# Data Validation Package

## November 2015 Groundwater and Surface Water Sampling at the Old and New Rifle, Colorado, Processing Sites

**February 2016**

U.S. DEPARTMENT OF ENERGY | Legacy Management

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# Sampling Event Summary

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

**Sampling Period:** November 3, 5, and 6, 2015

Water samples were collected from 36 locations at New Rifle and Old Rifle, Colorado, Processing Sites. Duplicate samples were collected from New Rifle locations 0659 and 0855, and Old Rifle location 0304. One equipment blank was collected after decontamination of non-dedicated equipment used to collect one surface water sample. Sampling and analyses 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 16 monitoring wells and 7 surface locations in compliance with the December 2008 *Groundwater Compliance Action Plan* [GCAP] *for the New Rifle, Colorado, Processing Site* (LMS/RFN/S01920), with one exception: New Rifle location 0635 could not be sampled because it was inaccessible; a fence installed by the Colorado Department of Transportation prevents access to this location. DOE is currently negotiating access with the Colorado Department of Transportation.

Analytes measured at the New Rifle site included contaminants of concern (COCs) (arsenic, molybdenum, nitrate + nitrite as nitrogen, selenium, uranium, and vanadium) ammonia as nitrogen, major cations, and major anions. Field measurements of total alkalinity, oxidation-reduction potential, pH, specific conductance, turbidity, and temperature were made at each location, and the water level was measured at each sampled well. A proposed alternate concentration limit (ACL) for vanadium of 50 milligrams per liter (mg/L), specific to the compliance (POC) wells (RFN-0217, -0659, -0664, and -0669) is included in the New Rifle GCAP. Vanadium concentrations in the POC wells were below the proposed ACL as shown in the time-concentration graphs in the Data Presentation section (Attachment 2). Time-concentration graphs from all other locations sampled are also included in Attachment 2.

Sampling location RFN-0195 was misidentified for the June/August 2014 and November 2014 sampling events. (Well RFN-0609 was inadvertently sampled instead of RFN-0195 in 2014.) The results for RFN-0195 have been corrected, and are included in associated time-concentration graphs for this location. Recent results for RFN-0195 are consistent with established trends with the possible exception of vanadium. The most recent result for vanadium showed an increase over recent values. Vanadium concentrations at RFN-0195 and other locations will continue to be evaluated in the future to determine the potential for deviations from established trends.

The surface water locations were sampled to monitor the impact of groundwater discharge. COC concentrations at Colorado River surface water locations RFN-0324 and RFN-0326, downgradient of the site, remained low and were consistent with historical results, as shown in the time-concentration graphs. COC concentrations did not indicate there are any impacts related to groundwater discharge to the river. In many cases, elevated COC concentrations at the

New Rifle site pond locations were observed, as shown in the time-versus concentration graphs. As noted in the GCAP, this indicates impacts from groundwater discharge to the ponds.

Old Rifle Site

Samples were collected at the Old Rifle site from eight monitoring wells and five surface locations in compliance with the December 2001 *Groundwater Compliance Action Plan for the Old Rifle, Colorado, UMTRA Project Site* (GJO-2000-177-TAR).

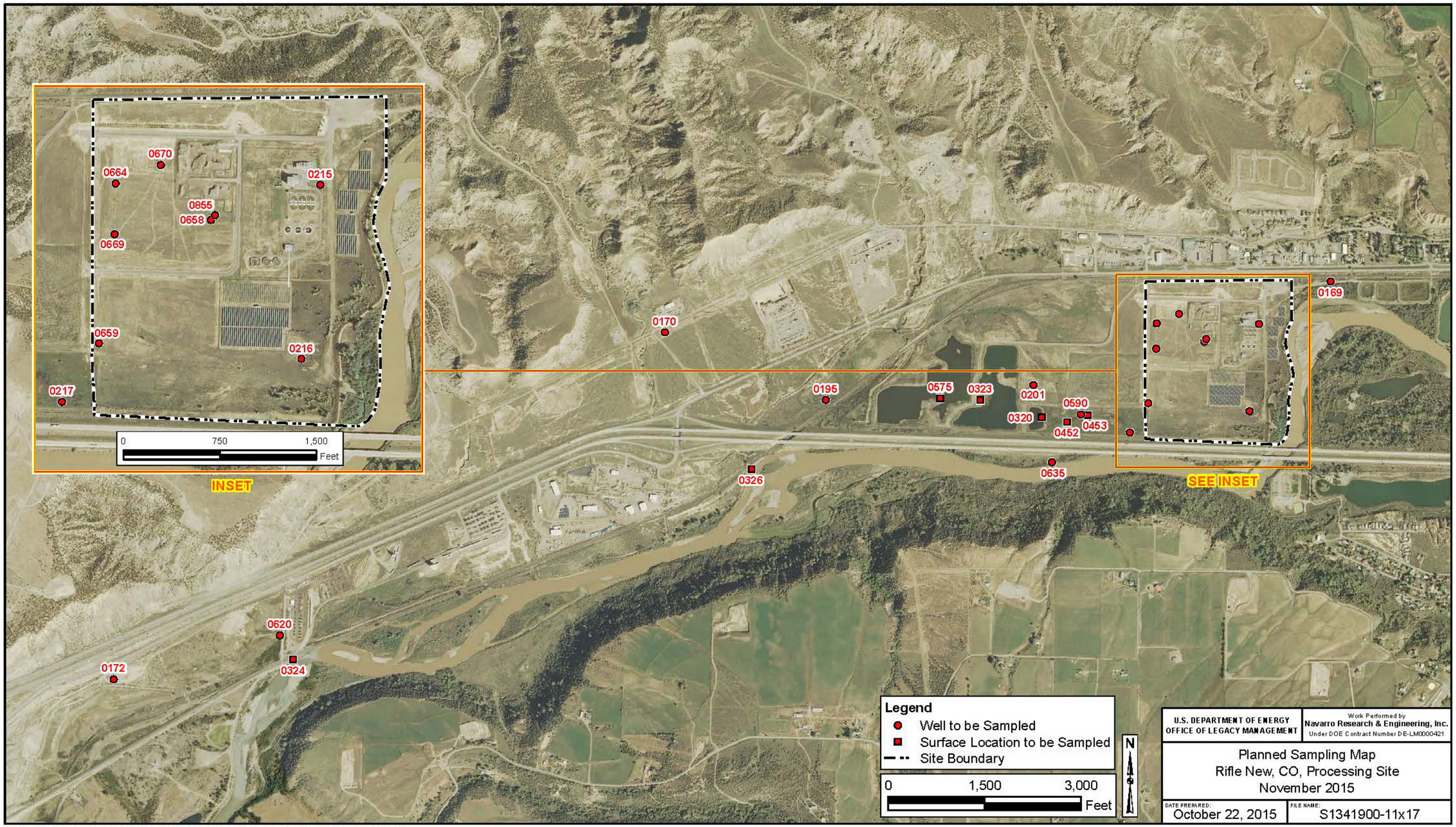
Analytes measured at the Old Rifle site included COCs (selenium, uranium, and vanadium), major cations, and major anions. Field measurements of total alkalinity, oxidation-reduction potential, pH, specific conductance, turbidity, temperature, were made at each location, and the water level was measured at each sampled well.

The monitoring strategy described in the GCAP is designed to determine progress of the natural flushing process in meeting compliance standards for site COCs. Standards for selenium and vanadium are the proposed ACLs of 0.05 mg/L and 1.0 mg/L, respectively. For uranium the cleanup goal is the UMTRA standard of 0.044 mg/L or background, whichever is higher. As shown in the time concentration graphs, the uranium concentration exceeds the cleanup goal at groundwater monitoring locations RFO-0304, -0305, -0310, -0655, and -0656.

The surface water locations were sampled to monitor the impact of groundwater discharge at Colorado River surface water locations adjacent to (RFO-0396) and downgradient of the site (RFO-0741). COC concentrations remain low and consistent with historical concentrations as shown in the time-concentration graphs (Attachment 2), which indicate no impacts from groundwater discharge to the river.

Scott Smith
Navarro Research and Engineering, Inc.

4/27/16
Date

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*New Rifle, Colorado, Processing Site, Planned Sampling Map*


*Old Rifle, Colorado, Processing Site, Planned Sampling Map*

# Data Assessment Summary

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# Water Sampling Field Activities Verification Checklist

| | | | |
|---|---|---|---|
| **Project** | Rifle, Colorado | **Date(s) of Water Sampling** | November 3, 5, and 6, 2015 |
| **Date(s) of Verification** | January 30, 2016 | **Name of Verifier** | Gretchen Baer |

| | Response (Yes, No, NA) | Comments |
|---|---|---|
| 1. Is the SAP the primary document directing field procedures? | Yes | |
| List any Program Directives or other documents, SOPs, instructions. | | Work Order letter dated October 23, 2015. |
| 2. Were the sampling locations specified in the planning documents sampled? | No | Monitoring well RFN 0635 was not sampled due to access issues. |
| 3. Were field equipment calibrations conducted as specified in the above-named documents? | Yes | Calibrations were performed October 29, 2015. |
| 4. Was an operational check of the field equipment conducted daily? | Yes | |
| Did the operational checks meet criteria? | Yes | |
| 5. Were the number and types (alkalinity, temperature, specific conductance, pH, turbidity, DO, ORP) of field measurements taken as specified? | Yes | |
| 6. Were wells categorized correctly? | Yes | |
| 7. Were the following conditions met when purging a Category I well: | | |
| Was one pump/tubing volume purged prior to sampling? | Yes | |
| Did the water level stabilize prior to sampling? | Yes | |
| Did pH, specific conductance, and turbidity measurements meet criteria prior to sampling? | Yes | |
| Was the flow rate less than 500 mL/min? | Yes | |

# Water Sampling Field Activities Verification Checklist (continued)

| | Response (Yes, No, NA) | Comments |
|---|---|---|
| 8. Were the following conditions met when purging a Category II well: | | |
| Was the flow rate less than 500 mL/min? | Yes | |
| Was one pump/tubing volume removed prior to sampling? | Yes | |
| 9. Were duplicates taken at a frequency of one per 20 samples? | Yes | Duplicate samples were collected from New Rifle locations 0659 and 0855, and Old Rifle location 0304. |
| 10. Were equipment blanks taken at a frequency of one per 20 samples that were collected with non-dedicated equipment? | Yes | One equipment blank was collected for the one location that was sampled using non-dedicated equipment. |
| 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? | No | The presence of ice was inadvertently not documented at a location. |
| 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): | 15107463 |
| Sample Event: | November 3, 5, and 6, 2015 |
| Site(s): | New Rifle Processing Site, Colorado |
| Laboratory: | ALS Laboratory Group, Fort Collins, Colorado |
| Work Order No.: | 1511165 |
| Analysis: | Metals and Wet Chemistry |
| Validator: | Gretchen Baer |
| Review Date: | January 30, 2016 |

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 1.

*Table 1. 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 2. Refer to the sections below for an explanation of the data qualifiers applied.

*Table 2. Data Qualifier Summary*

| Sample Number | Location | Analyte(s) | Flag | Reason |
|---|---|---|---|---|
| 1511165-1 | 0169 | Arsenic | U | Less than 5 times the method blank |
| 1511165-1 | 0169 | Molybdenum | J | Reporting limit verification > 130% |
| 1511165-1 | 0169 | Selenium | J | Reporting limit verification > 130% |
| 1511165-1 | 0169 | Vanadium | U | Less than 5 times the method blank |
| 1511165-2 | 0170 | Arsenic | U | Less than 5 times the method blank |
| 1511165-2 | 0170 | Molybdenum | J | Reporting limit verification > 130% |
| 1511165-2 | 0170 | Vanadium | U | Less than 5 times the method blank |

*Table 2 (continued). Data Qualifier Summary*

| Sample Number | Location | Analyte(s) | Flag | Reason |
|---|---|---|---|---|
| 1511165-3 | 0172 | Vanadium | U | Less than 5 times the method blank |
| 1511165-4 | 0195 | Arsenic | J | Reporting limit verification > 130% |
| 1511165-4 | 0195 | Selenium | U | Less than 5 times the calibration blank |
| 1511165-4 | 0195 | Vanadium | U | Less than 5 times the method blank |
| 1511165-5 | 0201 | Arsenic | U | Less than 5 times the method blank |
| 1511165-5 | 0201 | Vanadium | U | Less than 5 times the method blank |
| 1511165-5 | 0201 | Chloride | J | Exceeded holding time |
| 1511165-5 | 0201 | Sulfate | J | Exceeded holding time |
| 1511165-6 | 0215 | Arsenic | U | Less than 5 times the method blank |
| 1511165-6 | 0215 | Selenium | U | Less than 5 times the calibration blank |
| 1511165-6 | 0215 | Vanadium | U | Less than 5 times the method blank |
| 1511165-7 | 0216 | Selenium | U | Less than 5 times the calibration blank |
| 1511165-8 | 0217 | Arsenic | U | Less than 5 times the method blank |
| 1511165-8 | 0217 | Selenium | J | Reporting limit verification > 130% |
| 1511165-9 | 0320 | Arsenic | J | Reporting limit verification > 130% |
| 1511165-9 | 0320 | Selenium | J | Reporting limit verification > 130% |
| 1511165-10 | 0323 | Arsenic | J | Reporting limit verification > 130% |
| 1511165-10 | 0323 | Vanadium | U | Less than 5 times the method blank |
| 1511165-10 | 0323 | Chloride | J | Exceeded holding time |
| 1511165-10 | 0323 | Sulfate | J | Exceeded holding time |
| 1511165-11 | 0324 | Arsenic | U | Less than 5 times the method blank |
| 1511165-11 | 0324 | Selenium | J | Reporting limit verification > 130% |
| 1511165-11 | 0324 | Vanadium | U | Less than 5 times the method blank |
| 1511165-12 | 0326 | Arsenic | U | Less than 5 times the method blank |
| 1511165-12 | 0326 | Molybdenum | J | Reporting limit verification > 130% |
| 1511165-12 | 0326 | Vanadium | U | Less than 5 times the method blank |
| 1511165-12 | 0326 | Chloride | J | Exceeded holding time |
| 1511165-12 | 0326 | Sulfate | J | Exceeded holding time |
| 1511165-13 | 0452 | Selenium | J | Reporting limit verification > 130% |
| 1511165-13 | 0452 | Chloride | J | Exceeded holding time |
| 1511165-13 | 0452 | Sulfate | J | Exceeded holding time |
| 1511165-14 | 0453 | Selenium | J | Reporting limit verification > 130% |
| 1511165-14 | 0453 | Chloride | J | Exceeded holding time |
| 1511165-14 | 0453 | Sulfate | J | Exceeded holding time |
| 1511165-15 | 0575 | Arsenic | J | Reporting limit verification > 130% |
| 1511165-15 | 0575 | Selenium | J | Reporting limit verification > 130% |
| 1511165-15 | 0575 | Vanadium | U | Less than 5 times the method blank |
| 1511165-16 | 0590 | Arsenic | U | Less than 5 times the method blank |
| 1511165-17 | 0620 | Arsenic | U | Less than 5 times the method blank |
| 1511165-17 | 0620 | Vanadium | U | Less than 5 times the method blank |
| 1511165-25 | Equip Blank | Calcium | U | Less than 5 times the calibration blank |
| 1511165-25 | Equip Blank | Vanadium | U | Less than 5 times the method blank |

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 26 water samples on November 10, 2015, 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 2.6 °C, which complies with requirements. All samples were analyzed within the applicable holding times, with the exception of five locations for chloride and sulfate analyses. These samples were initially analyzed within holding time but were reanalyzed out of holding time in response to a request for information, which was issued to correct a laboratory error. Chloride and sulfate results for these samples are qualified with a "J" flag as estimated values. All samples were received in the correct container types and had been preserved correctly for the requested analyses.

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 November 16 and 17, 2015. 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 November 13, 2015. 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 November 12, 2015, using three calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than or only slightly above 3 times the MDL. 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 November 12, 2015, using three calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 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 exception of arsenic, molybdenum, selenium, and vanadium. This indicates a higher degree of uncertainty in these measurements at low concentrations and the associated sample detects that are less than 5 times the PQL are qualified with a "J" flag as estimated values. 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 November 13, 2015, and January 4, 2016. 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. Method blank and calibration blank results associated with the samples were below the PQLs with the exception of sulfate. Some blank results for sulfate were slightly above the PQL. The samples associated with these blanks had sulfate concentrations greater than 10 times the blank, so no qualification is necessary. 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.

Laboratory Replicate Analysis

Laboratory replicate analyses are used to determine laboratory precision for each sample matrix. The relative percent difference for replicate results that are greater than 5 times the PQL should be less than 20 percent. For results 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.

Completeness

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

Electronic Data Deliverable (EDD) File

The original EDD file arrived on December 1, 2015. A revised EDD file arrived on January 22, 2016, in response to a request for information. The revision included corrections to some chloride and sulfate results. The data were loaded into the environmental database on January 26, 2016. The Sample Management System EDD validation module was used to verify that the EDD files were 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.

Anion/Cation Balance

Environmental water should be electrically neutral. Expressed in milliequivalents per liter (meq/L), the sum of the anions should equal the sum of the cations. The anion/cation balance is calculated as the difference between the anions and cations, divided by the sum of the anions and cations. The anion/cation balance can be used to identify potential errors in the analytical results. Typically, a charge balance of less than 10 percent is considered acceptable. When a charge balance is greater than 10 percent, the associated data are closely examined for error. If no errors are found, the results are considered to be acceptable. Table 3 shows the total anion and cation results from this event and the charge balance.

*Table 3. Comparison of Major Anions and Cations*

| Location | Cations (meq/L) | Anions (meq/L) | Charge Balance (%) |
|---|---|---|---|
| 0169 | 26.1 | 26.7 | 1.2 |
| 0170 | 34.1 | 36.4 | 3.2 |
| 0172 | 141.7 | 155.8 | 4.8 |
| 0195 | 13.6 | 13.3 | 1.0 |
| 0201 | 50.0 | 49.2 | 0.8 |
| 0215 | 10.5 | 10.7 | 0.7 |
| 0216 | 7.7 | 8.3 | 3.3 |
| 0217 | 45.0 | 43.8 | 1.3 |
| 0320 | 49.9 | 54.5 | 4.4 |
| 0323 | 81.5 | 81.9 | 0.3 |
| 0324 | 9.5 | 10.9 | 6.6 |
| 0326 | 10.0 | 9.9 | 0.8 |
| 0452 | 54.6 | 57.2 | 2.3 |
| 0453 | 51.2 | 52.4 | 1.2 |
| 0575 | 91.5 | 97.7 | 3.3 |
| 0590 | 61.2 | 61.8 | 0.5 |
| 0620 | 86.5 | 95.0 | 4.7 |
| 0658 | 38.9 | 40.0 | 1.4 |
| 0659 | 44.0 | 45.5 | 1.6 |
| 0664 | 24.4 | 24.6 | 0.3 |
| 0669 | 28.5 | 27.6 | 1.6 |
| 0670 | 24.7 | 25.0 | 0.7 |
| 0855 | 24.8 | 25.5 | 1.5 |

All charge balance values were below 10 percent.

# SAMPLE MANAGEMENT SYSTEM

## General Data Validation Report

**RIN:** 15107463 **Lab Code:** PAR **Validator:** Gretchen Baer **Validation Date:** 1/30/2016

**Project:** Rifle Disposal/Processing Site (old/new) **Analysis Type:** ☑ Metals ☑ General Chem ☐ Rad ☐ Organics

**# of Samples:** 26 **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 | There are 10 holding time failures. |
| ☑ Detection Limits | The reported detection limits are equal to or below contract requirements. |
| ☑ Field/Trip Blanks | There was 1 trip/equipment blank evaluated. |
| ☑ Field Duplicates | There were 2 duplicates evaluated. |

## SAMPLE MANAGEMENT SYSTEM



**RIN:** 15107463 **Lab Code:** PAR

## Non-Compliance Report: Holding Times

**Project:** Rifle Disposal/Processing Site (old/new)

**Validation Date:** 1/30/2016

| | | | | Holding Times | | | Criteria | | | Reported Dates | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ticket | Location | Lab Sample ID | Method Code | Collection to Preparation | Preparation to Analysis | Collection to Analysis | Collection to Preparation | Preparation to Analysis | Collection to Analysis | Collection Date | Preparation Date | Analysis Date |
| NLW 982 | 0201 | 1511165-5 | MIS-A-045 | | | 74 | | | 28 | 11/06/2015 | 01/19/2016 | 01/19/2016 |
| NLW 982 | 0201 | 1511165-5 | MIS-A-045 | | | 74 | | | 28 | 11/06/2015 | 01/19/2016 | 01/19/2016 |
| NLW 994 | 0323 | 1511165-10 | MIS-A-045 | | | 74 | | | 28 | 11/06/2015 | 01/19/2016 | 01/19/2016 |
| NLW 994 | 0323 | 1511165-10 | MIS-A-045 | | | 74 | | | 28 | 11/06/2015 | 01/19/2016 | 01/19/2016 |
| NLW 996 | 0452 | 1511165-13 | MIS-A-045 | | | 77 | | | 28 | 11/03/2015 | 01/19/2016 | 01/19/2016 |
| NLW 996 | 0452 | 1511165-13 | MIS-A-045 | | | 77 | | | 28 | 11/03/2015 | 01/19/2016 | 01/19/2016 |
| NLW 997 | 0453 | 1511165-14 | MIS-A-045 | | | 77 | | | 28 | 11/03/2015 | 01/19/2016 | 01/19/2016 |
| NLW 997 | 0453 | 1511165-14 | MIS-A-045 | | | 77 | | | 28 | 11/03/2015 | 01/19/2016 | 01/19/2016 |
| NLX 000 | 0326 | 1511165-12 | MIS-A-045 | | | 77 | | | 28 | 11/03/2015 | 01/19/2016 | 01/19/2016 |
| NLX 000 | 0326 | 1511165-12 | MIS-A-045 | | | 77 | | | 28 | 11/03/2015 | 01/19/2016 | 01/19/2016 |

# SAMPLE MANAGEMENT SYSTEM

## Metals Data Validation Worksheet

**RIN:** 15107463 **Lab Code:** PAR **Date Due:** 12/8/2015

**Matrix:** Water **Site Code:** RFL01 **Date Completed:** 12/2/2015

| Analyte | Method Type | Date Analyzed | CALIBRATION | | | | Method Blank | LCS %R | MS %R | MSD %R | Dup. RPD | ICSAB %R | Serial Dil. %R | CRI %R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Int. | R^2 | CCV | CCB | | | | | | | | |
| Calcium | ICP/ES | 11/12/2015 | -9.0000 | 0.9996 | OK | OK | OK | 103.0 | 101.0 | 101.0 | 0.0 | 99.0 | 4.0 | 104.0 |
| Calcium | ICP/ES | 11/12/2015 | | | | | OK | 103.0 | 101.0 | 102.0 | 0.0 | | 2.0 | 110.0 |
| Magnesium | ICP/ES | 11/12/2015 | 8.0000 | 0.9999 | OK | OK | OK | 101.0 | 102.0 | 102.0 | 0.0 | 102.0 | 2.0 | 102.0 |
| Magnesium | ICP/ES | 11/12/2015 | | | | | OK | 102.0 | 101.0 | 102.0 | 0.0 | | 2.0 | 103.0 |
| Potassium | ICP/ES | 11/12/2015 | | | | | OK | 100.0 | 104.0 | 104.0 | 0.0 | | 2.0 | 93.0 |
| Potassium | ICP/ES | 11/12/2015 | 78.0000 | 0.9999 | OK | OK | OK | 100.0 | 103.0 | 102.0 | 0.0 | | 5.0 | 91.0 |
| Sodium | ICP/ES | 11/12/2015 | 21.0000 | 1.0000 | OK | OK | OK | 101.0 | 102.0 | 106.0 | 1.0 | | 3.0 | 95.0 |
| Sodium | ICP/ES | 11/12/2015 | | | | | OK | 102.0 | 100.0 | 101.0 | 0.0 | | 0.0 | 101.0 |
| Arsenic | ICP/MS | 11/12/2015 | | | | | OK | 100.0 | 86.0 | 101.0 | 6.0 | | | 111.0 |
| Arsenic | ICP/MS | 11/12/2015 | 0.0000 | 1.0000 | OK | OK | OK | 101.0 | 97.0 | 100.0 | 3.0 | 88.0 | 1.0 | 136.0 |
| Molybdenum | ICP/MS | 11/12/2015 | | | | | OK | 103.0 | 87.0 | 95.0 | 2.0 | 104.0 | 2.0 | 163.0 |
| Molybdenum | ICP/MS | 11/12/2015 | -0.0180 | 1.0000 | OK | OK | OK | 102.0 | 98.0 | 97.0 | 1.0 | 96.0 | 2.0 | 104.0 |
| Selenium | ICP/MS | 11/12/2015 | | | | | OK | 100.0 | 102.0 | 100.0 | 2.0 | | | 228.0 |
| Selenium | ICP/MS | 11/12/2015 | -0.0150 | 1.0000 | OK | OK | OK | 106.0 | | | 1.0 | 100.0 | 2.0 | 138.0 |
| Uranium | ICP/MS | 11/12/2015 | 0.0000 | 1.0000 | OK | OK | OK | 95.0 | 101.0 | 109.0 | 3.0 | 99.0 | 3.0 | 120.0 |
| Uranium | ICP/MS | 11/12/2015 | | | | | OK | 96.0 | 105.0 | 110.0 | 1.0 | | 3.0 | 130.0 |
| Vanadium | ICP/MS | 11/12/2015 | -0.1300 | 1.0000 | OK | OK | OK | 97.0 | 95.0 | 99.0 | 4.0 | | | 50.0 |

# SAMPLE MANAGEMENT SYSTEM

## Metals Data Validation Worksheet

**RIN:** 15107463 **Lab Code:** PAR **Date Due:** 12/8/2015

**Matrix:** Water **Site Code:** RFL01 **Date Completed:** 12/2/2015

| Analyte | Method Type | Date Analyzed | CALIBRATION | | | | Method Blank | LCS %R | MS %R | MSD %R | Dup. RPD | ICSAB %R | Serial Dil. %R | CRI %R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Int. | R^2 | CCV | CCB | | | | | | | | |
| Vanadium | ICP/MS | 11/12/2015 | | | | | OK | 99.0 | | | | 98.0 | | 309.0 |
| Vanadium | ICP/MS | 11/13/2015 | -0.1840 | 1.0000 | OK | OK | | | | | 2.0 | 92.0 | 4.0 | 111.0 |

# SAMPLE MANAGEMENT SYSTEM

## Wet Chemistry Data Validation Worksheet

**RIN:** 15107463 **Lab Code:** PAR **Date Due:** 12/8/2015

**Matrix:** Water **Site Code:** RFL01 **Date Completed:** 12/2/2015

| Analyte | Date Analyzed | CALIBRATION | | | | Method Blank | LCS %R | MS %R | MSD %R | DUP RPD | Serial Dil. %R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Int. | R^2 | CCV | CCB | | | | | | |
| Ammonia as N | 11/16/2015 | -0.117 | 0.9993 | OK | OK | OK | 106 | | | | |
| Ammonia as N | 11/17/2015 | -0.075 | 0.9999 | OK | OK | OK | 108 | 95 | 98 | 1 | |
| Chloride | 11/13/2015 | 0.003 | 1.0000 | | | | | | | | |
| Chloride | 11/17/2015 | | | OK | OK | OK | 98 | | | | |
| Chloride | 11/17/2015 | | | OK | OK | OK | 102 | 94 | 90 | 2 | |
| Chloride | 01/04/2016 | 0.000 | 1.0000 | | | | | | | | |
| Chloride | 01/19/2016 | | | OK | OK | OK | 97.00 | | | | |
| NITRATE/NITRITE AS N | 11/13/2015 | -0.001 | 0.9995 | OK | OK | OK | 96 | 93 | 99 | 4 | |
| NITRATE/NITRITE AS N | 11/13/2015 | | | OK | OK | OK | 96 | | | | |
| Sulfate | 11/13/2015 | 0.200 | 0.9999 | | | | | | | | |
| Sulfate | 11/17/2015 | | | OK | OK | OK | 96 | 103 | 99 | 2 | |
| Sulfate | 11/17/2015 | | | OK | OK | OK | 101 | | | | |
| Sulfate | 01/04/2016 | 0.000 | 1.0000 | | | | | | | | |
| Sulfate | 01/19/2016 | | | OK | OK | OK | 94.00 | | | | |

General Information

Report Number (RIN): 15107464
Sample Event: November 3 and 5, 2015
Site(s): Old Rifle Processing Site, Colorado
Laboratory: ALS Laboratory Group, Fort Collins, Colorado
Work Order No.: 1511166
Analysis: Metals and Wet Chemistry
Validator: Gretchen Baer
Review Date: January 18, 2016

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 4.

*Table 4. Analytes and Methods*

| Analyte | Line Item Code | Prep Method | Analytical Method |
|---|---|---|---|
| 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 5. Refer to the sections below for an explanation of the data qualifiers applied.

*Table 5. Data Qualifier Summary*

| Sample Number | Location | Analyte(s) | Flag | Reason |
|---|---|---|---|---|
| 1511166-1 | 0292A | Selenium | J | Reporting limit verification > 130% |
| 1511166-1 | 0292A | Vanadium | U | Less than 5 times the method blank |
| 1511166-2 | 0294 | Vanadium | U | Less than 5 times the method blank |
| 1511166-3 | 0304 | Selenium | J | Reporting limit verification > 130% |
| 1511166-5 | 0309 | Vanadium | U | Less than 5 times the method blank |
| 1511166-8 | 0396 | Selenium | U | Less than 5 times the calibration blank |
| 1511166-8 | 0396 | Vanadium | U | Less than 5 times the method blank |
| 1511166-9 | 0398 | Selenium | U | Less than 5 times the calibration blank |
| 1511166-9 | 0398 | Vanadium | U | Less than 5 times the method blank |
| 1511166-11 | 0656 | Selenium | J | Reporting limit verification > 130% |

*Table 5 (continued). Data Qualifier Summary*

| Sample Number | Location | Analyte(s) | Flag | Reason |
|---|---|---|---|---|
| 1511166-12 | 0658 | Selenium | J | Reporting limit verification > 130% |
| 1511166-12 | 0658 | Vanadium | U | Less than 5 times the method blank |
| 1511166-13 | 0741 | Selenium | J | Reporting limit verification > 130% |
| 1511166-13 | 0741 | Vanadium | U | Less than 5 times the method blank |
| 1511166-14 | 0304 Dup | Selenium | J | Reporting limit verification > 130% |
| All | All | Chloride | J | Exceeded holding time |
| All | All | Sulfate | J | Exceeded holding time |

Sample Shipping/Receiving

ALS Laboratory Group in Fort Collins, Colorado, received 14 water samples on November 10, 2015, 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 1.2 °C, which complies with requirements. All samples were analyzed within the applicable holding times, with the exception of the chloride and sulfate samples. Due to laboratory error, all chloride and sulfate samples were analyzed outside the 28-day holding time. All chloride and sulfate samples are qualified with a "J" flag as estimated values. All samples were received in the correct container types and had been preserved correctly for the requested analyses.

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 353.2 Nitrate + Nitrite as N*
Calibrations for nitrate + nitrite as N were performed using seven calibration standards on November 13, 2015. 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 not made at the required frequency: 11 samples were analyzed between a set of checks. However, all affected results were for another client; no qualification is required. All calibration check results were within the acceptance criteria.

*Method SW-846 6010 Ca, Mg, K, Na*
Calibrations were performed on November 17, 2015, using three calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than or only slightly above 3 times the MDL. 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 Se, U, V*
Calibrations were performed on November 17, 2015, using three calibration standards. The calibration curve correlation coefficient values were greater than 0.995 and the absolute values of the intercepts were less than 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 exception of selenium and vanadium. This indicates a higher degree of uncertainty in these measurements at low concentrations and the associated sample detects that are less than 5 times the PQL are qualified with a "J" flag as estimated values. 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 January 4, 2016. 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. 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.

Laboratory Replicate Analysis

Laboratory replicate analyses are used to determine laboratory precision for each sample matrix. The relative percent difference for replicate results that are greater than 5 times the PQL should be less than 20 percent. For results 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.

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 January 12, 2016. The data were loaded into the environmental database on January 20, 2016. The Sample Management System EDD validation module was used to verify that the EDD files were 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.

Anion/Cation Balance

Environmental water should be electrically neutral. Expressed in milliequivalents per liter (meq/L), the sum of the anions should equal the sum of the cations. The anion/cation balance is calculated as the difference between the anions and cations, divided by the sum of the anions and cations. The anion/cation balance can be used to identify potential errors in the analytical results. Typically, a charge balance of less than 10 percent is considered acceptable. When a charge balance is greater than 10 percent, the associated data are closely examined for error. If no errors are found, the results are considered to be acceptable. Table 6 shows the total anion and cation results from this event and the charge balance.

*Table 6. Comparison of Major Anions and Cations*

| Location | Cations (meq/L) | Anions (meq/L) | Charge Balance (%) |
|---|---|---|---|
| 0292A | 30.0 | 29.3 | 1.2 |
| 0294 | 10.0 | 9.6 | 2.3 |
| 0304 | 22.3 | 23.1 | 1.7 |
| 0305 | 22.8 | 23.6 | 1.8 |
| 0309 | 26.9 | 26.9 | 0.2 |
| 0310 | 29.4 | 29.3 | 0.2 |
| 0395 | 17.0 | 16.0 | 3.0 |
| 0396 | 9.9 | 9.6 | 1.8 |
| 0398 | 14.0 | 10.9 | 12.5 |
| 0655 | 25.9 | 26.3 | 0.7 |
| 0656 | 23.8 | 24.6 | 1.7 |
| 0658 | 22.9 | 21.9 | 2.3 |
| 0741 | 10.0 | 9.1 | 4.6 |

Location 0398 had a charge balance greater than 10 percent. There were no analytical errors identified during the review of the laboratory data. All other charge balances were below 10 percent.

# SAMPLE MANAGEMENT SYSTEM

## General Data Validation Report

**RIN:** 15107464 **Lab Code:** PAR **Validator:** Gretchen Baer **Validation Date:** 1/18/2016

**Project:** Rifle Disposal/Processing Site (old/new) **Analysis Type:** ☑ Metals ☑ General Chem ☐ Rad ☐ Organics

**# of Samples:** 14 **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 | There are 28 holding time failures. |
| ☑ Detection Limits | The reported detection limits are equal to or below contract requirements. |
| ☐ Field/Trip Blanks | |
| ☑ Field Duplicates | There was 1 duplicate evaluated. |

# SAMPLE MANAGEMENT SYSTEM



**RIN:** 15107464 **Lab Code:** PAR

## Non-Compliance Report: Holding Times

**Project:** Rifle Disposal/Processing Site (old/new)

**Validation Date:** 1/18/2016

| | | | | Holding Times | | | Criteria | | | Reported Dates | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ticket | Location | Lab Sample ID | Method Code | Collection to Preparation | Preparation to Analysis | Collection to Analysis | Collection to Preparation | Preparation to Analysis | Collection to Analysis | Collection Date | Preparation Date | Analysis Date |
| NLX 006 | 0292A | 1511166-1 | MIS-A-045 | | | 65 | | | 28 | 11/03/2015 | 01/07/2016 | 01/07/2016 |
| NLX 006 | 0292A | 1511166-1 | MIS-A-045 | | | 65 | | | 28 | 11/03/2015 | 01/07/2016 | 01/07/2016 |
| NLX 007 | 0304 | 1511166-3 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 007 | 0304 | 1511166-3 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 008 | 0305 | 1511166-4 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 008 | 0305 | 1511166-4 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 009 | 0309 | 1511166-5 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 009 | 0309 | 1511166-5 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 010 | 0310 | 1511166-6 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 010 | 0310 | 1511166-6 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 011 | 0655 | 1511166-10 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 011 | 0655 | 1511166-10 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 012 | 0656 | 1511166-11 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 012 | 0656 | 1511166-11 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 013 | 0658 | 1511166-12 | MIS-A-045 | | | 65 | | | 28 | 11/03/2015 | 01/07/2016 | 01/07/2016 |
| NLX 013 | 0658 | 1511166-12 | MIS-A-045 | | | 65 | | | 28 | 11/03/2015 | 01/07/2016 | 01/07/2016 |
| NLX 014 | 0294 | 1511166-2 | MIS-A-045 | | | 65 | | | 28 | 11/03/2015 | 01/07/2016 | 01/07/2016 |
| NLX 014 | 0294 | 1511166-2 | MIS-A-045 | | | 65 | | | 28 | 11/03/2015 | 01/07/2016 | 01/07/2016 |
| NLX 015 | 0395 | 1511166-7 | MIS-A-045 | | | 65 | | | 28 | 11/03/2015 | 01/07/2016 | 01/07/2016 |
| NLX 015 | 0395 | 1511166-7 | MIS-A-045 | | | 65 | | | 28 | 11/03/2015 | 01/07/2016 | 01/07/2016 |
| NLX 016 | 0396 | 1511166-8 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 016 | 0396 | 1511166-8 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 017 | 0398 | 1511166-9 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 017 | 0398 | 1511166-9 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 018 | 0741 | 1511166-13 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 018 | 0741 | 1511166-13 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 019 | 2551 | 1511166-14 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |
| NLX 019 | 2551 | 1511166-14 | MIS-A-045 | | | 63 | | | 28 | 11/05/2015 | 01/07/2016 | 01/07/2016 |

# SAMPLE MANAGEMENT SYSTEM

## Metals Data Validation Worksheet

**RIN:** 15107464 **Lab Code:** PAR **Date Due:** 12/8/2015

**Matrix:** Water **Site Code:** RFL01 **Date Completed:** 1/13/2016

| Analyte | Method Type | Date Analyzed | CALIBRATION | | | | Method Blank | LCS %R | MS %R | MSD %R | Dup. RPD | ICSAB %R | Serial Dil. %R | CRI %R |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Int. | R^2 | CCV | CCB | | | | | | | | |
| Calcium | ICP/ES | 11/17/2015 | 57.0000 | 0.9999 | OK | OK | OK | 102.0 | 101.0 | 93.0 | 2.0 | 97.0 | 2.0 | 93.0 |
| Magnesium | ICP/ES | 11/17/2015 | 11.0000 | 0.9999 | OK | OK | OK | 101.0 | 103.0 | 100.0 | 1.0 | 102.0 | 1.0 | 101.0 |
| Potassium | ICP/ES | 11/17/2015 | 2.0000 | 0.9994 | OK | OK | OK | 103.0 | 106.0 | 106.0 | 0.0 | | 4.0 | 89.0 |
| Sodium | ICP/ES | 11/17/2015 | 13.0000 | 0.9999 | OK | OK | OK | 103.0 | 102.0 | 103.0 | 0.0 | | 3.0 | 95.0 |
| Selenium | ICP/MS | 11/17/2015 | -0.0300 | 1.0000 | OK | OK | OK | 106.0 | 103.0 | 111.0 | 7.0 | 96.0 | | 183.0 |
| Uranium | ICP/MS | 11/17/2015 | -0.0020 | 1.0000 | OK | OK | OK | 102.0 | 99.0 | 106.0 | 2.0 | 103.0 | 2.0 | 110.0 |
| Vanadium | ICP/MS | 11/17/2015 | -0.1500 | 1.0000 | OK | OK | OK | 97.0 | 99.0 | 99.0 | 1.0 | 100.0 | | 138.0 |

# SAMPLE MANAGEMENT SYSTEM

## Wet Chemistry Data Validation Worksheet

**RIN:** 15107464 **Lab Code:** PAR **Date Due:** 12/8/2015

**Matrix:** Water **Site Code:** RFL01 **Date Completed:** 1/13/2016

| Analyte | Date Analyzed | CALIBRATION | | | | Method Blank | LCS %R | MS %R | MSD %R | DUP RPD | Serial Dil. %R |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Int. | R^2 | CCV | CCB | | | | | | |
| CHLORIDE | 01/04/2016 | -0.079 | 0.9999 | OK | OK | | | | | | |
| CHLORIDE | 01/07/2016 | | | | | OK | 97 | 106 | 104 | 1 | |
| Nitrate+Nitrite as N | 11/13/2015 | 0.000 | 0.9995 | OK | OK | OK | 96 | 101 | 103 | 2 | |
| Sulfate | 01/04/2016 | 0.229 | 0.9998 | OK | OK | | | | | | |
| SULFATE | 01/07/2016 | | | | | OK | 95 | 106 | 104 | 1 | |

## Sampling Quality Control Assessment

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

Sampling Protocol

Sample results for all monitoring wells were qualified with an "F" flag, indicating the wells were purged and sampled using the low-flow method. At all monitoring well locations, purging and sampling met the Category I criteria with the following exceptions: wells RFN01-0669 and RFN01-0670 were classified as Category II because they produced water at a rate less than the minimum low-flow purging rate. The sample results for these wells were qualified with a "Q" flag (qualitative), indicating the samples were not collected under the optimal conditions of the Category I stability criteria.

Equipment Blank Assessment

Equipment blanks are prepared and analyzed to document contamination attributable to the sample collection process. An equipment blank (field ID 2804) was collected after decontamination of the non-dedicated tubing reel used to collect one surface water sample at the New Rifle site. (An equipment blank was not required at the Old Rifle site because all samples were collected using dedicated equipment.) Magnesium and uranium were detected in the equipment blank. All magnesium and uranium results in the associated sample were greater than 5 times the equipment blank, so no further qualification is required. Calcium and vanadium were also detected in the equipment blank by the laboratory but these results were qualified during data validation with a "U" flag as not detected.

Field Duplicate Assessment

Field duplicate samples are collected and analyzed as an indication of overall precision of the measurement process. The precision observed includes both field and laboratory precision and has more variability than laboratory duplicates, which measure only laboratory performance. A duplicate sample was collected from locations RFN01-0659, RFN01-0855, and RFO-0304. The relative percent difference for duplicate results that are greater than 5 times the PQL should be less than 20 percent. For results that are less than 5 times the PQL, the range should be no greater than the PQL. The duplicate results met the criteria, demonstrating acceptable overall precision.

# SAMPLE MANAGEMENT SYSTEM

## Validation Report: Equipment/Trip Blanks

**RIN:** 15107463 **Lab Code:** PAR **Project:** Rifle Disposal/Processing Site (old/new) **Validation Date:** 1/18/2016

**Blank Data**

| Blank Type | Lab Sample ID | Lab Method | Analyte Name | Result | Qualifier | MDL | Units |
|---|---|---|---|---|---|---|---|
| Equipment Blank | 1511165-25 | SW6010 | Magnesium | 31 | J | 30 | UG/L |

| Sample ID | Sample Ticket | Location | Result | Dilution Factor | Lab Qualifier | Validation Qualifier |
|---|---|---|---|---|---|---|
| 1511165-11 | NLW 995 | 0324 | 14000 | 1 | | |

**Blank Data**

| Blank Type | Lab Sample ID | Lab Method | Analyte Name | Result | Qualifier | MDL | Units |
|---|---|---|---|---|---|---|---|
| Equipment Blank | 1511165-25 | SW6020 | Uranium | 0.03 | J | 0.029 | UG/L |

| Sample ID | Sample Ticket | Location | Result | Dilution Factor | Lab Qualifier | Validation Qualifier |
|---|---|---|---|---|---|---|
| 1511165-11 | NLW 995 | 0324 | 2.3 | 10 | | |

# SAMPLE MANAGEMENT SYSTEM

## Validation Report: Field Duplicates

**RIN:** 15107463 **Lab Code:** PAR **Project:** Rifle Disposal/Processing Site (old/new) **Validation Date:** 1/18/2016

**Duplicate:** 2548 **Sample:** 0659

| Analyte | Sample Result | Flag | Error | Dilution | Duplicate Result | Flag | Error | Dilution | RPD | RER | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia as N | 4 | | | 1 | 4.4 | | | 1 | 9.52 | | MG/L |
| Arsenic | 49 | | | 10 | 49 | | | 10 | 0 | | UG/L |
| Calcium | 660000 | | | 5 | 650000 | | | 5 | 1.53 | | UG/L |
| Chloride | 200 | | | 20 | 210 | | | 20 | 4.88 | | MG/L |
| Magnesium | 33000 | | | 1 | 32000 | | | 1 | 3.08 | | UG/L |
| Molybdenum | 1100 | | | 10 | 1100 | | | 10 | 0 | | UG/L |
| NITRATE/NITRITE AS N | 15 | | | 50 | 15 | | | 50 | 0 | | MG/L |
| Potassium | 11000 | | | 1 | 11000 | | | 1 | 0 | | UG/L |
| Selenium | 110 | | | 10 | 120 | | | 10 | 8.70 | | UG/L |
| Sodium | 180000 | | | 1 | 180000 | | | 1 | 0 | | UG/L |
| Sulfate | 1700 | | | 20 | 1700 | | | 20 | 0 | | MG/L |
| Uranium | 88 | | | 10 | 86 | | | 10 | 2.30 | | UG/L |
| Vanadium | 2900 | | | 10 | 2800 | | | 10 | 3.51 | | UG/L |

**Duplicate:** 2805 **Sample:** 0855

| Analyte | Sample Result | Flag | Error | Dilution | Duplicate Result | Flag | Error | Dilution | RPD | RER | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia as N | 29 | | | 25 | 34 | | | 25 | 15.87 | | MG/L |
| Arsenic | 160 | | | 10 | 150 | | | 10 | 6.45 | | UG/L |
| Calcium | 200000 | | | 1 | 200000 | | | 1 | 0 | | UG/L |
| Chloride | 190 | | | 10 | 180 | | | 10 | 5.41 | | MG/L |
| Magnesium | 40000 | | | 1 | 40000 | | | 1 | 0 | | UG/L |
| Molybdenum | 390 | | | 10 | 380 | | | 10 | 2.60 | | UG/L |
| NITRATE/NITRITE AS N | 11 | | | 50 | 11 | | | 50 | 0 | | MG/L |
| Potassium | 11000 | | | 1 | 11000 | | | 1 | 0 | | UG/L |
| Selenium | 880 | | | 10 | 870 | | | 10 | 1.14 | | UG/L |
| Sodium | 210000 | | | 1 | 210000 | | | 1 | 0 | | UG/L |
| Sulfate | 690 | | | 10 | 680 | | | 10 | 1.46 | | MG/L |
| Uranium | 33 | | | 10 | 33 | | | 10 | 0 | | UG/L |
| Vanadium | 10000 | | | 100 | 10000 | | | 10 | 0 | | UG/L |

# SAMPLE MANAGEMENT SYSTEM

## Validation Report: Field Duplicates

**RIN:** 15107464 **Lab Code:** PAR **Project:** Rifle Disposal/Processing Site (old/new) **Validation Date:** 1/18/2016

**Duplicate:** 2551 **Sample:** 0304

| Analyte | Sample Result | Flag | Error | Dilution | Duplicate Result | Flag | Error | Dilution | RPD | RER | Units |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Calcium | 190000 | | | 1 | 190000 | | | 1 | 0 | | UG/L |
| CHLORIDE | 250 | | | 20 | 240 | | | 20 | 4.08 | | MG/L |
| Magnesium | 74000 | | | 1 | 74000 | | | 1 | 0 | | UG/L |
| Nitrate+Nitrite as N | 0.01 | U | | 1 | 0.01 | U | | 1 | | | MG/L |
| Potassium | 6600 | | | 1 | 6800 | | | 1 | 2.99 | | UG/L |
| Selenium | 1.8 | | | 10 | 1.3 | | | 10 | | | UG/L |
| Sodium | 150000 | | | 1 | 150000 | | | 1 | 0 | | UG/L |
| SULFATE | 480 | | | 20 | 480 | | | 20 | 0 | | MG/L |
| Uranium | 58 | | | 10 | 60 | | | 10 | 3.39 | | UG/L |
| Vanadium | 35 | | | 10 | 34 | | | 10 | 2.90 | | UG/L |

## Certification

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

Laboratory Coordinator: Stephen Donivan — Date: 2-26-2016

Data Validation Lead: Gretchen Baer — Date: 2/26/2016

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# Attachment 1

# Assessment of Anomalous Data

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# Potential Outliers Report

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**Potential Outliers Report**

Potential outliers are measurements that are extremely large or small relative to the rest of the data and, therefore, are suspected of misrepresenting the population from which they were collected. Potential outliers 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.

One laboratory result from the New Rifle site sampling event was identified as a potential outlier (see the Data Validation Outliers Report, below). The data associated with this result were reviewed in detail with no errors noted. Results for uranium since 2012 at this location indicate downward trending. The results for the New Rifle site sampling event are acceptable as qualified.

Three laboratory results from the Old Rifle site sampling event were identified as potential outliers. The data associated with these results were reviewed in detail with no errors noted. For these results, the historical ranges are narrow because of low variability and/or a small number of available data points. The results for the Old Rifle site sampling event are acceptable as qualified.

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**Data Validation Outliers Report - No Field Parameters**
**Comparison: All historical Data Beginning 1/1/2006**
Laboratory: ALS Laboratory Group
RIN: 15107463
Report Date: 1/30/2016

| 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 | 0169 | N001 | 11/06/2015 | Chloride | 81.0 | | F | 80.0 | | F | 50.0 | | F | 6 | 0 | No |
| RFN01 | 0170 | N001 | 11/06/2015 | Ammonia Total as N | 0.770 | | F | 0.630 | | F | 0.1000 | U | F | 15 | 2 | No |
| RFN01 | 0170 | N001 | 11/06/2015 | Chloride | 170 | | F | 160 | | F | 150 | | F | 6 | 0 | NA |
| RFN01 | 0170 | N001 | 11/06/2015 | Sodium | 420 | | F | 490 | | F | 430 | | F | 6 | 0 | No |
| RFN01 | 0172 | N001 | 11/05/2015 | Ammonia Total as N | 0.560 | | F | 0.166 | | F | 0.0160 | U | F | 17 | 13 | NA |
| RFN01 | 0172 | N001 | 11/05/2015 | Chloride | 1200 | | F | 3000 | | F | 1300 | | F | 7 | 0 | No |
| RFN01 | 0172 | N001 | 11/05/2015 | Magnesium | 300 | | F | 710 | | F | 350 | | F | 7 | 0 | No |
| RFN01 | 0172 | N001 | 11/05/2015 | Sodium | 2200 | | F | 3600 | | F | 2400 | | F | 7 | 0 | No |
| RFN01 | 0172 | N001 | 11/05/2015 | Uranium | 0.0400 | | F | 0.0780 | | F | 0.0480 | | F | 26 | 0 | Yes |
| RFN01 | 0195 | N001 | 11/03/2015 | Molybdenum | 0.0120 | | F | 0.390 | | FQ | 0.0130 | | F | 13 | 0 | No |
| RFN01 | 0201 | N001 | 11/06/2015 | Nitrate + Nitrite as Nitrogen | 20.0 | | F | 110 | | F | 22.0 | | F | 18 | 0 | No |
| RFN01 | 0215 | N001 | 11/06/2015 | Magnesium | 29.0 | | F | 46.0 | | F | 35.0 | | F | 8 | 0 | No |
| RFN01 | 0215 | N001 | 11/06/2015 | Potassium | 3.70 | | F | 6.40 | | F | 4.10 | | F | 8 | 0 | No |
| RFN01 | 0320 | N001 | 11/03/2015 | Molybdenum | 0.450 | | | 3.01 | | | 0.500 | | | 14 | 0 | No |
| RFN01 | 0320 | N001 | 11/03/2015 | Vanadium | 0.0150 | | | 0.250 | | | 0.0260 | | | 14 | 0 | No |
| RFN01 | 0323 | N001 | 11/06/2015 | Ammonia Total as N | 15.0 | | | 42.0 | | | 18.0 | | | 19 | 0 | NA |
| RFN01 | 0323 | N001 | 11/06/2015 | Nitrate + Nitrite as Nitrogen | 15.0 | | | 130 | | | 27.0 | | | 18 | 0 | No |

**Data Validation Outliers Report - No Field Parameters**
**Comparison: All historical Data Beginning 1/1/2006**
Laboratory: ALS Laboratory Group
RIN: 15107463
Report Date: 1/30/2016

| | | | | | Current | | | Historical Maximum | | | Historical Minimum | | | Number of Data Points | | Statistical Outlier |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Qualifiers | | | Qualifiers | | | Qualifiers | | | | |
| Site Code | Location Code | Sample ID | Sample Date | Analyte | Result | Lab | Data | Result | Lab | Data | Result | Lab | Data | N | N Below Detect | |
| RFN01 | 0323 | N001 | 11/06/2015 | Uranium | 0.220 | | | 0.353 | | | 0.230 | | | 19 | 0 | No |
| RFN01 | 0324 | 0001 | 11/05/2015 | Sulfate | 130 | | | 100.0 | | | 30.0 | | | 6 | 0 | No |
| RFN01 | 0453 | N001 | 11/03/2015 | Selenium | 0.00760 | | J | 0.0827 | N | | 0.0130 | | | 10 | 0 | No |
| RFN01 | 0575 | N001 | 11/06/2015 | Chloride | 570 | | | 550 | | | 320 | | | 6 | 0 | No |
| RFN01 | 0590 | N001 | 11/03/2015 | Magnesium | 50.0 | | F | 60.0 | | F | 54.0 | | F | 6 | 0 | No |
| RFN01 | 0590 | N001 | 11/03/2015 | Nitrate + Nitrite as Nitrogen | 3.60 | | F | 80.0 | | F | 9.60 | | F | 16 | 0 | No |
| RFN01 | 0590 | N001 | 11/03/2015 | Selenium | 0.0240 | | F | 0.0700 | | F | 0.0250 | | F | 14 | 0 | No |
| RFN01 | 0590 | N001 | 11/03/2015 | Sodium | 380 | | F | 530 | | F | 410 | | F | 6 | 0 | No |
| RFN01 | 0620 | N001 | 11/05/2015 | Chloride | 1400 | | F | 1200 | | F | 550 | | F | 8 | 0 | No |
| RFN01 | 0658 | N001 | 11/06/2015 | Calcium | 490 | | F | 480 | | F | 370 | | F | 5 | 0 | No |
| RFN01 | 0658 | N001 | 11/06/2015 | Sulfate | 1400 | | F | 1300 | | F | 1000 | | F | 5 | 0 | No |
| RFN01 | 0659 | N002 | 11/06/2015 | Ammonia Total as N | 4.40 | | F | 67.0 | | F | 7.60 | | F | 18 | 0 | No |
| RFN01 | 0659 | N001 | 11/06/2015 | Ammonia Total as N | 4.00 | | F | 67.0 | | F | 7.60 | | F | 18 | 0 | No |
| RFN01 | 0659 | N002 | 11/06/2015 | Molybdenum | 1.10 | | F | 2.60 | | F | 1.20 | | F | 18 | 0 | No |
| RFN01 | 0659 | N001 | 11/06/2015 | Molybdenum | 1.10 | | F | 2.60 | | F | 1.20 | | F | 18 | 0 | No |
| RFN01 | 0669 | 0001 | 11/06/2015 | Sulfate | 810 | | FQ | 1700 | | FQ | 830 | | FQ | 6 | 0 | No |
| RFN01 | 0855 | N001 | 11/06/2015 | Arsenic | 0.160 | | F | 2.20 | | FQ | 0.180 | | F | 17 | 0 | NA |

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

**Comparison: All historical Data Beginning 1/1/2006**

Laboratory: ALS Laboratory Group

RIN: 15107463

Report Date: 1/30/2016

| 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 | 0855 | N002 | 11/06/2015 | Arsenic | 0.150 | | F | 2.20 | | FQ | 0.180 | | F | 17 | 0 | NA |
| RFN01 | 0855 | N002 | 11/06/2015 | Calcium | 200 | | F | 780 | | FQ | 220 | | F | 8 | 0 | No |
| RFN01 | 0855 | N001 | 11/06/2015 | Calcium | 200 | | F | 780 | | FQ | 220 | | F | 8 | 0 | No |
| RFN01 | 0855 | N001 | 11/06/2015 | Magnesium | 40.0 | | F | 39.0 | | F | 25.0 | | FQ | 8 | 0 | No |
| RFN01 | 0855 | N002 | 11/06/2015 | Magnesium | 40.0 | | F | 39.0 | | F | 25.0 | | FQ | 8 | 0 | No |
| RFN01 | 0855 | N001 | 11/06/2015 | Molybdenum | 0.390 | | F | 18.0 | | FQ | 0.470 | | F | 17 | 0 | NA |
| RFN01 | 0855 | N002 | 11/06/2015 | Molybdenum | 0.380 | | F | 18.0 | | FQ | 0.470 | | F | 17 | 0 | NA |

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

NA: Data are not normally or lognormally distributed.

**Data Validation Outliers Report - No Field Parameters**
**Comparison: All historical Data Beginning 1/1/2006**
Laboratory: ALS Laboratory Group
RIN: 15107464
Report Date: 1/30/2016

| 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 | 0292A | N001 | 11/03/2015 | Calcium | 190 | | F | 170 | | F | 130 | | F | 14 | 0 | Yes |
| RFO01 | 0292A | N001 | 11/03/2015 | Magnesium | 110 | | F | 100.0 | | F | 78.0 | | F | 14 | 0 | No |
| RFO01 | 0292A | N001 | 11/03/2015 | Sodium | 260 | | F | 250 | | F | 160 | | F | 14 | 0 | No |
| RFO01 | 0292A | N001 | 11/03/2015 | Sulfate | 820 | | JF | 760 | | F | 480 | | F | 14 | 0 | No |
| RFO01 | 0305 | N001 | 11/05/2015 | Selenium | 0.00930 | | F | 0.0420 | | F | 0.0150 | | F | 27 | 0 | No |
| RFO01 | 0395 | N001 | 11/03/2015 | Selenium | 0.01000 | | | 0.00840 | | | 0.00093 | | | 17 | 0 | No |
| RFO01 | 0395 | N001 | 11/03/2015 | Vanadium | 0.00510 | | | 0.00300 | U | | 0.00098 | | | 17 | 1 | Yes |
| RFO01 | 0396 | N001 | 11/05/2015 | Calcium | 69.0 | | | 66.0 | | | 25.0 | | | 13 | 0 | No |
| RFO01 | 0396 | N001 | 11/05/2015 | Sodium | 120 | | | 110 | | | 13.0 | | | 13 | 0 | No |
| RFO01 | 0398 | N001 | 11/05/2015 | Magnesium | 39.0 | | | 99.0 | | | 40.0 | | | 14 | 0 | NA |
| RFO01 | 0656 | N001 | 11/05/2015 | Nitrate + Nitrite as Nitrogen | 1.30 | | F | 0.420 | | F | 0.01000 | U | F | 13 | 1 | Yes |
| RFO01 | 0741 | N001 | 11/05/2015 | Calcium | 70.0 | | | 66.0 | | | 25.0 | | | 14 | 0 | No |
| RFO01 | 0741 | N001 | 11/05/2015 | Sodium | 120 | | | 110 | | | 13.0 | | | 13 | 0 | No |

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

NA: Data are not normally or lognormally distributed

# Attachment 2

# Data Presentation

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# New Rifle
# Groundwater Quality Data

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**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0169 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/06/2015 | N001 | 3.13 | - | 18.13 | 480 | | F | # | | |
| Ammonia Total as N | mg/L | 11/06/2015 | N001 | 3.13 | - | 18.13 | 0.1 | U | F | # | 0.1 | |
| Arsenic | mg/L | 11/06/2015 | N001 | 3.13 | - | 18.13 | 0.00045 | J | UF | # | 0.00015 | |
| Calcium | mg/L | 11/06/2015 | N001 | 3.13 | - | 18.13 | 190 | | F | # | 0.024 | |
| Chloride | mg/L | 11/06/2015 | N001 | 3.13 | - | 18.13 | 81 | | F | # | 2 | |
| Magnesium | mg/L | 11/06/2015 | N001 | 3.13 | - | 18.13 | 110 | | F | # | 0.03 | |
| Molybdenum | mg/L | 11/06/2015 | N001 | 3.13 | - | 18.13 | 0.0035 | | JF | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/06/2015 | N001 | 3.13 | - | 18.13 | 0.29 | | F | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/06/2015 | N001 | 3.13 | - | 18.13 | 86.7 | | F | # | | |
| pH | s.u. | 11/06/2015 | N001 | 3.13 | - | 18.13 | 7.04 | | F | # | | |
| Potassium | mg/L | 11/06/2015 | N001 | 3.13 | - | 18.13 | 6 | | F | # | 0.052 | |
| Selenium | mg/L | 11/06/2015 | N001 | 3.13 | - | 18.13 | 0.007 | | JF | # | 0.00032 | |
| Sodium | mg/L | 11/06/2015 | N001 | 3.13 | - | 18.13 | 170 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/06/2015 | N001 | 3.13 | - | 18.13 | 2152 | | F | # | | |
| Sulfate | mg/L | 11/06/2015 | N001 | 3.13 | - | 18.13 | 710 | | F | # | 5 | |
| Temperature | C | 11/06/2015 | N001 | 3.13 | - | 18.13 | 15.55 | | F | # | | |
| Turbidity | NTU | 11/06/2015 | N001 | 3.13 | - | 18.13 | 1.94 | | F | # | | |
| Uranium | mg/L | 11/06/2015 | N001 | 3.13 | - | 18.13 | 0.02 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/06/2015 | N001 | 3.13 | - | 18.13 | 0.0019 | J | UF | # | 0.00015 | |

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

REPORT DATE: 1/30/2016

Location: 0170 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 Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/06/2015 | N001 | 92.23 - 112.23 | 514 | | F | # | | |
| Ammonia Total as N | mg/L | 11/06/2015 | N001 | 92.23 - 112.23 | 0.77 | | F | # | 0.1 | |
| Arsenic | mg/L | 11/06/2015 | N001 | 92.23 - 112.23 | 0.00049 | J | UF | # | 0.00015 | |
| Calcium | mg/L | 11/06/2015 | N001 | 92.23 - 112.23 | 160 | | F | # | 0.024 | |
| Chloride | mg/L | 11/06/2015 | N001 | 92.23 - 112.23 | 170 | | F | # | 4 | |
| Magnesium | mg/L | 11/06/2015 | N001 | 92.23 - 112.23 | 93 | | F | # | 0.03 | |
| Molybdenum | mg/L | 11/06/2015 | N001 | 92.23 - 112.23 | 0.003 | | JF | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/06/2015 | N001 | 92.23 - 112.23 | 9.4 | | F | # | 0.5 | |
| Oxidation Reduction Potential | mV | 11/06/2015 | N001 | 92.23 - 112.23 | 94.3 | | F | # | | |
| pH | s.u. | 11/06/2015 | N001 | 92.23 - 112.23 | 7.05 | | F | # | | |
| Potassium | mg/L | 11/06/2015 | N001 | 92.23 - 112.23 | 6 | | F | # | 0.052 | |
| Selenium | mg/L | 11/06/2015 | N001 | 92.23 - 112.23 | 0.02 | | F | # | 0.00032 | |
| Sodium | mg/L | 11/06/2015 | N001 | 92.23 - 112.23 | 420 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/06/2015 | N001 | 92.23 - 112.23 | 3027 | | F | # | | |
| Sulfate | mg/L | 11/06/2015 | N001 | 92.23 - 112.23 | 990 | | F | # | 10 | |
| Temperature | C | 11/06/2015 | N001 | 92.23 - 112.23 | 13.46 | | F | # | | |
| Turbidity | NTU | 11/06/2015 | N001 | 92.23 - 112.23 | 3.85 | | F | # | | |
| Uranium | mg/L | 11/06/2015 | N001 | 92.23 - 112.23 | 0.056 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/06/2015 | N001 | 92.23 - 112.23 | 0.0017 | J | UF | # | 0.00015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0172 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/05/2015 | N001 | 6.98 | - | 31.98 | 580 | | F | # | | |
| Ammonia Total as N | mg/L | 11/05/2015 | N001 | 6.98 | - | 31.98 | 0.56 | | F | # | 0.1 | |
| Arsenic | mg/L | 11/05/2015 | N001 | 6.98 | - | 31.98 | 0.0043 | | F | # | 0.00015 | |
| Calcium | mg/L | 11/05/2015 | N001 | 6.98 | - | 31.98 | 420 | | F | # | 0.12 | |
| Chloride | mg/L | 11/05/2015 | N001 | 6.98 | - | 31.98 | 1200 | | F | # | 20 | |
| Magnesium | mg/L | 11/05/2015 | N001 | 6.98 | - | 31.98 | 300 | | F | # | 0.15 | |
| Molybdenum | mg/L | 11/05/2015 | N001 | 6.98 | - | 31.98 | 0.0085 | | F | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/05/2015 | N001 | 6.98 | - | 31.98 | 0.025 | | F | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/05/2015 | N001 | 6.98 | - | 31.98 | -91.4 | | F | # | | |
| pH | s.u. | 11/05/2015 | N001 | 6.98 | - | 31.98 | 7.22 | | F | # | | |
| Potassium | mg/L | 11/05/2015 | N001 | 6.98 | - | 31.98 | 12 | | F | # | 0.26 | |
| Selenium | mg/L | 11/05/2015 | N001 | 6.98 | - | 31.98 | 0.00032 | U | F | # | 0.00032 | |
| Sodium | mg/L | 11/05/2015 | N001 | 6.98 | - | 31.98 | 2200 | | F | # | 0.23 | |
| Specific Conductance | umhos /cm | 11/05/2015 | N001 | 6.98 | - | 31.98 | 11741 | | F | # | | |
| Sulfate | mg/L | 11/05/2015 | N001 | 6.98 | - | 31.98 | 5300 | | F | # | 50 | |
| Temperature | C | 11/05/2015 | N001 | 6.98 | - | 31.98 | 13.92 | | F | # | | |
| Turbidity | NTU | 11/05/2015 | N001 | 6.98 | - | 31.98 | 2.86 | | F | # | | |
| Uranium | mg/L | 11/05/2015 | N001 | 6.98 | - | 31.98 | 0.04 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/05/2015 | N001 | 6.98 | - | 31.98 | 0.00098 | J | UF | # | 0.00015 | |

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

REPORT DATE: 1/30/2016

Location: 0195 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 Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/03/2015 | N001 | 5.29 | - | 25.29 | 460 | | F | # | | |
| Ammonia Total as N | mg/L | 11/03/2015 | N001 | 5.29 | - | 25.29 | 0.24 | | F | # | 0.1 | |
| Arsenic | mg/L | 11/03/2015 | N001 | 5.29 | - | 25.29 | 0.00091 | J | JF | # | 0.00015 | |
| Calcium | mg/L | 11/03/2015 | N001 | 5.29 | - | 25.29 | 92 | | F | # | 0.024 | |
| Chloride | mg/L | 11/03/2015 | N001 | 5.29 | - | 25.29 | 21 | | F | # | 0.4 | |
| Magnesium | mg/L | 11/03/2015 | N001 | 5.29 | - | 25.29 | 49 | | F | # | 0.03 | |
| Molybdenum | mg/L | 11/03/2015 | N001 | 5.29 | - | 25.29 | 0.012 | | F | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/03/2015 | N001 | 5.29 | - | 25.29 | 0.01 | U | F | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/03/2015 | N001 | 5.29 | - | 25.29 | -38 | | F | # | | |
| pH | s.u. | 11/03/2015 | N001 | 5.29 | - | 25.29 | 7.12 | | F | # | | |
| Potassium | mg/L | 11/03/2015 | N001 | 5.29 | - | 25.29 | 7.1 | | F | # | 0.052 | |
| Selenium | mg/L | 11/03/2015 | N001 | 5.29 | - | 25.29 | 0.00034 | J | UF | # | 0.00032 | |
| Sodium | mg/L | 11/03/2015 | N001 | 5.29 | - | 25.29 | 110 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/03/2015 | N001 | 5.29 | - | 25.29 | 1176 | | F | # | | |
| Sulfate | mg/L | 11/03/2015 | N001 | 5.29 | - | 25.29 | 170 | | F | # | 1 | |
| Temperature | C | 11/03/2015 | N001 | 5.29 | - | 25.29 | 14.85 | | F | # | | |
| Turbidity | NTU | 11/03/2015 | N001 | 5.29 | - | 25.29 | 6.52 | | F | # | | |
| Uranium | mg/L | 11/03/2015 | N001 | 5.29 | - | 25.29 | 0.011 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/03/2015 | N001 | 5.29 | - | 25.29 | 0.0021 | J | UF | # | 0.00015 | |

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

REPORT DATE: 1/30/2016

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 Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/06/2015 | N001 | 7.35 | - | 22.35 | 260 | | F | # | | |
| Ammonia Total as N | mg/L | 11/06/2015 | N001 | 7.35 | - | 22.35 | 71 | | F | # | 2.5 | |
| Arsenic | mg/L | 11/06/2015 | N001 | 7.35 | - | 22.35 | 0.00045 | J | UF | # | 0.00015 | |
| Calcium | mg/L | 11/06/2015 | N001 | 7.35 | - | 22.35 | 580 | | F | # | 0.12 | |
| Chloride | mg/L | 11/06/2015 | N001 | 7.35 | - | 22.35 | 180 | | JF | # | 10 | |
| Magnesium | mg/L | 11/06/2015 | N001 | 7.35 | - | 22.35 | 48 | | F | # | 0.15 | |
| Molybdenum | mg/L | 11/06/2015 | N001 | 7.35 | - | 22.35 | 1.7 | | F | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/06/2015 | N001 | 7.35 | - | 22.35 | 20 | | F | # | 0.5 | |
| Oxidation Reduction Potential | mV | 11/06/2015 | N001 | 7.35 | - | 22.35 | 210.6 | | F | # | | |
| pH | s.u. | 11/06/2015 | N001 | 7.35 | - | 22.35 | 6.93 | | F | # | | |
| Potassium | mg/L | 11/06/2015 | N001 | 7.35 | - | 22.35 | 10 | | F | # | 0.26 | |
| Selenium | mg/L | 11/06/2015 | N001 | 7.35 | - | 22.35 | 0.045 | | F | # | 0.00032 | |
| Sodium | mg/L | 11/06/2015 | N001 | 7.35 | - | 22.35 | 270 | | F | # | 0.23 | |
| Specific Conductance | umhos /cm | 11/06/2015 | N001 | 7.35 | - | 22.35 | 3900 | | F | # | | |
| Sulfate | mg/L | 11/06/2015 | N001 | 7.35 | - | 22.35 | 1800 | | JF | # | 25 | |
| Temperature | C | 11/06/2015 | N001 | 7.35 | - | 22.35 | 14.13 | | F | # | | |
| Turbidity | NTU | 11/06/2015 | N001 | 7.35 | - | 22.35 | 1.92 | | F | # | | |
| Uranium | mg/L | 11/06/2015 | N001 | 7.35 | - | 22.35 | 0.095 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/06/2015 | N001 | 7.35 | - | 22.35 | 0.0019 | J | UF | # | 0.00015 | |

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

REPORT DATE: 1/30/2016

Location: 0215 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 Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/06/2015 | N001 | 6.84 - 21.84 | 210 | | F | # | | |
| Ammonia Total as N | mg/L | 11/06/2015 | N001 | 6.84 - 21.84 | 1.8 | | F | # | 0.1 | |
| Arsenic | mg/L | 11/06/2015 | N001 | 6.84 - 21.84 | 0.00041 | J | UF | # | 0.00015 | |
| Calcium | mg/L | 11/06/2015 | N001 | 6.84 - 21.84 | 71 | | F | # | 0.024 | |
| Chloride | mg/L | 11/06/2015 | N001 | 6.84 - 21.84 | 96 | | F | # | 2 | |
| Magnesium | mg/L | 11/06/2015 | N001 | 6.84 - 21.84 | 29 | | F | # | 0.03 | |
| Molybdenum | mg/L | 11/06/2015 | N001 | 6.84 - 21.84 | 0.016 | | F | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/06/2015 | N001 | 6.84 - 21.84 | 0.016 | | F | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/06/2015 | N001 | 6.84 - 21.84 | 50.4 | | F | # | | |
| pH | s.u. | 11/06/2015 | N001 | 6.84 - 21.84 | 7.47 | | F | # | | |
| Potassium | mg/L | 11/06/2015 | N001 | 6.84 - 21.84 | 3.7 | | F | # | 0.052 | |
| Selenium | mg/L | 11/06/2015 | N001 | 6.84 - 21.84 | 0.002 | | UF | # | 0.00032 | |
| Sodium | mg/L | 11/06/2015 | N001 | 6.84 - 21.84 | 100 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/06/2015 | N001 | 6.84 - 21.84 | 1027 | | F | # | | |
| Sulfate | mg/L | 11/06/2015 | N001 | 6.84 - 21.84 | 180 | | F | # | 5 | |
| Temperature | C | 11/06/2015 | N001 | 6.84 - 21.84 | 14.68 | | F | # | | |
| Turbidity | NTU | 11/06/2015 | N001 | 6.84 - 21.84 | 1.22 | | F | # | | |
| Uranium | mg/L | 11/06/2015 | N001 | 6.84 - 21.84 | 0.012 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/06/2015 | N001 | 6.84 - 21.84 | 0.0026 | J | UF | # | 0.00015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0216 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/03/2015 | N001 | 5.5 | - | 20.5 | 180 | | F | # | | |
| Ammonia Total as N | mg/L | 11/03/2015 | N001 | 5.5 | - | 20.5 | 5.6 | | F | # | 1 | |
| Arsenic | mg/L | 11/03/2015 | N001 | 5.5 | - | 20.5 | 0.021 | | F | # | 0.00015 | |
| Calcium | mg/L | 11/03/2015 | N001 | 5.5 | - | 20.5 | 59 | | F | # | 0.024 | |
| Chloride | mg/L | 11/03/2015 | N001 | 5.5 | - | 20.5 | 84 | | F | # | 2 | |
| Magnesium | mg/L | 11/03/2015 | N001 | 5.5 | - | 20.5 | 12 | | F | # | 0.03 | |
| Molybdenum | mg/L | 11/03/2015 | N001 | 5.5 | - | 20.5 | 0.04 | | F | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/03/2015 | N001 | 5.5 | - | 20.5 | 0.01 | U | F | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/03/2015 | N001 | 5.5 | - | 20.5 | -31.1 | | F | # | | |
| pH | s.u. | 11/03/2015 | N001 | 5.5 | - | 20.5 | 7.72 | | F | # | | |
| Potassium | mg/L | 11/03/2015 | N001 | 5.5 | - | 20.5 | 5.7 | | F | # | 0.052 | |
| Selenium | mg/L | 11/03/2015 | N001 | 5.5 | - | 20.5 | 0.00098 | J | UF | # | 0.00032 | |
| Sodium | mg/L | 11/03/2015 | N001 | 5.5 | - | 20.5 | 75 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/03/2015 | N001 | 5.5 | - | 20.5 | 770 | | F | # | | |
| Sulfate | mg/L | 11/03/2015 | N001 | 5.5 | - | 20.5 | 110 | | F | # | 5 | |
| Temperature | C | 11/03/2015 | N001 | 5.5 | - | 20.5 | 15.57 | | F | # | | |
| Turbidity | NTU | 11/03/2015 | N001 | 5.5 | - | 20.5 | 3.6 | | F | # | | |
| Uranium | mg/L | 11/03/2015 | N001 | 5.5 | - | 20.5 | 0.01 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/03/2015 | N001 | 5.5 | - | 20.5 | 0.15 | | F | # | 0.00015 | |

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

REPORT DATE: 1/30/2016

Location: 0217 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 Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/03/2015 | N001 | 7.4 | - | 22.4 | 240 | | F | # | | |
| Ammonia Total as N | mg/L | 11/03/2015 | N001 | 7.4 | - | 22.4 | 44 | | F | # | 2.5 | |
| Arsenic | mg/L | 11/03/2015 | N001 | 7.4 | - | 22.4 | 0.00068 | J | UF | # | 0.00015 | |
| Calcium | mg/L | 11/03/2015 | N001 | 7.4 | - | 22.4 | 620 | | F | # | 0.12 | |
| Chloride | mg/L | 11/03/2015 | N001 | 7.4 | - | 22.4 | 200 | | F | # | 4 | |
| Magnesium | mg/L | 11/03/2015 | N001 | 7.4 | - | 22.4 | 21 | | F | # | 0.03 | |
| Molybdenum | mg/L | 11/03/2015 | N001 | 7.4 | - | 22.4 | 1.6 | | F | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/03/2015 | N001 | 7.4 | - | 22.4 | 0.016 | | F | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/03/2015 | N001 | 7.4 | - | 22.4 | 92.7 | | F | # | | |
| pH | s.u. | 11/03/2015 | N001 | 7.4 | - | 22.4 | 6.96 | | F | # | | |
| Potassium | mg/L | 11/03/2015 | N001 | 7.4 | - | 22.4 | 17 | | F | # | 0.052 | |
| Selenium | mg/L | 11/03/2015 | N001 | 7.4 | - | 22.4 | 0.0063 | | JF | # | 0.00032 | |
| Sodium | mg/L | 11/03/2015 | N001 | 7.4 | - | 22.4 | 200 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/03/2015 | N001 | 7.4 | - | 22.4 | 3443 | | F | # | | |
| Sulfate | mg/L | 11/03/2015 | N001 | 7.4 | - | 22.4 | 1600 | | F | # | 10 | |
| Temperature | C | 11/03/2015 | N001 | 7.4 | - | 22.4 | 13.27 | | F | # | | |
| Turbidity | NTU | 11/03/2015 | N001 | 7.4 | - | 22.4 | 1.38 | | F | # | | |
| Uranium | mg/L | 11/03/2015 | N001 | 7.4 | - | 22.4 | 0.13 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/03/2015 | N001 | 7.4 | - | 22.4 | 2.1 | | F | # | 0.00015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0590 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/03/2015 | N001 | 5.21 - 19.21 | 260 | | F | # | | |
| Ammonia Total as N | mg/L | 11/03/2015 | N001 | 5.21 - 19.21 | 160 | | F | # | 5.5 | |
| Arsenic | mg/L | 11/03/2015 | N001 | 5.21 - 19.21 | 0.00053 | J | UF | # | 0.00015 | |
| Calcium | mg/L | 11/03/2015 | N001 | 5.21 - 19.21 | 570 | | F | # | 0.12 | |
| Chloride | mg/L | 11/03/2015 | N001 | 5.21 - 19.21 | 300 | | F | # | 10 | |
| Magnesium | mg/L | 11/03/2015 | N001 | 5.21 - 19.21 | 50 | | F | # | 0.03 | |
| Molybdenum | mg/L | 11/03/2015 | N001 | 5.21 - 19.21 | 1.3 | | F | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/03/2015 | N001 | 5.21 - 19.21 | 3.6 | | F | # | 0.1 | |
| Oxidation Reduction Potential | mV | 11/03/2015 | N001 | 5.21 - 19.21 | 110.9 | | F | # | | |
| pH | s.u. | 11/03/2015 | N001 | 5.21 - 19.21 | 6.93 | | F | # | | |
| Potassium | mg/L | 11/03/2015 | N001 | 5.21 - 19.21 | 25 | | F | # | 0.052 | |
| Selenium | mg/L | 11/03/2015 | N001 | 5.21 - 19.21 | 0.024 | | F | # | 0.00032 | |
| Sodium | mg/L | 11/03/2015 | N001 | 5.21 - 19.21 | 380 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/03/2015 | N001 | 5.21 - 19.21 | 4918 | | F | # | | |
| Sulfate | mg/L | 11/03/2015 | N001 | 5.21 - 19.21 | 2300 | | F | # | 25 | |
| Temperature | C | 11/03/2015 | N001 | 5.21 - 19.21 | 15.24 | | F | # | | |
| Turbidity | NTU | 11/03/2015 | N001 | 5.21 - 19.21 | 2.05 | | F | # | | |
| Uranium | mg/L | 11/03/2015 | N001 | 5.21 - 19.21 | 0.068 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/03/2015 | N001 | 5.21 - 19.21 | 0.37 | | F | # | 0.00015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0620 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/05/2015 | N001 | 6.7 | - | 10.7 | 545 | | F | # | | |
| Ammonia Total as N | mg/L | 11/05/2015 | N001 | 6.7 | - | 10.7 | 0.1 | U | F | # | 0.1 | |
| Arsenic | mg/L | 11/05/2015 | N001 | 6.7 | - | 10.7 | 0.00055 | J | UF | # | 0.00015 | |
| Calcium | mg/L | 11/05/2015 | N001 | 6.7 | - | 10.7 | 390 | | F | # | 0.12 | |
| Chloride | mg/L | 11/05/2015 | N001 | 6.7 | - | 10.7 | 1400 | | F | # | 20 | |
| Magnesium | mg/L | 11/05/2015 | N001 | 6.7 | - | 10.7 | 230 | | F | # | 0.15 | |
| Molybdenum | mg/L | 11/05/2015 | N001 | 6.7 | - | 10.7 | 0.0094 | | F | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/05/2015 | N001 | 6.7 | - | 10.7 | 12 | | F | # | 0.5 | |
| Oxidation Reduction Potential | mV | 11/05/2015 | N001 | 6.7 | - | 10.7 | 197.3 | | F | # | | |
| pH | s.u. | 11/05/2015 | N001 | 6.7 | - | 10.7 | 7.3 | | F | # | | |
| Potassium | mg/L | 11/05/2015 | N001 | 6.7 | - | 10.7 | 9.8 | | F | # | 0.26 | |
| Selenium | mg/L | 11/05/2015 | N001 | 6.7 | - | 10.7 | 0.031 | | F | # | 0.00032 | |
| Sodium | mg/L | 11/05/2015 | N001 | 6.7 | - | 10.7 | 1100 | | F | # | 0.23 | |
| Specific Conductance | umhos /cm | 11/05/2015 | N001 | 6.7 | - | 10.7 | 7700 | | F | # | | |
| Sulfate | mg/L | 11/05/2015 | N001 | 6.7 | - | 10.7 | 2100 | | F | # | 50 | |
| Temperature | C | 11/05/2015 | N001 | 6.7 | - | 10.7 | 14.22 | | F | # | | |
| Turbidity | NTU | 11/05/2015 | N001 | 6.7 | - | 10.7 | 2.42 | | F | # | | |
| Uranium | mg/L | 11/05/2015 | N001 | 6.7 | - | 10.7 | 0.06 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/05/2015 | N001 | 6.7 | - | 10.7 | 0.0016 | J | UF | # | 0.00015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0658 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/06/2015 | N001 | .5 | - | 5.5 | 280 | | F | # | | |
| Ammonia Total as N | mg/L | 11/06/2015 | N001 | .5 | - | 5.5 | 51 | | F | # | 2.5 | |
| Arsenic | mg/L | 11/06/2015 | N001 | .5 | - | 5.5 | 0.095 | | F | # | 0.00015 | |
| Calcium | mg/L | 11/06/2015 | N001 | .5 | - | 5.5 | 490 | | F | # | 0.024 | |
| Chloride | mg/L | 11/06/2015 | N001 | .5 | - | 5.5 | 180 | | F | # | 4 | |
| Magnesium | mg/L | 11/06/2015 | N001 | .5 | - | 5.5 | 33 | | F | # | 0.03 | |
| Molybdenum | mg/L | 11/06/2015 | N001 | .5 | - | 5.5 | 2 | | F | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/06/2015 | N001 | .5 | - | 5.5 | 2.3 | | F | # | 0.1 | |
| Oxidation Reduction Potential | mV | 11/06/2015 | N001 | .5 | - | 5.5 | 130.2 | | F | # | | |
| pH | s.u. | 11/06/2015 | N001 | .5 | - | 5.5 | 6.92 | | F | # | | |
| Potassium | mg/L | 11/06/2015 | N001 | .5 | - | 5.5 | 8.3 | | F | # | 0.052 | |
| Selenium | mg/L | 11/06/2015 | N001 | .5 | - | 5.5 | 1 | | F | # | 0.00032 | |
| Sodium | mg/L | 11/06/2015 | N001 | .5 | - | 5.5 | 180 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/06/2015 | N001 | .5 | - | 5.5 | 3185 | | F | # | | |
| Sulfate | mg/L | 11/06/2015 | N001 | .5 | - | 5.5 | 1400 | | F | # | 10 | |
| Temperature | C | 11/06/2015 | N001 | .5 | - | 5.5 | 13.82 | | F | # | | |
| Turbidity | NTU | 11/06/2015 | N001 | .5 | - | 5.5 | 9.78 | | F | # | | |
| Uranium | mg/L | 11/06/2015 | N001 | .5 | - | 5.5 | 0.056 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/06/2015 | N001 | .5 | - | 5.5 | 28 | | F | # | 0.0015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0659 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/06/2015 | N001 | .5 | - | 10.5 | 168 | | F | # | | |
| Ammonia Total as N | mg/L | 11/06/2015 | N001 | .5 | - | 10.5 | 4 | | F | # | 0.1 | |
| Ammonia Total as N | mg/L | 11/06/2015 | N002 | .5 | - | 10.5 | 4.4 | | F | # | 0.1 | |
| Arsenic | mg/L | 11/06/2015 | N001 | .5 | - | 10.5 | 0.049 | | F | # | 0.00015 | |
| Arsenic | mg/L | 11/06/2015 | N002 | .5 | - | 10.5 | 0.049 | | F | # | 0.00015 | |
| Calcium | mg/L | 11/06/2015 | N001 | .5 | - | 10.5 | 660 | | F | # | 0.12 | |
| Calcium | mg/L | 11/06/2015 | N002 | .5 | - | 10.5 | 650 | | F | # | 0.12 | |
| Chloride | mg/L | 11/06/2015 | N001 | .5 | - | 10.5 | 200 | | F | # | 4 | |
| Chloride | mg/L | 11/06/2015 | N002 | .5 | - | 10.5 | 210 | | F | # | 4 | |
| Magnesium | mg/L | 11/06/2015 | N001 | .5 | - | 10.5 | 33 | | F | # | 0.03 | |
| Magnesium | mg/L | 11/06/2015 | N002 | .5 | - | 10.5 | 32 | | F | # | 0.03 | |
| Molybdenum | mg/L | 11/06/2015 | N001 | .5 | - | 10.5 | 1.1 | | F | # | 0.00032 | |
| Molybdenum | mg/L | 11/06/2015 | N002 | .5 | - | 10.5 | 1.1 | | F | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/06/2015 | N001 | .5 | - | 10.5 | 15 | | F | # | 0.5 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/06/2015 | N002 | .5 | - | 10.5 | 15 | | F | # | 0.5 | |
| Oxidation Reduction Potential | mV | 11/06/2015 | N001 | .5 | - | 10.5 | 61.6 | | F | # | | |
| pH | s.u. | 11/06/2015 | N001 | .5 | - | 10.5 | 7.07 | | F | # | | |
| Potassium | mg/L | 11/06/2015 | N001 | .5 | - | 10.5 | 11 | | F | # | 0.052 | |
| Potassium | mg/L | 11/06/2015 | N002 | .5 | - | 10.5 | 11 | | F | # | 0.052 | |
| Selenium | mg/L | 11/06/2015 | N001 | .5 | - | 10.5 | 0.11 | | F | # | 0.00032 | |
| Selenium | mg/L | 11/06/2015 | N002 | .5 | - | 10.5 | 0.12 | | F | # | 0.00032 | |
| Sodium | mg/L | 11/06/2015 | N001 | .5 | - | 10.5 | 180 | | F | # | 0.047 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0659 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sodium | mg/L | 11/06/2015 | N002 | .5 | - | 10.5 | 180 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/06/2015 | N001 | .5 | - | 10.5 | 3312 | | F | # | | |
| Sulfate | mg/L | 11/06/2015 | N001 | .5 | - | 10.5 | 1700 | | F | # | 10 | |
| Sulfate | mg/L | 11/06/2015 | N002 | .5 | - | 10.5 | 1700 | | F | # | 10 | |
| Temperature | C | 11/06/2015 | N001 | .5 | - | 10.5 | 13.29 | | F | # | | |
| Turbidity | NTU | 11/06/2015 | N001 | .5 | - | 10.5 | 9.72 | | F | # | | |
| Uranium | mg/L | 11/06/2015 | N001 | .5 | - | 10.5 | 0.088 | | F | # | 0.000029 | |
| Uranium | mg/L | 11/06/2015 | N002 | .5 | - | 10.5 | 0.086 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/06/2015 | N001 | .5 | - | 10.5 | 2.9 | | F | # | 0.00015 | |
| Vanadium | mg/L | 11/06/2015 | N002 | .5 | - | 10.5 | 2.8 | | F | # | 0.00015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0664 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/06/2015 | N001 | 7.7 | - | 14.7 | 380 | | F | # | | |
| Ammonia Total as N | mg/L | 11/06/2015 | N001 | 7.7 | - | 14.7 | 28 | | F | # | 2.5 | |
| Arsenic | mg/L | 11/06/2015 | N001 | 7.7 | - | 14.7 | 0.0041 | | F | # | 0.00015 | |
| Calcium | mg/L | 11/06/2015 | N001 | 7.7 | - | 14.7 | 150 | | F | # | 0.024 | |
| Chloride | mg/L | 11/06/2015 | N001 | 7.7 | - | 14.7 | 120 | | F | # | 2 | |
| Magnesium | mg/L | 11/06/2015 | N001 | 7.7 | - | 14.7 | 73 | | F | # | 0.03 | |
| Molybdenum | mg/L | 11/06/2015 | N001 | 7.7 | - | 14.7 | 0.24 | | F | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/06/2015 | N001 | 7.7 | - | 14.7 | 3.8 | | F | # | 0.1 | |
| Oxidation Reduction Potential | mV | 11/06/2015 | N001 | 7.7 | - | 14.7 | 94.7 | | F | # | | |
| pH | s.u. | 11/06/2015 | N001 | 7.7 | - | 14.7 | 7.09 | | F | # | | |
| Potassium | mg/L | 11/06/2015 | N001 | 7.7 | - | 14.7 | 9.4 | | F | # | 0.052 | |
| Selenium | mg/L | 11/06/2015 | N001 | 7.7 | - | 14.7 | 0.17 | | F | # | 0.00032 | |
| Sodium | mg/L | 11/06/2015 | N001 | 7.7 | - | 14.7 | 200 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/06/2015 | N001 | 7.7 | - | 14.7 | 2186 | | F | # | | |
| Sulfate | mg/L | 11/06/2015 | N001 | 7.7 | - | 14.7 | 640 | | F | # | 5 | |
| Temperature | C | 11/06/2015 | N001 | 7.7 | - | 14.7 | 13.83 | | F | # | | |
| Turbidity | NTU | 11/06/2015 | N001 | 7.7 | - | 14.7 | 7.37 | | F | # | | |
| Uranium | mg/L | 11/06/2015 | N001 | 7.7 | - | 14.7 | 0.051 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/06/2015 | N001 | 7.7 | - | 14.7 | 2.1 | | F | # | 0.00015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0669 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/06/2015 | N001 | 4 | - | 10.6 | 350 | | FQ | # | | |
| Ammonia Total as N | mg/L | 11/06/2015 | 0001 | 4 | - | 10.6 | 65 | | FQ | # | 2.5 | |
| Arsenic | mg/L | 11/06/2015 | 0001 | 4 | - | 10.6 | 0.0082 | | FQ | # | 0.00015 | |
| Calcium | mg/L | 11/06/2015 | 0001 | 4 | - | 10.6 | 250 | | FQ | # | 0.024 | |
| Chloride | mg/L | 11/06/2015 | 0001 | 4 | - | 10.6 | 130 | | FQ | # | 2 | |
| Magnesium | mg/L | 11/06/2015 | 0001 | 4 | - | 10.6 | 36 | | FQ | # | 0.03 | |
| Molybdenum | mg/L | 11/06/2015 | 0001 | 4 | - | 10.6 | 0.71 | | FQ | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/06/2015 | 0001 | 4 | - | 10.6 | 1.1 | | FQ | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/06/2015 | N001 | 4 | - | 10.6 | 73.8 | | FQ | # | | |
| pH | s.u. | 11/06/2015 | N001 | 4 | - | 10.6 | 7.1 | | FQ | # | | |
| Potassium | mg/L | 11/06/2015 | 0001 | 4 | - | 10.6 | 7 | | FQ | # | 0.052 | |
| Selenium | mg/L | 11/06/2015 | 0001 | 4 | - | 10.6 | 0.029 | | FQ | # | 0.00032 | |
| Sodium | mg/L | 11/06/2015 | 0001 | 4 | - | 10.6 | 190 | | FQ | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/06/2015 | N001 | 4 | - | 10.6 | 2477 | | FQ | # | | |
| Sulfate | mg/L | 11/06/2015 | 0001 | 4 | - | 10.6 | 810 | | FQ | # | 5 | |
| Temperature | C | 11/06/2015 | N001 | 4 | - | 10.6 | 13 | | FQ | # | | |
| Turbidity | NTU | 11/06/2015 | N001 | 4 | - | 10.6 | 12.5 | | FQ | # | | |
| Uranium | mg/L | 11/06/2015 | 0001 | 4 | - | 10.6 | 0.086 | | FQ | # | 0.000029 | |
| Vanadium | mg/L | 11/06/2015 | 0001 | 4 | - | 10.6 | 3.2 | | FQ | # | 0.00015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0670 WELL For Organics Study.

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/06/2015 | N001 | 5.2 | - | 12.2 | 380 | | FQ | # | | |
| Ammonia Total as N | mg/L | 11/06/2015 | N001 | 5.2 | - | 12.2 | 15 | | FQ | # | 2.5 | |
| Arsenic | mg/L | 11/06/2015 | N001 | 5.2 | - | 12.2 | 0.0043 | | FQ | # | 0.00015 | |
| Calcium | mg/L | 11/06/2015 | N001 | 5.2 | - | 12.2 | 150 | | FQ | # | 0.024 | |
| Chloride | mg/L | 11/06/2015 | N001 | 5.2 | - | 12.2 | 130 | | FQ | # | 2 | |
| Magnesium | mg/L | 11/06/2015 | N001 | 5.2 | - | 12.2 | 82 | | FQ | # | 0.03 | |
| Molybdenum | mg/L | 11/06/2015 | N001 | 5.2 | - | 12.2 | 0.23 | | FQ | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/06/2015 | N001 | 5.2 | - | 12.2 | 6.1 | | FQ | # | 0.1 | |
| Oxidation Reduction Potential | mV | 11/06/2015 | N001 | 5.2 | - | 12.2 | 127.9 | | FQ | # | | |
| pH | s.u. | 11/06/2015 | N001 | 5.2 | - | 12.2 | 7.19 | | FQ | # | | |
| Potassium | mg/L | 11/06/2015 | N001 | 5.2 | - | 12.2 | 9.8 | | FQ | # | 0.052 | |
| Selenium | mg/L | 11/06/2015 | N001 | 5.2 | - | 12.2 | 0.5 | | FQ | # | 0.00032 | |
| Sodium | mg/L | 11/06/2015 | N001 | 5.2 | - | 12.2 | 210 | | FQ | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/06/2015 | N001 | 5.2 | - | 12.2 | 2125 | | FQ | # | | |
| Sulfate | mg/L | 11/06/2015 | N001 | 5.2 | - | 12.2 | 640 | | FQ | # | 5 | |
| Temperature | C | 11/06/2015 | N001 | 5.2 | - | 12.2 | 10.76 | | FQ | # | | |
| Turbidity | NTU | 11/06/2015 | N001 | 5.2 | - | 12.2 | 5.22 | | FQ | # | | |
| Uranium | mg/L | 11/06/2015 | N001 | 5.2 | - | 12.2 | 0.077 | | FQ | # | 0.000029 | |
| Vanadium | mg/L | 11/06/2015 | 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: 1/30/2016
Location: 0855 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/06/2015 | N001 | 6 | - | 11 | 250 | | F | # | | |
| Ammonia Total as N | mg/L | 11/06/2015 | N001 | 6 | - | 11 | 29 | | F | # | 2.5 | |
| Ammonia Total as N | mg/L | 11/06/2015 | N002 | 6 | - | 11 | 34 | | F | # | 2.5 | |
| Arsenic | mg/L | 11/06/2015 | N001 | 6 | - | 11 | 0.16 | | F | # | 0.00015 | |
| Arsenic | mg/L | 11/06/2015 | N002 | 6 | - | 11 | 0.15 | | F | # | 0.00015 | |
| Calcium | mg/L | 11/06/2015 | N001 | 6 | - | 11 | 200 | | F | # | 0.024 | |
| Calcium | mg/L | 11/06/2015 | N002 | 6 | - | 11 | 200 | | F | # | 0.024 | |
| Chloride | mg/L | 11/06/2015 | N001 | 6 | - | 11 | 190 | | F | # | 2 | |
| Chloride | mg/L | 11/06/2015 | N002 | 6 | - | 11 | 180 | | F | # | 2 | |
| Magnesium | mg/L | 11/06/2015 | N001 | 6 | - | 11 | 40 | | F | # | 0.03 | |
| Magnesium | mg/L | 11/06/2015 | N002 | 6 | - | 11 | 40 | | F | # | 0.03 | |
| Molybdenum | mg/L | 11/06/2015 | N001 | 6 | - | 11 | 0.39 | | F | # | 0.00032 | |
| Molybdenum | mg/L | 11/06/2015 | N002 | 6 | - | 11 | 0.38 | | F | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/06/2015 | N001 | 6 | - | 11 | 11 | | F | # | 0.5 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/06/2015 | N002 | 6 | - | 11 | 11 | | F | # | 0.5 | |
| Oxidation Reduction Potential | mV | 11/06/2015 | N001 | 6 | - | 11 | 106 | | F | # | | |
| pH | s.u. | 11/06/2015 | N001 | 6 | - | 11 | 7.14 | | F | # | | |
| Potassium | mg/L | 11/06/2015 | N001 | 6 | - | 11 | 11 | | F | # | 0.052 | |
| Potassium | mg/L | 11/06/2015 | N002 | 6 | - | 11 | 11 | | F | # | 0.052 | |
| Selenium | mg/L | 11/06/2015 | N001 | 6 | - | 11 | 0.88 | | F | # | 0.00032 | |
| Selenium | mg/L | 11/06/2015 | N002 | 6 | - | 11 | 0.87 | | F | # | 0.00032 | |
| Sodium | mg/L | 11/06/2015 | N001 | 6 | - | 11 | 210 | | F | # | 0.047 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0855 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sodium | mg/L | 11/06/2015 | N002 | 6 | - | 11 | 210 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/06/2015 | N001 | 6 | - | 11 | 2233 | | F | # | | |
| Sulfate | mg/L | 11/06/2015 | N001 | 6 | - | 11 | 690 | | F | # | 5 | |
| Sulfate | mg/L | 11/06/2015 | N002 | 6 | - | 11 | 680 | | F | # | 5 | |
| Temperature | C | 11/06/2015 | N001 | 6 | - | 11 | 14.61 | | F | # | | |
| Turbidity | NTU | 11/06/2015 | N001 | 6 | - | 11 | 2.41 | | F | # | | |
| Uranium | mg/L | 11/06/2015 | N001 | 6 | - | 11 | 0.033 | | F | # | 0.000029 | |
| Uranium | mg/L | 11/06/2015 | N002 | 6 | - | 11 | 0.033 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/06/2015 | N001 | 6 | - | 11 | 10 | | F | # | 0.0015 | |
| Vanadium | mg/L | 11/06/2015 | N002 | 6 | - | 11 | 10 | | F | # | 0.00015 | |

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: 1/30/2016
Location: 0320 SURFACE LOCATION

| Parameter | Units | Sample Date | Sample ID | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/03/2015 | N001 | 50 | | | # | | |
| Ammonia Total as N | mg/L | 11/03/2015 | N001 | 7.5 | | | # | 1 | |
| Arsenic | mg/L | 11/03/2015 | N001 | 0.0032 | | J | # | 0.00015 | |
| Calcium | mg/L | 11/03/2015 | N001 | 450 | | | # | 0.024 | |
| Chloride | mg/L | 11/03/2015 | N001 | 420 | | | # | 10 | |
| Magnesium | mg/L | 11/03/2015 | N001 | 77 | | | # | 0.03 | |
| Molybdenum | mg/L | 11/03/2015 | N001 | 0.45 | | | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/03/2015 | N001 | 0.16 | | | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/03/2015 | N001 | 134.9 | | | # | | |
| pH | s.u. | 11/03/2015 | N001 | 8.7 | | | # | | |
| Potassium | mg/L | 11/03/2015 | N001 | 39 | | | # | 0.052 | |
| Selenium | mg/L | 11/03/2015 | N001 | 0.0038 | | J | # | 0.00032 | |
| Sodium | mg/L | 11/03/2015 | N001 | 450 | | | # | 0.047 | |
| Specific Conductance | umhos/cm | 11/03/2015 | N001 | 4362 | | | # | | |
| Sulfate | mg/L | 11/03/2015 | N001 | 2000 | | | # | 25 | |
| Temperature | C | 11/03/2015 | N001 | 11.47 | | | # | | |
| Turbidity | NTU | 11/03/2015 | N001 | 3.96 | | | # | | |
| Uranium | mg/L | 11/03/2015 | N001 | 0.062 | | | # | 0.000029 | |
| Vanadium | mg/L | 11/03/2015 | N001 | 0.015 | | | # | 0.00015 | |

**Surface Water Quality Data by Location (USEE102) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0323 SURFACE LOCATION

| Parameter | Units | Sample Date | Sample ID | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/06/2015 | N001 | 90 | | | # | | |
| Ammonia Total as N | mg/L | 11/06/2015 | N001 | 15 | | | # | 2.5 | |
| Arsenic | mg/L | 11/06/2015 | N001 | 0.00084 | J | J | # | 0.00015 | |
| Calcium | mg/L | 11/06/2015 | N001 | 610 | | | # | 0.12 | |
| Chloride | mg/L | 11/06/2015 | N001 | 440 | | J | # | 20 | |
| Magnesium | mg/L | 11/06/2015 | N001 | 140 | | | # | 0.15 | |
| Molybdenum | mg/L | 11/06/2015 | N001 | 2 | | | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/06/2015 | N001 | 15 | | | # | 0.5 | |
| Oxidation Reduction Potential | mV | 11/06/2015 | N001 | 258.6 | | | # | | |
| pH | s.u. | 11/06/2015 | N001 | 8.04 | | | # | | |
| Potassium | mg/L | 11/06/2015 | N001 | 57 | | | # | 0.26 | |
| Selenium | mg/L | 11/06/2015 | N001 | 0.011 | | | # | 0.00032 | |
| Sodium | mg/L | 11/06/2015 | N001 | 850 | | | # | 0.23 | |
| Specific Conductance | umhos/cm | 11/06/2015 | N001 | 6287 | | | # | | |
| Sulfate | mg/L | 11/06/2015 | N001 | 3200 | | J | # | 50 | |
| Temperature | C | 11/06/2015 | N001 | 6.93 | | | # | | |
| Uranium | mg/L | 11/06/2015 | N001 | 0.22 | | | # | 0.000029 | |
| Vanadium | mg/L | 11/06/2015 | N001 | 0.004 | | U | # | 0.00015 | |

**Surface Water Quality Data by Location (USEE102) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0324 SURFACE LOCATION

| Parameter | Units | Sample Date | Sample ID | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/05/2015 | 0001 | 140 | | | # | | |
| Ammonia Total as N | mg/L | 11/05/2015 | 0001 | 0.1 | U | | # | 0.1 | |
| Arsenic | mg/L | 11/05/2015 | 0001 | 0.00028 | J | U | # | 0.00015 | |
| Calcium | mg/L | 11/05/2015 | 0001 | 70 | | | # | 0.024 | |
| Chloride | mg/L | 11/05/2015 | 0001 | 190 | | | # | 4 | |
| Magnesium | mg/L | 11/05/2015 | 0001 | 14 | | | # | 0.03 | |
| Molybdenum | mg/L | 11/05/2015 | 0001 | 0.0084 | | | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/05/2015 | 0001 | 0.01 | | | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/05/2015 | N001 | 150.3 | | | # | | |
| pH | s.u. | 11/05/2015 | N001 | 8.44 | | | # | | |
| Potassium | mg/L | 11/05/2015 | 0001 | 3.6 | | | # | 0.052 | |
| Selenium | mg/L | 11/05/2015 | 0001 | 0.00096 | J | J | # | 0.00032 | |
| Sodium | mg/L | 11/05/2015 | 0001 | 110 | | | # | 0.047 | |
| Specific Conductance | umhos/cm | 11/05/2015 | N001 | 1053 | | | # | | |
| Sulfate | mg/L | 11/05/2015 | 0001 | 130 | | | # | 10 | |
| Temperature | C | 11/05/2015 | N001 | 7.41 | | | # | | |
| Turbidity | NTU | 11/05/2015 | N001 | 37 | | | # | | |
| Uranium | mg/L | 11/05/2015 | 0001 | 0.0023 | | | # | 0.000029 | |
| Vanadium | mg/L | 11/05/2015 | 0001 | 0.0013 | J | U | # | 0.00015 | |

**Surface Water Quality Data by Location (USEE102) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0326 SURFACE LOCATION

| Parameter | Units | Sample Date | Sample ID | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/03/2015 | N001 | 110 | | | # | | |
| Ammonia Total as N | mg/L | 11/03/2015 | N001 | 0.1 | U | | # | 0.1 | |
| Arsenic | mg/L | 11/03/2015 | N001 | 0.00025 | J | U | # | 0.00015 | |
| Calcium | mg/L | 11/03/2015 | N001 | 71 | | | # | 0.024 | |
| Chloride | mg/L | 11/03/2015 | N001 | 190 | | J | # | 4 | |
| Magnesium | mg/L | 11/03/2015 | N001 | 14 | | | # | 0.03 | |
| Molybdenum | mg/L | 11/03/2015 | N001 | 0.0074 | | J | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/03/2015 | N001 | 0.012 | | | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/03/2015 | N001 | 91.2 | | | # | | |
| pH | s.u. | 11/03/2015 | N001 | 8.6 | | | # | | |
| Potassium | mg/L | 11/03/2015 | N001 | 3.7 | | | # | 0.052 | |
| Selenium | mg/L | 11/03/2015 | N001 | 0.00032 | U | | # | 0.00032 | |
| Sodium | mg/L | 11/03/2015 | N001 | 120 | | | # | 0.047 | |
| Specific Conductance | umhos/cm | 11/03/2015 | N001 | 1033 | | | # | | |
| Sulfate | mg/L | 11/03/2015 | N001 | 110 | | J | # | 10 | |
| Temperature | C | 11/03/2015 | N001 | 10.94 | | | # | | |
| Turbidity | NTU | 11/03/2015 | N001 | 3.46 | | | # | | |
| Uranium | mg/L | 11/03/2015 | N001 | 0.0021 | | | # | 0.000029 | |
| Vanadium | mg/L | 11/03/2015 | N001 | 0.0013 | J | U | # | 0.00015 | |

**Surface Water Quality Data by Location (USEE102) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0452 SURFACE LOCATION

| Parameter | Units | Sample Date | Sample ID | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/03/2015 | N001 | 90 | | | # | | |
| Ammonia Total as N | mg/L | 11/03/2015 | N001 | 9.2 | | | # | 1 | |
| Arsenic | mg/L | 11/03/2015 | N001 | 0.0067 | | | # | 0.00015 | |
| Calcium | mg/L | 11/03/2015 | N001 | 630 | | | # | 0.12 | |
| Chloride | mg/L | 11/03/2015 | N001 | 390 | | J | # | 10 | |
| Magnesium | mg/L | 11/03/2015 | N001 | 57 | | | # | 0.03 | |
| Molybdenum | mg/L | 11/03/2015 | N001 | 1.5 | | | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/03/2015 | N001 | 9.4 | | | # | 0.5 | |
| Oxidation Reduction Potential | mV | 11/03/2015 | N001 | 136.8 | | | # | | |
| pH | s.u. | 11/03/2015 | N001 | 7.62 | | | # | | |
| Potassium | mg/L | 11/03/2015 | N001 | 35 | | | # | 0.052 | |
| Selenium | mg/L | 11/03/2015 | N001 | 0.0076 | | J | # | 0.00032 | |
| Sodium | mg/L | 11/03/2015 | N001 | 390 | | | # | 0.047 | |
| Specific Conductance | umhos/cm | 11/03/2015 | N001 | 4451 | | | # | | |
| Sulfate | mg/L | 11/03/2015 | N001 | 2100 | | J | # | 25 | |
| Temperature | C | 11/03/2015 | N001 | 13.72 | | | # | | |
| Turbidity | NTU | 11/03/2015 | N001 | 1.73 | | | # | | |
| Uranium | mg/L | 11/03/2015 | N001 | 0.097 | | | # | 0.000029 | |
| Vanadium | mg/L | 11/03/2015 | N001 | 0.33 | | | # | 0.00015 | |

**Surface Water Quality Data by Location (USEE102) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0453 SURFACE LOCATION

| Parameter | Units | Sample Date | Sample ID | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/03/2015 | N001 | 120 | | | # | | |
| Ammonia Total as N | mg/L | 11/03/2015 | N001 | 18 | | | # | 2.5 | |
| Arsenic | mg/L | 11/03/2015 | N001 | 0.0086 | | | # | 0.00015 | |
| Calcium | mg/L | 11/03/2015 | N001 | 610 | | | # | 0.12 | |
| Chloride | mg/L | 11/03/2015 | N001 | 330 | | J | # | 10 | |
| Magnesium | mg/L | 11/03/2015 | N001 | 48 | | | # | 0.03 | |
| Molybdenum | mg/L | 11/03/2015 | N001 | 1.6 | | | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/03/2015 | N001 | 16 | | | # | 0.5 | |
| Oxidation Reduction Potential | mV | 11/03/2015 | N001 | 121.9 | | | # | | |
| pH | s.u. | 11/03/2015 | N001 | 7.28 | | | # | | |
| Potassium | mg/L | 11/03/2015 | N001 | 27 | | | # | 0.052 | |
| Selenium | mg/L | 11/03/2015 | N001 | 0.0076 | | J | # | 0.00032 | |
| Sodium | mg/L | 11/03/2015 | N001 | 340 | | | # | 0.047 | |
| Specific Conductance | umhos/cm | 11/03/2015 | N001 | 4167 | | | # | | |
| Sulfate | mg/L | 11/03/2015 | N001 | 1900 | | J | # | 25 | |
| Temperature | C | 11/03/2015 | N001 | 12.75 | | | # | | |
| Turbidity | NTU | 11/03/2015 | N001 | 4.93 | | | # | | |
| Uranium | mg/L | 11/03/2015 | N001 | 0.11 | | | # | 0.000029 | |
| Vanadium | mg/L | 11/03/2015 | N001 | 0.57 | | | # | 0.00015 | |

**Surface Water Quality Data by Location (USEE102) FOR SITE RFN01, Rifle New Processing Site**
REPORT DATE: 1/30/2016
Location: 0575 SURFACE LOCATION

| Parameter | Units | Sample Date | Sample ID | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/06/2015 | N001 | 120 | | | # | | |
| Ammonia Total as N | mg/L | 11/06/2015 | N001 | 2.1 | | | # | 0.1 | |
| Arsenic | mg/L | 11/06/2015 | N001 | 0.00093 | J | J | # | 0.00015 | |
| Calcium | mg/L | 11/06/2015 | N001 | 410 | | | # | 0.12 | |
| Chloride | mg/L | 11/06/2015 | N001 | 570 | | | # | 20 | |
| Magnesium | mg/L | 11/06/2015 | N001 | 260 | | | # | 0.15 | |
| Molybdenum | mg/L | 11/06/2015 | N001 | 0.74 | | | # | 0.00032 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/06/2015 | N001 | 1.1 | | | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/06/2015 | N001 | 263.3 | | | # | | |
| pH | s.u. | 11/06/2015 | N001 | 7.37 | | | # | | |
| Potassium | mg/L | 11/06/2015 | N001 | 64 | | | # | 0.26 | |
| Selenium | mg/L | 11/06/2015 | N001 | 0.0005 | J | J | # | 0.00032 | |
| Sodium | mg/L | 11/06/2015 | N001 | 1100 | | | # | 0.23 | |
| Specific Conductance | umhos/cm | 11/06/2015 | N001 | 7022 | | | # | | |
| Sulfate | mg/L | 11/06/2015 | N001 | 3800 | | | # | 50 | |
| Temperature | C | 11/06/2015 | N001 | 6.53 | | | # | | |
| Turbidity | NTU | 11/06/2015 | N001 | 7.2 | | | # | | |
| Uranium | mg/L | 11/06/2015 | N001 | 0.13 | | | # | 0.000029 | |
| Vanadium | mg/L | 11/06/2015 | N001 | 0.0022 | J | U | # | 0.00015 | |

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. |

# Old Rifle
# Groundwater Quality Data

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**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**
REPORT DATE: 1/30/2016
Location: 0292A WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/03/2015 | N001 | 10.5 - 20.5 | 470 | | F | # | | |
| Calcium | mg/L | 11/03/2015 | N001 | 10.5 - 20.5 | 190 | | F | # | 0.024 | |
| Chloride | mg/L | 11/03/2015 | N001 | 10.5 - 20.5 | 100 | | JF | # | 4 | |
| Magnesium | mg/L | 11/03/2015 | N001 | 10.5 - 20.5 | 110 | | F | # | 0.03 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/03/2015 | N001 | 10.5 - 20.5 | 0.23 | | F | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/03/2015 | N001 | 10.5 - 20.5 | 28.3 | | F | # | | |
| pH | s.u. | 11/03/2015 | N001 | 10.5 - 20.5 | 7.03 | | F | # | | |
| Potassium | mg/L | 11/03/2015 | N001 | 10.5 - 20.5 | 6.7 | | F | # | 0.052 | |
| Selenium | mg/L | 11/03/2015 | N001 | 10.5 - 20.5 | 0.0073 | | JF | # | 0.00032 | |
| Sodium | mg/L | 11/03/2015 | N001 | 10.5 - 20.5 | 260 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/03/2015 | N001 | 10.5 - 20.5 | 2442 | | F | # | | |
| Sulfate | mg/L | 11/03/2015 | N001 | 10.5 - 20.5 | 820 | | JF | # | 10 | |
| Temperature | C | 11/03/2015 | N001 | 10.5 - 20.5 | 14.69 | | F | # | | |
| Turbidity | NTU | 11/03/2015 | N001 | 10.5 - 20.5 | 5.46 | | F | # | | |
| Uranium | mg/L | 11/03/2015 | N001 | 10.5 - 20.5 | 0.038 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/03/2015 | N001 | 10.5 - 20.5 | 0.0014 | J | UF | # | 0.00015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**
REPORT DATE: 1/30/2016
Location: 0304 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/05/2015 | N001 | 13.2 | - | 18.2 | 300 | | F | # | | |
| Calcium | mg/L | 11/05/2015 | N001 | 13.2 | - | 18.2 | 190 | | F | # | 0.024 | |
| Calcium | mg/L | 11/05/2015 | N002 | 13.2 | - | 18.2 | 190 | | F | # | 0.024 | |
| Chloride | mg/L | 11/05/2015 | N001 | 13.2 | - | 18.2 | 250 | | JF | # | 4 | |
| Chloride | mg/L | 11/05/2015 | N002 | 13.2 | - | 18.2 | 240 | | JF | # | 4 | |
| Magnesium | mg/L | 11/05/2015 | N001 | 13.2 | - | 18.2 | 74 | | F | # | 0.03 | |
| Magnesium | mg/L | 11/05/2015 | N002 | 13.2 | - | 18.2 | 74 | | F | # | 0.03 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/05/2015 | N001 | 13.2 | - | 18.2 | 0.01 | U | F | # | 0.01 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/05/2015 | N002 | 13.2 | - | 18.2 | 0.01 | U | F | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/05/2015 | N001 | 13.2 | - | 18.2 | 30.6 | | F | # | | |
| pH | s.u. | 11/05/2015 | N001 | 13.2 | - | 18.2 | 7.26 | | F | # | | |
| Potassium | mg/L | 11/05/2015 | N001 | 13.2 | - | 18.2 | 6.6 | | F | # | 0.052 | |
| Potassium | mg/L | 11/05/2015 | N002 | 13.2 | - | 18.2 | 6.8 | | F | # | 0.052 | |
| Selenium | mg/L | 11/05/2015 | N001 | 13.2 | - | 18.2 | 0.0018 | | JF | # | 0.00032 | |
| Selenium | mg/L | 11/05/2015 | N002 | 13.2 | - | 18.2 | 0.0013 | | JF | # | 0.00032 | |
| Sodium | mg/L | 11/05/2015 | N001 | 13.2 | - | 18.2 | 150 | | F | # | 0.047 | |
| Sodium | mg/L | 11/05/2015 | N002 | 13.2 | - | 18.2 | 150 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/05/2015 | N001 | 13.2 | - | 18.2 | 2059 | | F | # | | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**
REPORT DATE: 1/30/2016
Location: 0304 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | mg/L | 11/05/2015 | N001 | 13.2 | - | 18.2 | 480 | | JF | # | 10 | |
| Sulfate | mg/L | 11/05/2015 | N002 | 13.2 | - | 18.2 | 480 | | JF | # | 10 | |
| Temperature | C | 11/05/2015 | N001 | 13.2 | - | 18.2 | 13.88 | | F | # | | |
| Turbidity | NTU | 11/05/2015 | N001 | 13.2 | - | 18.2 | 8.5 | | F | # | | |
| Uranium | mg/L | 11/05/2015 | N001 | 13.2 | - | 18.2 | 0.058 | | F | # | 0.000029 | |
| Uranium | mg/L | 11/05/2015 | N002 | 13.2 | - | 18.2 | 0.06 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/05/2015 | N001 | 13.2 | - | 18.2 | 0.035 | | F | # | 0.00015 | |
| Vanadium | mg/L | 11/05/2015 | N002 | 13.2 | - | 18.2 | 0.034 | | F | # | 0.00015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**
REPORT DATE: 1/30/2016
Location: 0305 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/05/2015 | N001 | 13.76 - 18.76 | 376 | | F | # | | |
| Calcium | mg/L | 11/05/2015 | N001 | 13.76 - 18.76 | 180 | | F | # | 0.024 | |
| Chloride | mg/L | 11/05/2015 | N001 | 13.76 - 18.76 | 230 | | JF | # | 4 | |
| Magnesium | mg/L | 11/05/2015 | N001 | 13.76 - 18.76 | 75 | | F | # | 0.03 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/05/2015 | N001 | 13.76 - 18.76 | 0.016 | | F | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/05/2015 | N001 | 13.76 - 18.76 | 1.8 | | F | # | | |
| pH | s.u. | 11/05/2015 | N001 | 13.76 - 18.76 | 7.15 | | F | # | | |
| Potassium | mg/L | 11/05/2015 | N001 | 13.76 - 18.76 | 8.3 | | F | # | 0.052 | |
| Selenium | mg/L | 11/05/2015 | N001 | 13.76 - 18.76 | 0.0093 | | F | # | 0.00032 | |
| Sodium | mg/L | 11/05/2015 | N001 | 13.76 - 18.76 | 170 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/05/2015 | N001 | 13.76 - 18.76 | 2047 | | F | # | | |
| Sulfate | mg/L | 11/05/2015 | N001 | 13.76 - 18.76 | 460 | | JF | # | 10 | |
| Temperature | C | 11/05/2015 | N001 | 13.76 - 18.76 | 14.51 | | F | # | | |
| Turbidity | NTU | 11/05/2015 | N001 | 13.76 - 18.76 | 1.61 | | F | # | | |
| Uranium | mg/L | 11/05/2015 | N001 | 13.76 - 18.76 | 0.069 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/05/2015 | N001 | 13.76 - 18.76 | 0.32 | | F | # | 0.00015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**
REPORT DATE: 1/30/2016
Location: 0309 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/05/2015 | N001 | 16.93 - 21.93 | 372 | | F | # | | |
| Calcium | mg/L | 11/05/2015 | N001 | 16.93 - 21.93 | 170 | | F | # | 0.024 | |
| Chloride | mg/L | 11/05/2015 | N001 | 16.93 - 21.93 | 130 | | JF | # | 4 | |
| Magnesium | mg/L | 11/05/2015 | N001 | 16.93 - 21.93 | 110 | | F | # | 0.03 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/05/2015 | N001 | 16.93 - 21.93 | 0.01 | U | F | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/05/2015 | N001 | 16.93 - 21.93 | -46.8 | | F | # | | |
| pH | s.u. | 11/05/2015 | N001 | 16.93 - 21.93 | 7.27 | | F | # | | |
| Potassium | mg/L | 11/05/2015 | N001 | 16.93 - 21.93 | 7.4 | | F | # | 0.052 | |
| Selenium | mg/L | 11/05/2015 | N001 | 16.93 - 21.93 | 0.00032 | U | F | # | 0.00032 | |
| Sodium | mg/L | 11/05/2015 | N001 | 16.93 - 21.93 | 210 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/05/2015 | N001 | 16.93 - 21.93 | 2306 | | F | # | | |
| Sulfate | mg/L | 11/05/2015 | N001 | 16.93 - 21.93 | 760 | | JF | # | 10 | |
| Temperature | C | 11/05/2015 | N001 | 16.93 - 21.93 | 14 | | F | # | | |
| Turbidity | NTU | 11/05/2015 | N001 | 16.93 - 21.93 | 2.72 | | F | # | | |
| Uranium | mg/L | 11/05/2015 | N001 | 16.93 - 21.93 | 0.019 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/05/2015 | N001 | 16.93 - 21.93 | 0.0017 | J | UF | # | 0.00015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**
REPORT DATE: 1/30/2016
Location: 0310 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/05/2015 | N001 | 17.93 - 22.93 | 448 | | F | # | | |
| Calcium | mg/L | 11/05/2015 | N001 | 17.93 - 22.93 | 220 | | F | # | 0.024 | |
| Chloride | mg/L | 11/05/2015 | N001 | 17.93 - 22.93 | 160 | | JF | # | 4 | |
| Magnesium | mg/L | 11/05/2015 | N001 | 17.93 - 22.93 | 110 | | F | # | 0.03 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/05/2015 | N001 | 17.93 - 22.93 | 0.017 | | F | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/05/2015 | N001 | 17.93 - 22.93 | -38.9 | | F | # | | |
| pH | s.u. | 11/05/2015 | N001 | 17.93 - 22.93 | 7.23 | | F | # | | |
| Potassium | mg/L | 11/05/2015 | N001 | 17.93 - 22.93 | 9.3 | | F | # | 0.052 | |
| Selenium | mg/L | 11/05/2015 | N001 | 17.93 - 22.93 | 0.00032 | U | F | # | 0.00032 | |
| Sodium | mg/L | 11/05/2015 | N001 | 17.93 - 22.93 | 210 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/05/2015 | N001 | 17.93 - 22.93 | 2486 | | F | # | | |
| Sulfate | mg/L | 11/05/2015 | N001 | 17.93 - 22.93 | 760 | | JF | # | 10 | |
| Temperature | C | 11/05/2015 | N001 | 17.93 - 22.93 | 13.62 | | F | # | | |
| Turbidity | NTU | 11/05/2015 | N001 | 17.93 - 22.93 | 1.66 | | F | # | | |
| Uranium | mg/L | 11/05/2015 | N001 | 17.93 - 22.93 | 0.16 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/05/2015 | N001 | 17.93 - 22.93 | 0.01 | | F | # | 0.00015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**
REPORT DATE: 1/30/2016
Location: 0655 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/05/2015 | N001 | 13.6 | - | 23.6 | 480 | | F | # | | |
| Calcium | mg/L | 11/05/2015 | N001 | 13.6 | - | 23.6 | 170 | | F | # | 0.024 | |
| Chloride | mg/L | 11/05/2015 | N001 | 13.6 | - | 23.6 | 110 | | JF | # | 4 | |
| Magnesium | mg/L | 11/05/2015 | N001 | 13.6 | - | 23.6 | 120 | | F | # | 0.03 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/05/2015 | N001 | 13.6 | - | 23.6 | 0.71 | | F | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/05/2015 | N001 | 13.6 | - | 23.6 | -64.6 | | F | # | | |
| pH | s.u. | 11/05/2015 | N001 | 13.6 | - | 23.6 | 7.13 | | F | # | | |
| Potassium | mg/L | 11/05/2015 | N001 | 13.6 | - | 23.6 | 7.6 | | F | # | 0.052 | |
| Selenium | mg/L | 11/05/2015 | N001 | 13.6 | - | 23.6 | 0.026 | | F | # | 0.00032 | |
| Sodium | mg/L | 11/05/2015 | N001 | 13.6 | - | 23.6 | 170 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/05/2015 | N001 | 13.6 | - | 23.6 | 2137 | | F | # | | |
| Sulfate | mg/L | 11/05/2015 | N001 | 13.6 | - | 23.6 | 650 | | JF | # | 10 | |
| Temperature | C | 11/05/2015 | N001 | 13.6 | - | 23.6 | 13.71 | | F | # | | |
| Turbidity | NTU | 11/05/2015 | N001 | 13.6 | - | 23.6 | 1.55 | | F | # | | |
| Uranium | mg/L | 11/05/2015 | N001 | 13.6 | - | 23.6 | 0.085 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/05/2015 | N001 | 13.6 | - | 23.6 | 0.29 | | F | # | 0.00015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**
REPORT DATE: 1/30/2016
Location: 0656 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/05/2015 | N001 | 6.35 - 21.35 | 350 | | F | # | | |
| Calcium | mg/L | 11/05/2015 | N001 | 6.35 - 21.35 | 130 | | F | # | 0.024 | |
| Chloride | mg/L | 11/05/2015 | N001 | 6.35 - 21.35 | 340 | | JF | # | 4 | |
| Magnesium | mg/L | 11/05/2015 | N001 | 6.35 - 21.35 | 65 | | F | # | 0.03 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/05/2015 | N001 | 6.35 - 21.35 | 1.3 | | F | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/05/2015 | N001 | 6.35 - 21.35 | 111.6 | | F | # | | |
| pH | s.u. | 11/05/2015 | N001 | 6.35 - 21.35 | 7.27 | | F | # | | |
| Potassium | mg/L | 11/05/2015 | N001 | 6.35 - 21.35 | 8 | | F | # | 0.052 | |
| Selenium | mg/L | 11/05/2015 | N001 | 6.35 - 21.35 | 0.0051 | | JF | # | 0.00032 | |
| Sodium | mg/L | 11/05/2015 | N001 | 6.35 - 21.35 | 270 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/05/2015 | N001 | 6.35 - 21.35 | 2291 | | F | # | | |
| Sulfate | mg/L | 11/05/2015 | N001 | 6.35 - 21.35 | 380 | | JF | # | 10 | |
| Temperature | C | 11/05/2015 | N001 | 6.35 - 21.35 | 17.4 | | F | # | | |
| Turbidity | NTU | 11/05/2015 | N001 | 6.35 - 21.35 | 3.61 | | F | # | | |
| Uranium | mg/L | 11/05/2015 | N001 | 6.35 - 21.35 | 0.19 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/05/2015 | N001 | 6.35 - 21.35 | 0.023 | | F | # | 0.00015 | |

**Groundwater Quality Data by Location (USEE100) FOR SITE RFO01, Rifle Old Processing Site**
REPORT DATE: 1/30/2016
Location: 0658 WELL

| Parameter | Units | Sample Date | Sample ID | Depth Range (Ft BLS) | | | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/03/2015 | 0001 | 2.3 | - | 17.3 | 506 | | F | # | | |
| Calcium | mg/L | 11/03/2015 | 0001 | 2.3 | - | 17.3 | 190 | | F | # | 0.024 | |
| Chloride | mg/L | 11/03/2015 | 0001 | 2.3 | - | 17.3 | 33 | | JF | # | 4 | |
| Magnesium | mg/L | 11/03/2015 | 0001 | 2.3 | - | 17.3 | 110 | | F | # | 0.03 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/03/2015 | 0001 | 2.3 | - | 17.3 | 0.01 | U | F | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/03/2015 | N001 | 2.3 | - | 17.3 | 47.2 | | F | # | | |
| pH | s.u. | 11/03/2015 | N001 | 2.3 | - | 17.3 | 7.13 | | F | # | | |
| Potassium | mg/L | 11/03/2015 | 0001 | 2.3 | - | 17.3 | 3.7 | | F | # | 0.052 | |
| Selenium | mg/L | 11/03/2015 | 0001 | 2.3 | - | 17.3 | 0.0015 | | JF | # | 0.00032 | |
| Sodium | mg/L | 11/03/2015 | 0001 | 2.3 | - | 17.3 | 99 | | F | # | 0.047 | |
| Specific Conductance | umhos /cm | 11/03/2015 | N001 | 2.3 | - | 17.3 | 1815 | | F | # | | |
| Sulfate | mg/L | 11/03/2015 | 0001 | 2.3 | - | 17.3 | 520 | | JF | # | 10 | |
| Temperature | C | 11/03/2015 | N001 | 2.3 | - | 17.3 | 11.38 | | F | # | | |
| Turbidity | NTU | 11/03/2015 | N001 | 2.3 | - | 17.3 | 18.5 | | F | # | | |
| Uranium | mg/L | 11/03/2015 | 0001 | 2.3 | - | 17.3 | 0.018 | | F | # | 0.000029 | |
| Vanadium | mg/L | 11/03/2015 | 0001 | 2.3 | - | 17.3 | 0.0017 | J | UF | # | 0.00015 | |

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. |

# 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: 1/30/2016
Location: 0294 SURFACE LOCATION

| Parameter | Units | Sample Date | Sample ID | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/03/2015 | N001 | 96 | | | # | | |
| Calcium | mg/L | 11/03/2015 | N001 | 71 | | | # | 0.024 | |
| Chloride | mg/L | 11/03/2015 | N001 | 190 | | J | # | 4 | |
| Magnesium | mg/L | 11/03/2015 | N001 | 14 | | | # | 0.03 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/03/2015 | N001 | 0.01 | U | | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/03/2015 | N001 | 40.4 | | | # | | |
| pH | s.u. | 11/03/2015 | N001 | 8.41 | | | # | | |
| Potassium | mg/L | 11/03/2015 | N001 | 3.9 | | | # | 0.052 | |
| Selenium | mg/L | 11/03/2015 | N001 | 0.00032 | U | | # | 0.00032 | |
| Sodium | mg/L | 11/03/2015 | N001 | 120 | | | # | 0.047 | |
| Specific Conductance | umhos/cm | 11/03/2015 | N001 | 1062 | | | # | | |
| Sulfate | mg/L | 11/03/2015 | N001 | 110 | | J | # | 10 | |
| Temperature | C | 11/03/2015 | N001 | 8.07 | | | # | | |
| Turbidity | NTU | 11/03/2015 | N001 | 2.79 | | | # | | |
| Uranium | mg/L | 11/03/2015 | N001 | 0.0021 | | | # | 0.000029 | |
| Vanadium | mg/L | 11/03/2015 | N001 | 0.0015 | J | U | # | 0.00015 | |

**Surface Water Quality Data by Location (USEE102) FOR SITE RFO01, Rifle Old Processing Site**
REPORT DATE: 1/30/2016
Location: 0395 SURFACE LOCATION

| Parameter | Units | Sample Date | Sample ID | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/03/2015 | N001 | 270 | | | # | | |
| Calcium | mg/L | 11/03/2015 | N001 | 130 | | | # | 0.024 | |
| Chloride | mg/L | 11/03/2015 | N001 | 56 | | J | # | 4 | |
| Magnesium | mg/L | 11/03/2015 | N001 | 90 | | | # | 0.03 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/03/2015 | N001 | 0.41 | | | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/03/2015 | N001 | 130.5 | | | # | | |
| pH | s.u. | 11/03/2015 | N001 | 8.11 | | | # | | |
| Potassium | mg/L | 11/03/2015 | N001 | 2.9 | | | # | 0.052 | |
| Selenium | mg/L | 11/03/2015 | N001 | 0.01 | | | # | 0.00032 | |
| Sodium | mg/L | 11/03/2015 | N001 | 69 | | | # | 0.047 | |
| Specific Conductance | umhos/cm | 11/03/2015 | N001 | 804 | | | # | | |
| Sulfate | mg/L | 11/03/2015 | N001 | 430 | | J | # | 10 | |
| Temperature | C | 11/03/2015 | N001 | 17.74 | | | # | | |
| Turbidity | NTU | 11/03/2015 | N001 | 7.57 | | | # | | |
| Uranium | mg/L | 11/03/2015 | N001 | 0.033 | | | # | 0.000029 | |
| Vanadium | mg/L | 11/03/2015 | N001 | 0.0051 | | | # | 0.00015 | |

**Surface Water Quality Data by Location (USEE102) FOR SITE RFO01, Rifle Old Processing Site**
REPORT DATE: 1/30/2016
Location: 0396 SURFACE LOCATION

| Parameter | Units | Sample Date | Sample ID | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/05/2015 | N001 | 110 | | | # | | |
| Calcium | mg/L | 11/05/2015 | N001 | 69 | | | # | 0.024 | |
| Chloride | mg/L | 11/05/2015 | N001 | 180 | | J | # | 4 | |
| Magnesium | mg/L | 11/05/2015 | N001 | 14 | | | # | 0.03 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/05/2015 | N001 | 0.01 | U | | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/05/2015 | N001 | -5.1 | | | # | | |
| pH | s.u. | 11/05/2015 | N001 | 8.61 | | | # | | |
| Potassium | mg/L | 11/05/2015 | N001 | 3.8 | | | # | 0.052 | |
| Selenium | mg/L | 11/05/2015 | N001 | 0.00096 | J | U | # | 0.00032 | |
| Sodium | mg/L | 11/05/2015 | N001 | 120 | | | # | 0.047 | |
| Specific Conductance | umhos/cm | 11/05/2015 | N001 | 1284 | | | # | | |
| Sulfate | mg/L | 11/05/2015 | N001 | 110 | | J | # | 10 | |
| Temperature | C | 11/05/2015 | N001 | 7.06 | | | # | | |
| Turbidity | NTU | 11/05/2015 | N001 | 6.81 | | | # | | |
| Uranium | mg/L | 11/05/2015 | N001 | 0.0022 | | | # | 0.000029 | |
| Vanadium | mg/L | 11/05/2015 | N001 | 0.0017 | J | U | # | 0.00015 | |

**Surface Water Quality Data by Location (USEE102) FOR SITE RFO01, Rifle Old Processing Site**
REPORT DATE: 1/30/2016
Location: 0398 SURFACE LOCATION

| Parameter | Units | Sample Date | Sample ID | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/05/2015 | N001 | 104 | | | # | | |
| Calcium | mg/L | 11/05/2015 | N001 | 110 | | | # | 0.024 | |
| Chloride | mg/L | 11/05/2015 | N001 | 120 | | J | # | 4 | |
| Magnesium | mg/L | 11/05/2015 | N001 | 39 | | | # | 0.03 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/05/2015 | N001 | 0.21 | | | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/05/2015 | N001 | 120.4 | | | # | | |
| pH | s.u. | 11/05/2015 | N001 | 8.3 | | | # | | |
| Potassium | mg/L | 11/05/2015 | N001 | 3.5 | | | # | 0.052 | |
| Selenium | mg/L | 11/05/2015 | N001 | 0.0021 | | U | # | 0.00032 | |
| Sodium | mg/L | 11/05/2015 | N001 | 120 | | | # | 0.047 | |
| Specific Conductance | umhos/cm | 11/05/2015 | N001 | 1335 | | | # | | |
| Sulfate | mg/L | 11/05/2015 | N001 | 260 | | J | # | 10 | |
| Temperature | C | 11/05/2015 | N001 | 10.26 | | | # | | |
| Turbidity | NTU | 11/05/2015 | N001 | 4.67 | | | # | | |
| Uranium | mg/L | 11/05/2015 | N001 | 0.012 | | | # | 0.000029 | |
| Vanadium | mg/L | 11/05/2015 | N001 | 0.003 | | U | # | 0.00015 | |

**Surface Water Quality Data by Location (USEE102) FOR SITE RFO01, Rifle Old Processing Site**
REPORT DATE: 1/30/2016
Location: 0741 SURFACE LOCATION

| Parameter | Units | Sample Date | Sample ID | Result | Qualifiers Lab | Qualifiers Data | Qualifiers QA | Detection Limit | Uncertainty |
|---|---|---|---|---|---|---|---|---|---|
| Alkalinity, Total (as $CaCO_3$) | mg/L | 11/05/2015 | N001 | 110 | | | # | | |
| Calcium | mg/L | 11/05/2015 | N001 | 70 | | | # | 0.024 | |
| Chloride | mg/L | 11/05/2015 | N001 | 170 | | J | # | 4 | |
| Magnesium | mg/L | 11/05/2015 | N001 | 14 | | | # | 0.03 | |
| Nitrate + Nitrite as Nitrogen | mg/L | 11/05/2015 | N001 | 0.01 | U | | # | 0.01 | |
| Oxidation Reduction Potential | mV | 11/05/2015 | N001 | 34 | | | # | | |
| pH | s.u. | 11/05/2015 | N001 | 8.66 | | | # | | |
| Potassium | mg/L | 11/05/2015 | N001 | 3.7 | | | # | 0.052 | |
| Selenium | mg/L | 11/05/2015 | N001 | 0.00079 | J | J | # | 0.00032 | |
| Sodium | mg/L | 11/05/2015 | N001 | 120 | | | # | 0.047 | |
| Specific Conductance | umhos/cm | 11/05/2015 | N001 | 1044 | | | # | | |
| Sulfate | mg/L | 11/05/2015 | N001 | 100 | | J | # | 10 | |
| Temperature | C | 11/05/2015 | N001 | 6.85 | | | # | | |
| Turbidity | NTU | 11/05/2015 | N001 | 8.02 | | | # | | |
| Uranium | mg/L | 11/05/2015 | N001 | 0.0024 | | | # | 0.000029 | |
| Vanadium | mg/L | 11/05/2015 | N001 | 0.0018 | J | U | # | 0.00015 | |

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

LAB QUALIFIERS:

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

DATA QUALIFIERS:

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

QA QUALIFIER:

| | |
|---|---|
| # | Validated according to quality assurance guidelines. |

# Equipment Blank Data

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**BLANKS REPORT**

LAB: PARAGON/ALS LABORATORY GROUP (Fort Collins, CO)
RIN: 15107463
Report Date: 1/30/2016

| Parameter | Site Code | Location ID | Sample Date | Sample ID | Units | Result | Qualifiers Lab | Qualifiers Data | Detection Limit | Uncertainty | Sample Type |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ammonia Total as N | RFN01 | 0999 | 11/05/2015 | N001 | mg/L | 0.1 | U | | 0.1 | | E |
| Arsenic | RFN01 | 0999 | 11/05/2015 | N001 | mg/L | 0.00015 | U | | 0.00015 | | E |
| Calcium | RFN01 | 0999 | 11/05/2015 | N001 | mg/L | 0.08 | J | U | 0.024 | | E |
| Chloride | RFN01 | 0999 | 11/05/2015 | N001 | mg/L | 0.2 | U | | 0.2 | | E |
| Magnesium | RFN01 | 0999 | 11/05/2015 | N001 | mg/L | 0.031 | J | | 0.03 | | E |
| Molybdenum | RFN01 | 0999 | 11/05/2015 | N001 | mg/L | 0.00032 | U | | 0.00032 | | E |
| Nitrate + Nitrite as Nitrogen | RFN01 | 0999 | 11/05/2015 | N001 | mg/L | 0.01 | U | | 0.01 | | E |
| Potassium | RFN01 | 0999 | 11/05/2015 | N001 | mg/L | 0.052 | U | | 0.052 | | E |
| Selenium | RFN01 | 0999 | 11/05/2015 | N001 | mg/L | 0.00032 | U | | 0.00032 | | E |
| Sodium | RFN01 | 0999 | 11/05/2015 | N001 | mg/L | 0.047 | U | | 0.047 | | E |
| Sulfate | RFN01 | 0999 | 11/05/2015 | N001 | mg/L | 0.5 | U | | 0.5 | | E |
| Uranium | RFN01 | 0999 | 11/05/2015 | N001 | mg/L | 0.00003 | J | | 0.000029 | | E |
| Vanadium | RFN01 | 0999 | 11/05/2015 | N001 | mg/L | 0.002 | J | U | 0.00015 | | E |

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

LAB QUALIFIERS:

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

DATA QUALIFIERS:

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

SAMPLE TYPES:

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

# Static Water Level Data

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**STATIC WATER LEVELS (USEE700) FOR SITE RFN01, Rifle New Processing Site**
**REPORT DATE: 1/30/2016**

| 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 | 11/06/2015 | 14:05:55 | 9.1 | 5266.37 | |
| 0170 | D | 5332.97 | 11/06/2015 | 15:15:49 | 94.39 | 5238.58 | |
| 0172 | D | 5229.45 | 11/05/2015 | 15:40:54 | 16.5 | 5212.95 | |
| 0195 | D | 5253.1 | 11/03/2015 | 15:55:07 | 10.13 | 5242.97 | |
| 0215 | O | 5271.42 | 11/06/2015 | 13:40:20 | 10.84 | 5260.58 | |
| 0216 | O | 5265.41 | 11/03/2015 | 13:00:18 | 6.54 | 5258.87 | |
| 0217 | D | 5256.98 | 11/03/2015 | 14:50:59 | 4.4 | 5252.58 | |
| 0590 | D | 5256.37 | 11/03/2015 | 13:40:56 | 6.74 | 5249.63 | |
| 0620 | D | 5231.22 | 11/05/2015 | 09:10:22 | 10.58 | 5220.64 | |
| 0658 | O | 5265.91 | 11/06/2015 | 13:00:22 | 6.62 | 5259.29 | |
| 0659 | O | 5261.33 | 11/06/2015 | 10:10:16 | 6.48 | 5254.85 | |
| 0664 | O | 5270.17 | 11/06/2015 | 10:50:58 | 13.12 | 5257.05 | |
| 0669 | O | 5266.56 | 11/06/2015 | 10:25:33 | 9.8 | 5256.76 | |
| 0670 | O | 5270.94 | 11/06/2015 | 13:15:39 | 12.64 | 5258.3 | |
| 0855 | O | 5267.24 | 11/06/2015 | 12:25:52 | 7.86 | 5259.38 | |

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

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

**STATIC WATER LEVELS (USEE700) FOR SITE RFO01, Rifle Old Processing Site**
**REPORT DATE: 1/30/2016**

| 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 | 11/03/2015 | 10:10:04 | 11.68 | 5311.4 | |
| 0304 | O | 5310.63 | 11/05/2015 | 12:25:23 | 11.48 | 5299.15 | |
| 0305 | O | 5312.08 | 11/05/2015 | 12:45:40 | 12.56 | 5299.52 | |
| 0309 | O | 5313.37 | 11/05/2015 | 13:55:28 | 16.01 | 5297.36 | |
| 0310 | O | 5311.64 | 11/05/2015 | 13:30:44 | 13.75 | 5297.89 | |
| 0655 | O | 5312.87 | 11/05/2015 | 13:05:15 | 13.7 | 5299.17 | |
| 0656 | O | 5313.28 | 11/05/2015 | 11:45:50 | 13.5 | 5299.78 | |
| 0658 | U | 5323.07 | 11/03/2015 | 09:35:43 | 7.59 | 5315.48 | |

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

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

# New Rifle Hydrographs

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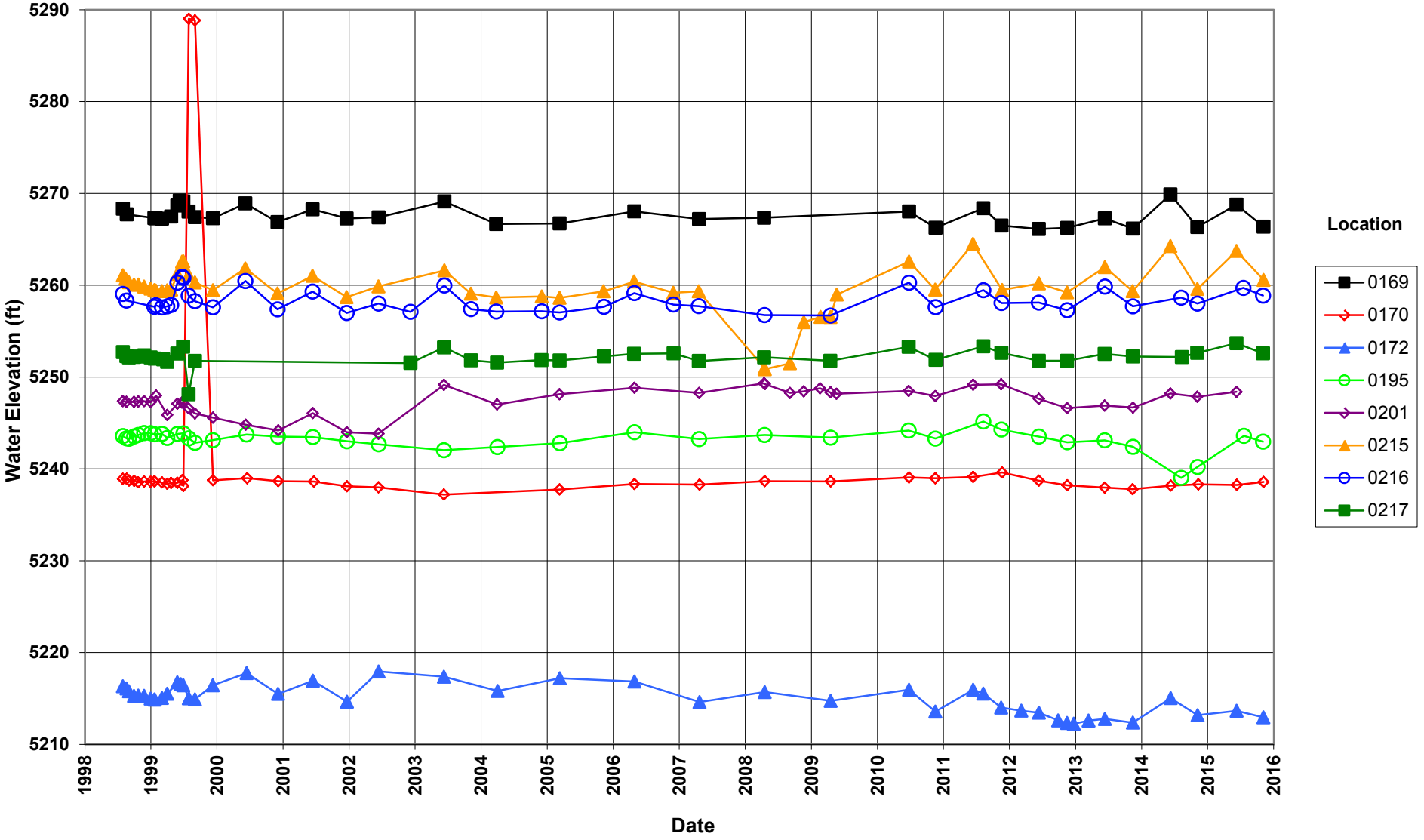
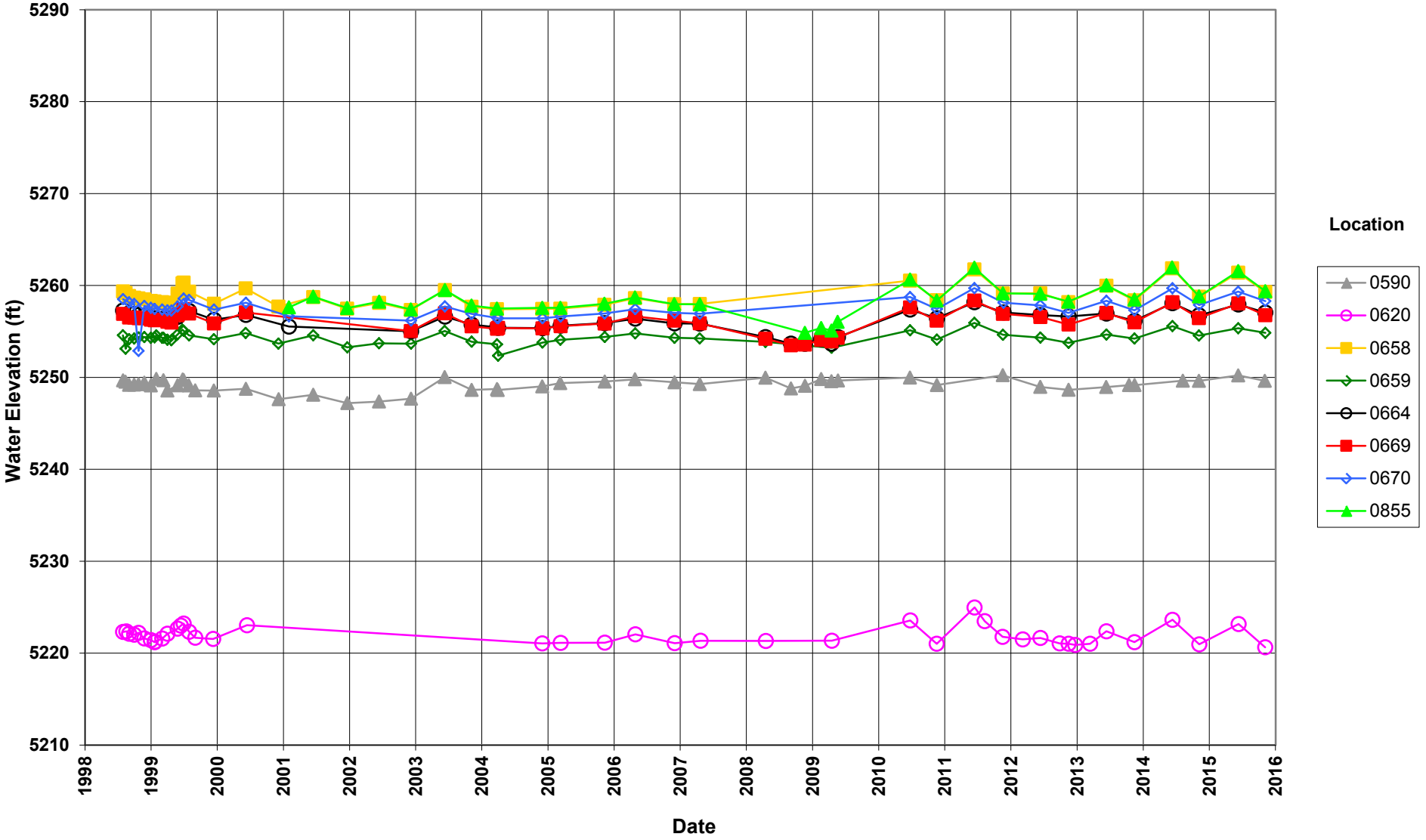
# Rifle New Processing Site
# Hydrograph



# Rifle New Processing Site
# Hydrograph



# Old Rifle
# Hydrograph

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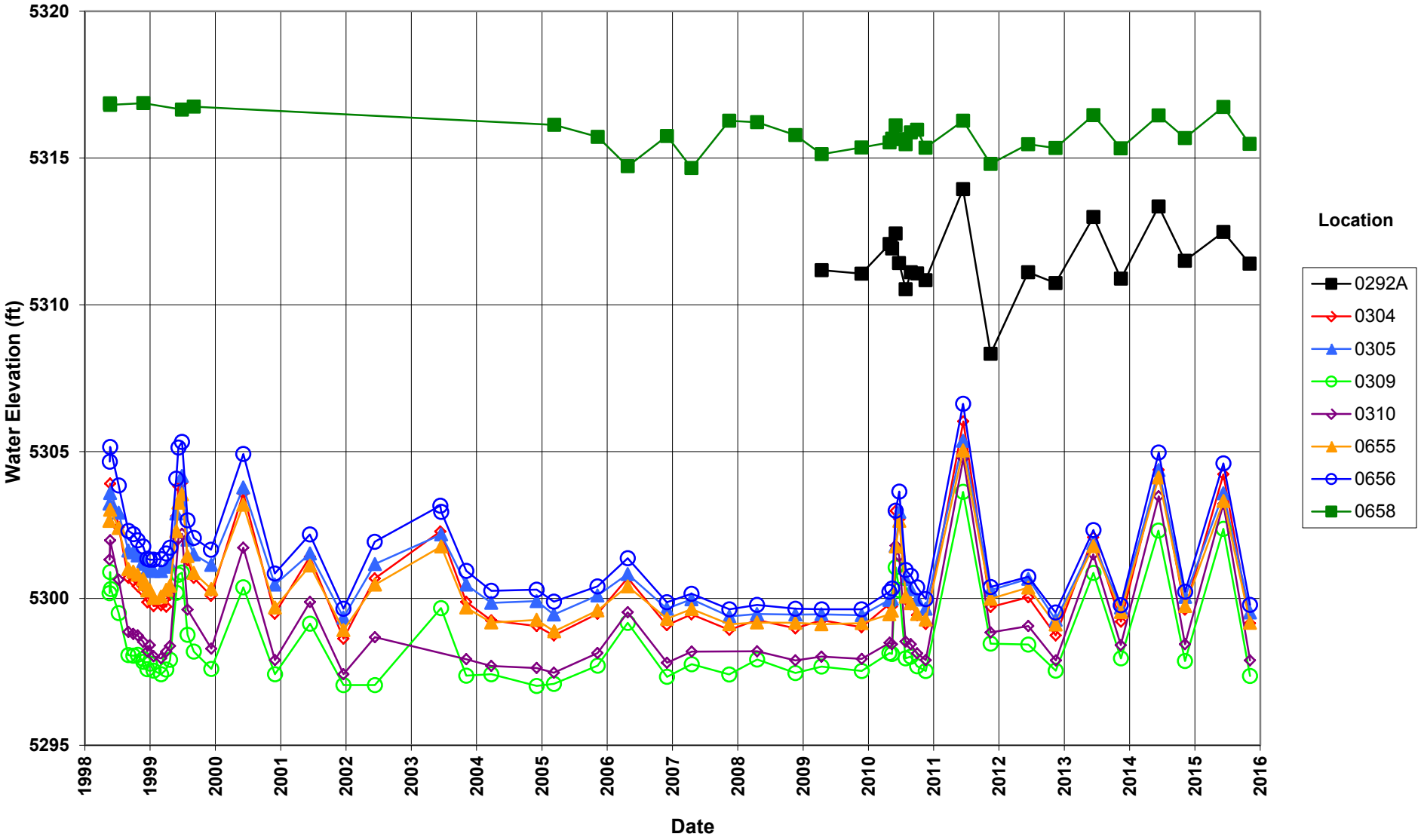
# Rifle Old Processing Site
# Hydrograph



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# New Rifle
# Groundwater Time-Concentration Graphs

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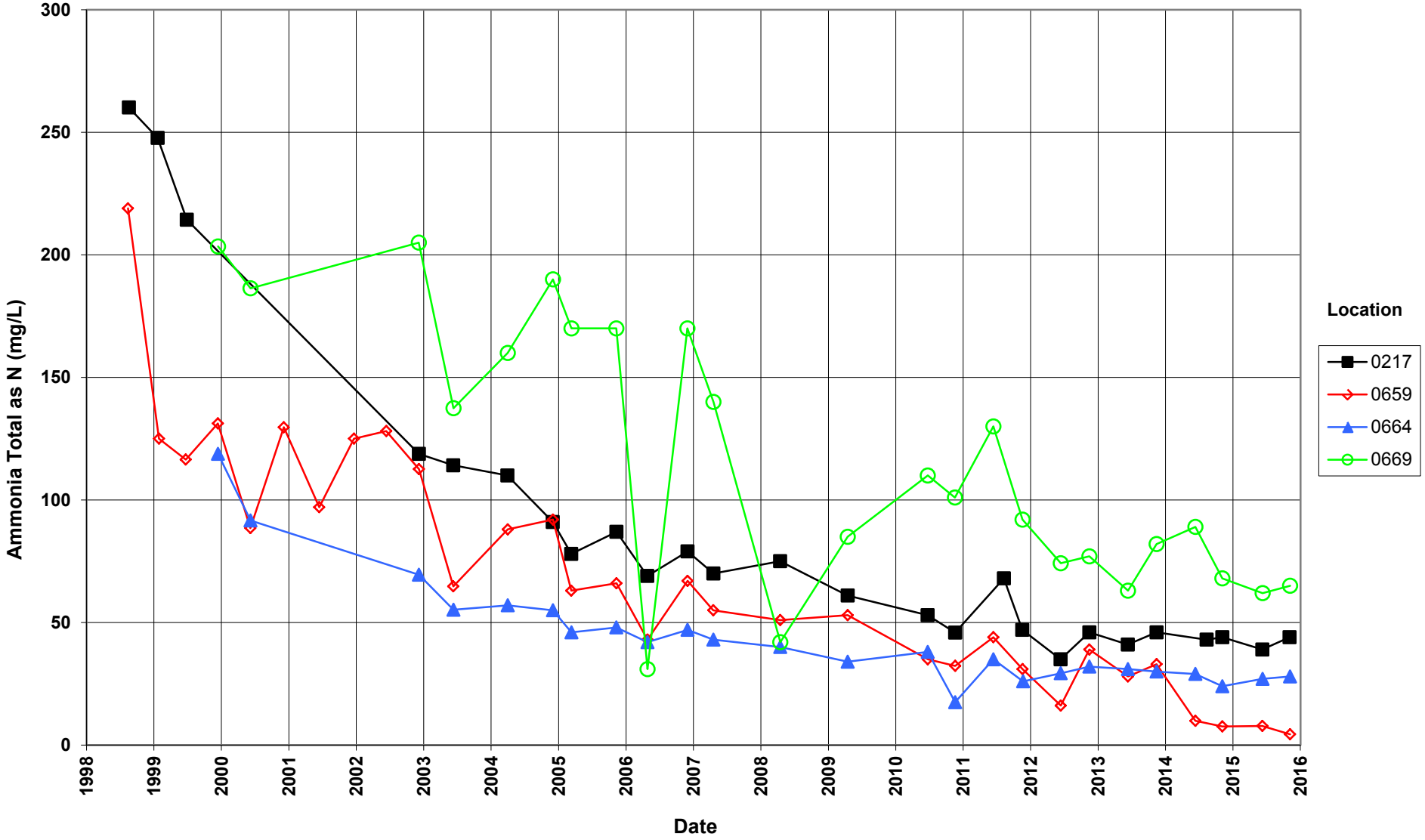
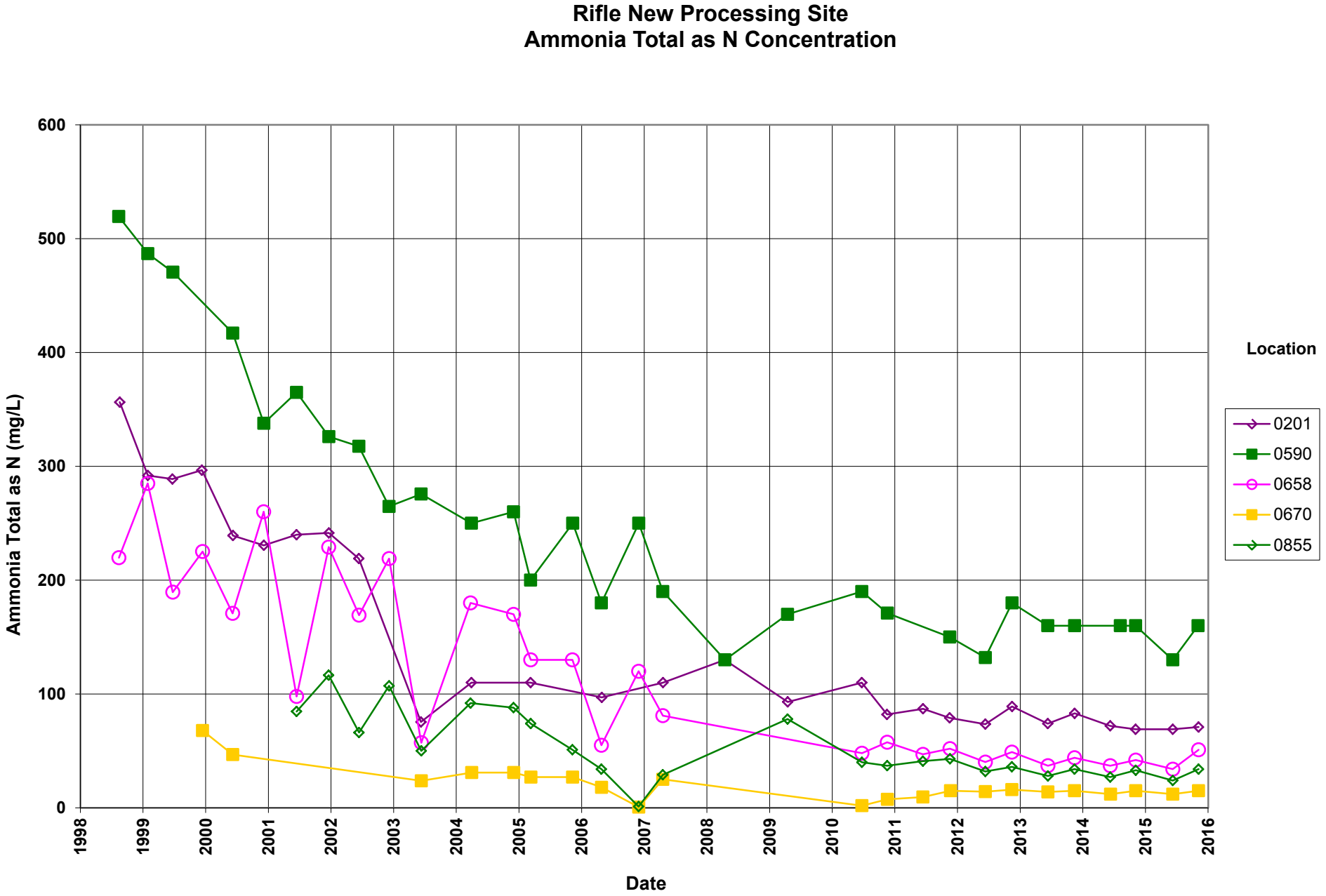
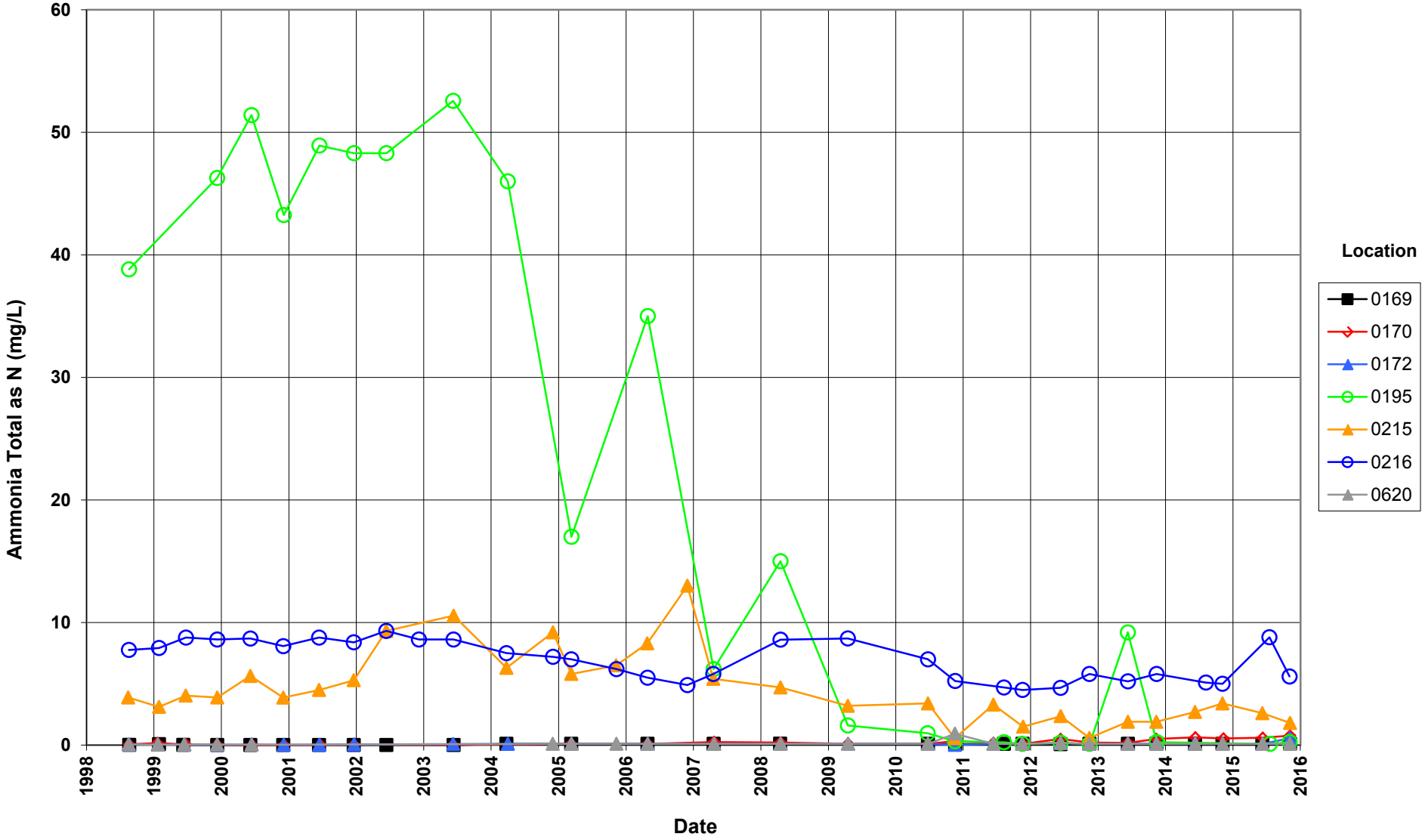
**Rifle New Processing Site**
**Ammonia Total as N Concentration**
**Point of Compliance Wells**

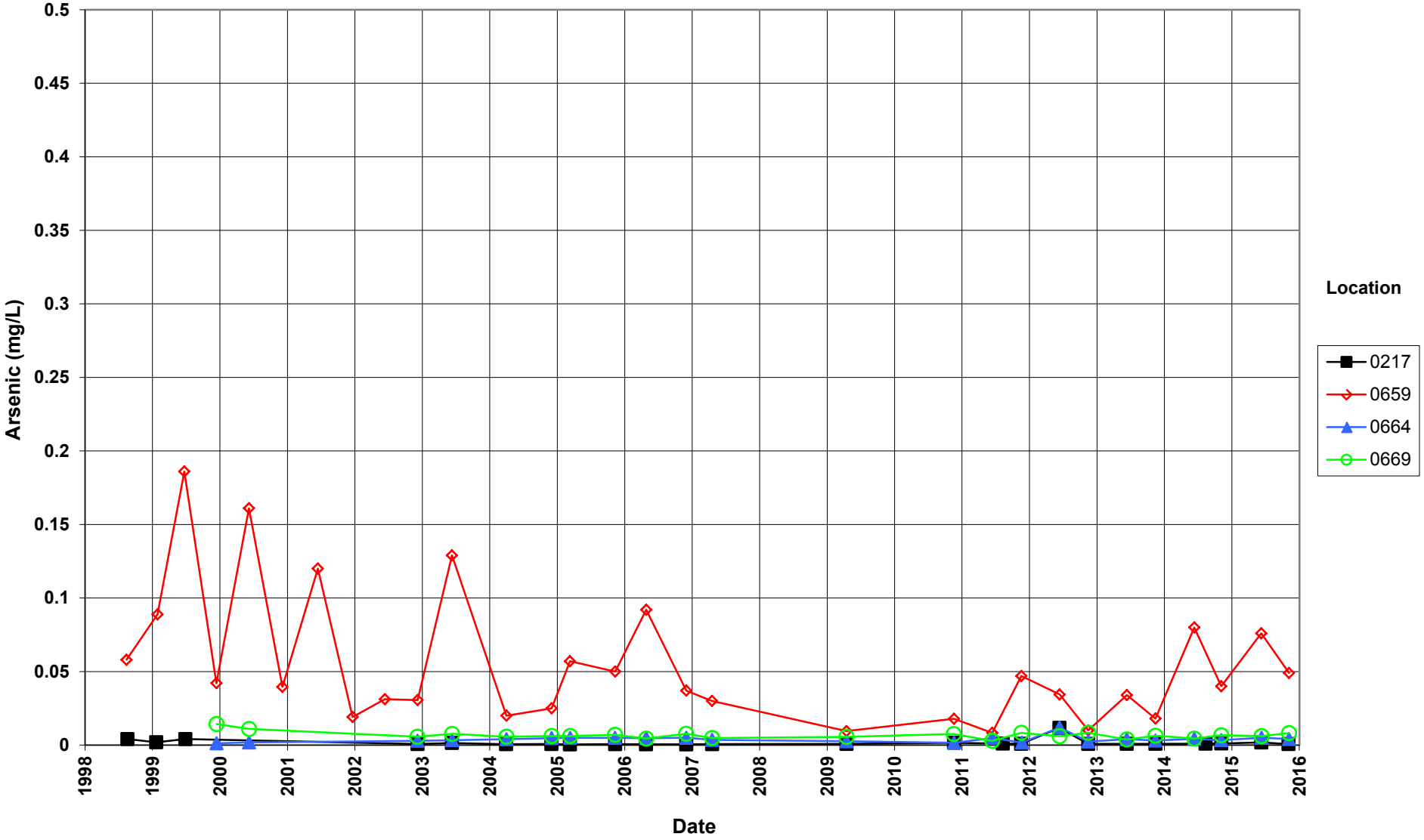



Rifle New Processing Site
Ammonia Total as N Concentration
Ammonia Total as N (mg/L)
600
500
400
300
200
100
0
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Date
Location
0201
0590
0658
0670
0855

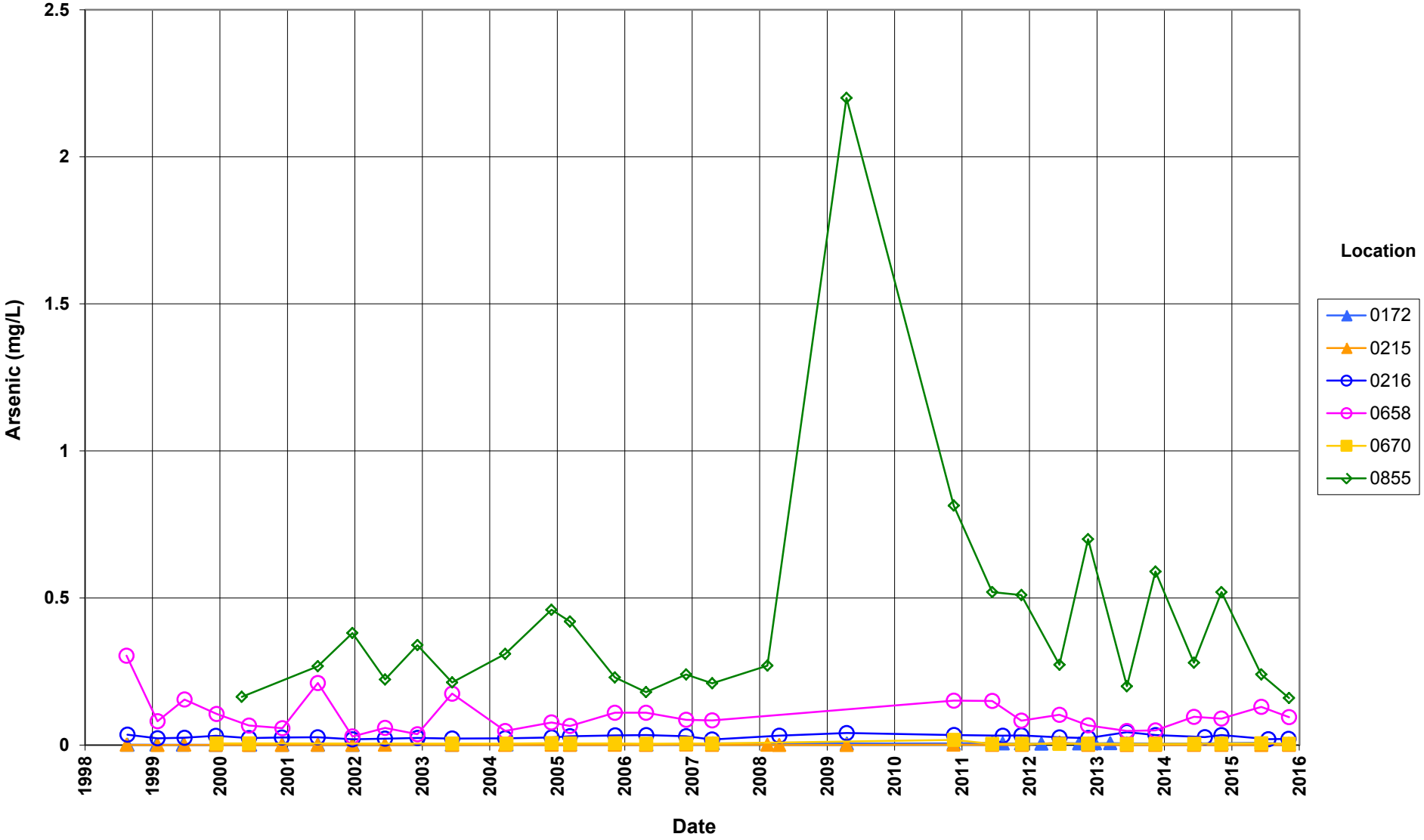
## Rifle New Processing Site
## Ammonia Total as N Concentration



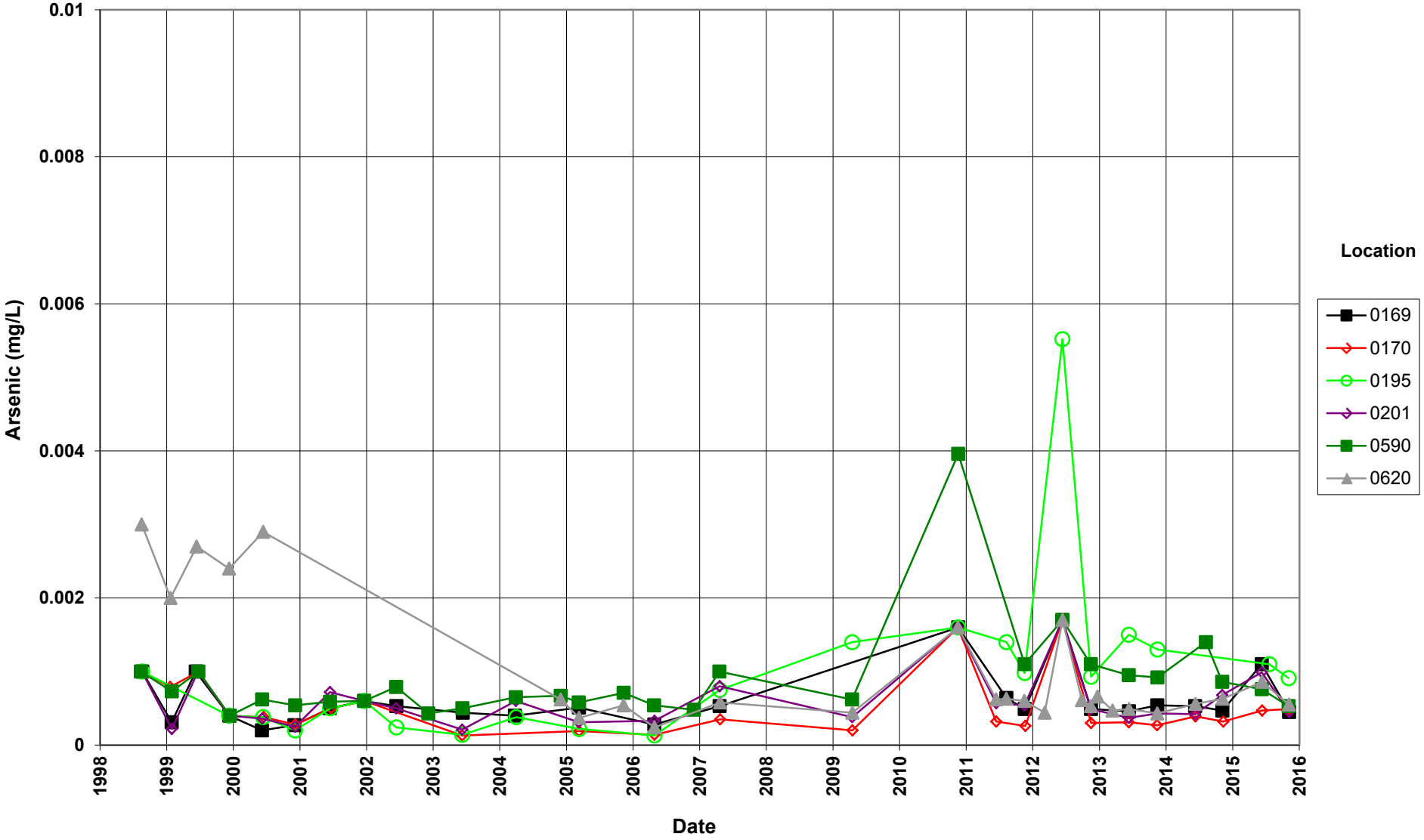
## Rifle New Processing Site
## Arsenic Concentration
## Point of Compliance Wells



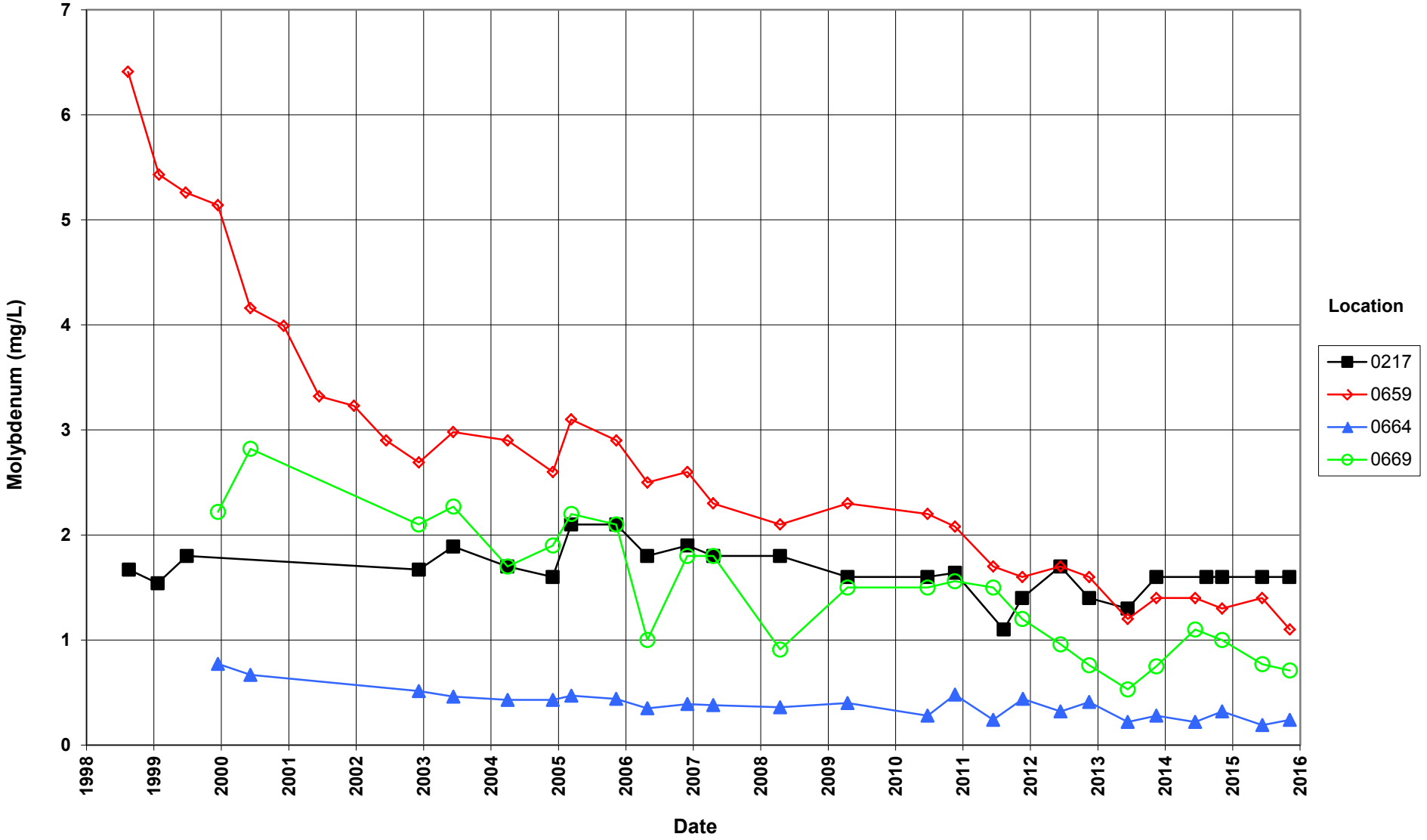
## Rifle New Processing Site
## Arsenic Concentration



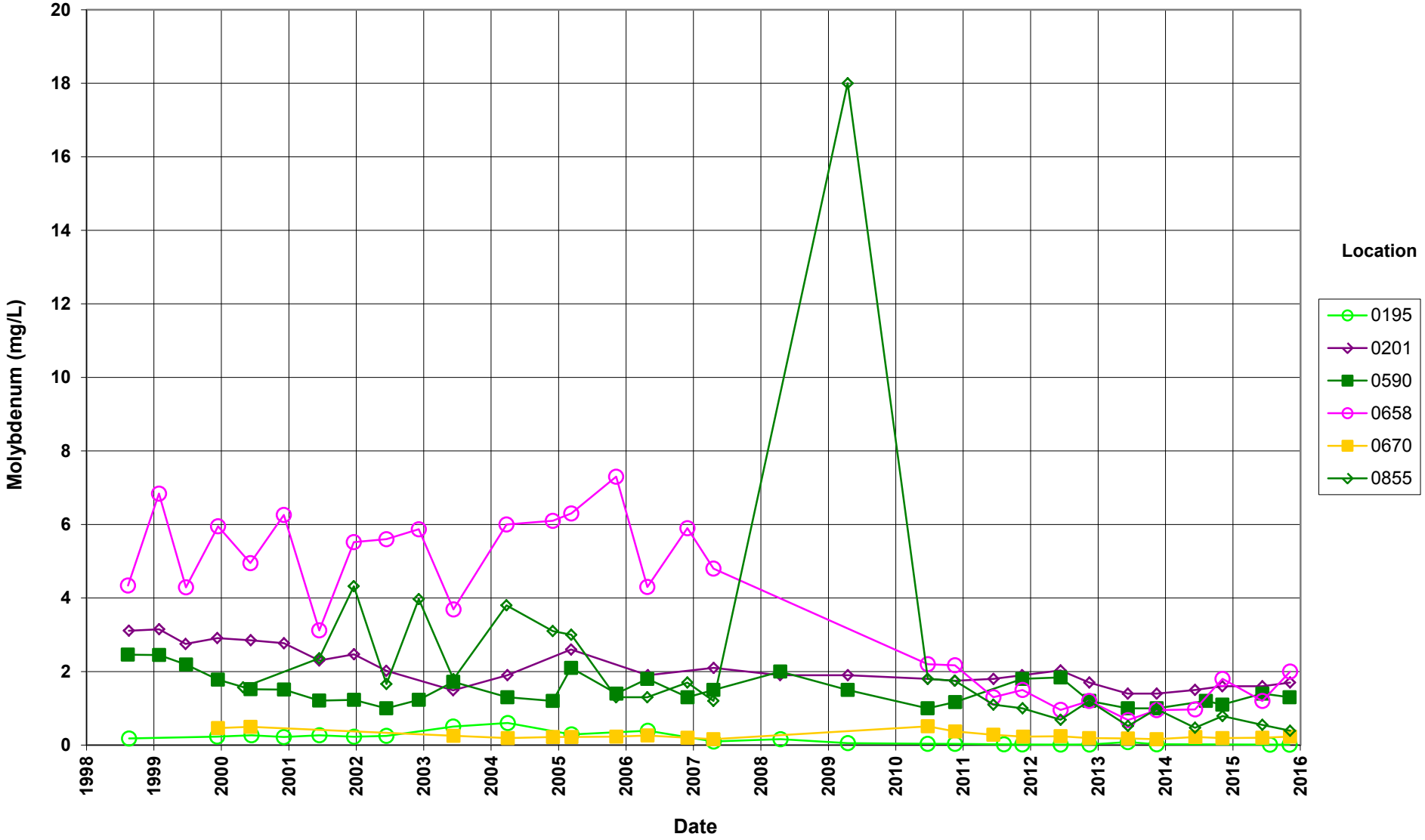
## Rifle New Processing Site
## Arsenic Concentration



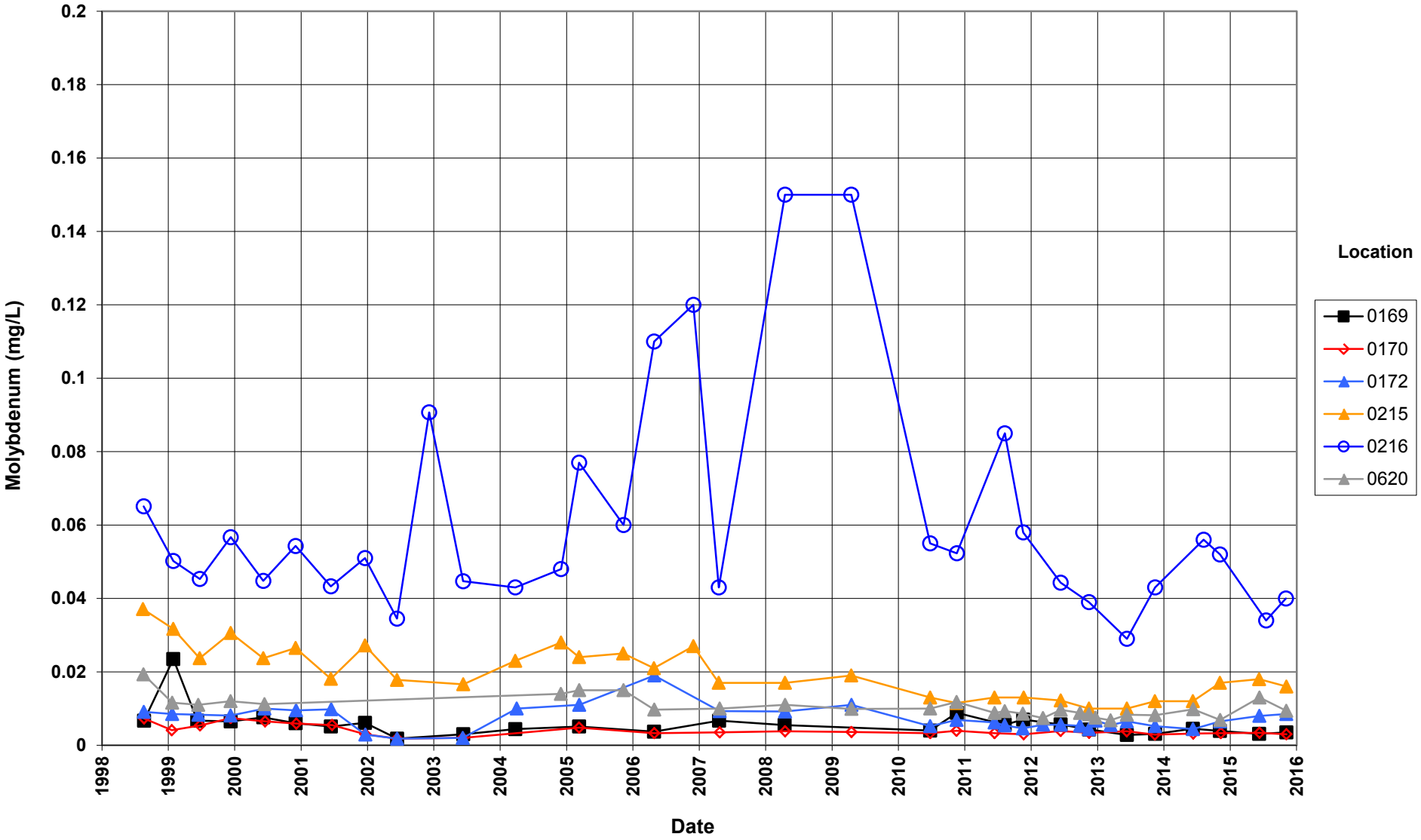
**Rifle New Processing Site**
**Molybdenum Concentration**
**Point of Compliance Wells**

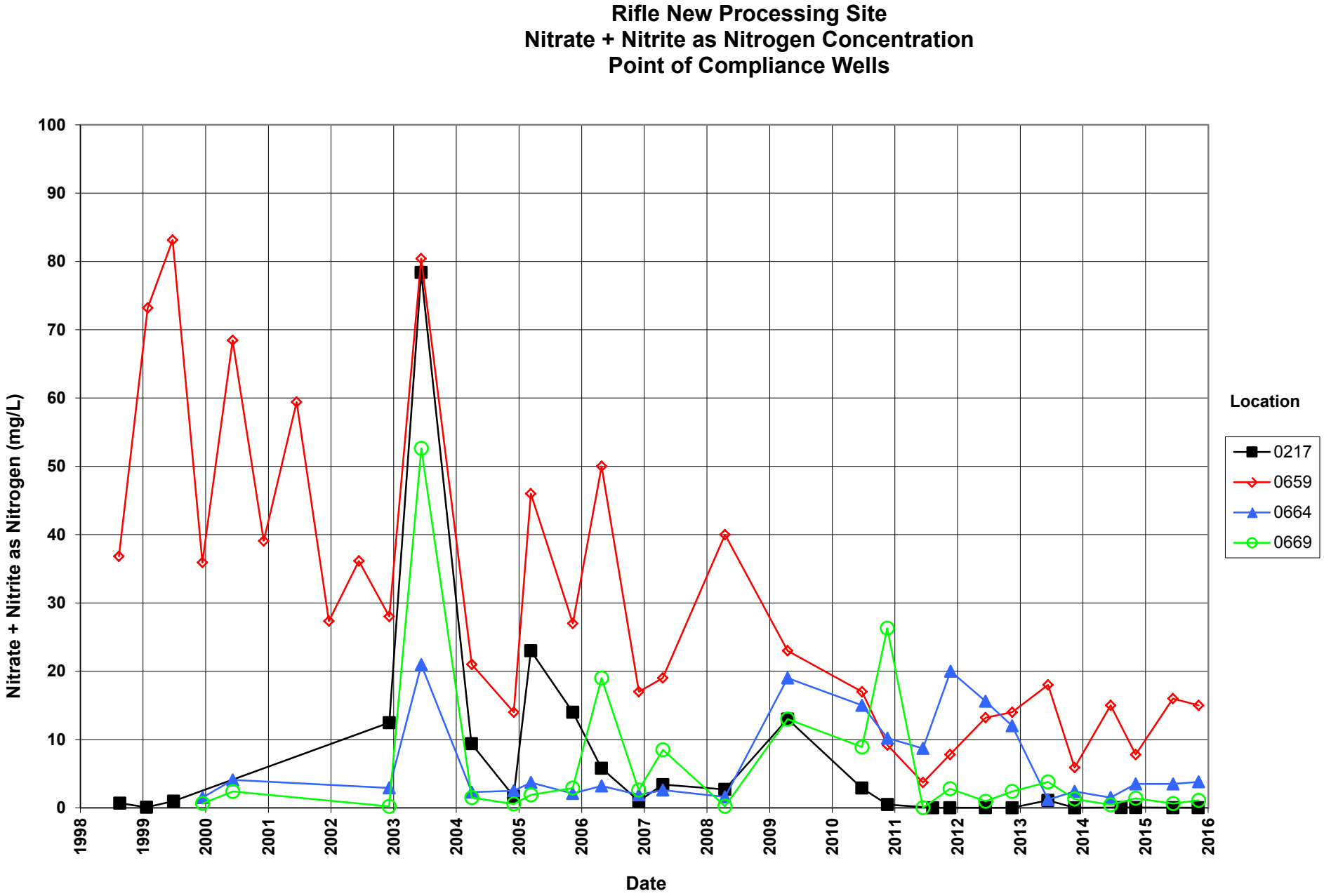


## Rifle New Processing Site
## Molybdenum Concentration

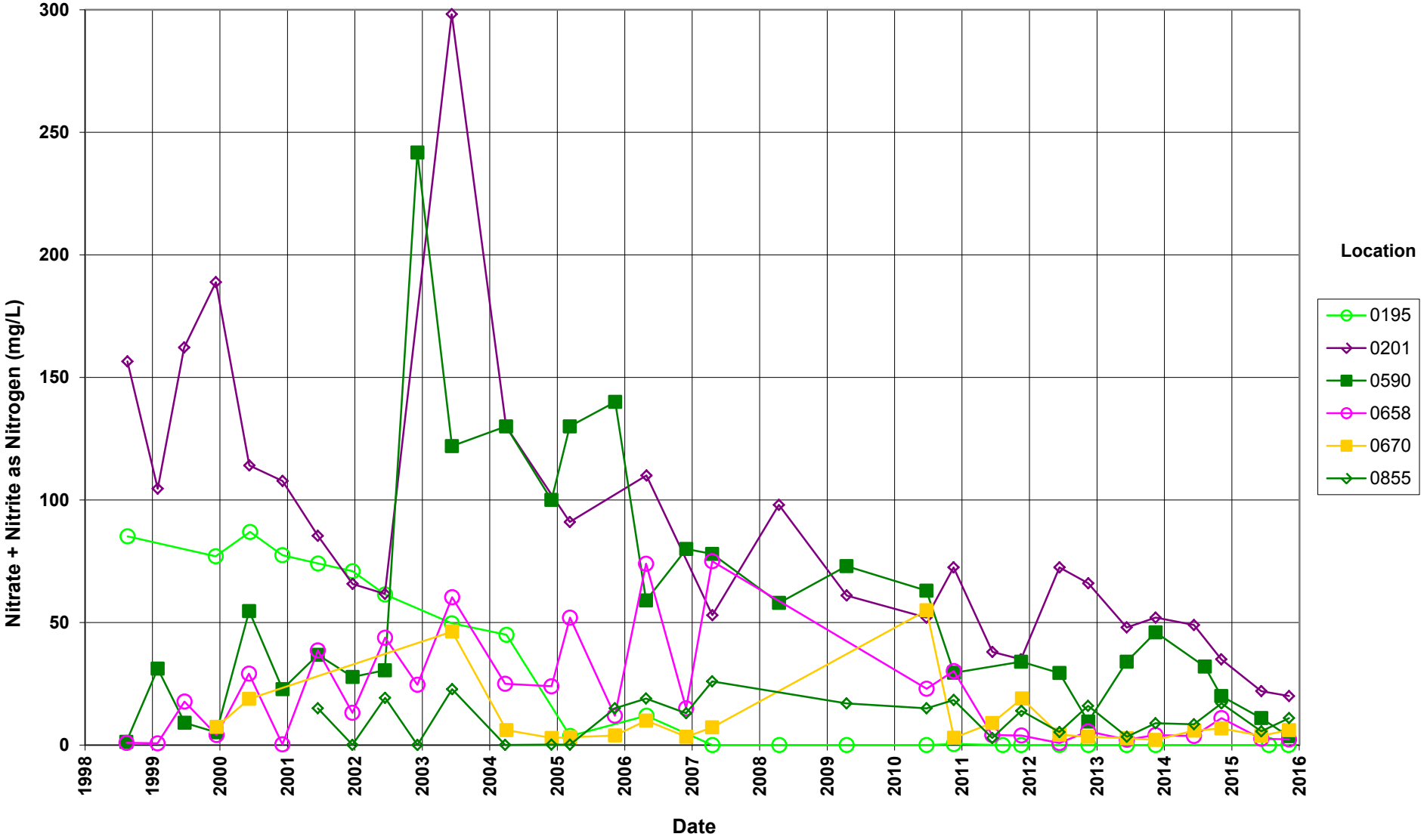


## Rifle New Processing Site
## Molybdenum Concentration

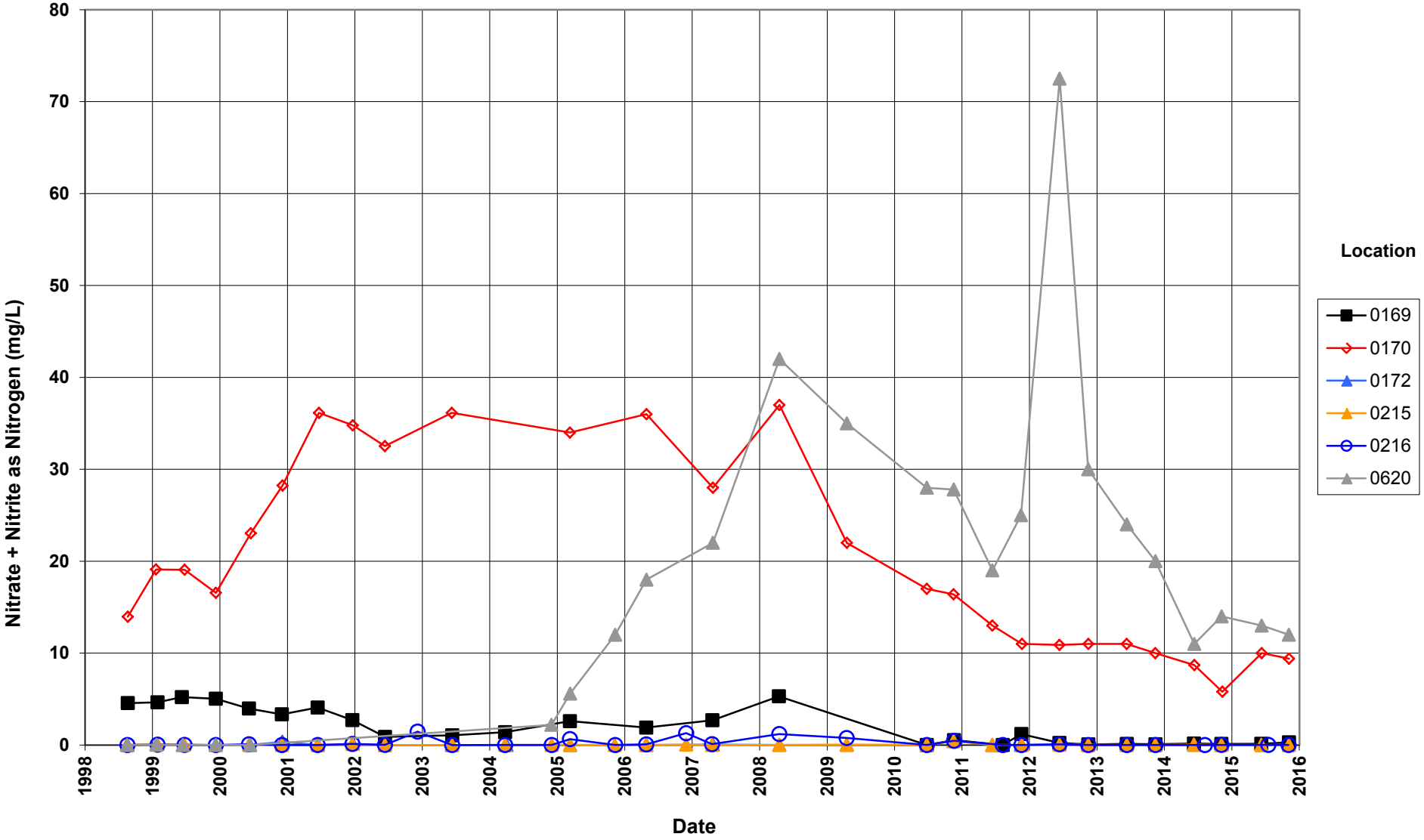


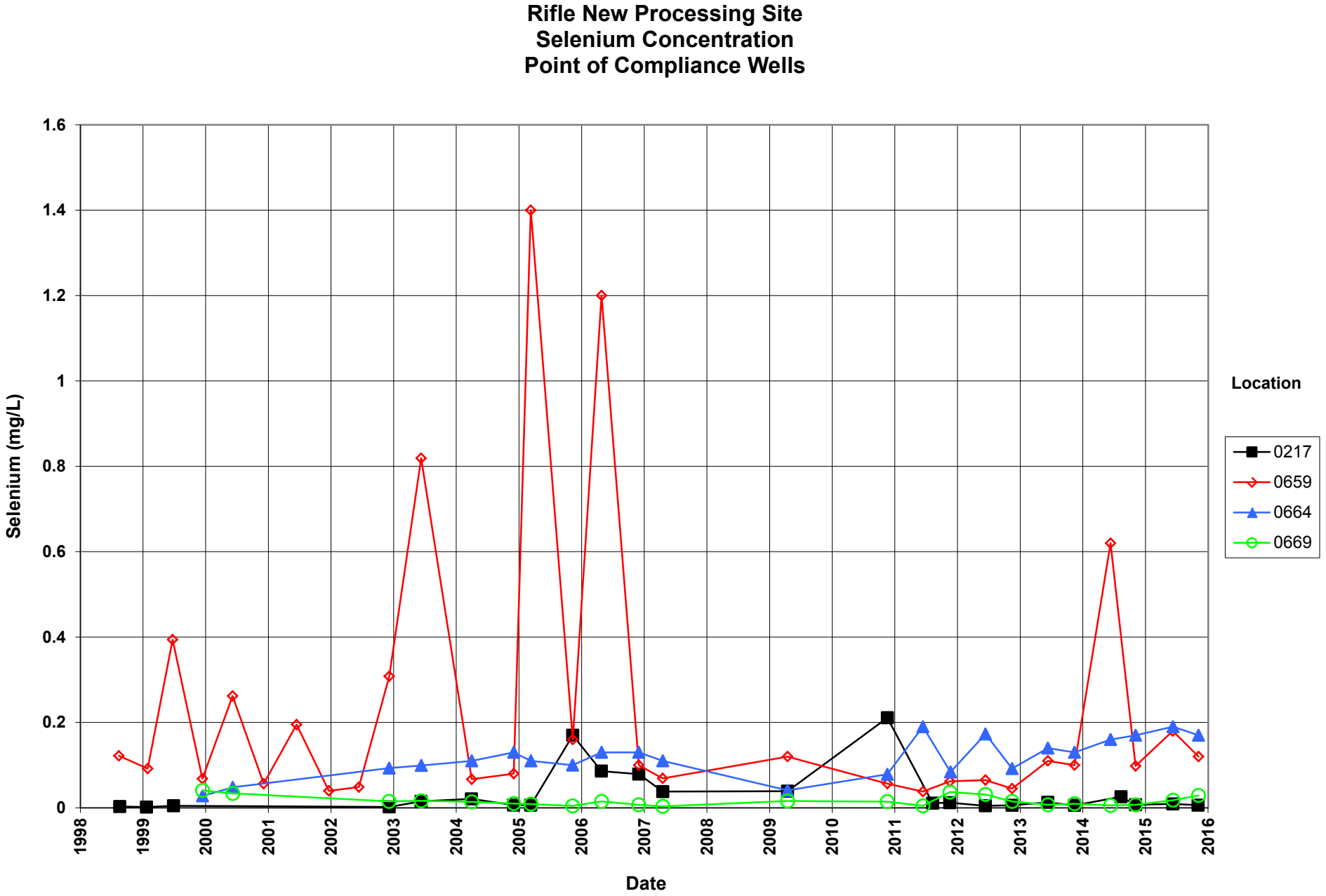

Rifle New Processing Site
Nitrate + Nitrite as Nitrogen Concentration
Point of Compliance Wells
Nitrate + Nitrite as Nitrogen (mg/L)
100
90
80
70
60
50
40
30
20
10
0
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Date
Location
0217
0659
0664
0669

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

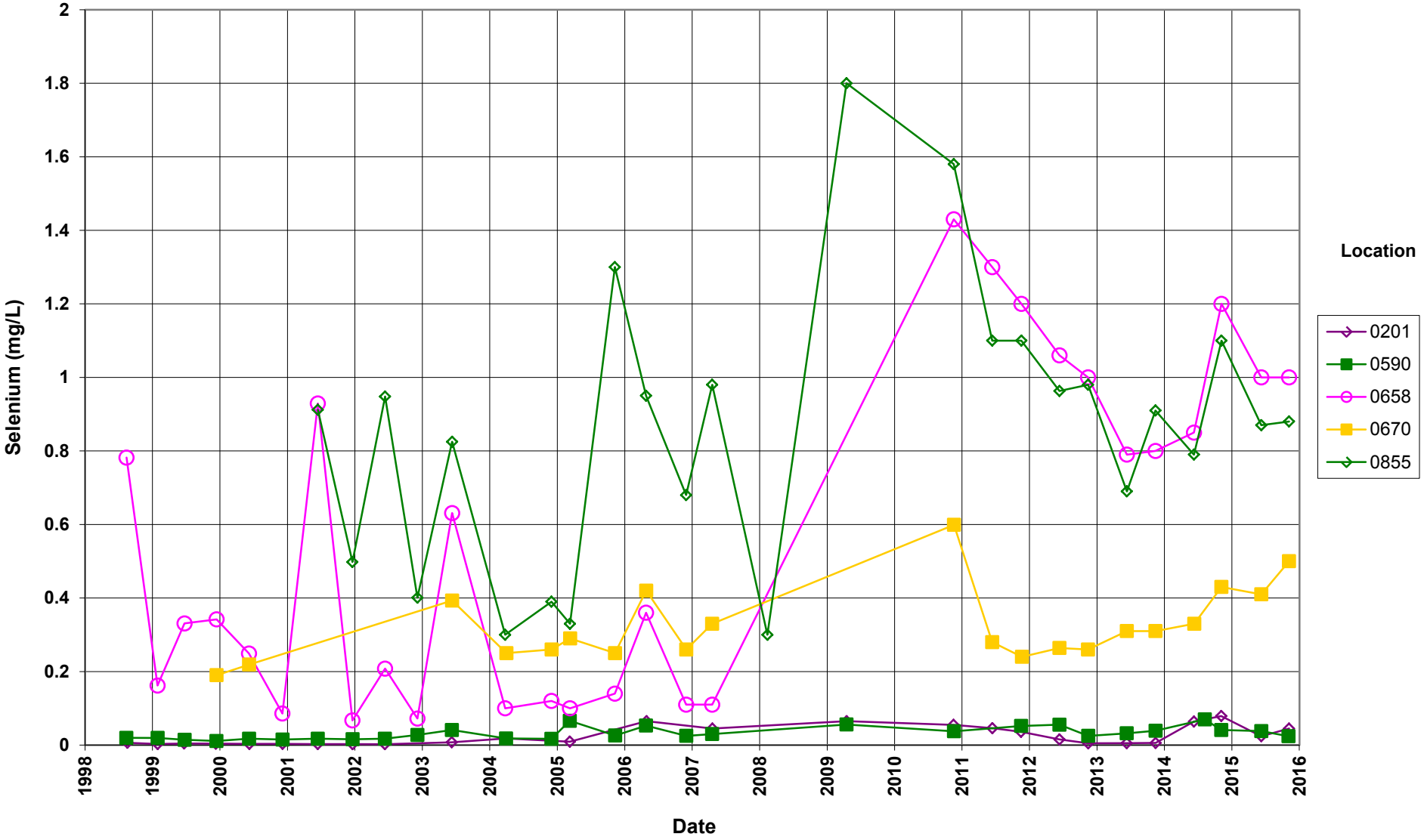


## Rifle New Processing Site
## Nitrate + Nitrite as Nitrogen Concentration

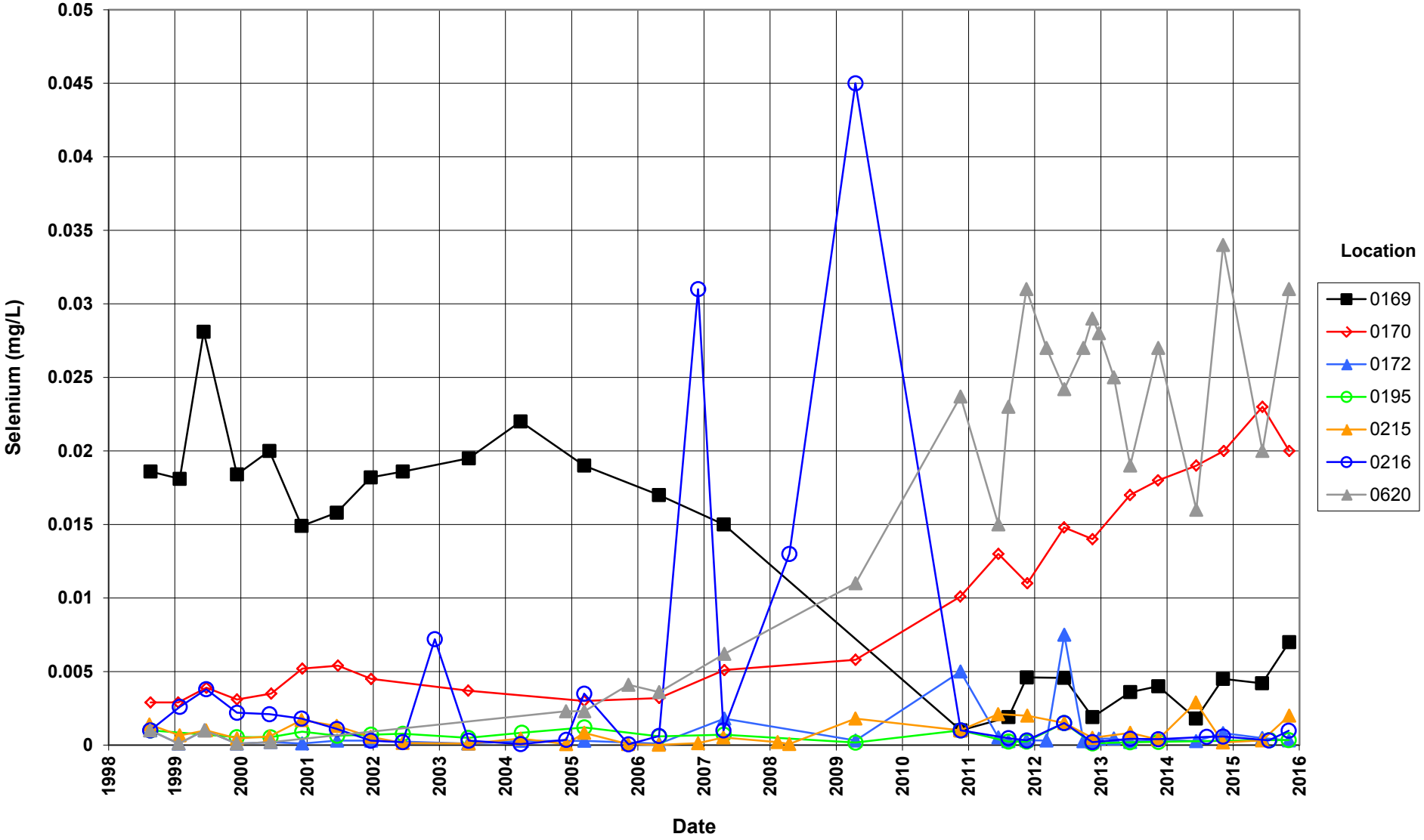


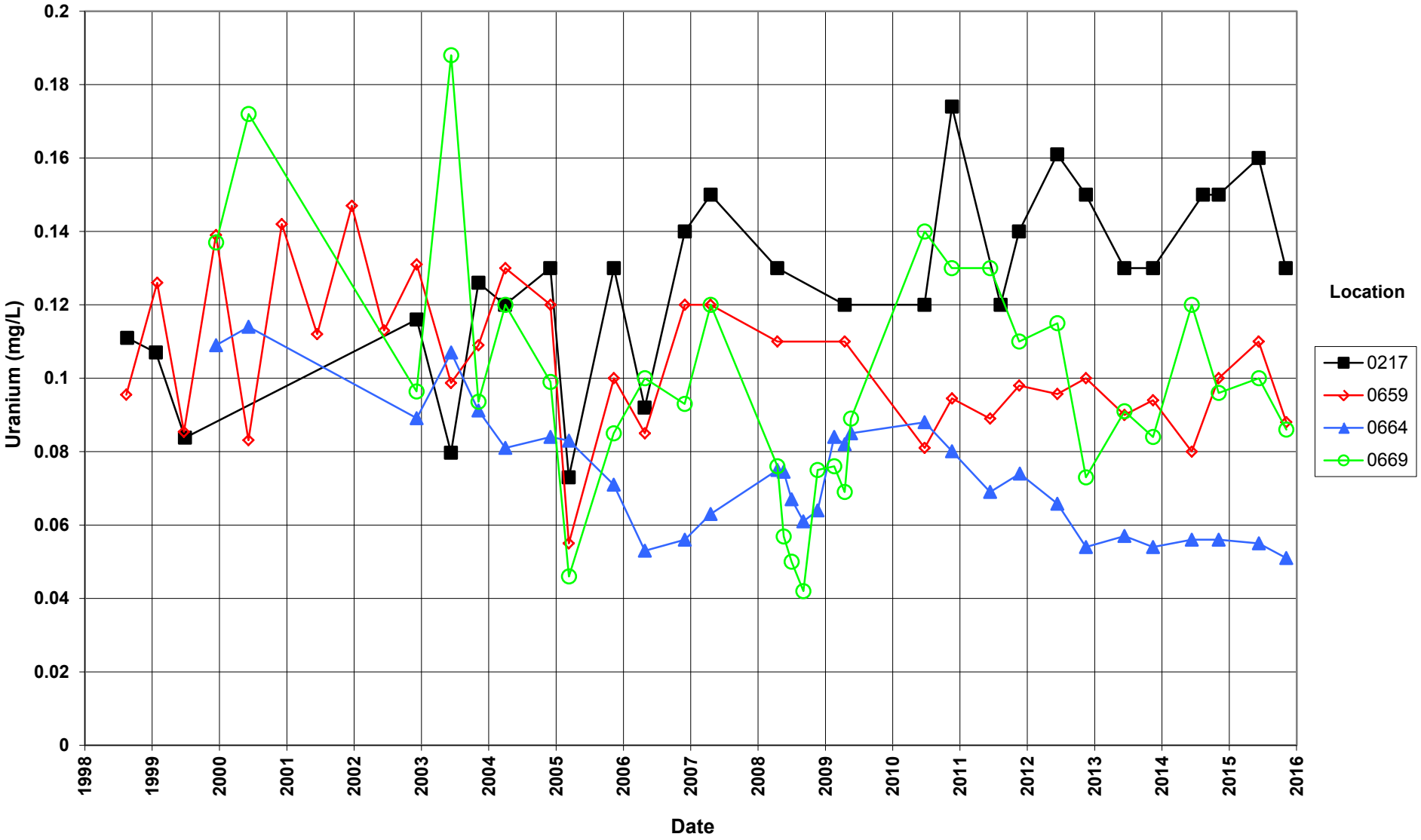

Rifle New Processing Site
Selenium Concentration
Point of Compliance Wells
Selenium (mg/L)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Date
Location
0217
0659
0664
0669

## Rifle New Processing Site
## Selenium Concentration

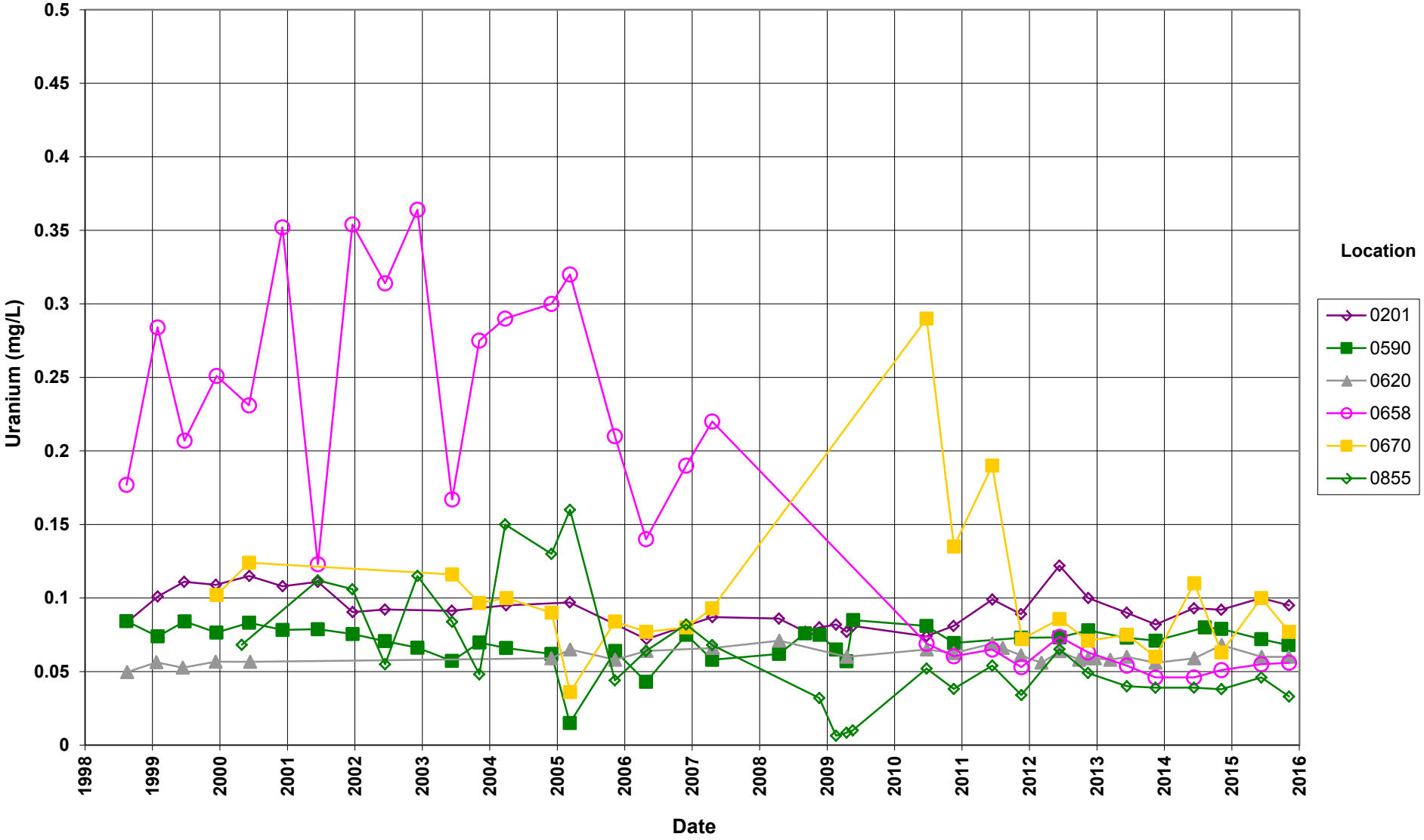


## Rifle New Processing Site
## Selenium Concentration

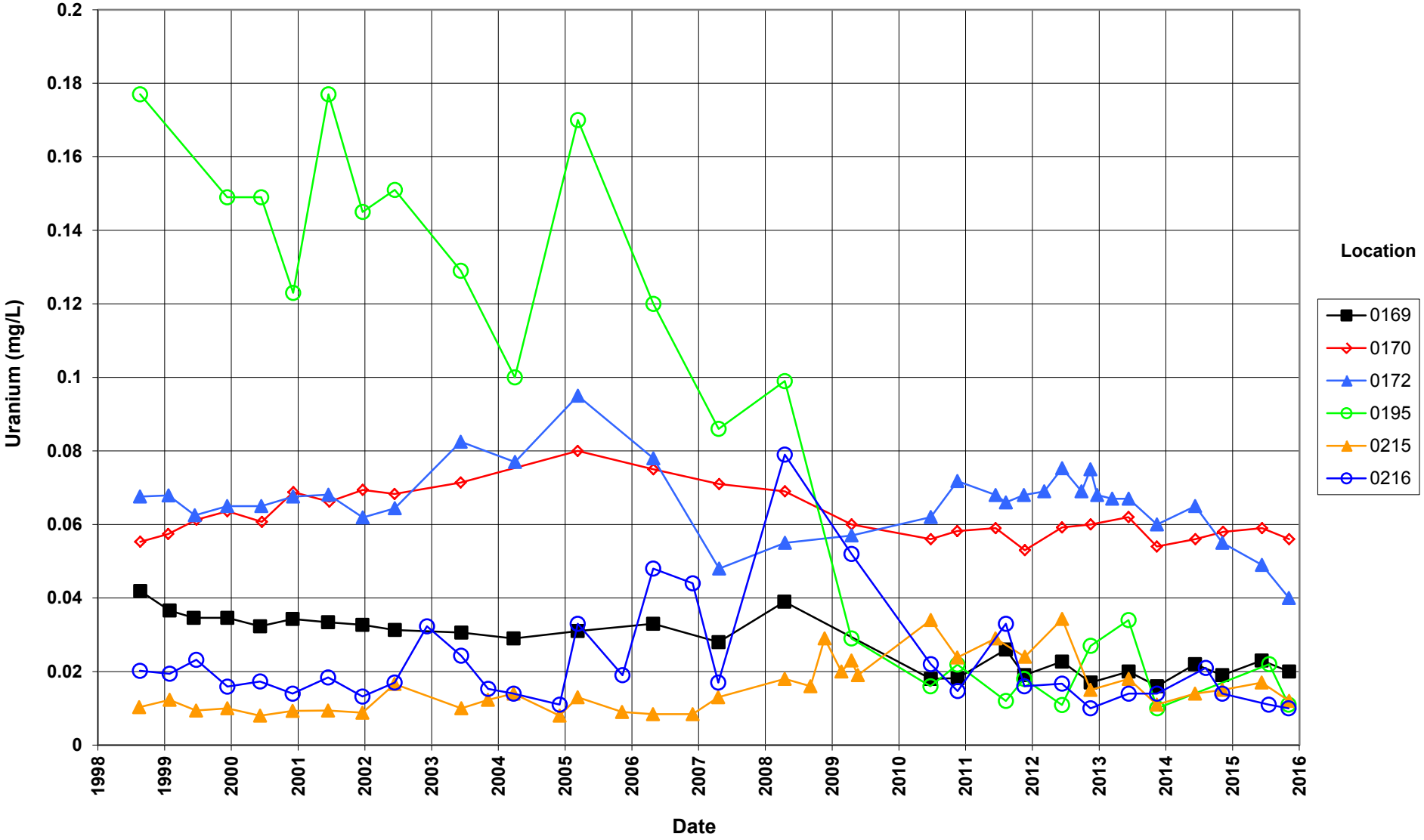



Rifle New Processing Site
Uranium Concentration
Point of Compliance Wells
Uranium (mg/L)
0.2
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Date
Location
0217
0659
0664
0669

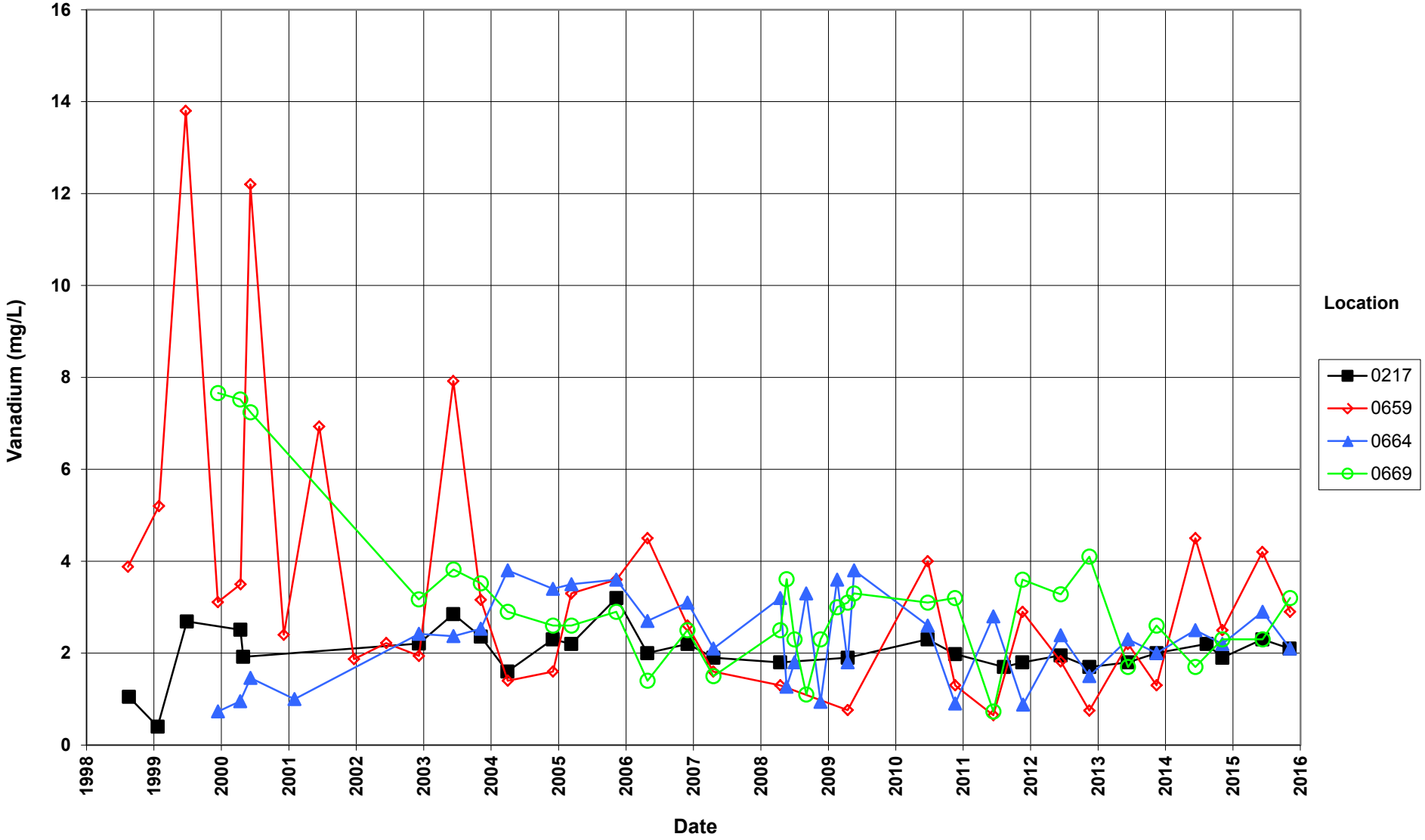
## Rifle New Processing Site
## Uranium Concentration



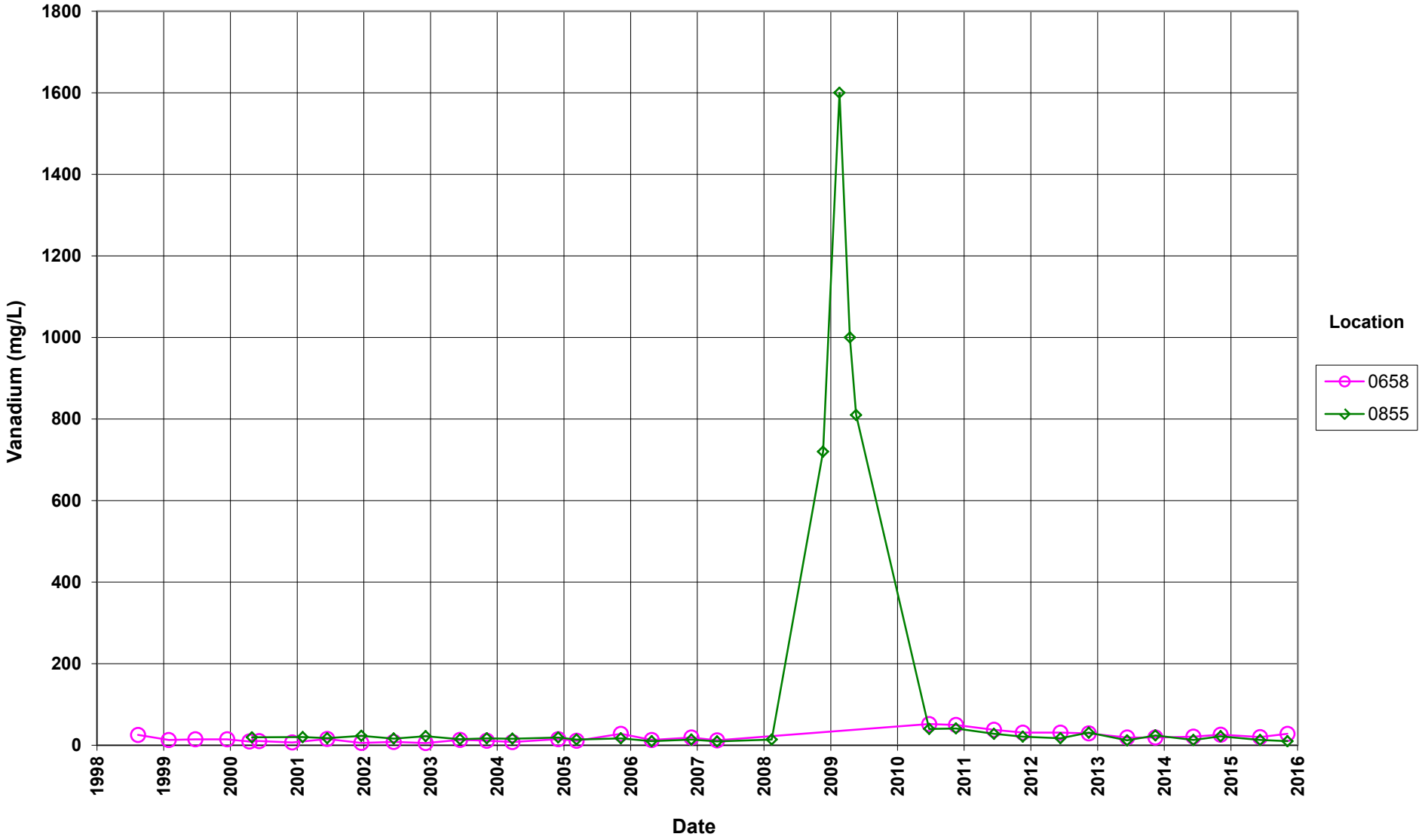
## Rifle New Processing Site
## Uranium Concentration



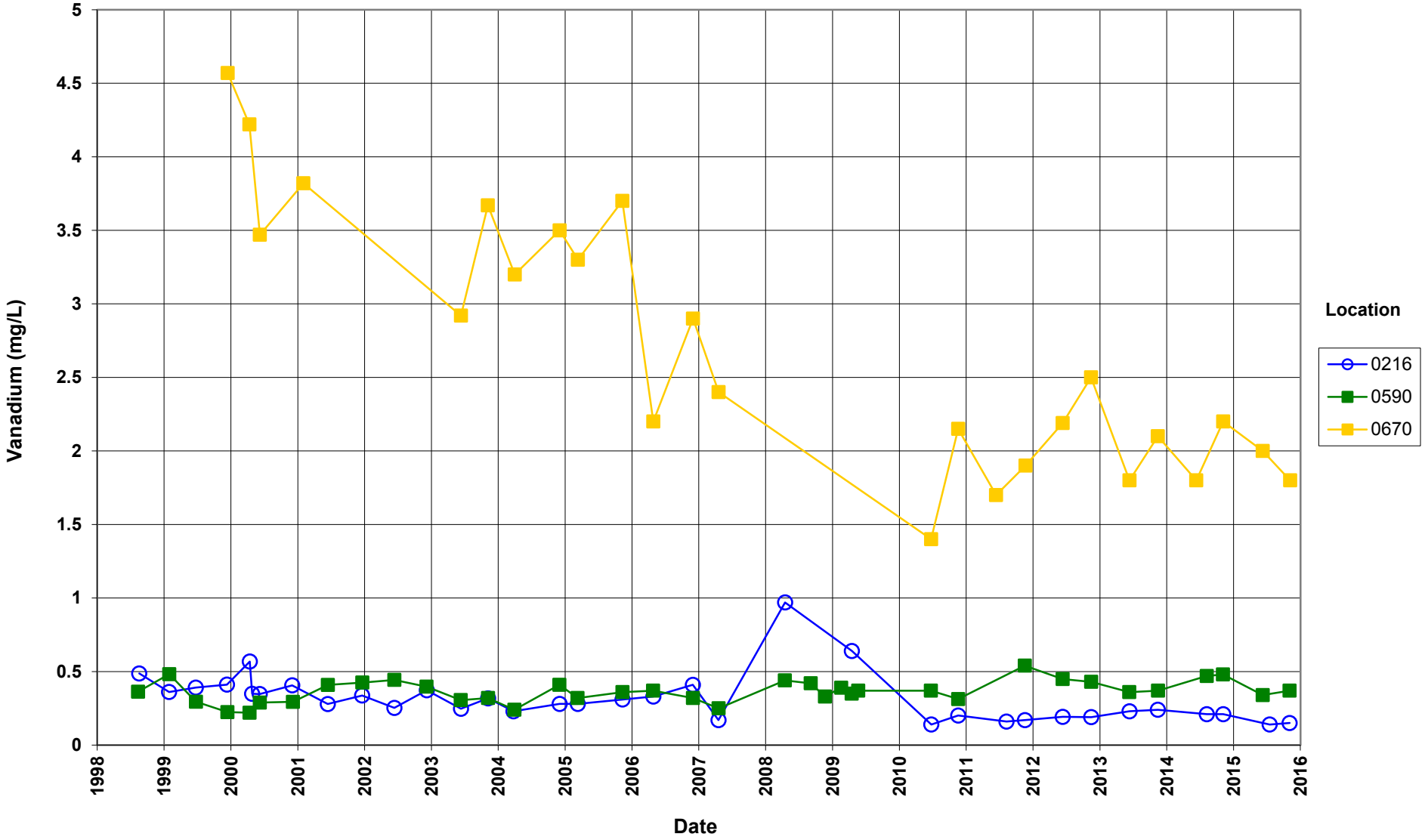
**Rifle New Processing Site**
**Vanadium Concentration**
**Point of Compliance Wells**
Alternate Concentration Limit (ACL) = 50 mg/L



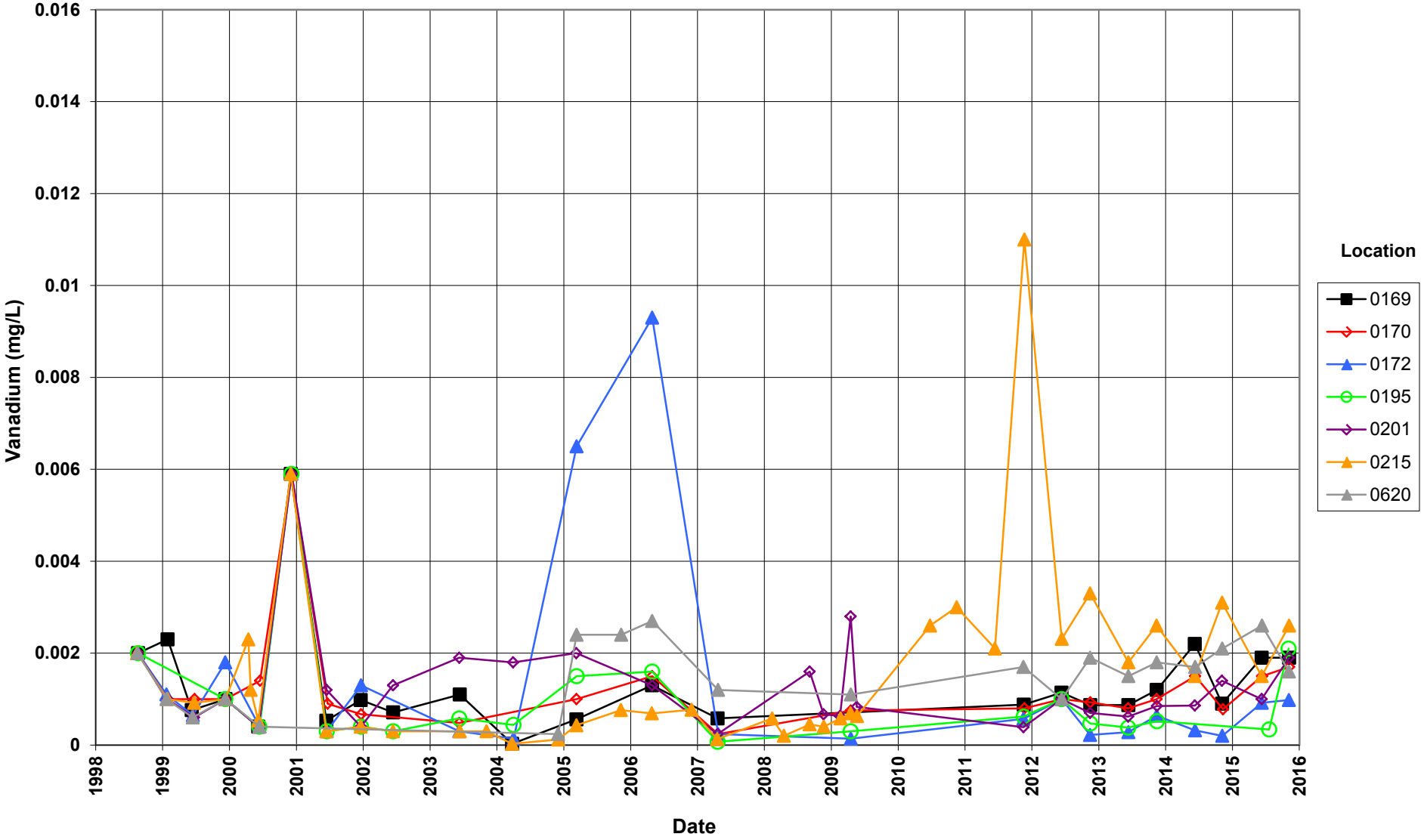
## Rifle New Processing Site
## Vanadium Concentration



## Rifle New Processing Site
## Vanadium Concentration



## Rifle New Processing Site
## Vanadium Concentration



# Old Rifle
# Groundwater Time-Concentration Graphs

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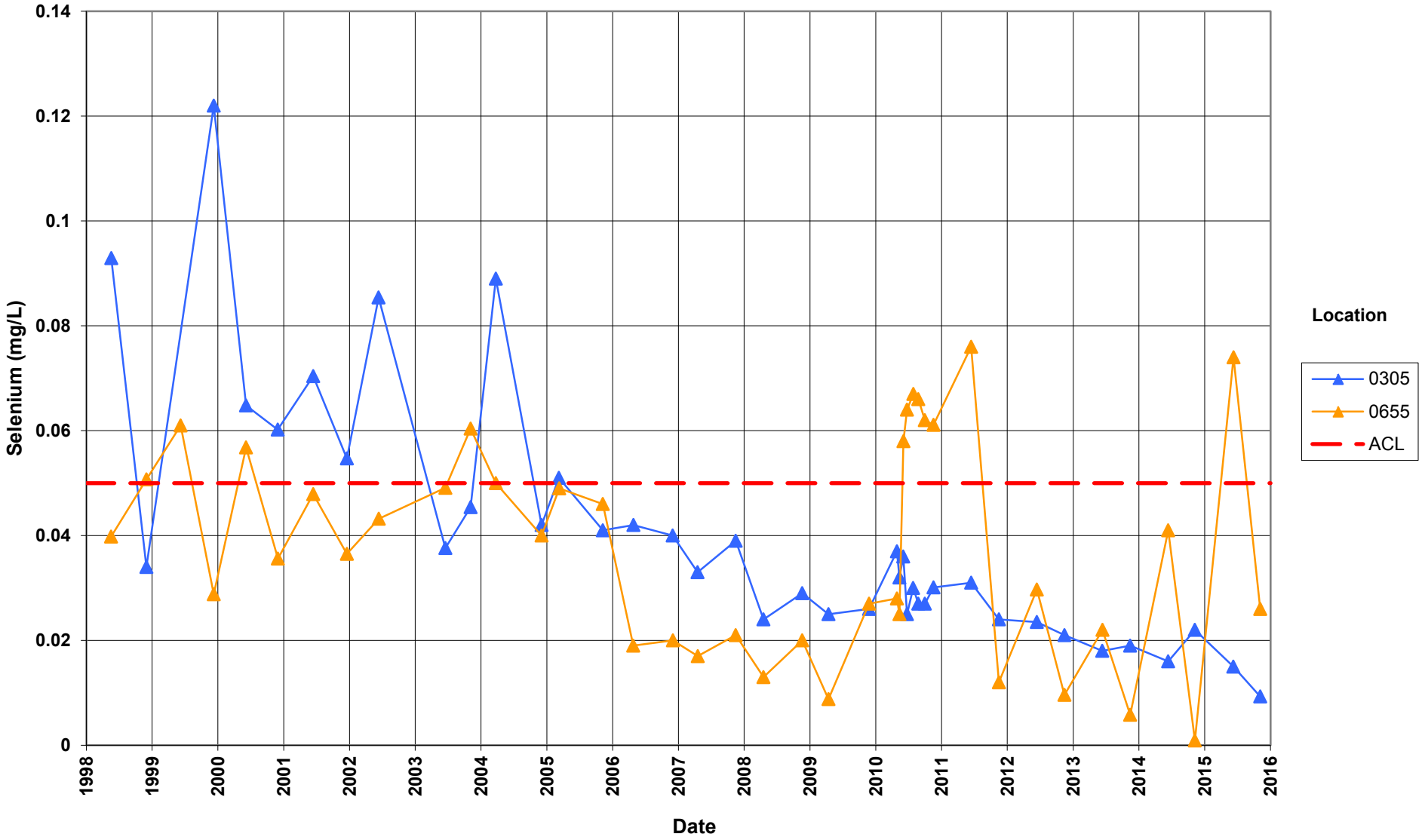
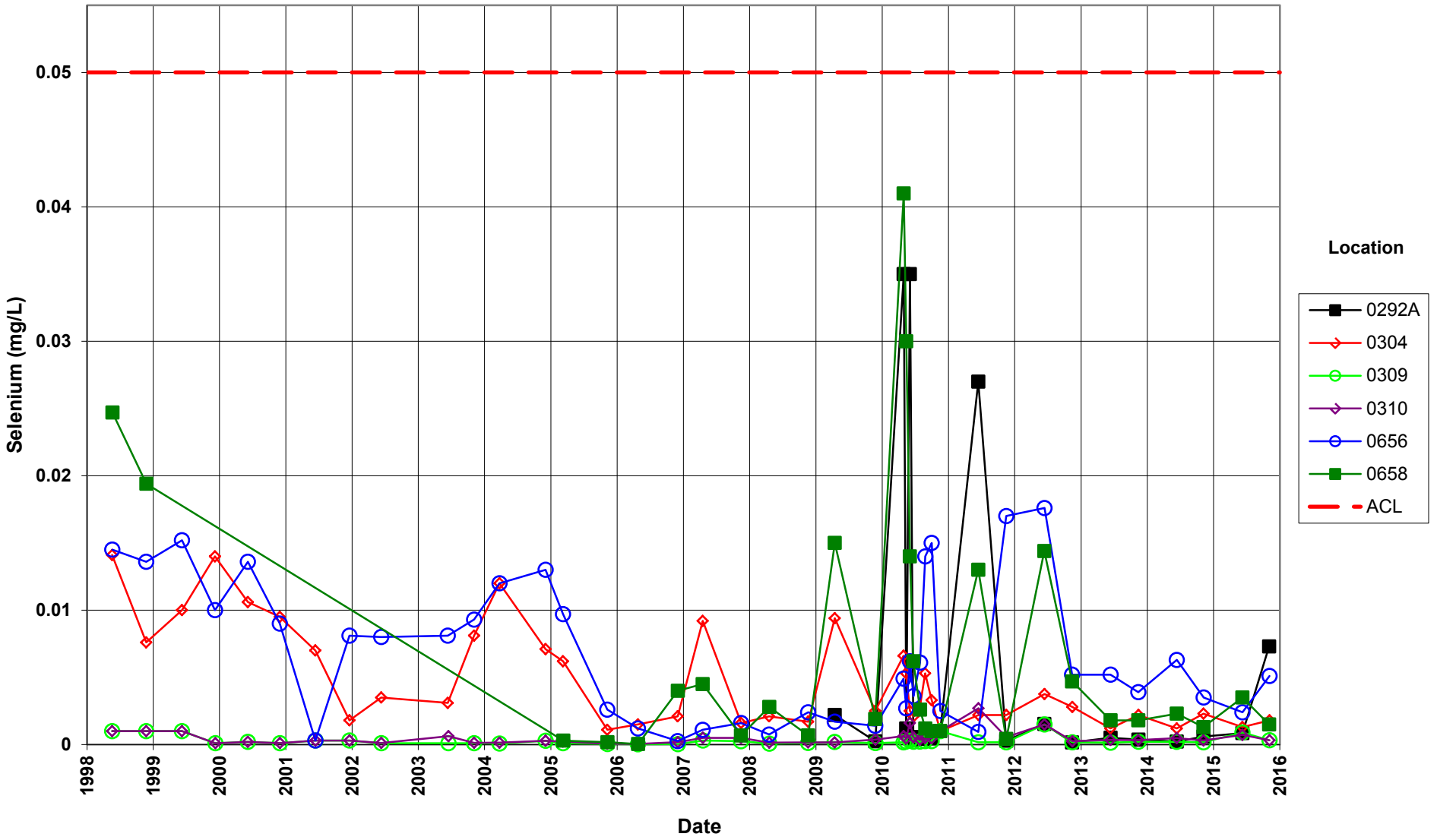
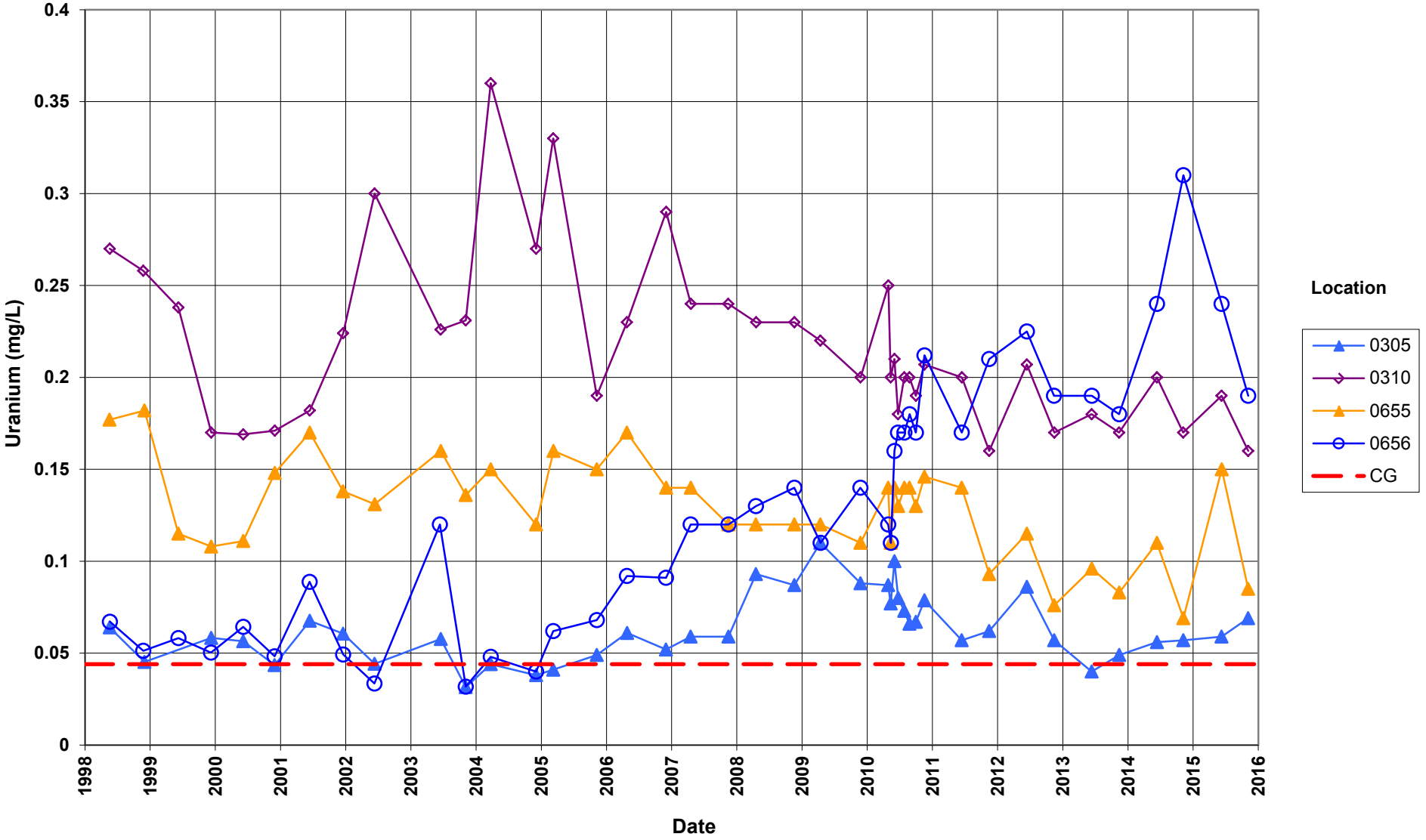
**Rifle Old Processing Site**
**Selenium Concentration**
Alternate Concentration Limit (ACL) = 0.05 mg/L



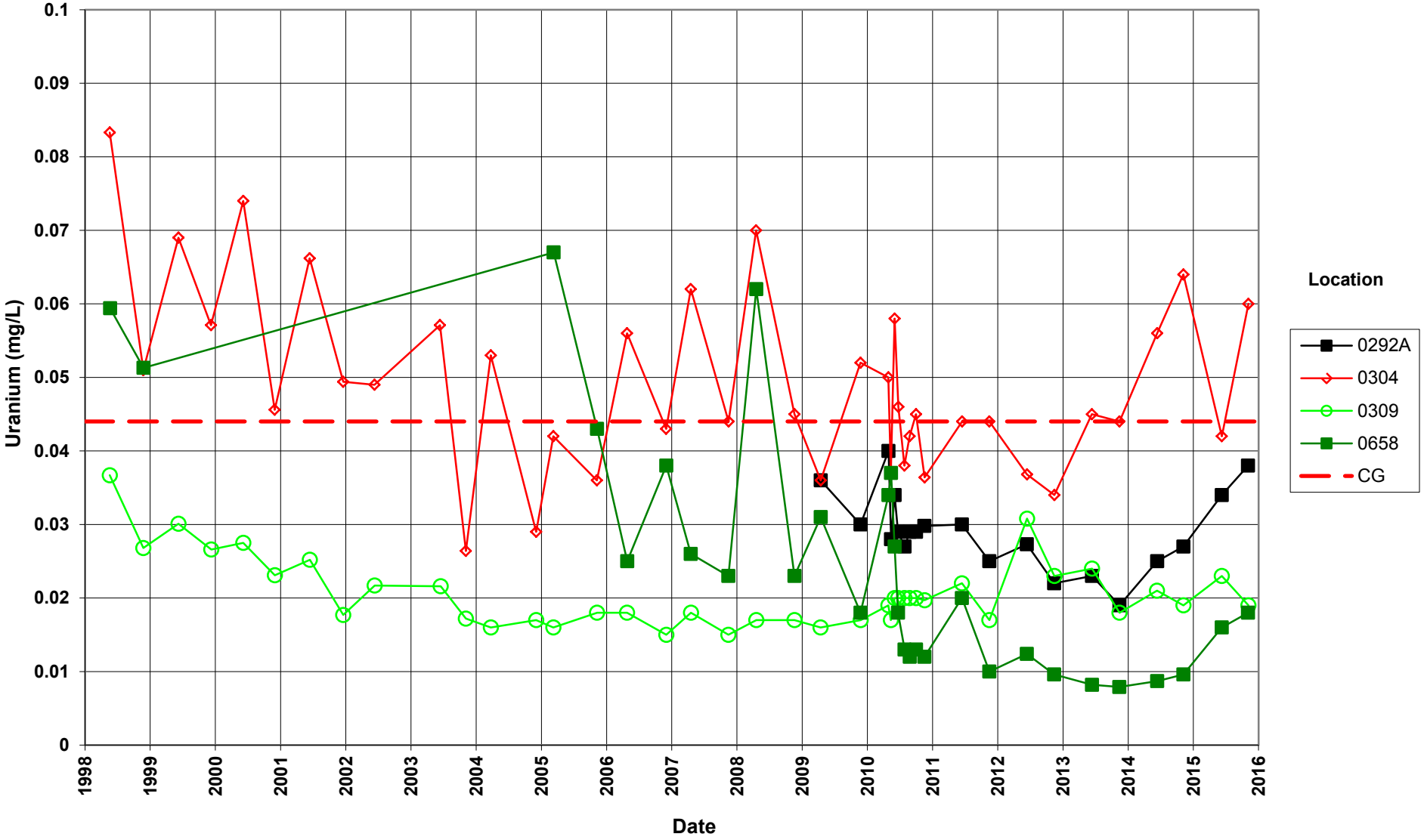
**Rifle Old Processing Site**
**Selenium Concentration**
Alternate Concentration Limit (ACL) = 0.05 mg/L



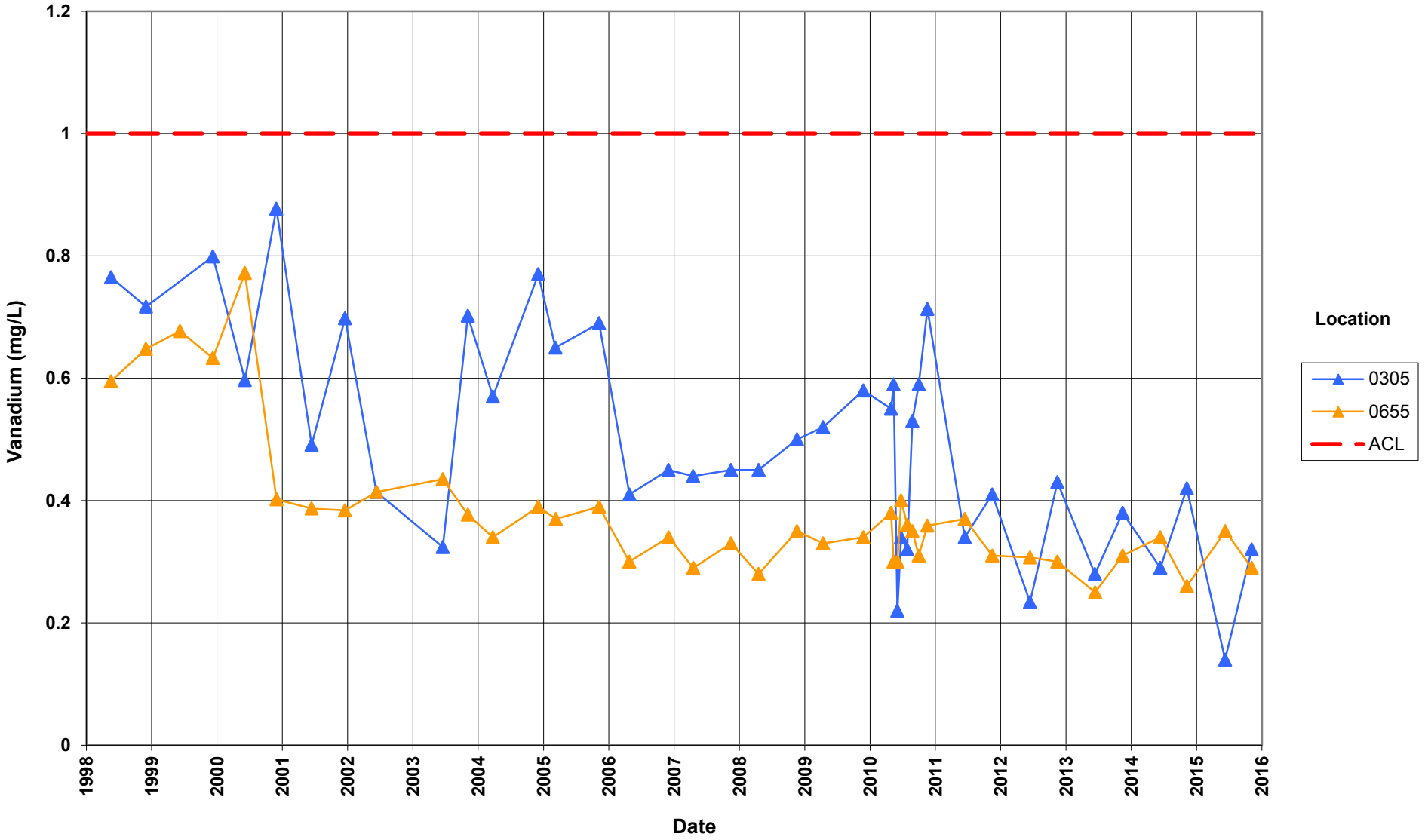
**Rifle Old Processing Site**
**Uranium Concentration**
Cleanup Goal (CG) = 0.044 mg/L



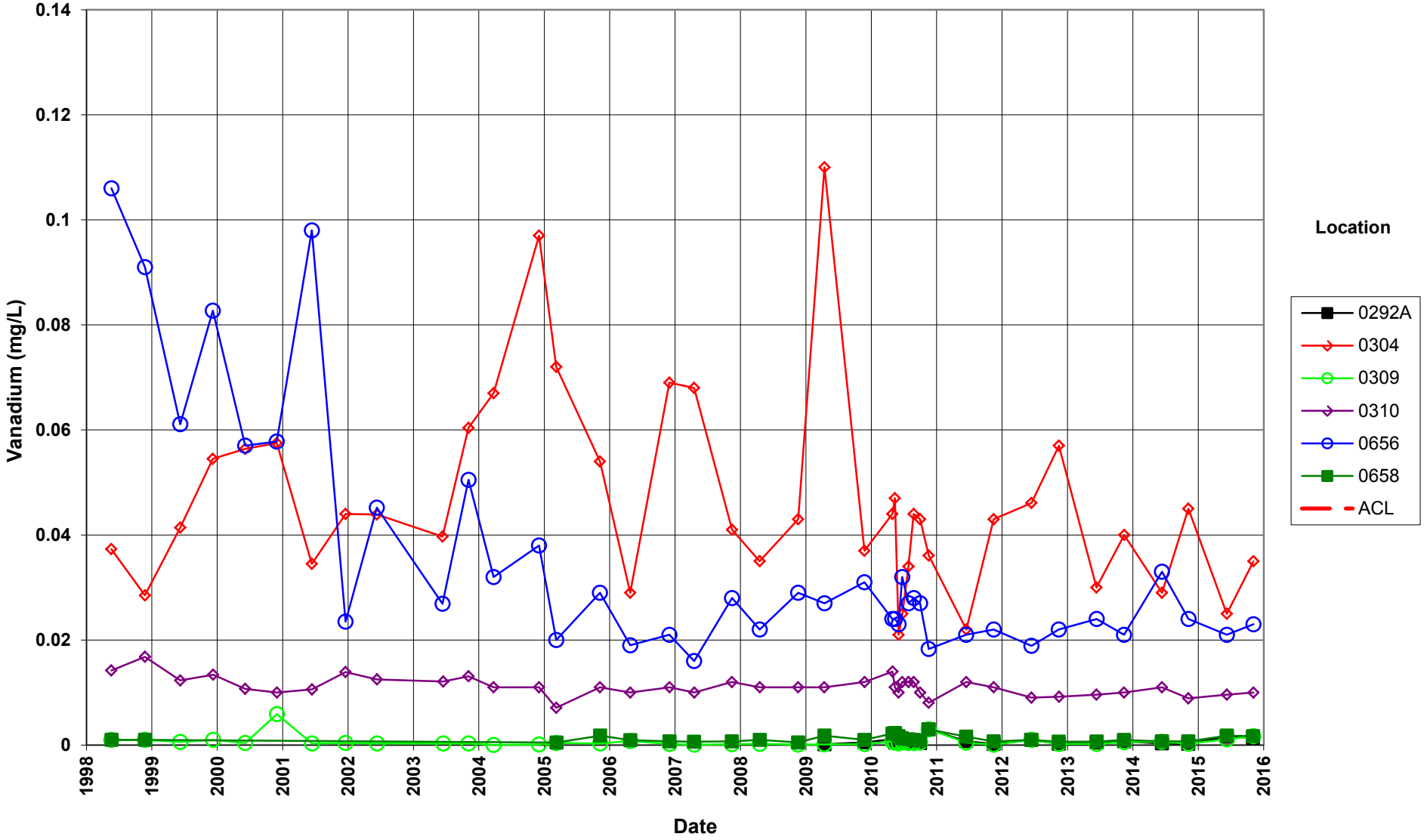
**Rifle Old Processing Site**
**Uranium Concentration**
Cleanup Goal (CG) = 0.044 mg/L



**Rifle Old Processing Site**
**Vanadium Concentration**
Alternate Concentration Limit (ACL) = 1.0 mg/L



**Rifle Old Processing Site**
**Vanadium Concentration**
Alternate Concentration Limit (ACL) = 1.0 mg/L



# New Rifle Pond Locations
# Time-Concentration Graphs

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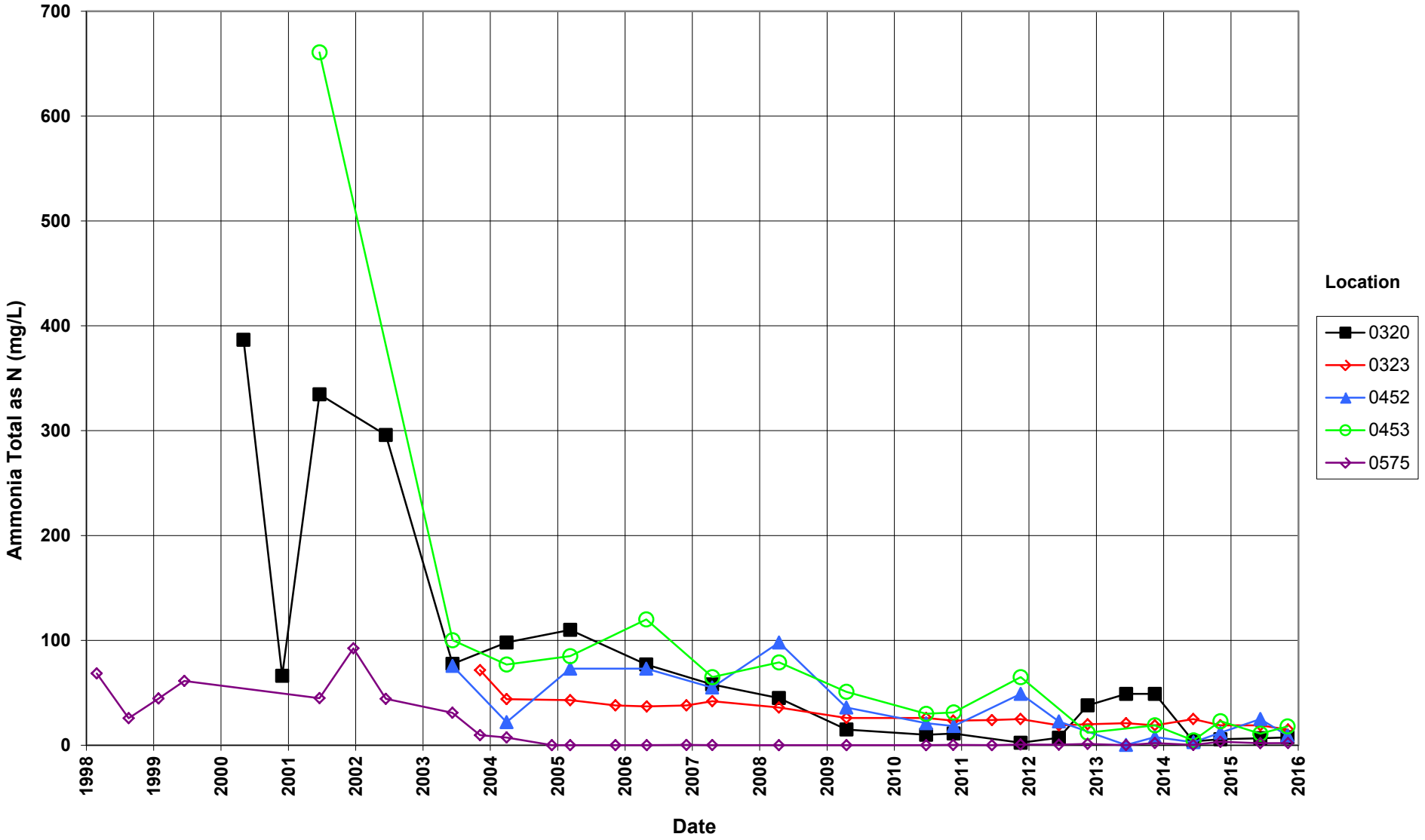
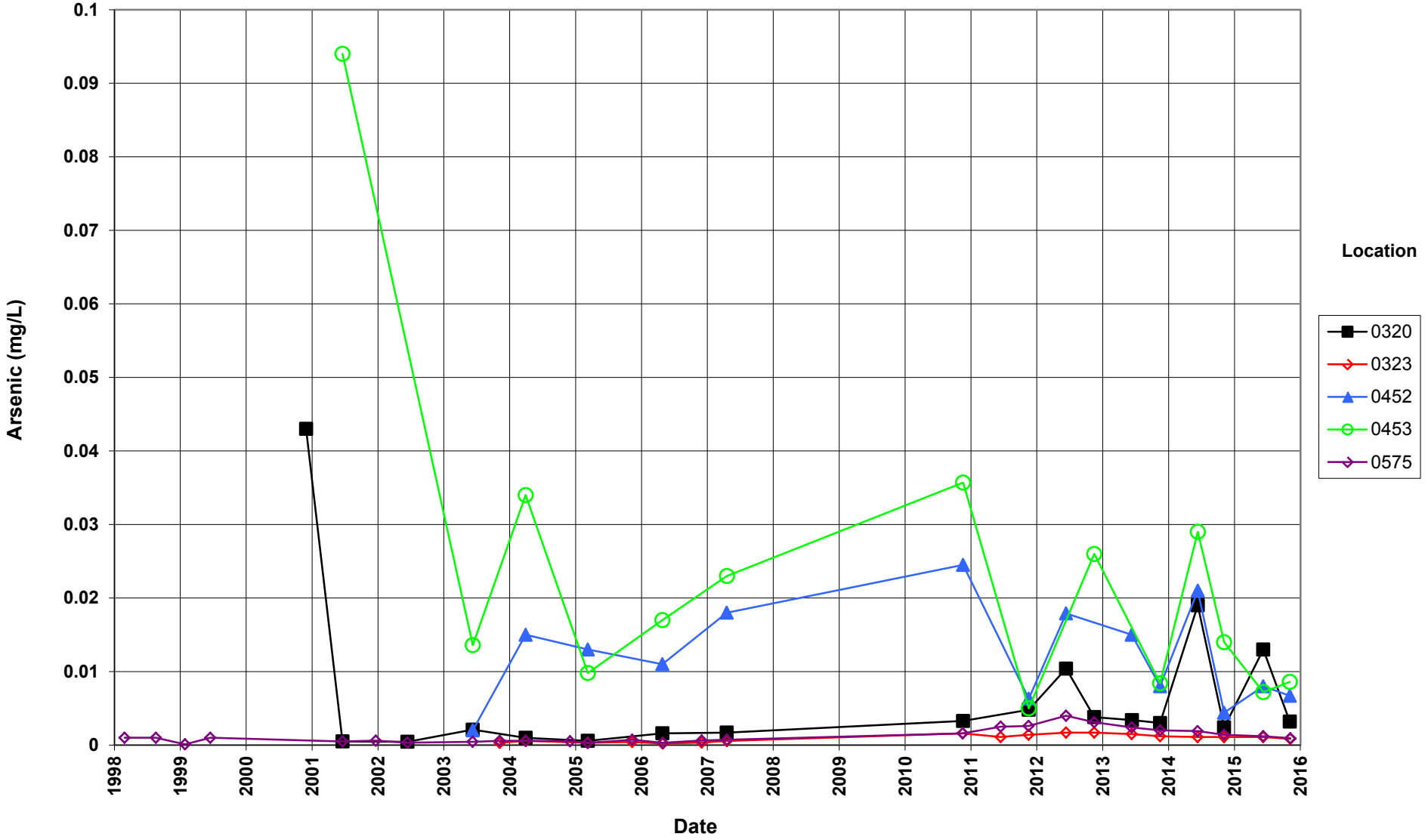
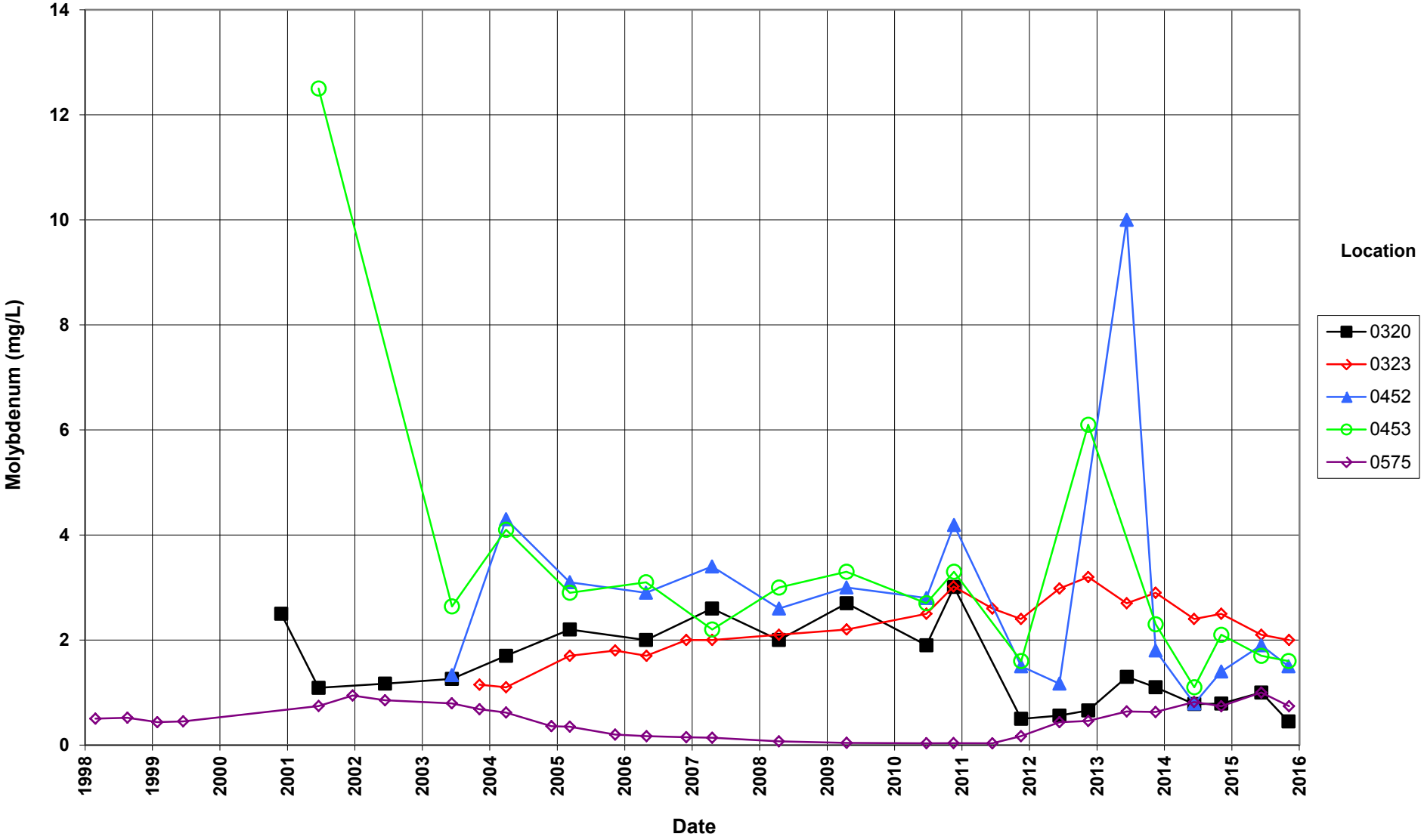
## Rifle New Processing Site
## Ammonia Total as N Concentration

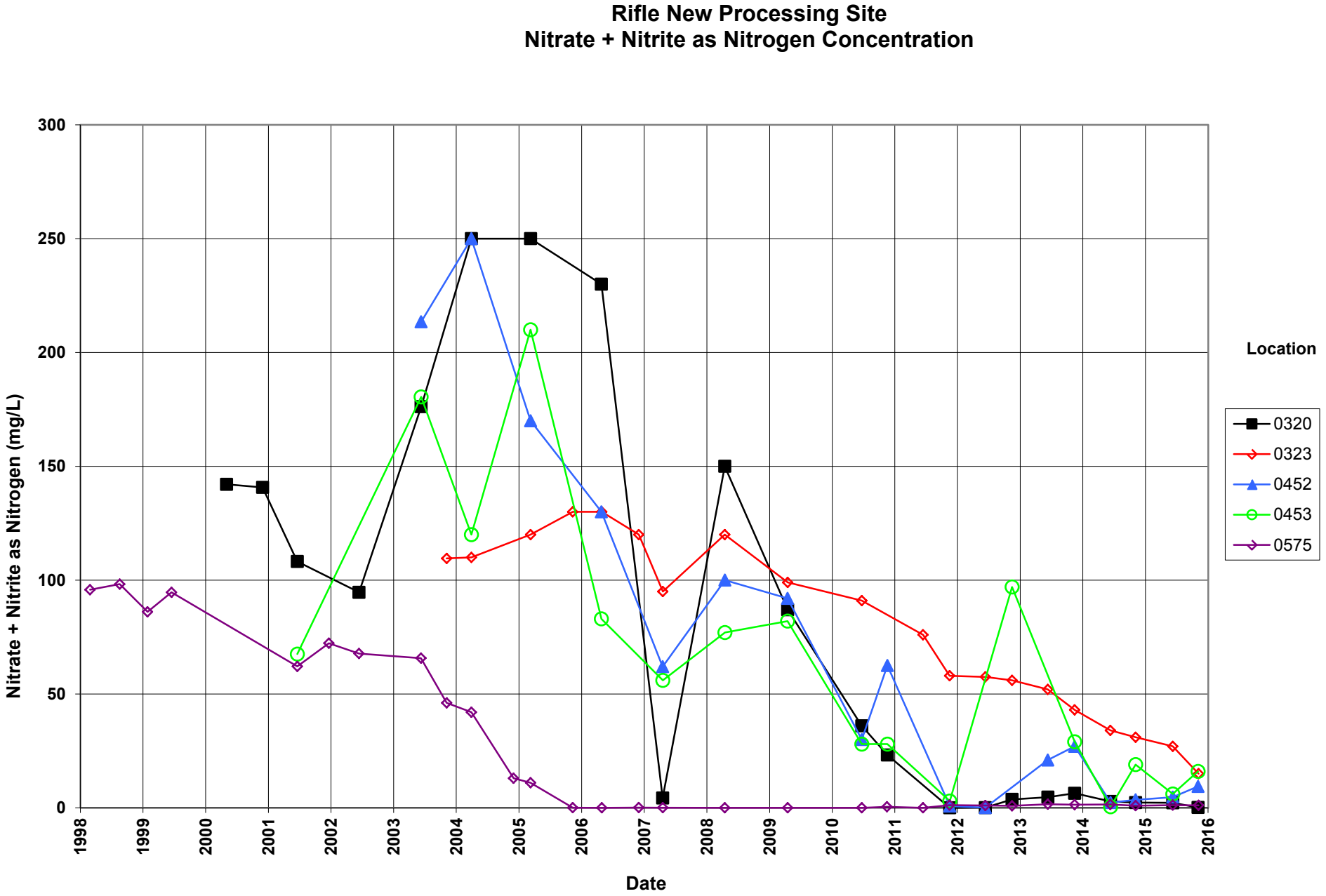


## Rifle New Processing Site
## Arsenic Concentration

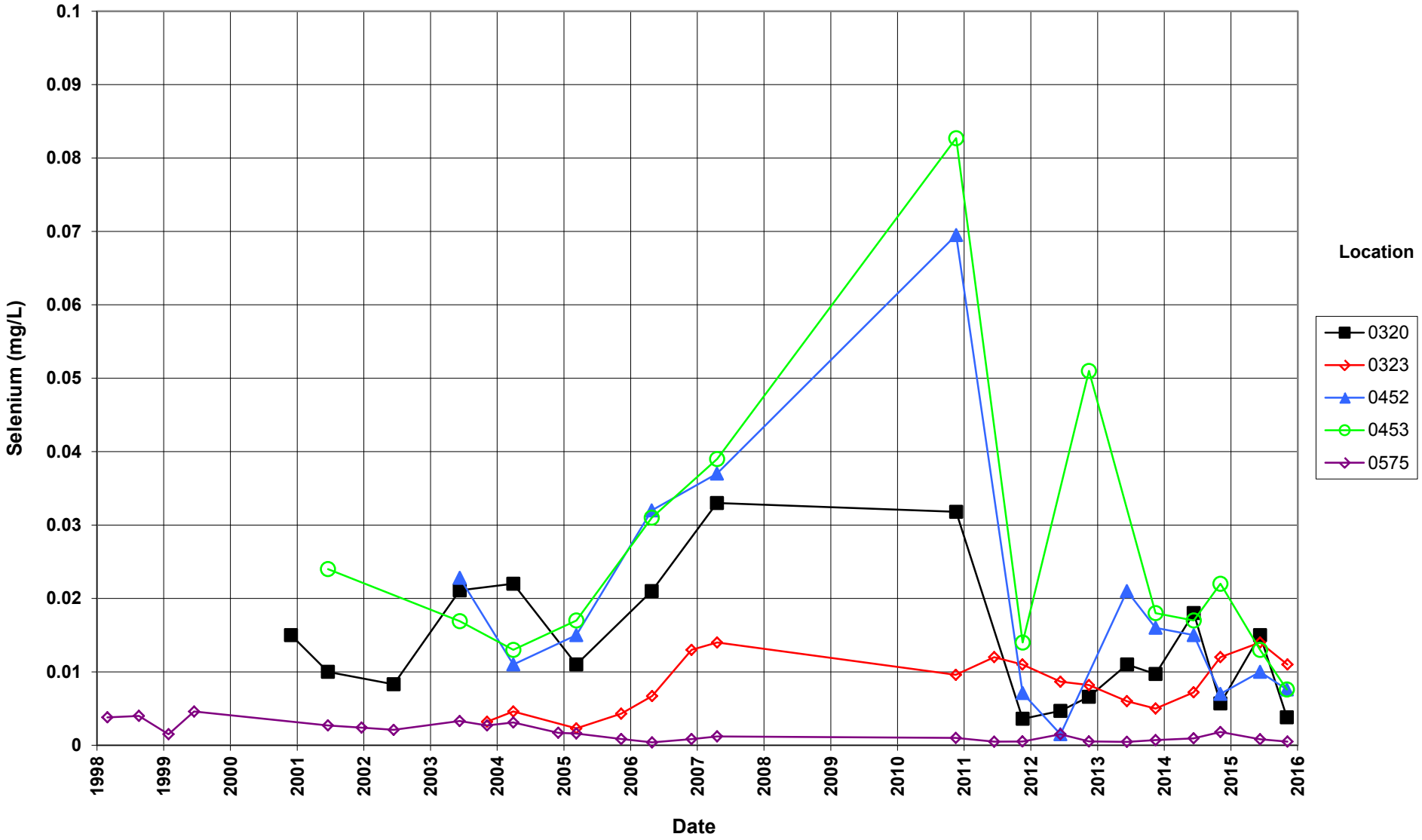


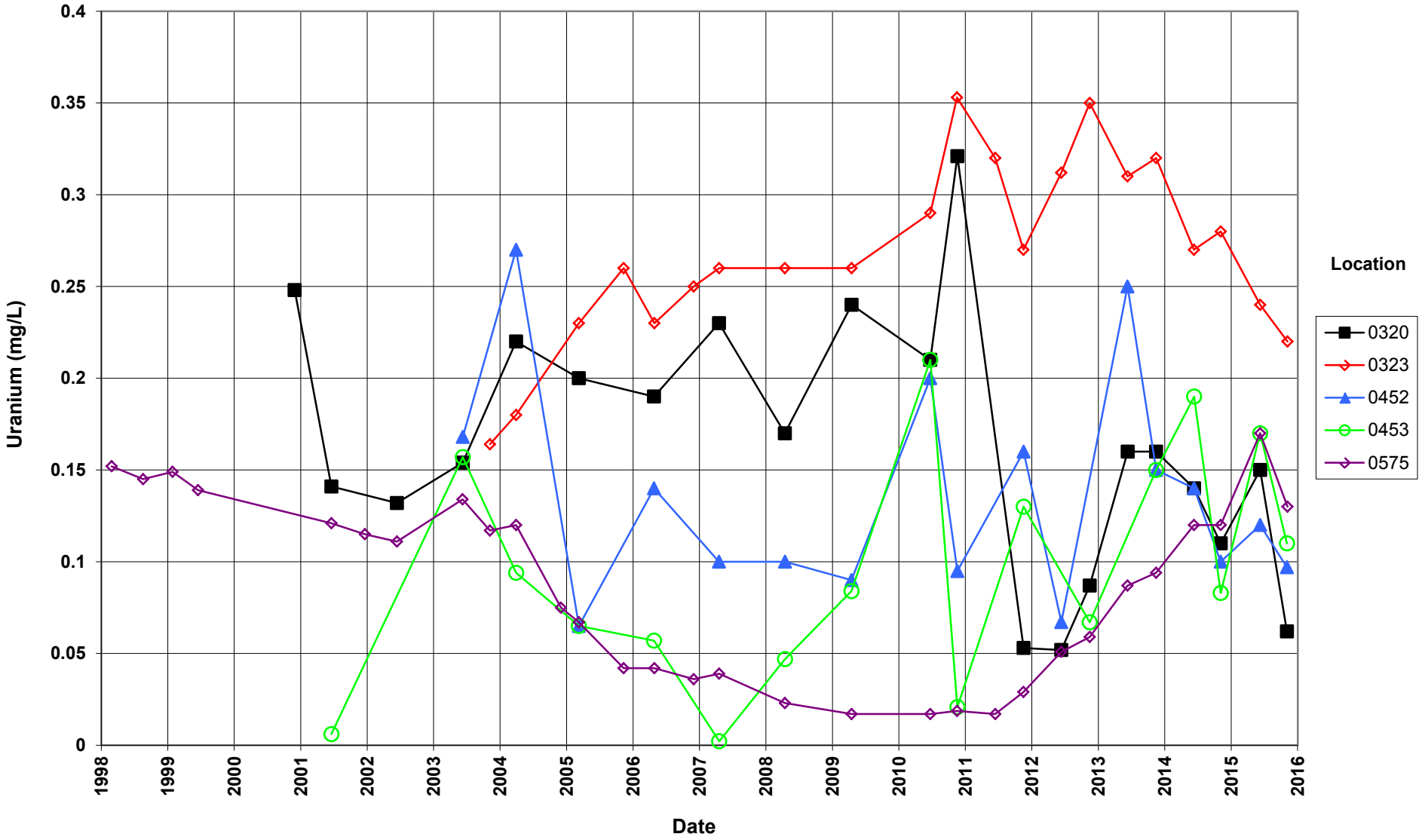
## Rifle New Processing Site
## Molybdenum Concentration



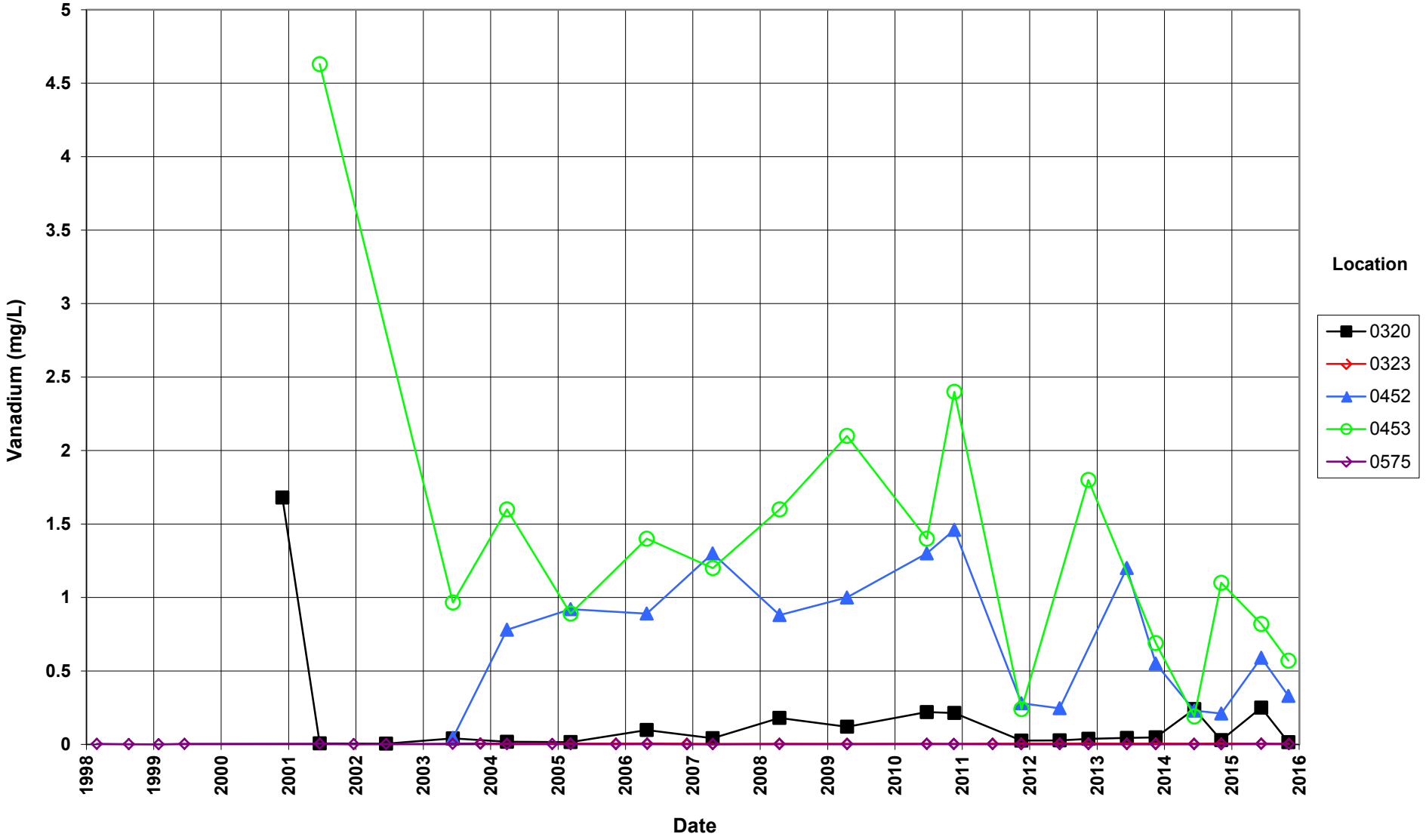

Rifle New Processing Site
Nitrate + Nitrite as Nitrogen Concentration
Nitrate + Nitrite as Nitrogen (mg/L)
300
250
200
150
100
50
0
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Date
Location
0320
0323
0452
0453
0575

## Rifle New Processing Site
## Selenium Concentration




Rifle New Processing Site
Uranium Concentration
Uranium (mg/L)
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
Date
Location
0320
0323
0452
0453
0575

## Rifle New Processing Site
## Vanadium Concentration



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# New and Old Rifle River Locations
# Time-Concentration Graphs

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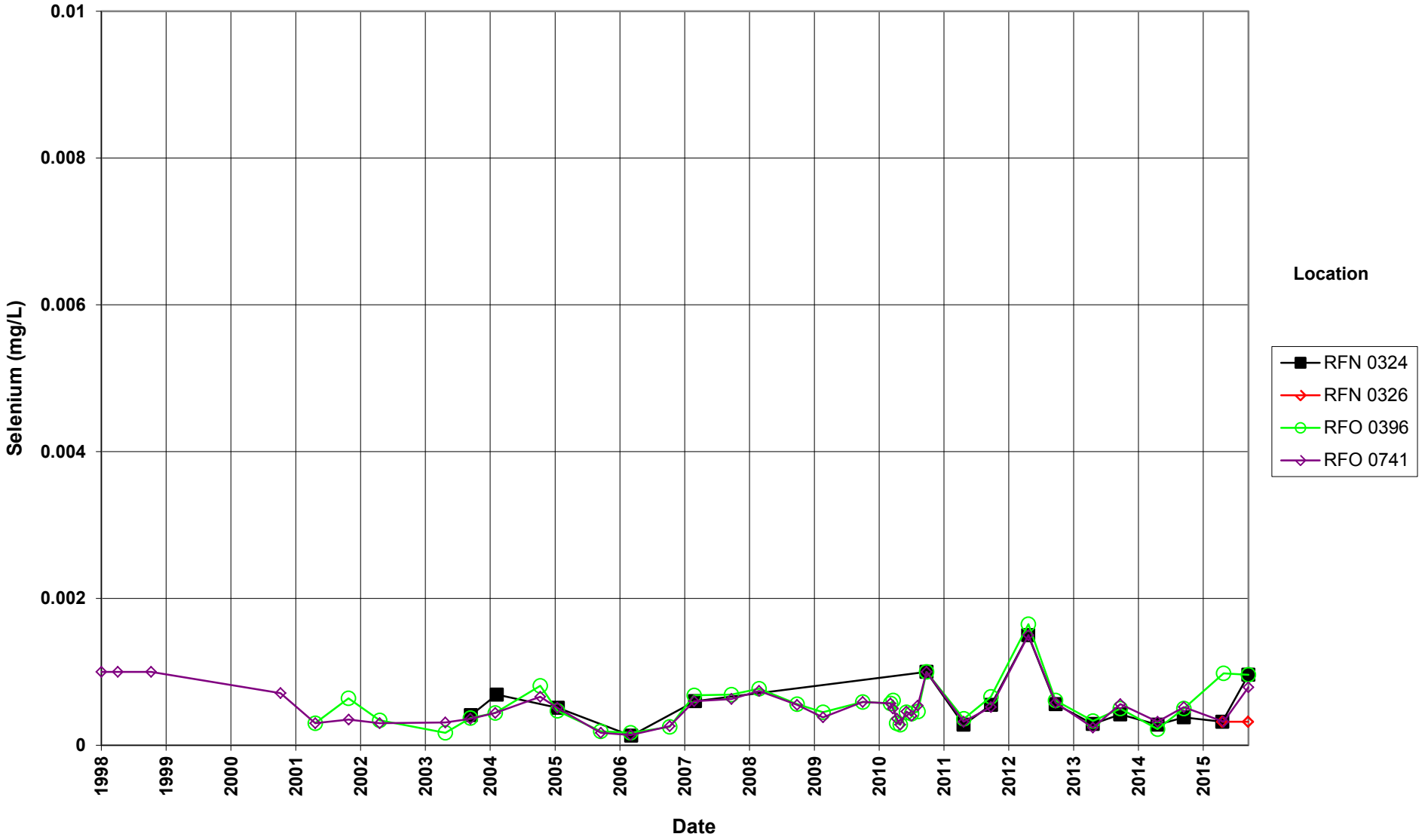
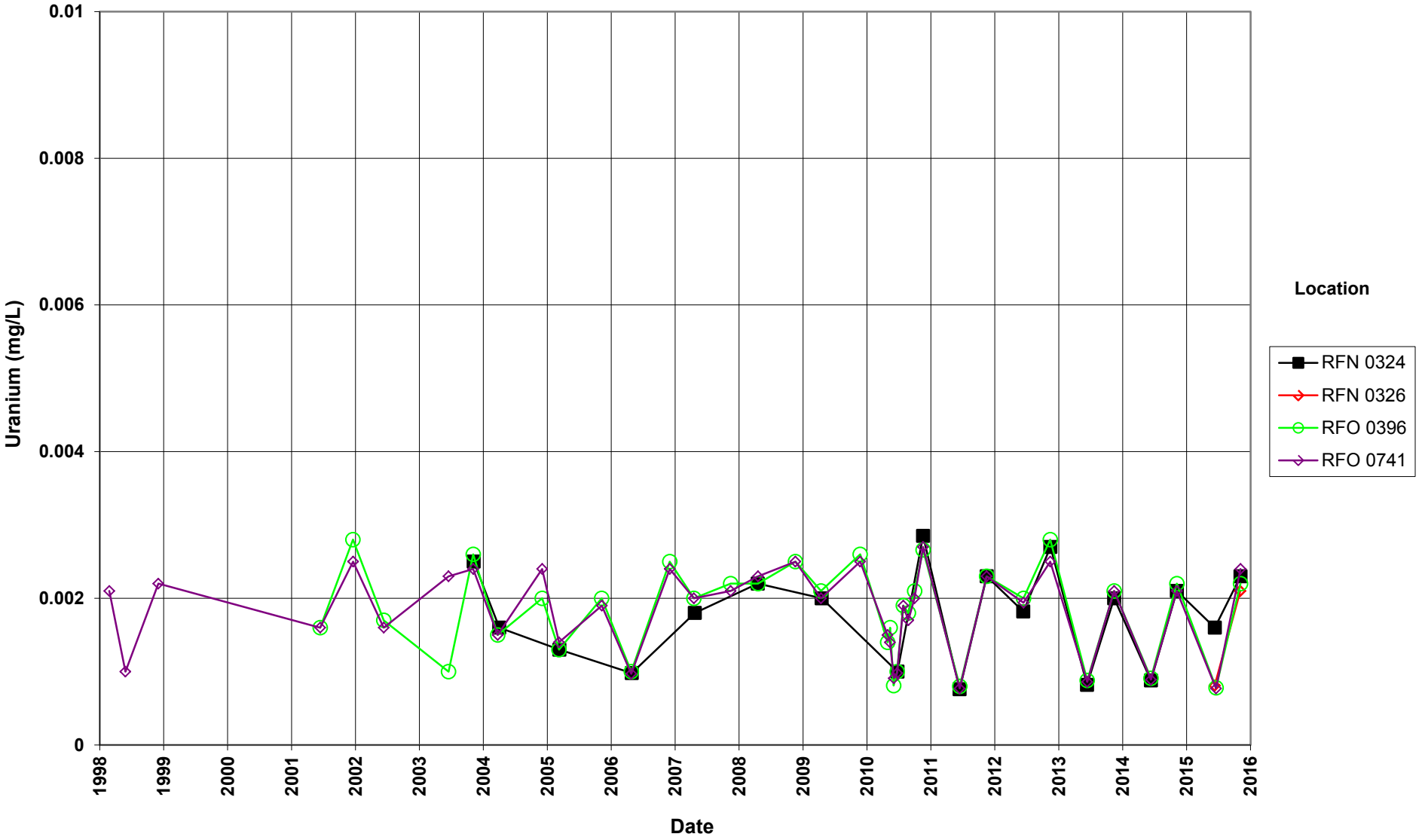
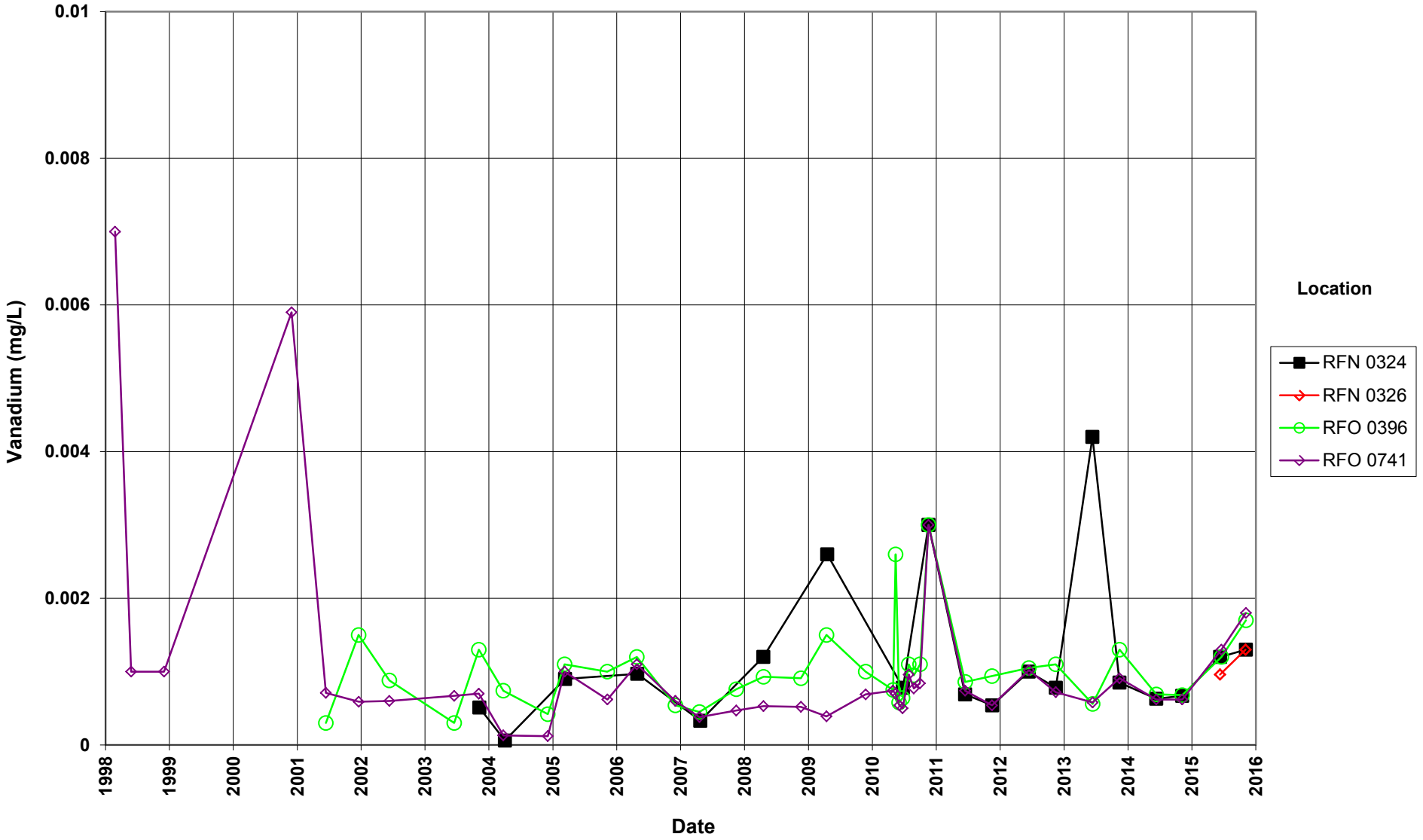

Rifle New Processing Site
River Locations
Selenium Concentration
Selenium (mg/L)
0.01
0.008
0.006
0.004
0.002
0
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Date
Location
RFN 0324
RFN 0326
RFO 0396
RFO 0741

# Rifle New Processing Site
# River Locations
# Uranium Concentration



# Rifle New Processing Site
# River Locations
# Vanadium Concentration



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# Attachment 3

# Sampling and Analysis Work Order

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October 23, 2015

Task Assignment 103
Control Number 16-0053

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

SUBJECT: Contract No. DE-LM0000421, Navarro Research & Engineering, Inc. (Navarro) Task Assignment 103 LTS&M-UMTRCA TI & TII Sites, D&D Sites, Other Sites, & Other, and AS&T November 2015 Environmental Sampling at the Rifle, Colorado, Processing Sites

REFERENCE: Task Assignment 103 LTS&M-UMTRCA TI & TII Sites, D&D Sites, Other Sites, & Other

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 November 2, 2015.

The following lists show the monitoring wells and surface water locations scheduled to be sampled during this event.

**MONITORING WELLS**

**New Rifle**

| | | | | | | |
|---|---|---|---|---|---|---|
| 169 Al | 195 Al | 216 Al | 620 Al | 658 Al | 664 Al | 670 Al |
| 170 Al | 201 Al | 217 Al | 635 Al | 659 Al | 669 Al | 855 Al |
| 172 Al | 215 Al | 590 Al | | | | |

**Old Rifle**

| | | | | | | |
|---|---|---|---|---|---|---|
| 292A Al | 305 Al | 309 Al | 310 Al | 655 Al | 656 Al | 658 Al |
| 304 Al | | | | | | |

*NOTE: Al = Alluvium

**SURFACE LOCATIONS**

**New Rifle**

| | | | | | | |
|---|---|---|---|---|---|---|
| 320 | 323 | 324 | 326 | 452 | 453 | 575 |

**Old Rifle**

| | | | | |
|---|---|---|---|---|
| 294 | 395 | 396 | 398 | 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) 248-6044 if you have any questions.

Sincerely,

Jeff Carman
LMS Task Assignment Manager

JC/lcg/lb/bkb

Enclosures (3)

cc: (electronic)
Christina Pennal, DOE
Beverly Cook, Navarro
Steve Donivan, Navarro
Lauren Goodknight, Navarro
Diana Osborne, Navarro
EDD Delivery
rc-grand.junction
File: RFN 410.02(A)
File: RFO 410.02(A)

## Constituent Sampling Breakdown

| Site | Rifle | | | | | | |
|---|---|---|---|---|---|---|---|
| Analyte | Groundwater | | Surface Water | | Required Detection Limit (mg/L) | Analytical Method | Line Item Code |
| **Approx. No. Samples/yr** | 51 | | 24 | | | | |
| *Field Measurements* | | | | | | | |
| Alkalinity | X | | X | | | | |
| Dissolved Oxygen | | | | | | | |
| Redox Potential | X | | X | | | | |
| pH | X | | X | | | | |
| Specific Conductance | X | | X | | | | |
| Turbidity | X | | | | | | |
| Temperature | X | | X | | | | |
| *Laboratory Measurements* | *RFO | *RFN | RFO | RFN | | | |
| 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 | 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 | | | | | | | |
| Uranium | X | X | X | X | 0.0001 | SW-846 6020 | LMM-02 |
| Vanadium | X | X | X | X | 0.0003 | SW-846 6020 | LMM-02 |
| Zinc | | | | | | | |
| **Total No. of Analytes** | 10 | 13 | 10 | 13 | | | |

*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 |
|---|---|---|---|---|---|---|
| ***Monitoring Wells*** | | | | | | |
| ***New Rifle*** | | | | | | |
| 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 |
| ***Old Rifle*** | | | | | | |
| 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 |
| ***Surface Locations*** | | | | | | |
| ***New Rifle*** | | | | | | |
| 320 | | X | | | | Wetland Pond |
| 323 | | X | | | | Gravel pit pond |
| 324 | | X | | | | Colorado River downgradient |
| 326 | | X | | | | Colorado River |
| 452 | | X | | | | Wetland Pond |
| 453 | | X | | | | Wetland Pond |
| 575 | | X | | | | Gravel pit pond |
| ***Old Rifle*** | | | | | | |
| 294 | | X | | | | River, upstream |
| 395 | | X | | | | Seep, upgradient |
| 396 | | X | | | | River |
| 398 | | X | | | | Ditch, onsite |
| 741 | | X | | | | River |

Semi-annual sampling conducted in June and November.

# Attachment 4

# Trip Report

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# *Memorandum*

DATE: November 24, 2015

TO: Scott Smith

FROM: Jennifer Graham

SUBJECT: Sampling Trip Report

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

**Dates of Sampling Event:** November 3, 5 & 6, 2015

**Team Members:** David Atkinson, Samantha Tigar, and Jennifer Graham

**Number of Locations Sampled:** 36 of the 37 planned locations were sampled as follows in Table 1.

*Table 1: Sampled versus Planned Location Summary*

| | Sampled Locations | Planned Locations |
|---|---|---|
| RFO Monitoring Wells | 8 | 8 |
| RFN Monitoring Wells | 16 | 17 |
| RFO Surface Water | 5 | 5 |
| RFN Surface Water | 7 | 7 |

**Locations Not Sampled/Reason:** Monitoring well RFN 0635 was not sampled due to access issues (see Access Issues below).

**Location Specific Information:**

*Table 2: Location Specific Information*

| Location IDs | Comments |
|---|---|
| RFO: 0292A, 0304, 0658 | Purge water from well contained particulates. |
| RFN 0201 | Obstruction in well at approximately 12.73 ft, possibly a root mat. Water level probe was covered with roots when extracted from well. Not able to take water level during sampling as a result of the obstruction. |
| RFN: 0658, 0659, 0664, 0669 | Purge water from well contained particulates. |

**Quality Control Sample Cross Reference:** Table 3 lists the false identifications assigned to the quality control samples.

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

*Table 3: QC Cross Reference*

| False ID | Ticket Number | True ID | Sample Type | Associated Matrix |
|---|---|---|---|---|
| 2548 | NLW 999 | RFN-0659 | Duplicate | Ground Water |
| 2551 | NLX 019 | RFO-0304 | Duplicate | Ground Water |
| 2804 | NLX 004 | RFN-0324 | RINST/EQBLANK | Surface water |
| 2805 | NLX 005 | RFN-0855 | Duplicate | Ground Water |

**RIN Number Assigned:** Samples were assigned to RIN 15107463 (New Rifle) and 15107464 (Old Rifle). Field data sheets can be found in \\crow\SMS\15107463\FieldData and \\crow\SMS\15107464\FieldData.

**Sample Shipment:** Samples were shipped overnight via FedEx from Grand Junction to ALS Laboratory in Ft. Collins on November 9, 2015.

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

**Well Inspection Summary:** Small animals are digging underneath the concrete pad around monitoring well RFN 0216. Monitoring well RFN 0201 has a possible obstruction approximately 12.73 feet downhole. All other wells appeared in good condition.

**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:** Water stability requirements were not met at the following Category I locations: RFO 0658-turbidity was not met and samples required filtration; RFN 0201 water level readings were not taken due to a downhole obstruction.

**Equipment:** All sampling equipment functioned properly. There were navigation issues with the Trimble GPS unit. The GIS team is investigating this unit.

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

**Institutional Controls**

**Fences, Gates, Locks:** All gates and locks were left as found.
**Signs:** No issues observed.
**Trespassing/Site Disturbances:** No issues observed.
**Disposal Cell/Drainage Structure Integrity**: N/A.
**Vegetation/Noxious Weed Concerns**: No issues observed.

**Safety Issues:** Surface water location RFO 0396 requires life vests and life ring.

**Access Issues:**

- Gary Reed with WPX was on site to provide locked-gate access on Clough Energy's property to locations RFN 0620 and 0324 on November 5, 2015.
- Eric Griffitts with Union Pacific Railroad was present during collection of samples RFO

0396 and 0741 on November 5, 2015. New contact information for Union Pacific will be updated.

- An elk fence prevents access to RFN 0635 from the interstate. Additional access was investigated from both the east and west directions along the river. No safe access to this location is possible at this time. Health and Safety will be contacted about the use of a nearby elk jump.

**Corrective Action Required/Taken**: Mud was removed from the bottom of RFN 0659 and downhole tubing. Well needs further redevelopment.

**Future Actions Required or Suggested:** Well redevelopment needs to be completed on the following wells:

- RFO 0292A, 0304, and 0658
- RFN 0201, 0658, 0659, 0664, and 0669

(JG/lcg)

cc: (electronic)
Richard Bush, DOE
Steve Donivan, Navarro
Scott Smith, Navarro
EDD Delivery

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