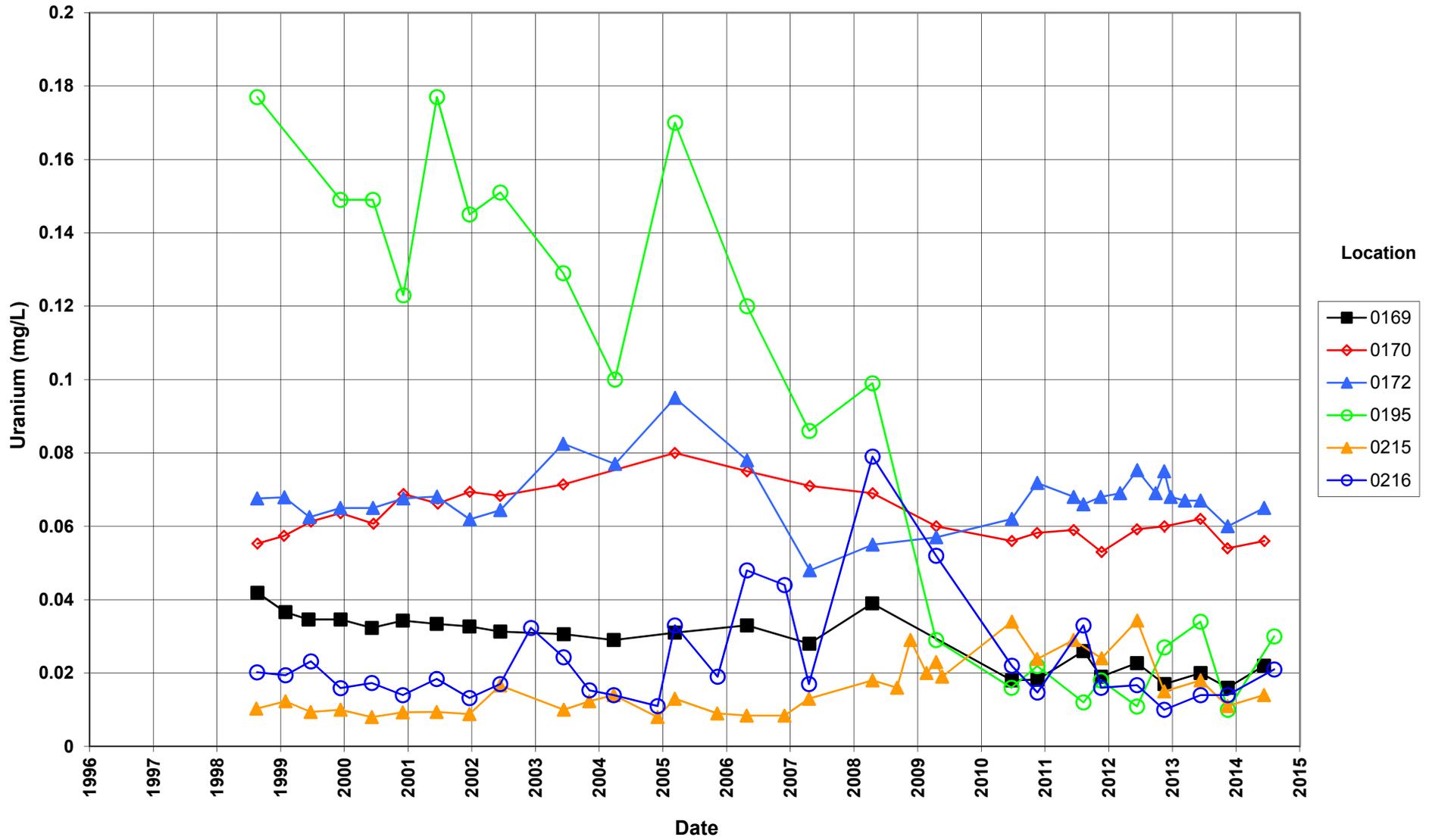
**Rifle New Processing Site  
Uranium Concentration  
Point of Compliance Wells**  
Alternate Concentration Limit (ACL) = 59 mg/L



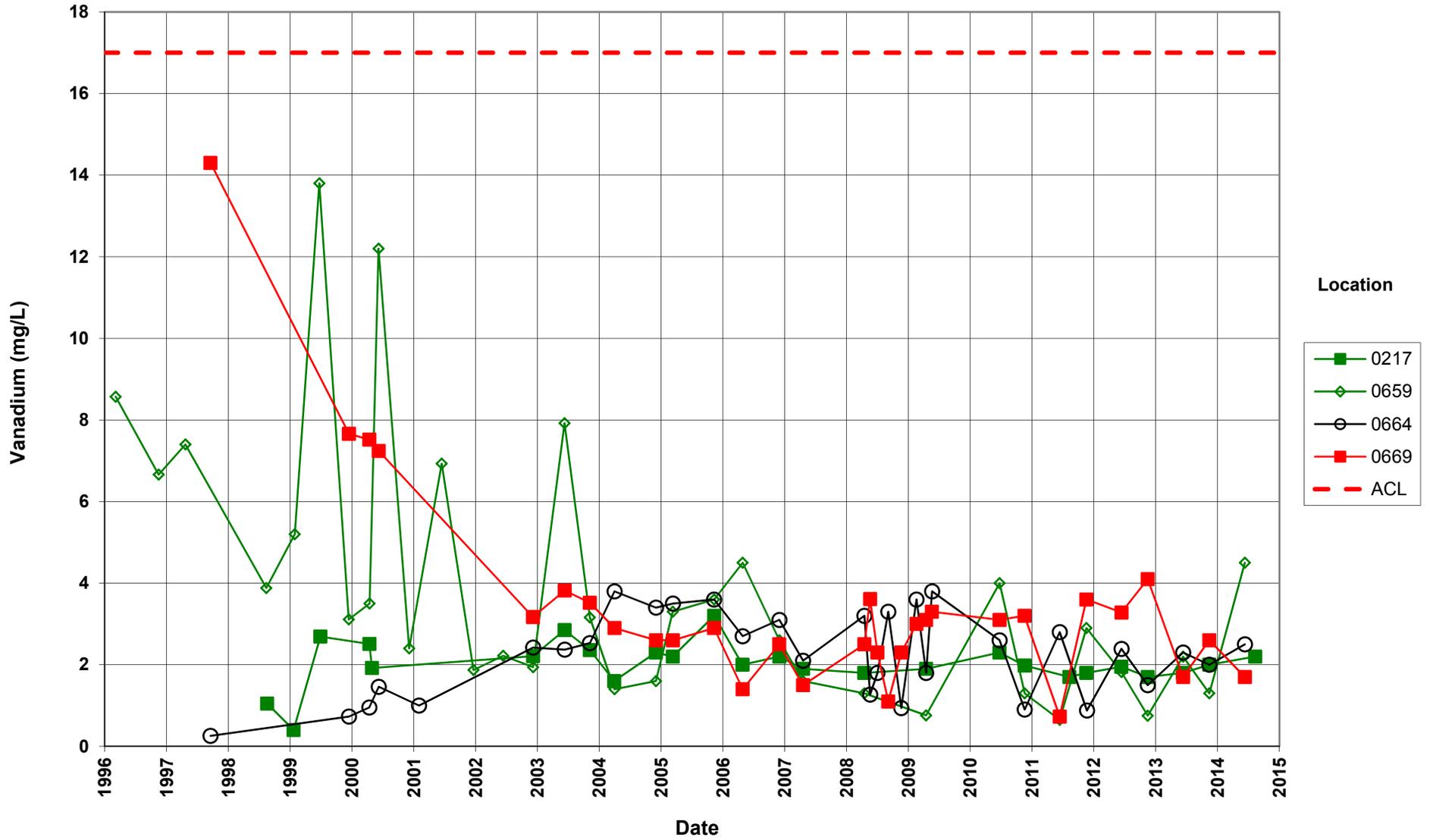
# Rifle New Processing Site Uranium Concentration



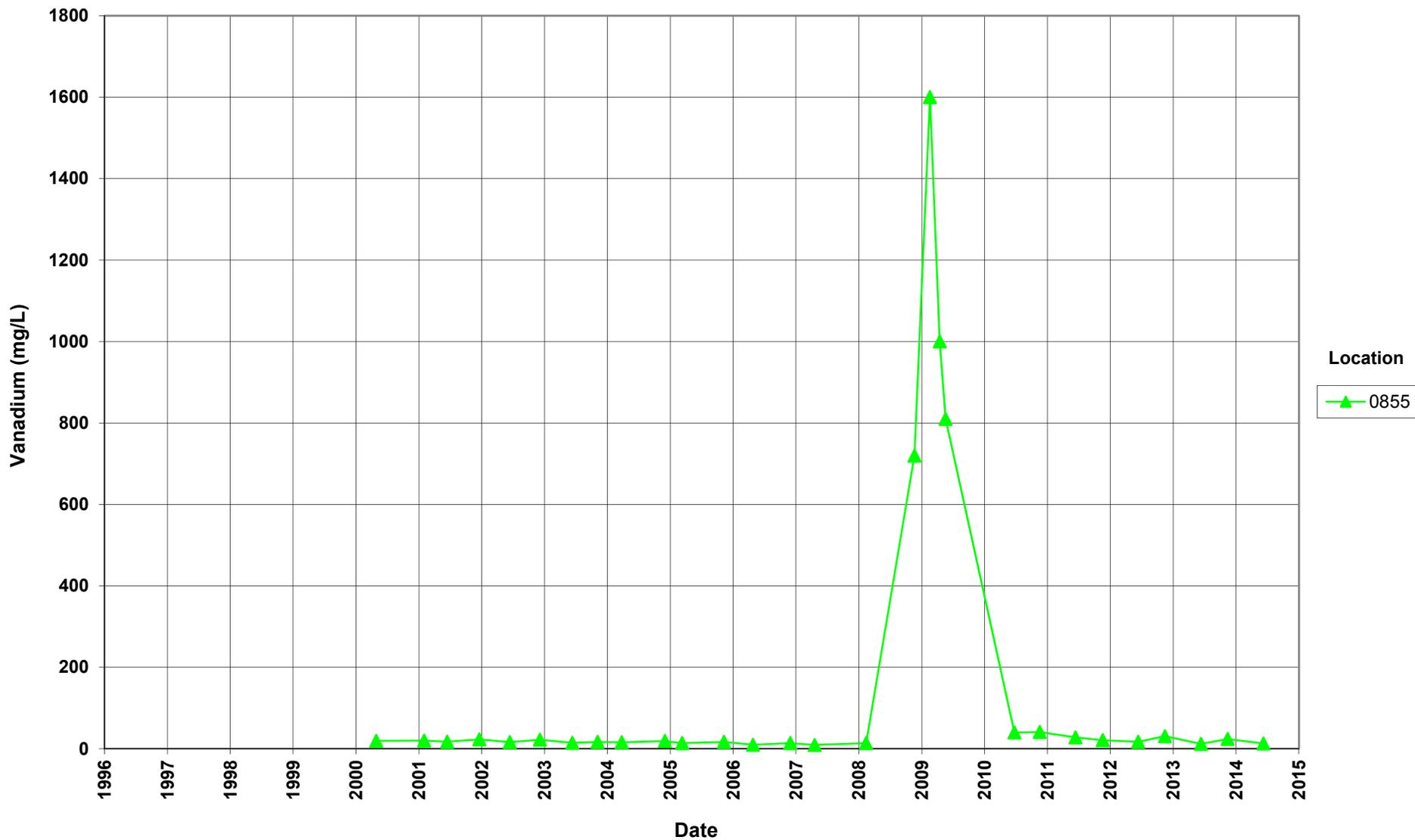
# Rifle New Processing Site Uranium Concentration



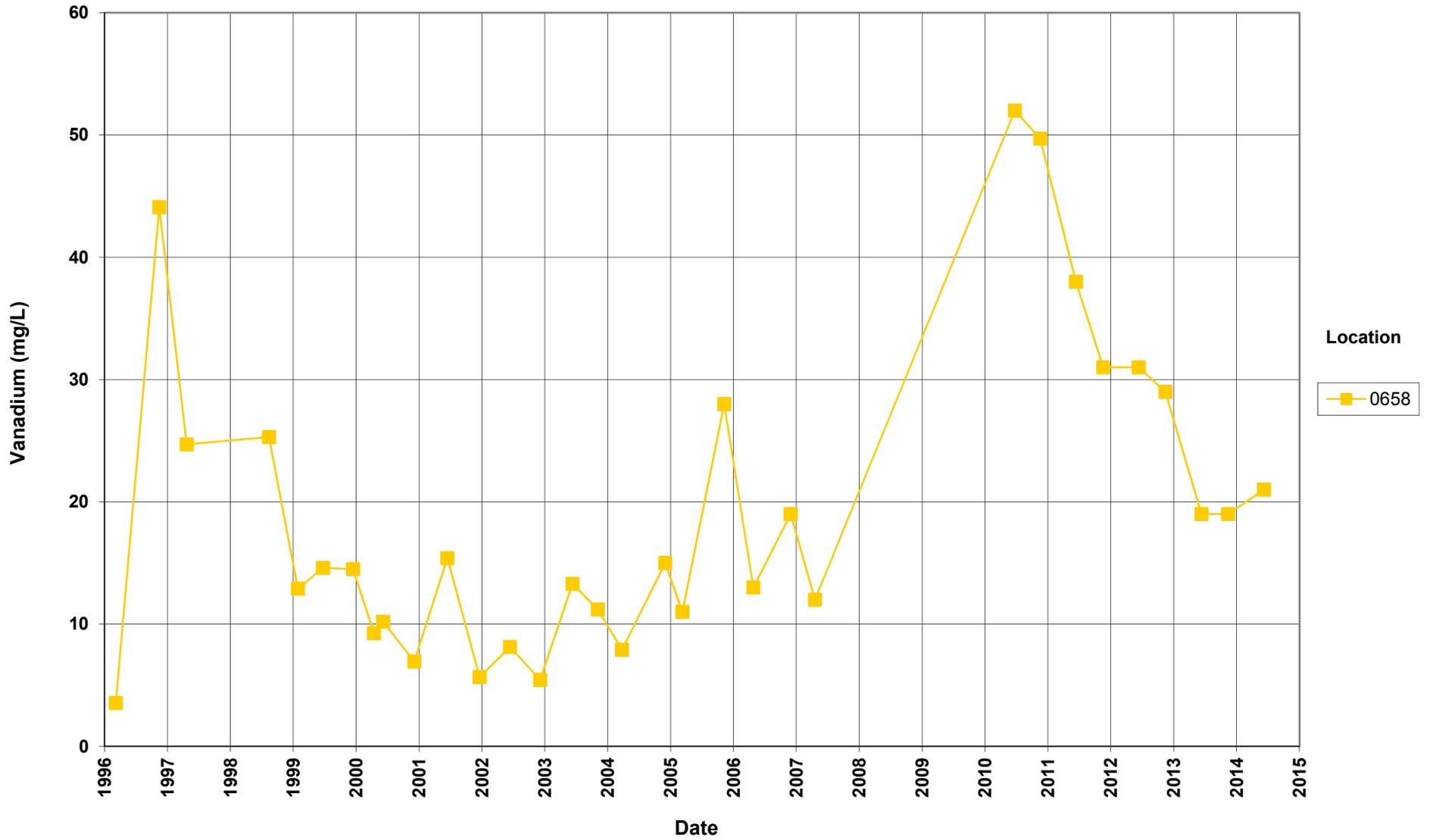
Rifle New Processing Site  
Vanadium Concentration  
Point of Compliance Wells  
Alternate Concentration Limit (ACL) = 17



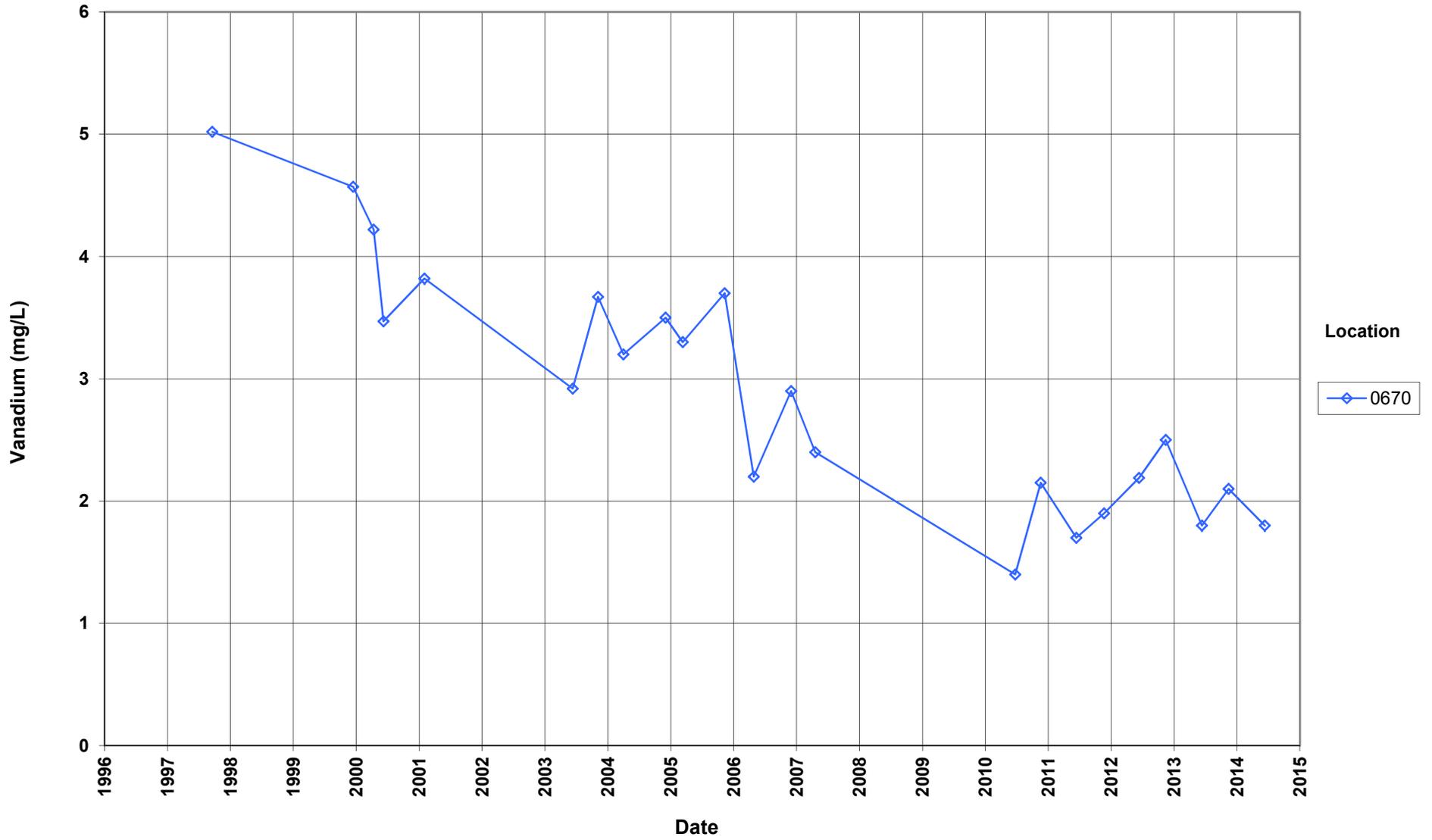
### Rifle New Processing Site Vanadium Concentration



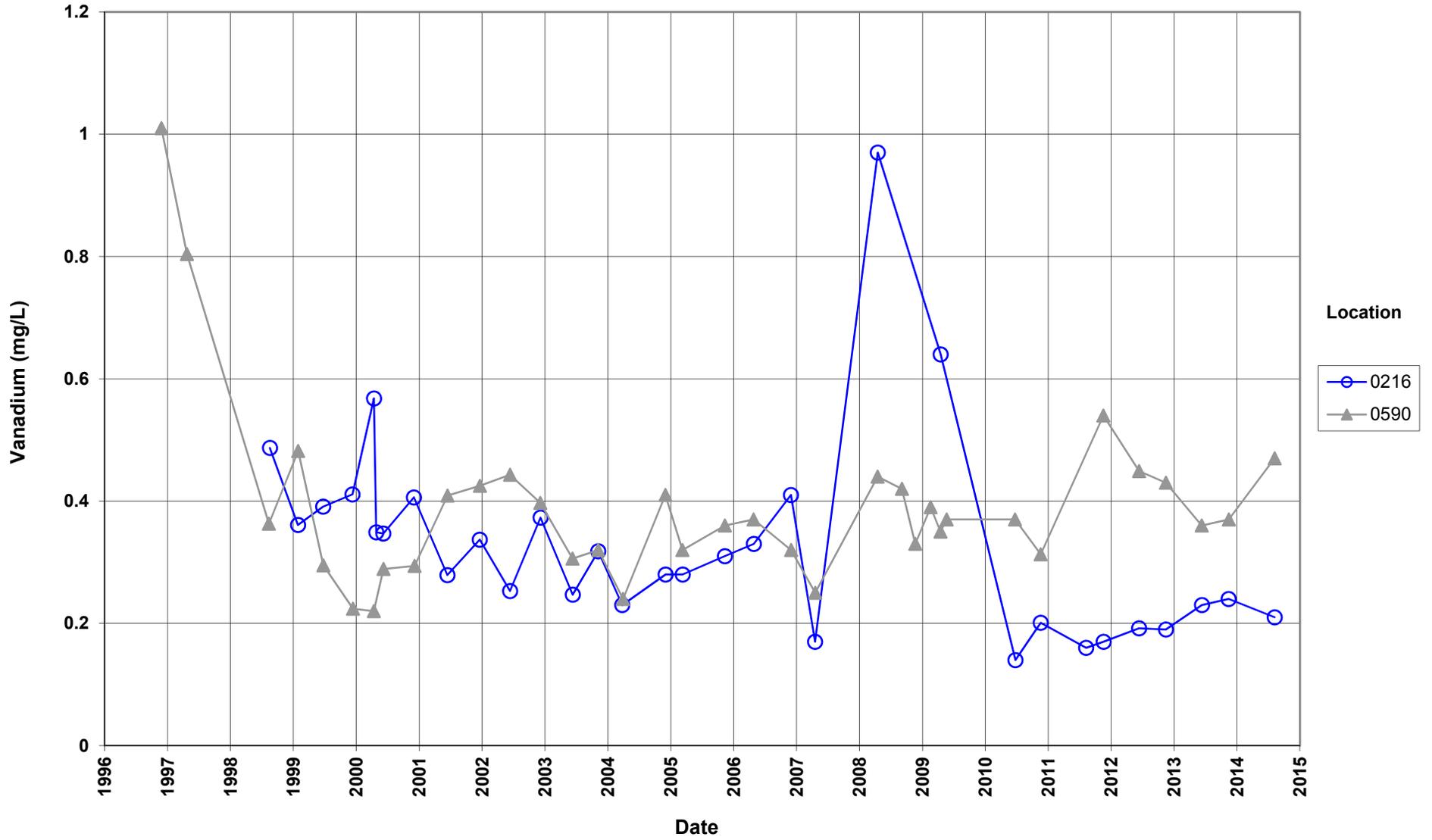
### Rifle New Processing Site Vanadium Concentration



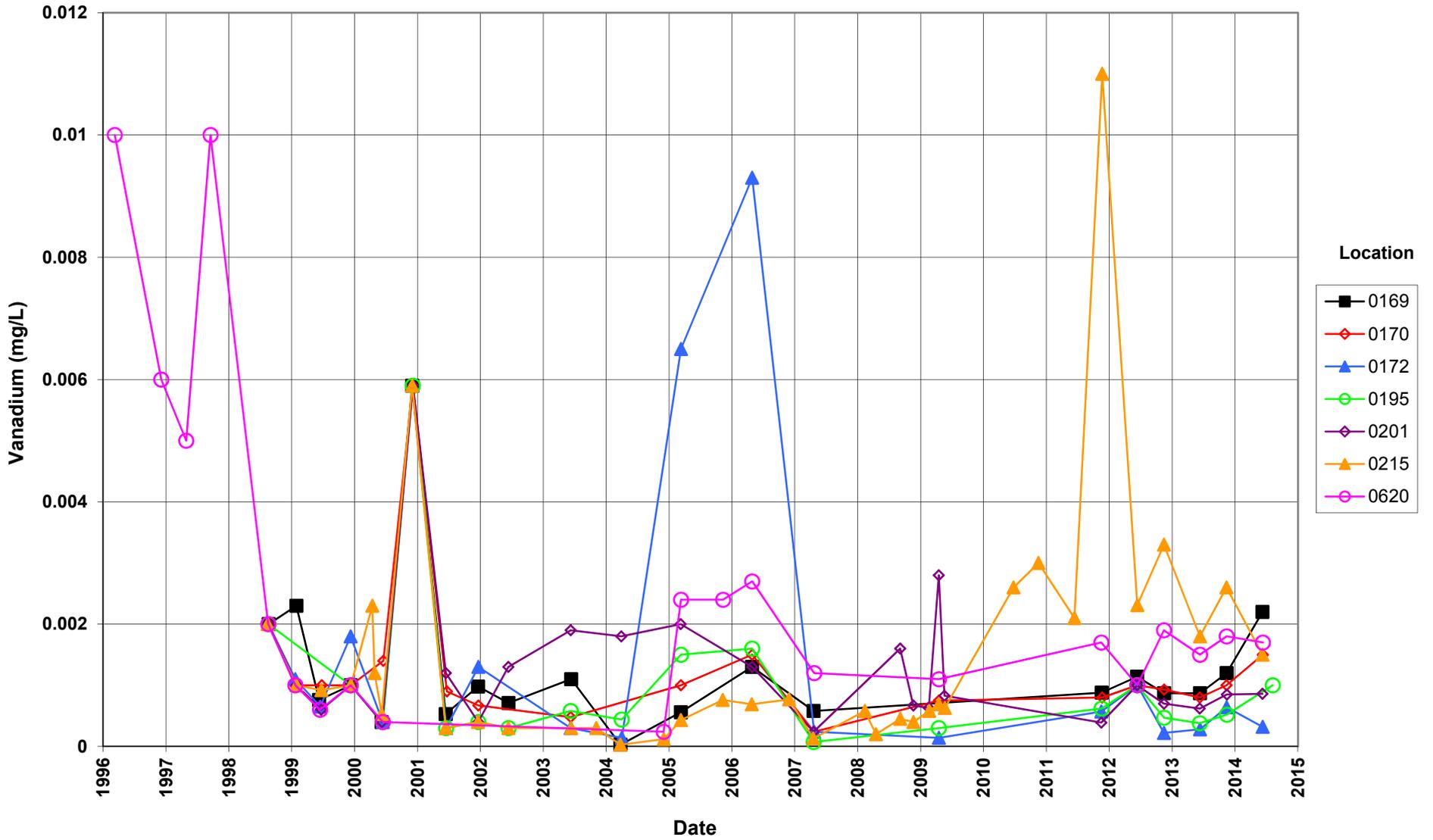
### Rifle New Processing Site Vanadium Concentration



### Rifle New Processing Site Vanadium Concentration



### Rifle New Processing Site Vanadium Concentration

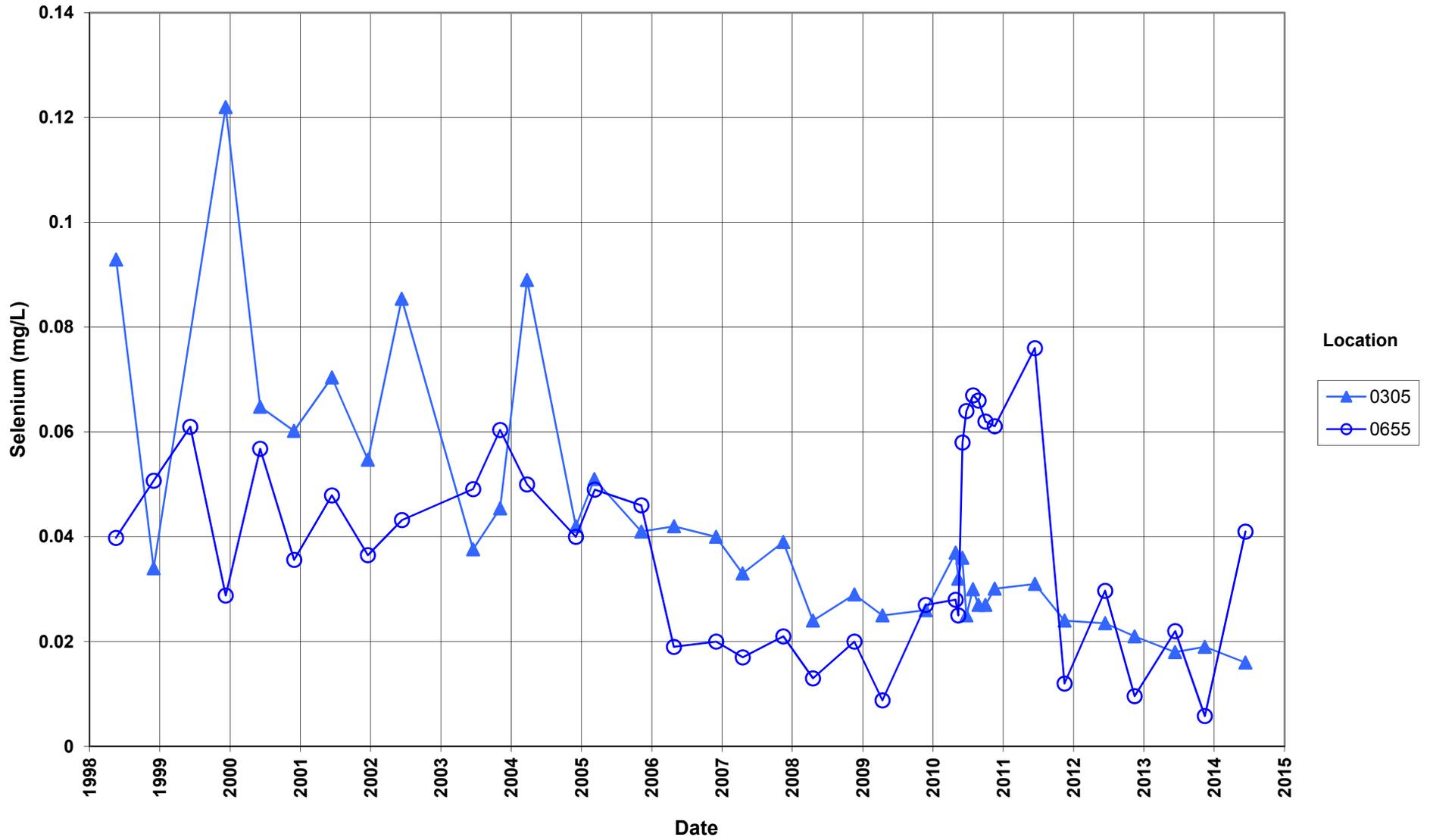


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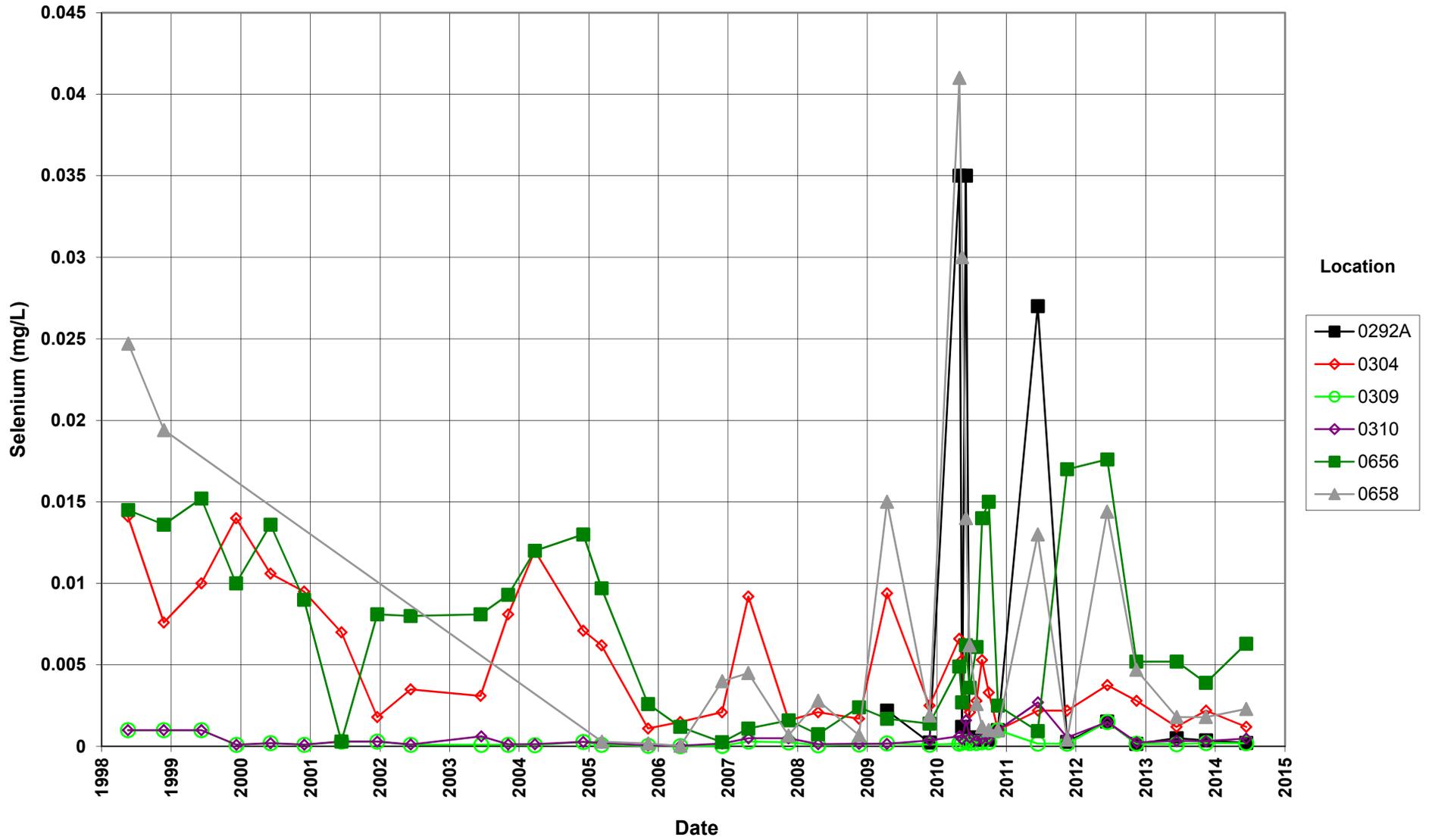
# **Old Rifle Groundwater Time-Concentration Graphs**

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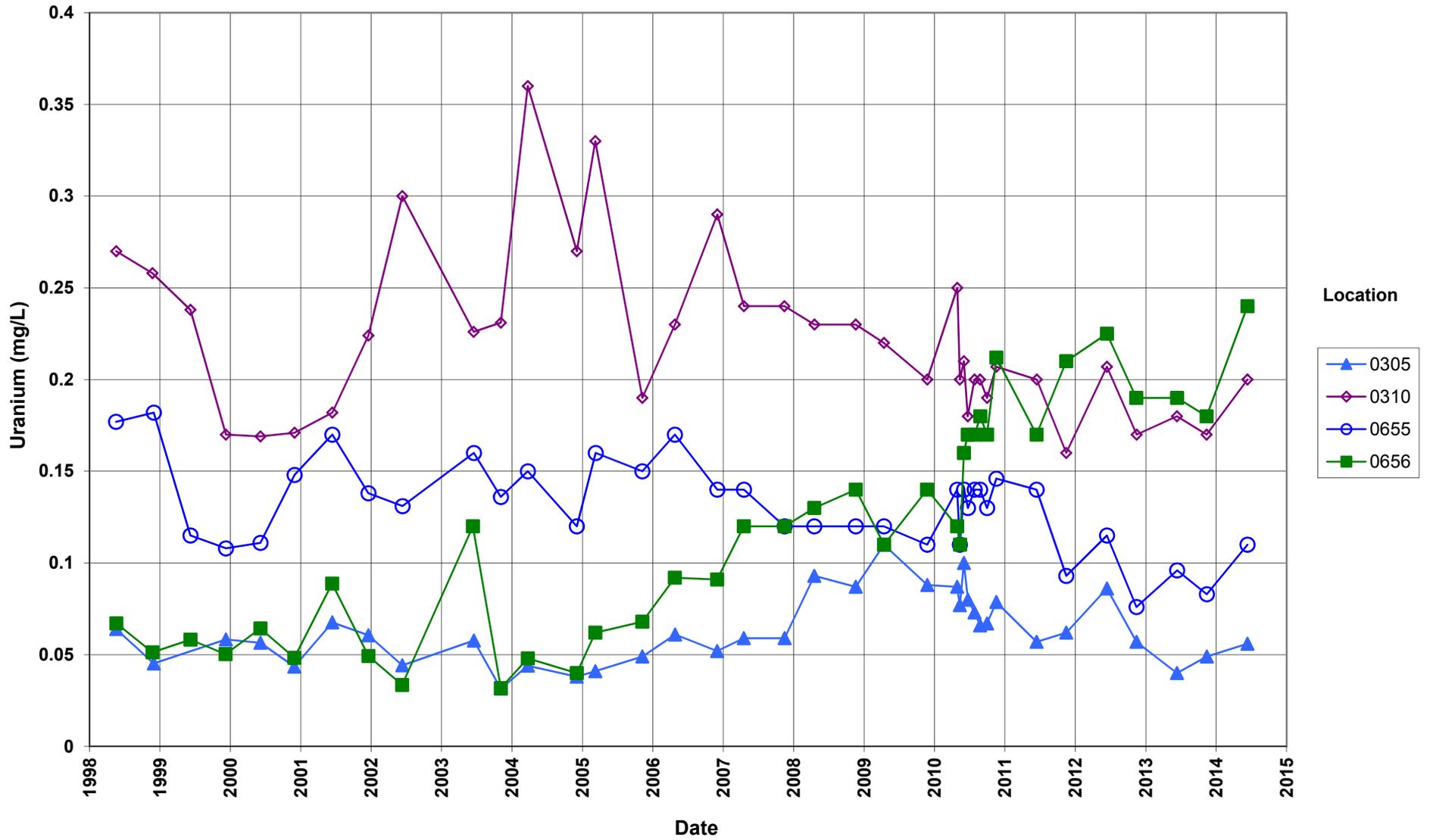
**Rifle Old Processing Site  
Selenium Concentration**  
Alternate Concentration Limit (ACL) = 12.3 mg/L



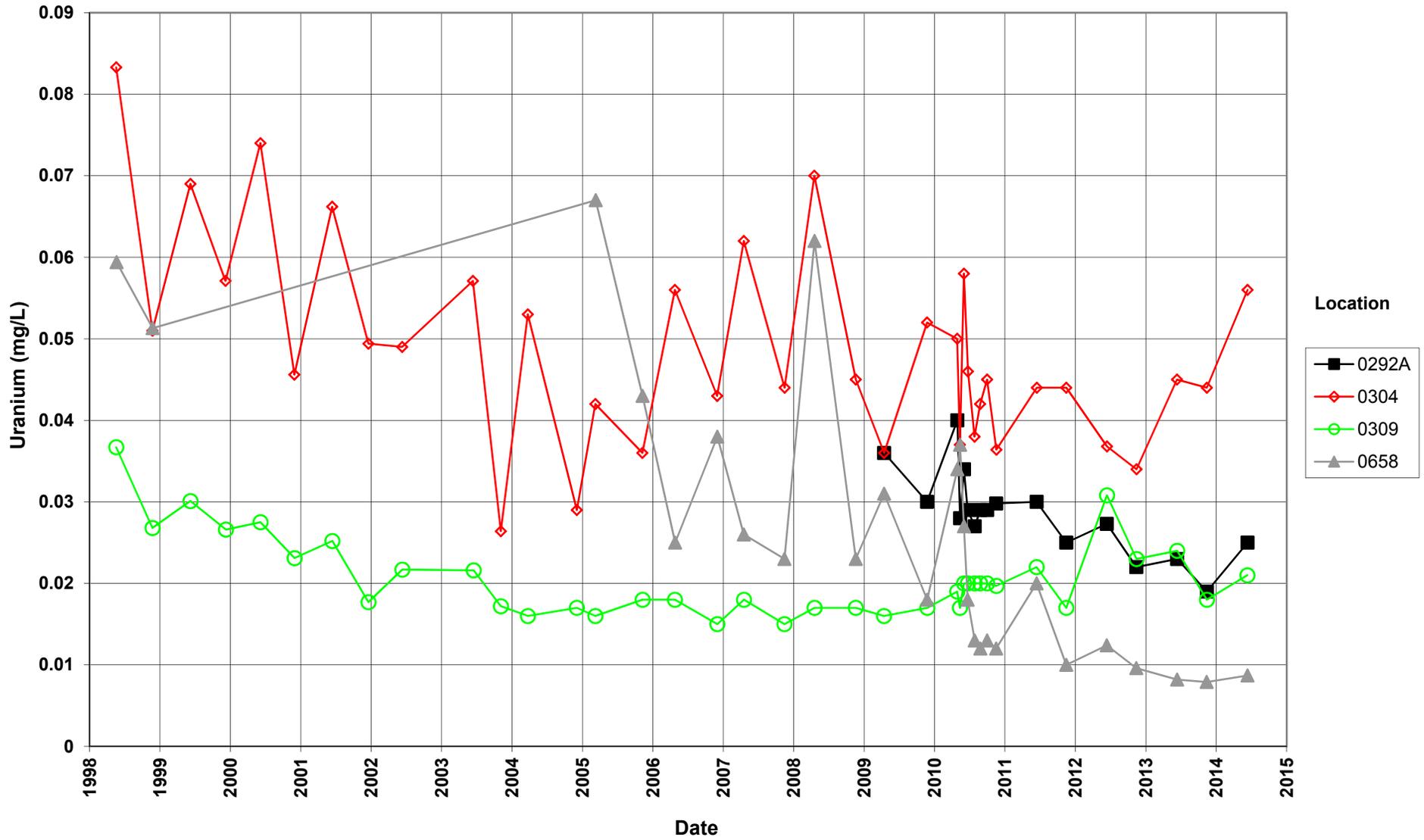
Rifle Old Processing Site  
Selenium Concentration  
Alternate Concentration Limit (ACL) = 12.3 mg/L



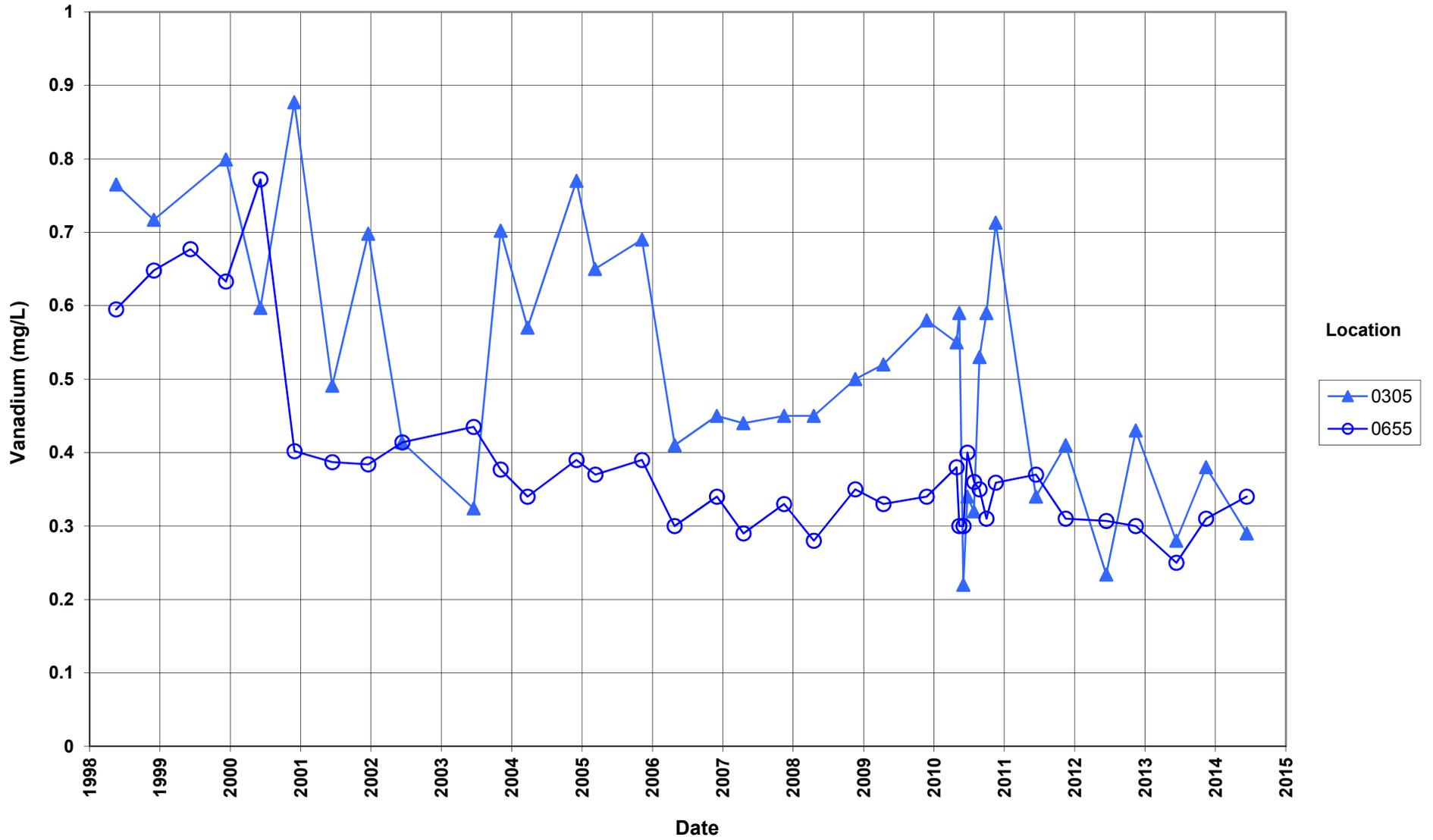
**Rifle Old Processing Site**  
**Uranium Concentration**  
Alternate Concentration Limit (ACL) = 44.4 mg/L



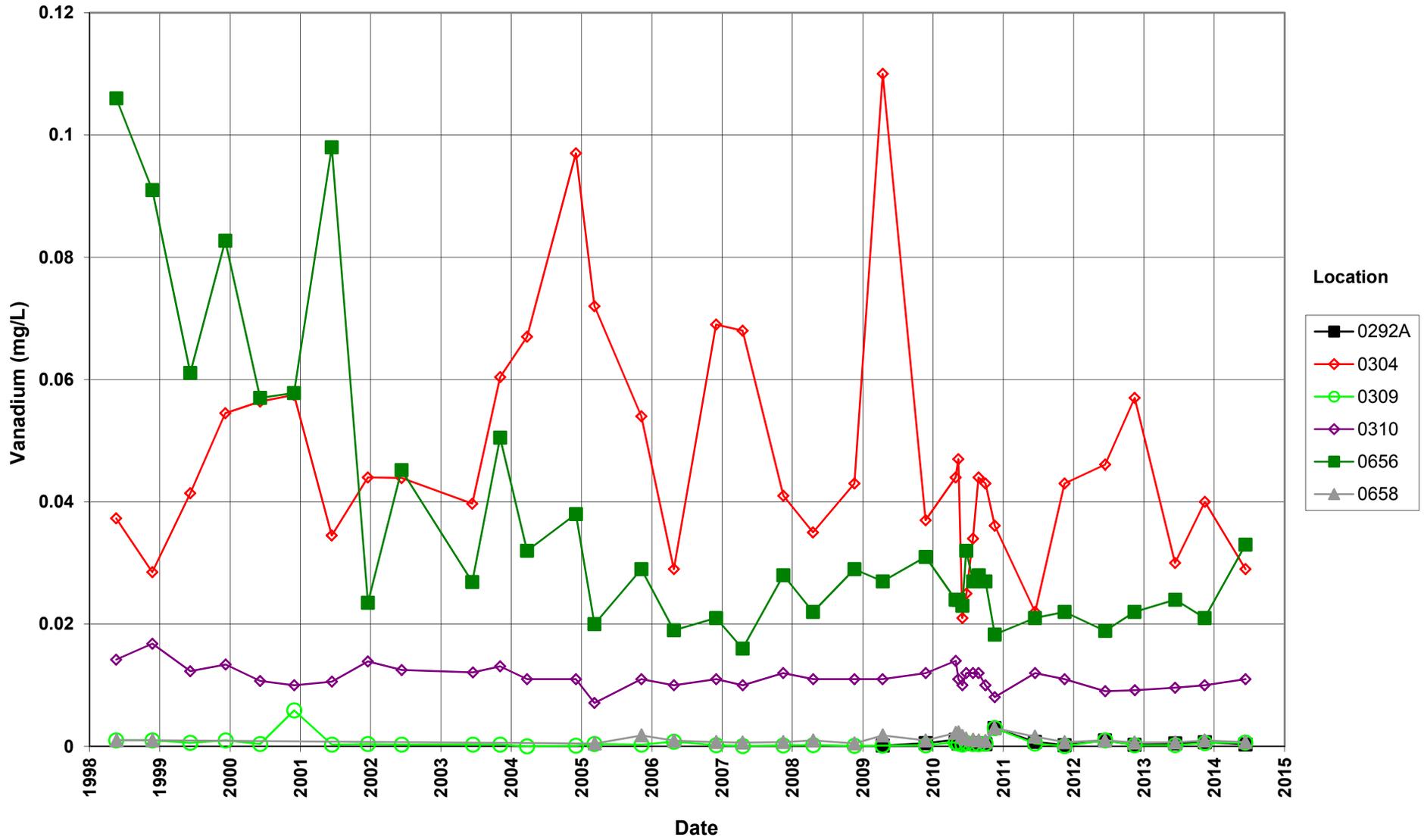
**Rifle Old Processing Site  
Uranium Concentration**  
Alternate Concentration Limit (ACL) = 44.4 mg/L



**Rifle Old Processing Site  
Vanadium Concentration**  
Alternate Concentration Limit (ACL) = 126 mg/L



**Rifle Old Processing Site  
Vanadium Concentration**  
Alternate Concentration Limit (ACL) = 126 mg/L

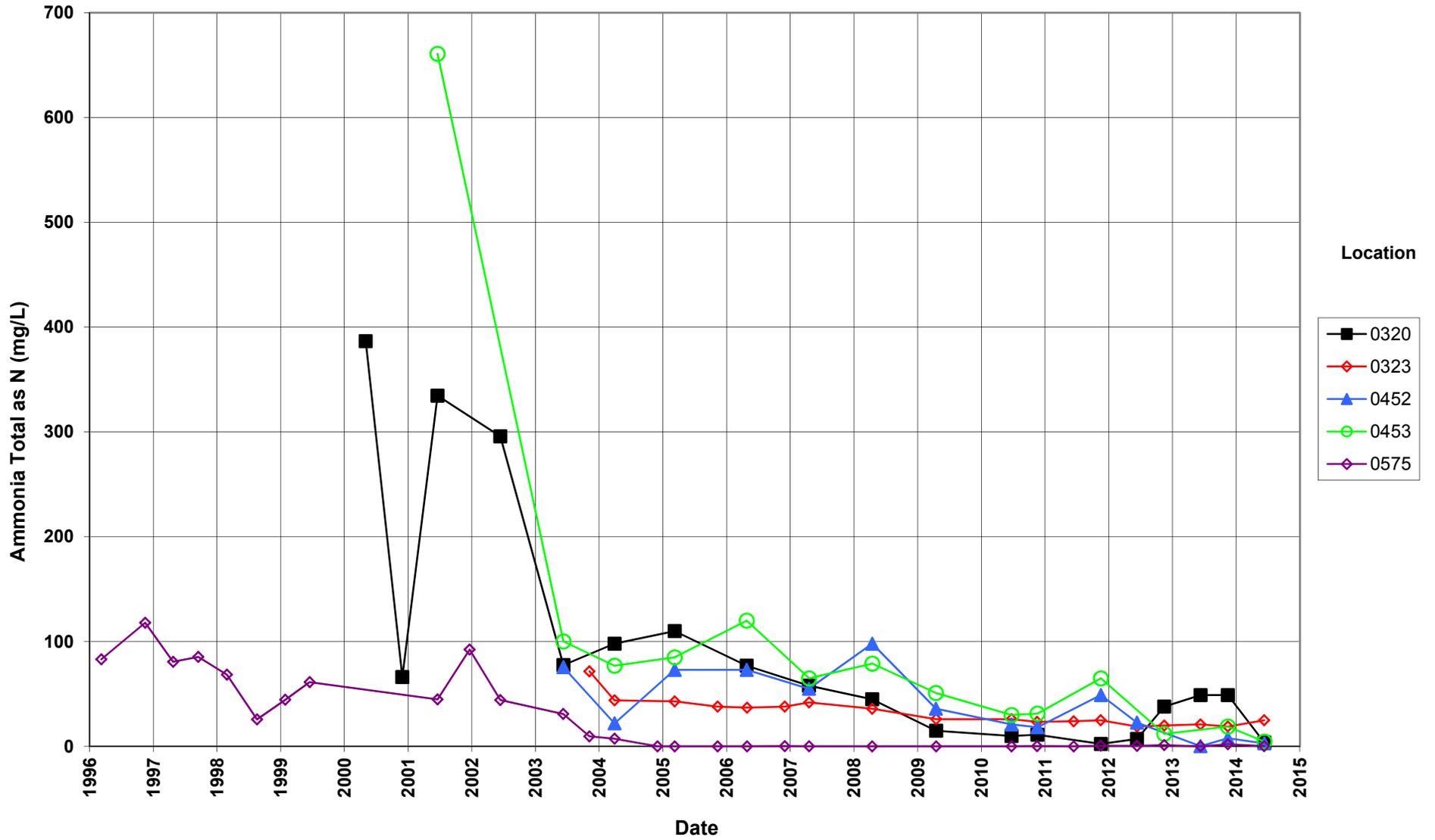


# **New Rifle Pond Locations Time-Concentration Graphs**

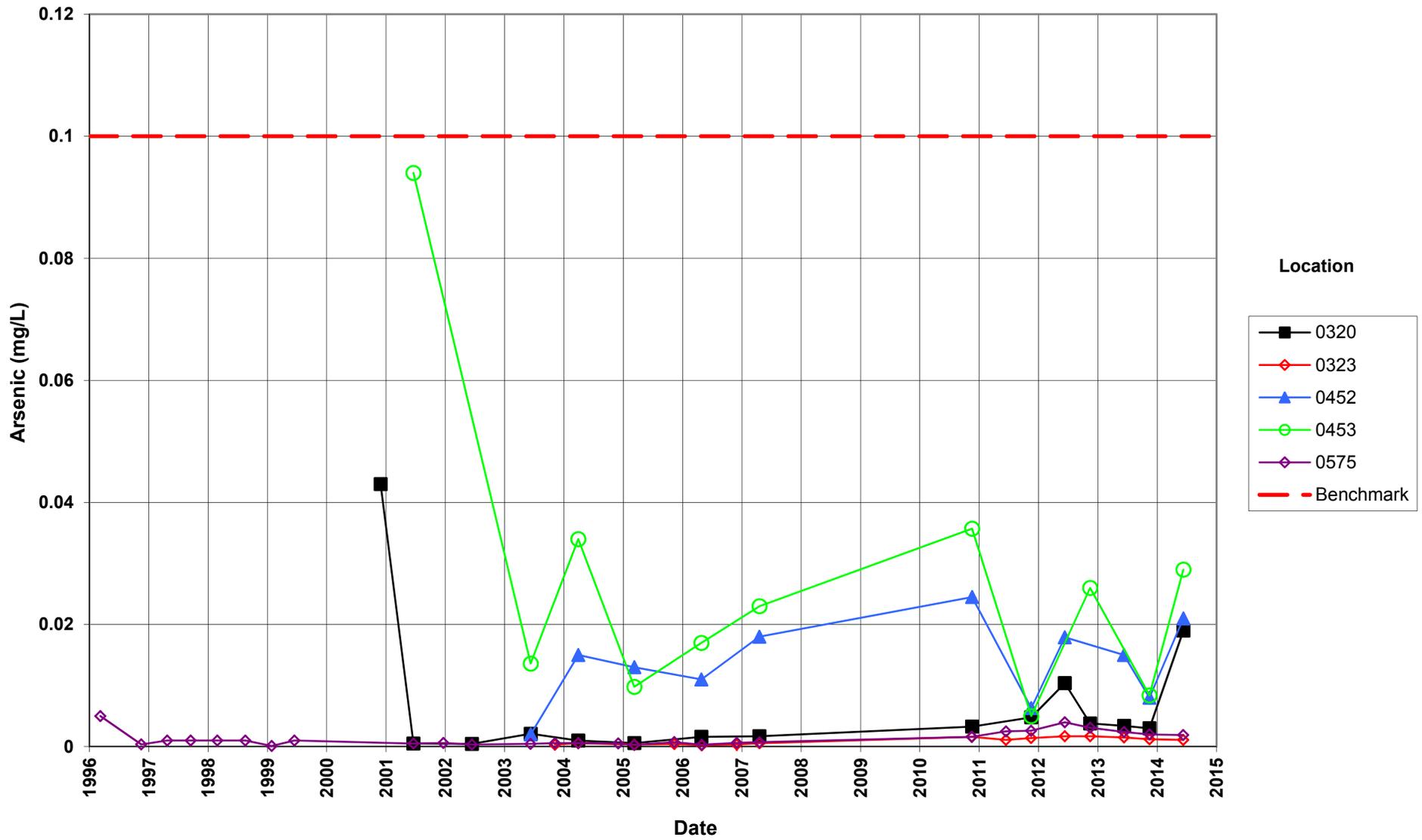
Agricultural standard/benchmark values are from Table 4 (New Rifle Ecological Risk Screening Table) of the March 2013 *Groundwater Compliance Action Plan for the New Rifle, Colorado, Processing Site* (LMS/RFN/S01920)

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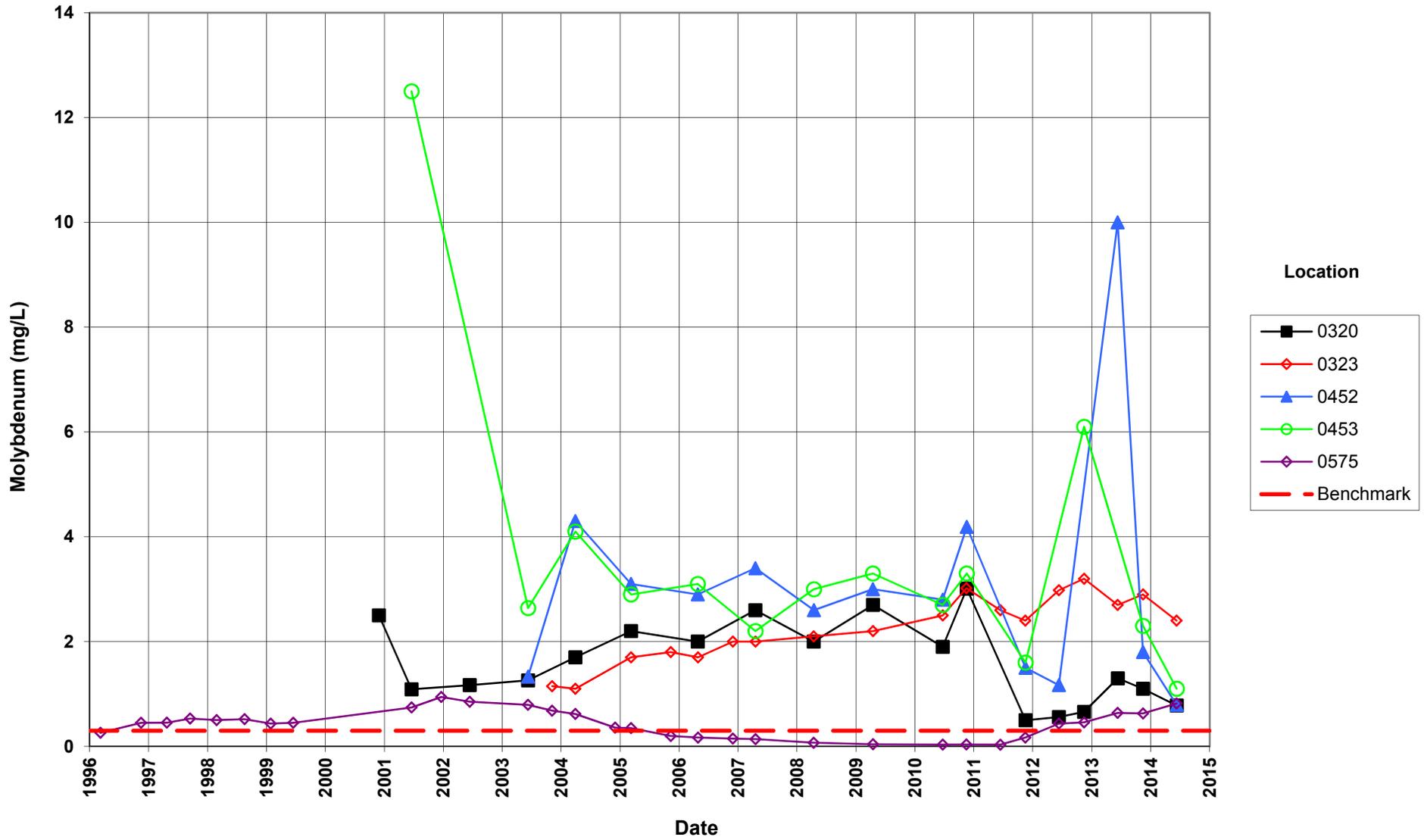
# Rifle New Processing Site Ammonia Total as N Concentration



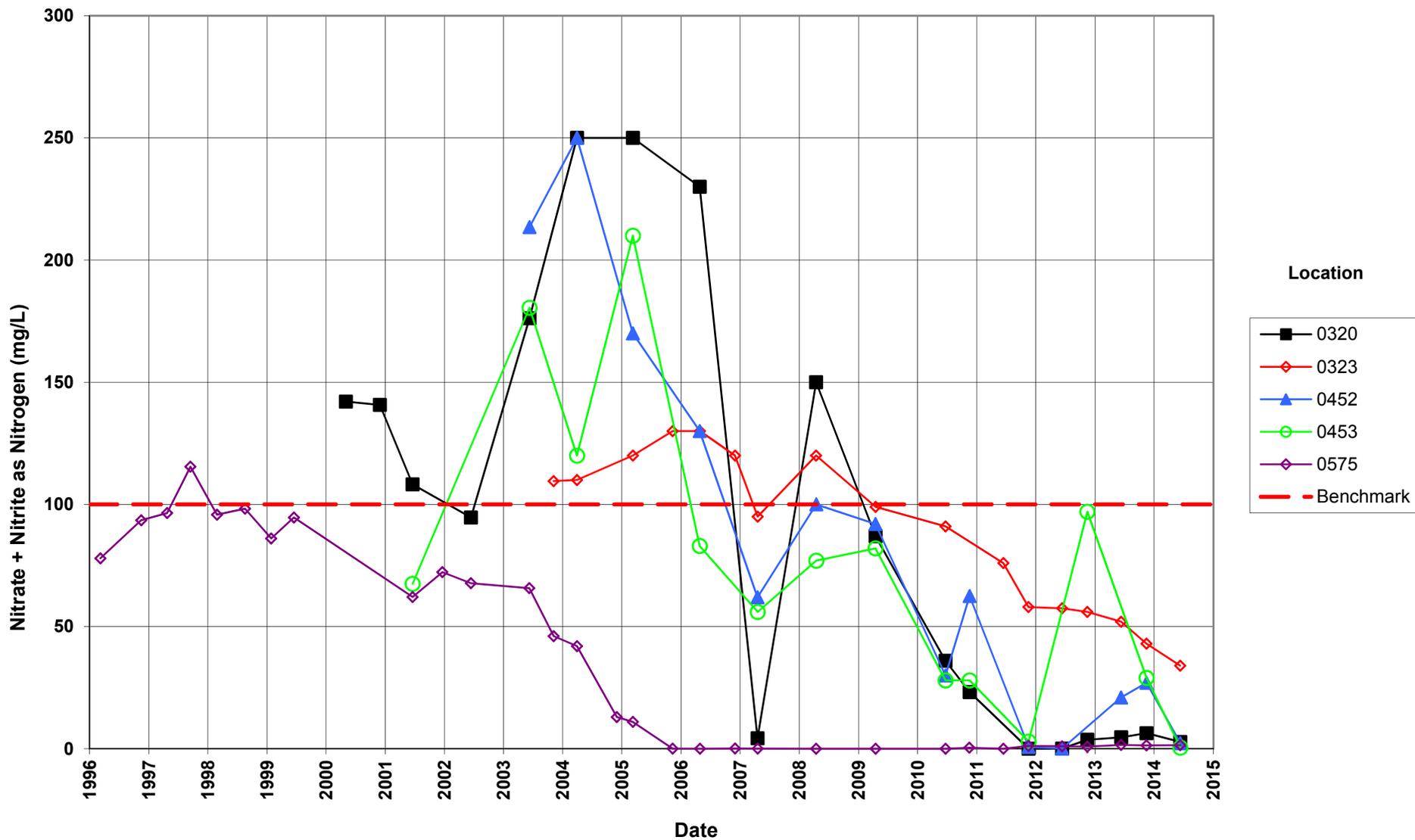
**Rifle New Processing Site**  
**Arsenic Concentration**  
 Agricultural Standard / Benchmark = 0.1 mg/L



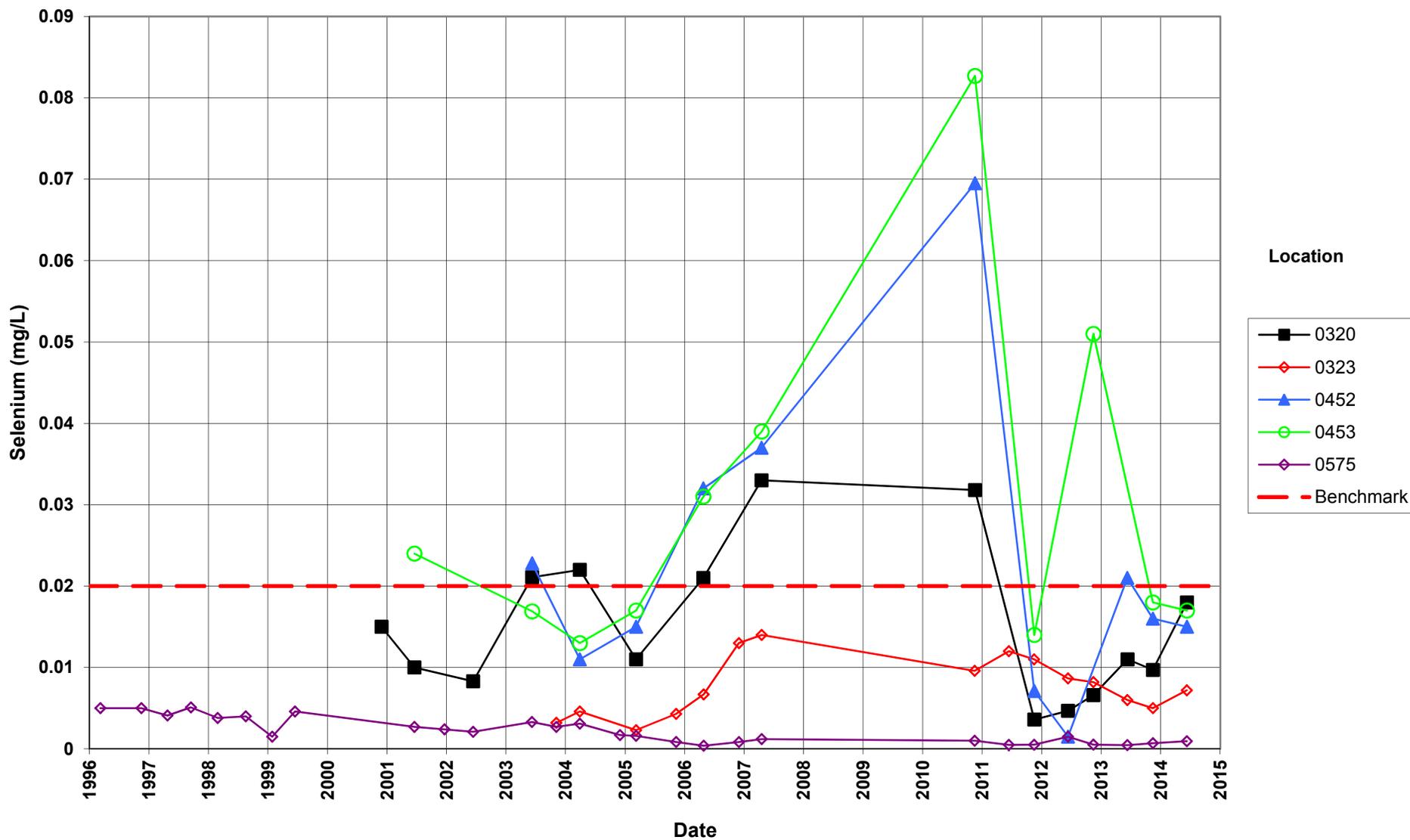
**Rifle New Processing Site  
Molybdenum Concentration**  
Agricultural Standard / Benchmark = 0.3 mg/L



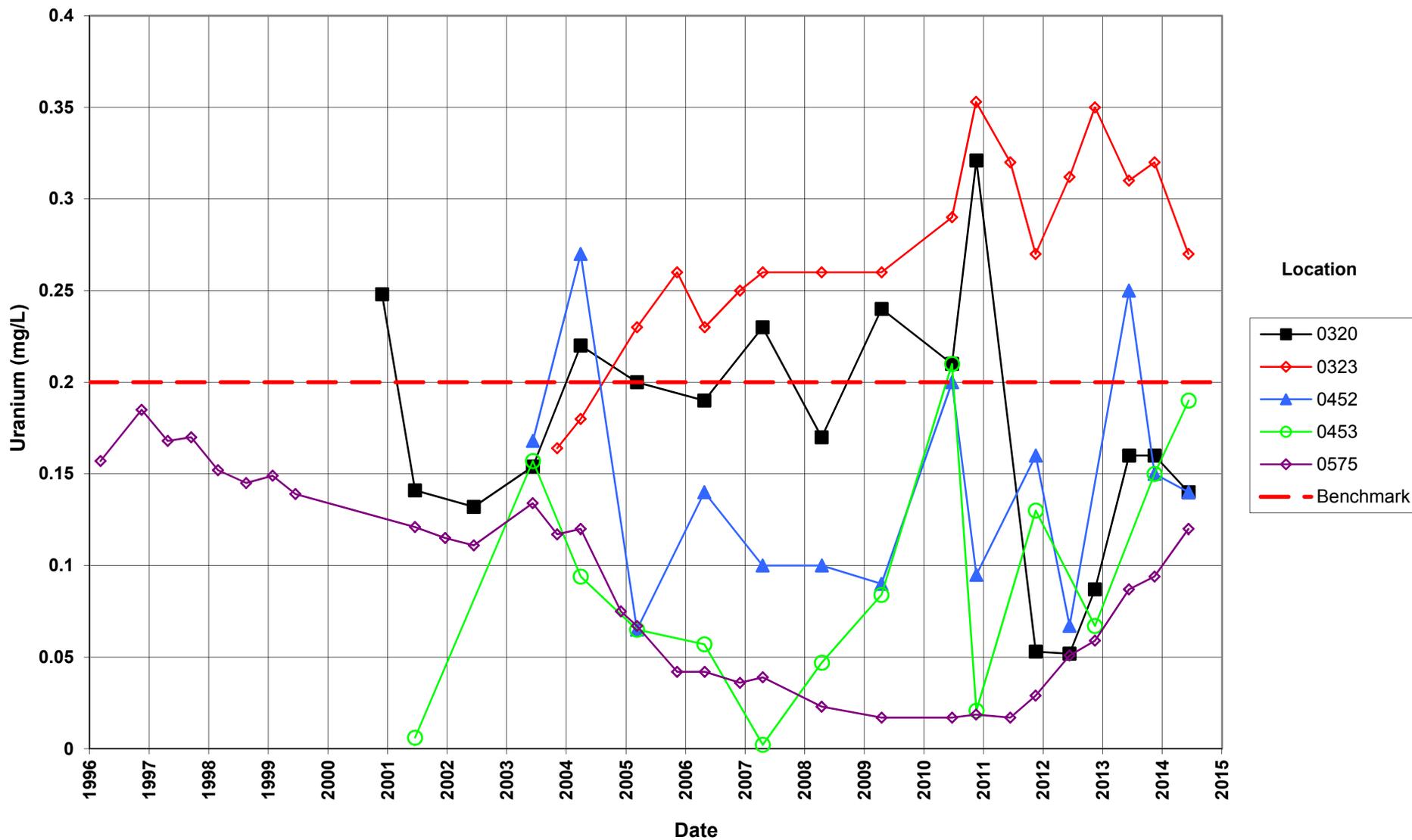
**Rifle New Processing Site**  
**Nitrate + Nitrite as Nitrogen Concentration**  
 Agricultural Standard / Benchmark = 100 mg/L



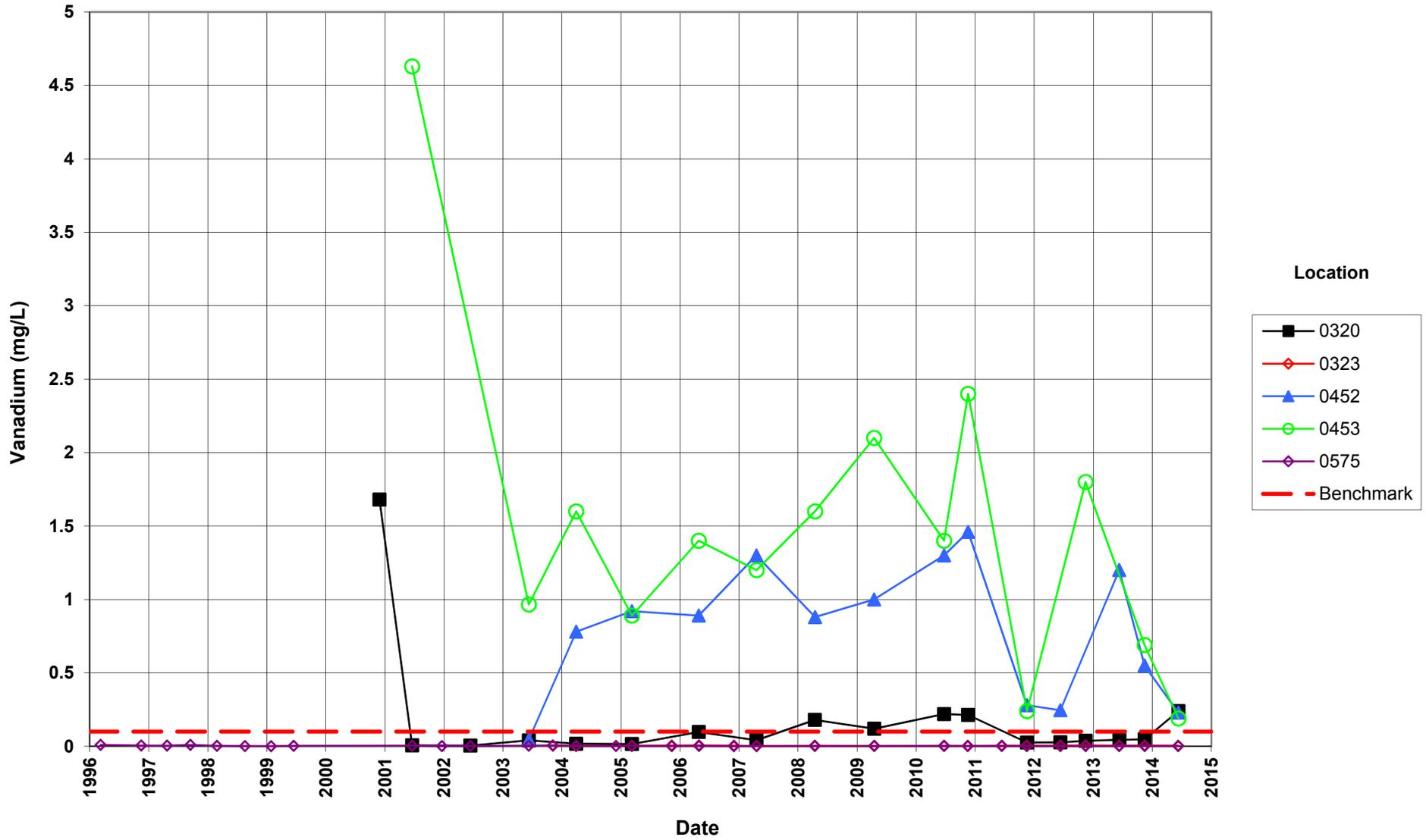
**Rifle New Processing Site**  
**Selenium Concentration**  
 Agricultural Standard / Benchmark = 0.02 mg/L



**Rifle New Processing Site  
Uranium Concentration**  
Agricultural Standard / Benchmark = 0.2 mg/L



**Rifle New Processing Site**  
**Vanadium Concentration**  
 Agricultural Standard / Benchmark = 0.1 mg/L



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

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June 2, 2014

Task Order LM00-501  
Control Number 14-0566

U.S. Department of Energy  
Office of Legacy Management  
ATTN: Richard Bush  
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)  
June 2014 Environmental Sampling at the Rifle, Colorado, New and Old Processing Sites

REFERENCE: Task Order LM00-501-02-116-402, Rifle, Colorado, New and Old Processing Sites

Dear Mr. Bush:

The purpose of this letter is to inform you of the upcoming sampling event at Rifle, Colorado. Enclosed are the map and tables specifying sample locations and analytes for monitoring at the Rifle New and Old sites. Water quality data will be collected from these sites as part of the environmental sampling currently scheduled to begin the week of June 9, 2014.

The following lists show the monitoring wells and surface water locations scheduled to be sampled during this event. Well RFN-0172 sampling may be delayed due to the high level of organic vapor encountered during well development on May 22, 2014.

**MONITORING WELLS**

**New Rifle**

169 AI	195 AI	216 AI	620 AI	658 AI	664 AI	670 AI
170 AI	201 AI	217 AI	635 AI	659 AI	669 AI	855 AI
172 AI	215 AI	590 AI	CW06 AI	CW09 AI	CW12 AI	CW19 AI
CW22 AI	CW23 AI	CW25 AI				

**Old Rifle**

292A AI	305 AI	309 AI	310 AI	655 AI	656 AI	658 AI
304 AI	Clough Well 1		Clough Well 2			

\*NOTE: AI = Alluvium

**SURFACE LOCATIONS**

**New Rifle**

320            322            323            324            452            453            575

**Old Rifle**

294            395            396            398            571            741

All samples will be collected as directed in the *Sampling and Analysis Plan for U.S. Department of Energy Office of Legacy Management Sites*. Access agreements are being reviewed and are expected to be complete by the beginning of fieldwork.

Please contact me at (970) 248-6375 if you have any questions.

Sincerely,



Richard Dayvault  
Site Lead

RD/lcg/lb

Enclosures (3)

cc: (electronic)

Christina Pennal, DOE  
Richard Dayvault, Stoller  
Steve Donovan, Stoller  
Bev Gallagher, Stoller  
Lauren Goodknight, Stoller  
EDD Delivery  
rc-grand.junction  
File: RFN 410.02(A)  
File: RFO 410.02(A)

### Constituent Sampling Breakdown

Site	Rifle					Required Detection Limit (mg/L)	Analytical Method	Line Item Code
	Groundwater	Surface Water						
Analyte								
Approx. No. Samples/yr	66	25						
<b>Field Measurements</b>								
Alkalinity	X		X					
Dissolved Oxygen								
Redox Potential	X		X					
pH	X		X					
Specific Conductance	X		X					
Turbidity	X							
Temperature	X		X					
<b>Laboratory Measurements</b>								
	*RFO	*RFN	RFO	RFN	RFL			
Aluminum								
Ammonia as N (NH3-N)		X		X		0.1	EPA 350.1	WCH-A-005
Arsenic		X		X		0.0001	SW-846 6020	LMM-02
Calcium	X	X	X	X		5	SW-846 6010	LMM-01
Chloride	X	X	X	X		0.5	SW-846 9056	MIS-A_039
Chromium								
Gross Alpha								
Gross Beta								
Iron								
Lead								
Magnesium	X	X	X	X		5	SW-846 6010	LMM-01
Manganese								
Molybdenum		X		X		0.003	SW-846 6020	LMM-02
Nickel								
Nickel-63								
Nitrate + Nitrite as N (NO3+NO2)-N	X	X	X	X		0.05	EPA 353.1	WCH-A-022
Potassium	X	X	X	X		1	SW-846 6010	LMM-01
Radium-226								
Radium-228								
Selenium	X	X	X	X	X	0.0001	SW-846 6020	LMM-02
Silica								
Sodium	X	X	X	X		1	SW-846 6010	LMM-01
Strontium								
Sulfate	X	X	X	X		0.5	SW-846 9056	MIS-A-044
Sulfide								
Total Dissolved Solids								
Total Organic Carbon		0172 and 0620 only				1	SM 5310	WCH-A-025
Uranium	X	X	X	X	X	0.0001	SW-846 6020	LMM-02
Vanadium	X	X	X	X	X	0.0003	SW-846 6020	LMM-02
Zinc								
<b>Total No. of Analytes</b>	10	14	10	13	3			

\*RFN = New Rifle; \*RFO = Old Rifle

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

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

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
<b>Monitoring Wells</b>						
<b>New Rifle</b>						
169		X				Background well
170		X				Far downgradient
172		X				Far downgradient
195		X				Downgradient
201		X				Data logger; downgradient
215		X				Onsite
216		X				Onsite
217		X				Downgradient
590		X				Data logger; downgradient
620		X				Far downgradient
635		X				Downgradient
658		X				Onsite
659		X				Onsite
664		X				Onsite
669		X				Onsite
670		X				Onsite
855		X				Onsite
CW06		X				
CW09		X				
CW12		X				
CW19		X				
CW22		X				
CW23		X				
CW25		X				
<b>Old Rifle</b>						
292A		X				Background well
304		X				Onsite
305		X				Onsite
309		X				Onsite
310		X				Data logger; onsite
655		X				Data logger; onsite
656		X				Onsite
658		X				Background well
Clough Well 1		X				
Clough Well 2		X				

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

Location ID	Quarterly	Semiannually	Annually	Biennially	Not Sampled	Notes
<b>Surface Locations</b>						
<b>New Rifle</b>						
320		X				Wetland Pond
322		X				Colorado River
323		X				Gravel pit pond
324		X				Colorado River downgradient
452		X				Wetland Pond
453		X				Wetland Pond
575		X				Gravel pit pond
<b>Old Rifle</b>						
294		X				River, upstream
395		X				Seep, upgradient
396		X				River
398		X				Ditch, onsite
571		X				
741		X				River

Semi-annual sampling conducted in June and November; annual sampling conducted for Rifle Disposal Cell in July

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# **Attachment 4**

## **Trip Reports**

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## *Memorandum*

DATE: July 2, 2014  
TO: Dick Dayvault  
FROM: David Atkinson  
SUBJECT: Sampling Trip Report

**Site:** Rifle Processing Sites

**Dates of Event:** 6/9/2014 – 6/12/2014

**Team Members:** David Atkinson, Alison Kuhlman

**Number of Locations Sampled:** Wells: RFN 18, RFO 9; Surface: RFN 6, RFO 6.

**Locations Not Sampled/Reason:** The following locations were not sampled due to wet, marshy conditions surrounding the locations and preventing access: RFN01-0195, -0216, -0217, -0322, -0590, and -0635. These locations will be sampled at a later date. New Rifle location CW12 near the City of Rifle water treatment plant could not be located and appeared to have been paved over. Old Rifle location Clough Well 1 could not be located and may have been destroyed.

**Location Specific Information:** During sampling, the Environmental Compliance POC informed the samplers that the purge water from RFN01-0172 did not need to be contained and disposed by WPX energy personnel, and could be safely dispersed on the ground. The SAP will be revised to include ground dispersal of purge water from this location. After collecting the samples, the samplers dispersed the purge water on the ground, then the downhole tubing was pulled up to the top of the water column and the top layer was collected for visual inspection. This top layer appeared darker in color and exhibited an oily odor. This was done by request from the site lead and DOE site manager, who observed the sampling along with the Environmental Compliance POC. In addition, a grab-sample of the top layer of the water column was collected for analysis by the IFRC per request of the Site Lead.

**Report Identification Number (RIN) Assigned:** 14066229. Field data sheets can be found in <\\crow\sms\14066229\FieldData>.

**Sample Shipment:** Samples were shipped overnight via FedEx from Grand Junction to ALS Laboratory Group on June 16, 2014.

A SUBSIDIARY OF HUNTINGTON INGALLS INDUSTRIES

2597 Legacy Way • Grand Junction, CO 81503-1789 • Telephone (970) 248-6000 • Fax (970) 248-6040

**Quality Control Sample Cross Reference:** The following table summarizes the QC samples taken during the sampling event:

Sample Date/Time	Sample Type	False ID	True ID	Ticket #
6-9-14/1200	Duplicate	2548	0169	MHT 414
6-9-14/1230	Duplicate	2549	0201	MHT 415
6-12-14/1205	Duplicate	2552	0656	MHT 430
6-12-14/1200	RINST/EQBLANK	2551	N/A	MHT 429
6-11-14/1200	Duplicate	2647	0620	MHU 497

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

**Well Inspection Summary:** No issues were identified.

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

**Field Variance:** Turbidity less than 10 NTUs could not be reached and the samples were filtered at the following locations: RFN01-0664, RFN01-0669, RFN01-0741, RFN01-0396, RFN01-0324, RFO01-0294, RFO01-0571.

**Equipment:** All equipment functioned properly.

**Institutional Controls:** No issues identified.

**Fences, Gates, Locks:** All appeared to be in working condition.  
**Trespassing/Site Disturbances:** None observed.

**Site Issues:**

**Disposal Cell/Drainage Structure Integrity:** N/A.  
**Vegetation/Noxious Weed Concerns:** None.  
**Maintenance Requirements:** None.  
**Access Issues:** Several locations could not be accessed because of wet, marshy ground conditions, these locations will be collected at a later date.

**Corrective Action Taken:** None.

(DA/lcg)

cc: (electronic)  
Rich Bush, DOE  
Dick Dayvault, Stoller

Steve Donovan, Stoller  
EDD Delivery



*Memorandum*

DATE: September 8, 2014  
TO: Richard Dayvault  
FROM: Tashina Jasso  
SUBJECT: Sampling Trip Report

**Site:** Rifle, CO, Rifle Processing Sites

**Dates of Event:** August 7 & 11, 2014

**Team Members:** David Atkinson, Tashina Jasso, Rob Rice

**Number of Locations Sampled:** 4 monitoring well locations were sampled (0195, 0216, 0217 and 0590) for metals (As, Mo, Se, U, V, Ca, K, Mg, and Na), chlorine, sulfate and nitrates/nitrites.

**Locations Not Sampled/Reason:** All locations were sampled.

**Location Specific Information:** Nothing to note.

**Quality Control Sample Cross Reference:** The following are the false identifications assigned to quality control samples.

False ID	Ticket Number	True ID	Sample Type	Associated Matrix
2656	MIZ 114	0216	Duplicate	Groundwater

**Report Identification Number (RIN) Assigned:** All samples were assigned to RIN 14076346.

**Sample Shipment:** Samples were shipped from Grand Junction to ALS Laboratory Group on August 12, 2014.

**Water Level Measurements:** Water levels were measured at all wells from the top of casing.

**Well Inspection Summary:** All wells were in good condition.

**Field Variance:** None.

**Equipment:** All equipment functioned properly. All wells were sampled using a peristaltic pump and dedicated tubing.

**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).

**Stakeholder/Regulatory:** No stakeholder or DOE personnel observed sampling activities.

**Institutional Controls:** No issues identified.

**Disposal Cell/ Drainage Structure Integrity:** No issues observed.

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

**Trespassing/Site Disturbances:** Nothing to note.

**Site Issues:**

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

**Maintenance Requirements:** None observed.

**Access Issues:** None.

**Safety Issues:** None.

**Corrective Action Taken:** None.

(TJ/lcg)

cc: (electronic)  
Richard Bush, DOE  
Dick Dayvault, Stoller  
Steve Donovan, Stoller  
EDD Delivery