

**2013 Verification  
Monitoring Report for the  
Old and New Rifle, Colorado,  
Processing Sites**

**December 2013**



U.S. DEPARTMENT OF  
**ENERGY**

Legacy  
Management

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## Abbreviations

CDPHE	Colorado Department of Public Health and Environment
CFR	<i>Code of Federal Regulations</i>
COC	contaminant of concern
CY	calendar year
DOE	U.S. Department of Energy
ft	feet
FY	fiscal year
GCAP	Ground Water Compliance Action Plan
IC	institutional control
IFRC	Integrated Field Research Challenge
LM	Office of Legacy Management
MCL	maximum concentration limit
mg/L	milligram per liter
NRC	U.S. Nuclear Regulatory Commission
SOWP	Site Observational Work Plan
UMTRCA	Uranium Mill Tailings Radiation Control Act
VMR	Verification Monitoring Report
VSP	Visual Sample Plan

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## 1.0 Introduction

This Verification Monitoring Report (VMR) presents and interprets groundwater monitoring data collected at the U.S. Department of Energy (DOE) Office of Legacy Management (LM) Old and New Rifle, Colorado, Title I Uranium Mill Tailings Radiation Control Act (UMTRCA) sites Figure 1 and Figure 2. These sites are located near the city of Rifle in Garfield County of western Colorado. Detailed information for the Old and New Rifle sites and water quality data through 1998 and 1999 are in the final Site Observational Work Plans (SOWPs) (DOE 1999a and 1999b) for the sites. Groundwater monitoring has been conducted semiannually for Old Rifle site since the 1998 and annually or semiannually at the New Rifle site since 1998. This VMR presents data collected during June and November of 2012.

### 1.1 Compliance Strategies

The Old Rifle SOWP (DOE 1999a) and Ground Water Compliance Action Plan (GCAP) (DOE 2001) are complete; the GCAP received concurrence from the U.S. Nuclear Regulatory Commission (NRC) and the Colorado Department of Public Health and Environment (CDPHE). The conditions of the natural flushing compliance strategy are to maintain institutional controls (ICs) over the site and conduct a monitoring program until concentrations of contaminants of concern (COCs) decrease to acceptable levels. Because the natural flushing compliance strategy has not been performing as expected, the GCAP was revised based on new characterization information. The new compliance strategy—no remediation with the application of alternate concentration limits—was proposed (DOE 2013b). The revised GCAP has been submitted to NRC and CDPHE for comment.

The New Rifle SOWP (DOE 1999b) was submitted to DOE and CDPHE. Modeling indicated that most COCs at the site would naturally flush to maximum concentration limits (MCLs) established in Title 40 *Code of Federal Regulations* (CFR) Part 192 for groundwater within 100 years. A draft GCAP supporting this natural flushing compliance strategy (DOE 2003) was submitted to regulators and has been the basis for continued monitoring and annual reporting at the site. As at the Old Rifle site, measurements of COCs at the New Rifle site for the past decade do not indicate that concentrations will decrease to acceptable levels within 100 years, and a new compliance strategy was proposed. A draft GCAP containing the new strategy—no remediation and application of alternate concentration limits—was recently submitted to regulators (DOE 2013a).

According to the historical compliance strategies of natural flushing at both sites, a VMR is required, and this report will therefore be generated again this year. Both the current natural flushing compliance strategies and proposed compliance strategies of no remediation with the application of alternate concentration limits require continued groundwater and surface water monitoring along with implementation of ICs that restrict access to contaminated groundwater.

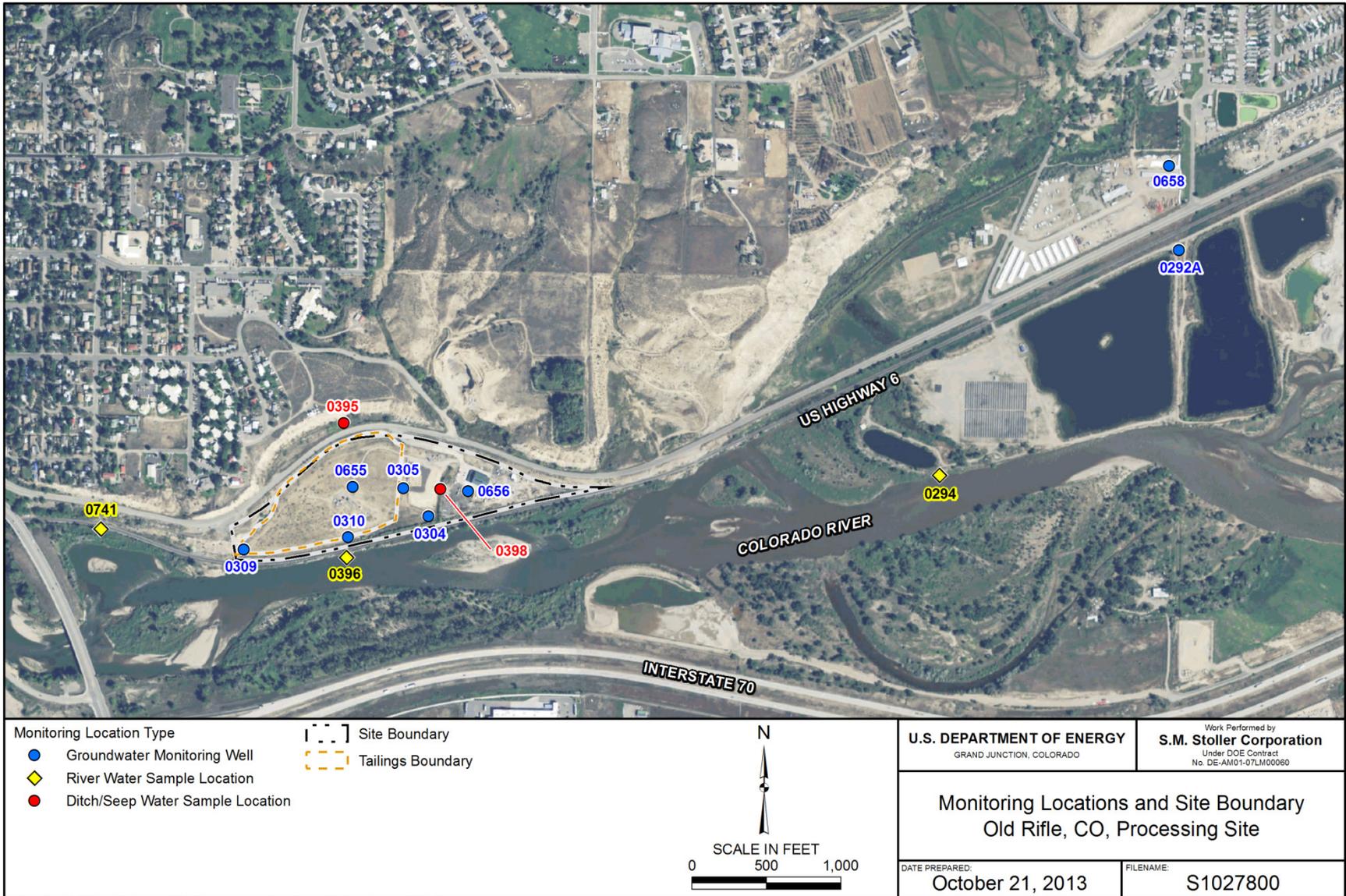
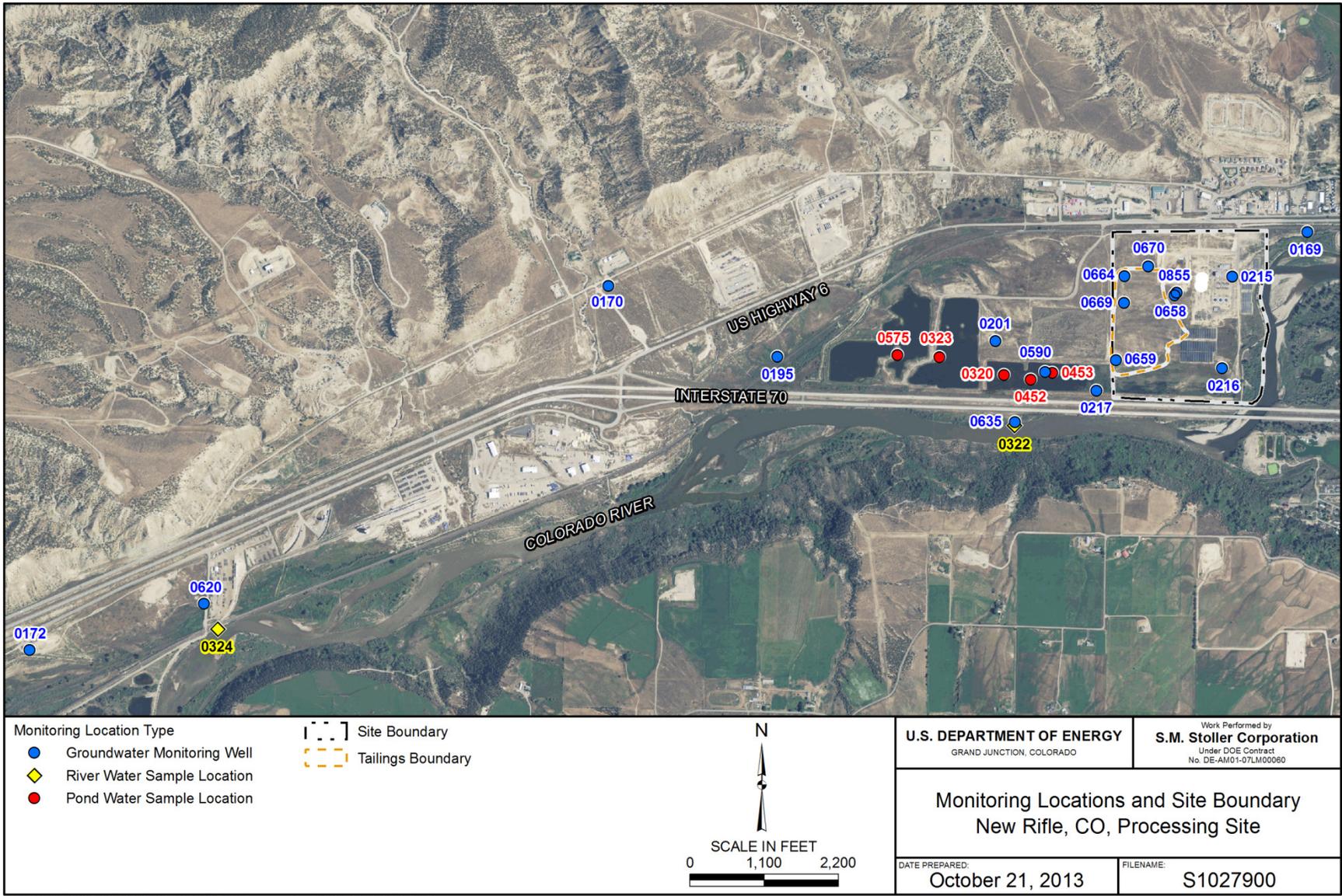


Figure 1. LM Monitoring Locations and Site Boundary, Old Rifle, Colorado, Processing Site



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Figure 2. Monitoring Locations and Site Boundary, New Rifle, Colorado, Processing Site

## 1.2 Site Status

The City of Rifle owns the Old and New Rifle processing sites. The area immediately downgradient of the New Rifle site is owned by Umetco, now DOW Chemical. Sampling occurred twice last year at both sites at locations shown in Figure 1 and Figure 2. A requirement of the natural flushing compliance strategies is to maintain ICs over the sites and affected downgradient areas until concentrations of COCs decrease to acceptable levels.

## 1.3 Land Use, Water Use, and ICs

The City of Rifle acquired the Old Rifle processing site from the State of Colorado in 2000. The City uses the site for an operations and maintenance facility. The site has also been established as an Integrated Field Research Challenge (IFRC) site through DOE's Office of Science. Experiments have been conducted at the Old Rifle site since 2003 to better understand the behavior of uranium in the alluvial aquifer.

Because of the geomorphology and hydrology of the Old Rifle site, contamination is contained onsite until it flushes into the Colorado River along the south side. The three ICs for the Old Rifle site—the quitclaim deed, an environmental covenant, and the Ordinance #9 Zone District—are all contained and overlap within the site boundary (Figure 3).

The New Rifle processing site was transferred from the State of Colorado to the City of Rifle in 2004. The site currently contains the City's wastewater treatment plant, a defunct composting facility, and the Colorado State University experimental station for producing biofuels. The City recently constructed roads and street lights along the northern and western corridors of the site. Dow Chemical (which acquired Umetco Minerals Corporation) owns the adjacent downgradient property (Figure 3). Other private parties own parcels farther downgradient of the site.

Historically, domestic wells downgradient of the New Rifle site were used for drinking water. However, these wells are no longer in use, and drinking water for these locations is supplied by the City via the alternate water supply system funded by DOE and the State. The Roaring Fork gravel pit (now owned by Dow Chemical) ceased operation in 2003, and the ponds have since filled with groundwater and equilibrated with the local water table. The banks of the ponds have been contoured and seeded. No immediate plans are in place for this property, although the City would like to acquire it for future development.

ICs prevent improper use of the groundwater while natural attenuation is in progress. Aside from government ownership of the former mill site properties, the quitclaim deeds for the properties state "Grantee covenants (ii) not to use groundwater from the site for any purpose, and not to construct wells or any means of exposing groundwater to the surface unless prior written approval for such use is given by the Grantor and the DOE." This restriction was recorded with the deeds, will be binding upon future landowners, and is enforceable by the State. Figure 3 shows the combined and overlapping IC areas for the New Rifle site.

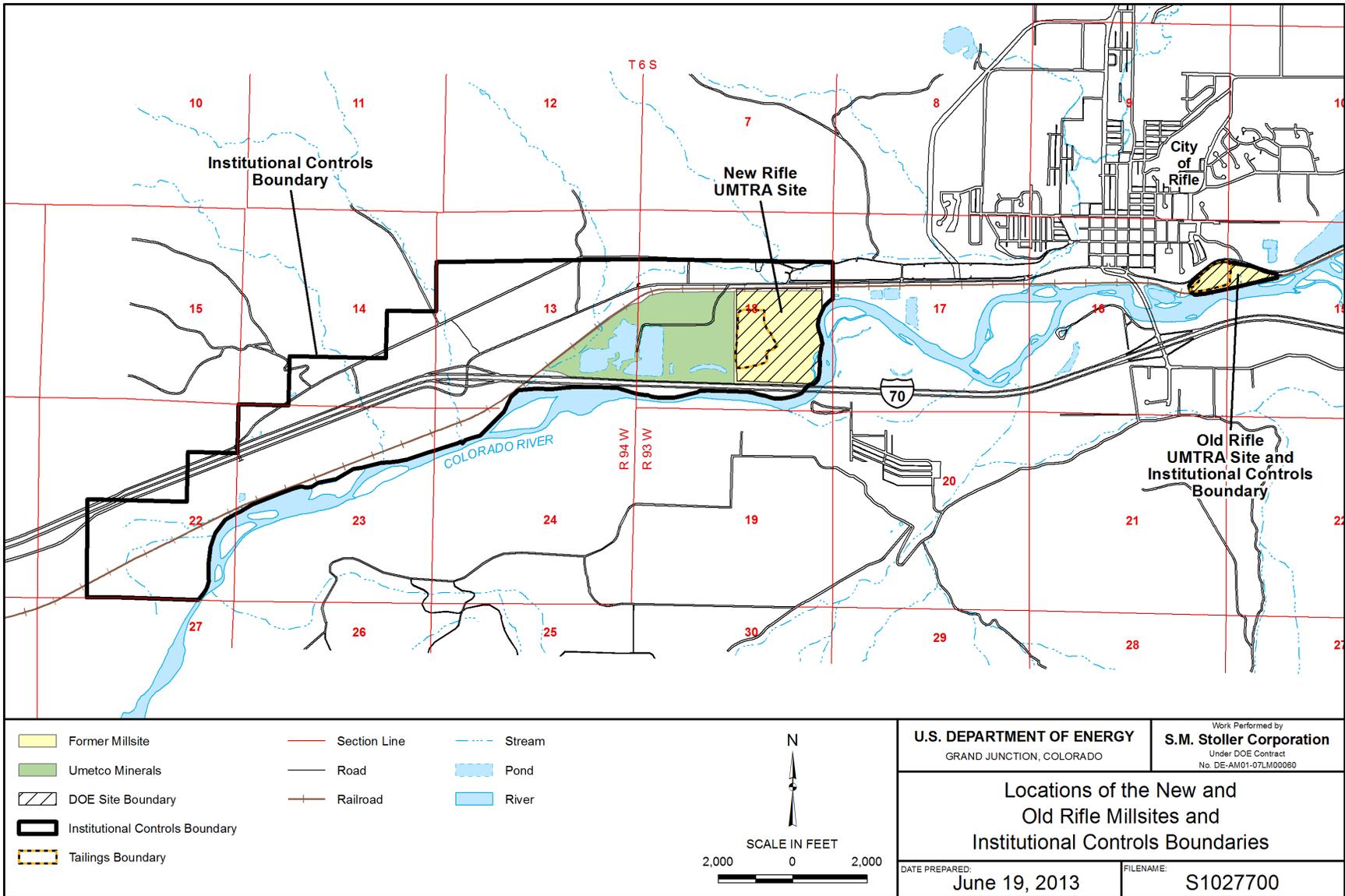


Figure 3. Location of the New and Old Rifle Mill Site and Institutional Controls Boundaries

In 2001, the State of Colorado passed into law Senate Bill 01-145 (effective July 1, 2001), which creates enforceable covenants that can be used to place environmental restrictions on properties. These covenants run with the land until a request is made to modify or terminate the covenants. Covenant ID HMC0V00001 was placed on the New Rifle site on October 8, 2001, and prevents potable use of groundwater. Covenant ID HMC0V00006 was placed on the Old Rifle property on October 29, 2002, and prohibits drilling of alluvial aquifer wells and earthmoving activities without CDPHE approval (<http://www.colorado.gov/cs/Satellite/CDPHE-HM/CBON/1251616815821>). It also requires the use of radon vent systems for any habitable structures.

A special zoning Ordinance 9, passed by the City of Rifle in 2008, sets forth procedures and restrictions governing development of these City-owned properties. Restrictions already outlined in the quitclaim deed and environmental covenants, and requirements for both soil and groundwater materials handling plans, were codified.

In 2009, covenant ID HMC0V00073 between CDPHE and Umetco Minerals Corporation (and parent company Dow Chemical) was signed for the parcel of land that is downgradient of the mill site and that contains the large Roaring Fork gravel ponds. It prohibits any wells from being drilled on the property, prohibits livestock from using the ponds, disallows interference with DOE monitoring wells, and grants DOE access to these wells.

The City ordinance for the New Rifle site extends downgradient from the site to the city limit and requires that property owners obtain their potable water from the municipal water supply system. A Garfield County zoning ordinance extends from the Rifle city limit to the downgradient extent of the IC area shown in Figure 3. It gives property owners the option of obtaining potable water from the municipal water supply system or using an alternative, approved domestic water supply. In the past, DOE supplied reverse-osmosis units to residents with domestic wells completed in the alluvial aquifer. Since that time, those wells were replaced with City water taps. No private domestic wells are in use or being sampled at this time.

## 2.0 Site Conditions

### 2.1 Hydrogeology

The Old Rifle processing site is 0.3 mile southeast of the city of Rifle, in a floodplain on the north side of the Colorado River (Figure 1). Groundwater is unconfined in the uppermost aquifer, which consists of river alluvium and the upper weathered surface of the Tertiary Wasatch Formation. The uppermost aquifer is 5 to 25 feet (ft) thick; saturation occurs from 5 to 10 ft below ground surface. The uppermost aquifer is composed of poorly sorted sediments that range from clay-sized material, to cobbles, to occasional boulders. Groundwater in the alluvial aquifer flows to the west-southwest. Hydraulic conductivity estimates for the alluvial aquifer range from 100 to 125 ft per day (DOE 1999a); estimates for the weathered Wasatch are about 0.02 ft per day (DOE 1999a).

Recharge to the alluvial aquifer is from an unlined irrigation return ditch that flows across the middle of the site, subsurface inflow from north of Highways 6&24, and precipitation. The Colorado River and the alluvial aquifer probably interact, but the monitoring network is insufficient to fully characterize the interaction. Groundwater discharge is mainly to the Colorado River. At the Old Rifle site, alluvium pinches out against bedrock outcrops at the downgradient end of the site. The alluvial aquifer at the Old Rifle site has no hydraulic connection to the alluvial aquifer at the New Rifle site.

The Old Rifle SOWP (DOE 1999a) provides additional data regarding the hydrogeology of the Old Rifle site and the site conceptual model. Results of subsequent IFRC studies have shown that the conceptual model for the site is much more complex than envisioned at the time the SOWP was completed. A recent report (DOE 2011) summarizes the results of the IFRC studies and presents a revised conceptual model for the site. A revised GCAP (DOE 2013b) also stresses the importance of groundwater inputs from north of the site.

The New Rifle former processing site is about 1.5 miles west of the city of Rifle and is also situated on the north floodplain of the Colorado River (Figure 2). As with the Old Rifle site, the uppermost aquifer consists of poorly sorted river alluvium and the weathered surface of the Wasatch Formation. Hydraulic conductivities for the alluvial aquifer range from 53 to 275 ft per day with an average of 114 ft per day (DOE 1999b). Alluvium is thickest along the western and southern portions of the site and is continuous for at least 4 miles downgradient of the site. Recharge is from ephemeral streams from the north, precipitation, and inflow from the Colorado River along the east side of the site (DOE 1999b). Groundwater discharge is primarily to the Colorado River; groundwater also discharges to other surface water features (wetland area, gravel ponds).

At one time, Roaring Fork Resources operated a gravel mine on the property adjacent to and downgradient of the New Rifle site. Water was pumped from an active onsite mining pit, where excavation was occurring, to another onsite pit for storage and infiltration. (These pits have been referred to previously as the “Roaring Fork ponds.”) During Roaring Fork Resources’ period of operation, the pumping affected groundwater flow downgradient of the New Rifle site, creating both a cone of depression in and a groundwater mound on the alluvial aquifer water table (DOE 1999b). Operation of the gravel mine ceased in early 2003, and natural alluvial groundwater flow conditions have been reestablished, though the effects of the ponds on

contaminant distribution persist today. Over time, and with the progression of natural flushing, these effects have become less pronounced. The revised GCAP (DOE 2013a) discusses the importance of flow from the north, especially toward the western stretches of the IC boundary.

## 2.2 Groundwater Quality

Alluvial groundwater in background locations near the Rifle sites has concentrations of selenium and uranium that are above MCLs (DOE 1995b). Sulfate levels in background locations have also been relatively high, far exceeding the secondary drinking water standard of 250 milligrams per liter (mg/L) (non-enforceable; based on aesthetic considerations). However, it has been demonstrated that site-related activities contributed to contamination of the groundwater in the uppermost aquifer beneath the Old Rifle site and beneath and downgradient of the New Rifle site.

Table 1 presents historical data for COCs in groundwater at both sites before surface remediation was completed. A comparison of historical data with benchmarks indicates that criteria were exceeded for a number of COCs. The New Rifle site had a greater number of contaminants and much higher contaminant concentrations than the Old Rifle site.

*Table 1. Historical Groundwater Chemistry for Old and New Rifle Site COCs*

COC (all units mg/L)	Benchmark	Old Rifle Site		New Rifle Site	
		Historical Range <sup>a</sup> Aug. 1990–Aug. 1994	Median <sup>a</sup>	Historical Range <sup>a</sup> Aug. 1990–Aug. 1994	Median <sup>a</sup>
Ammonia as NH <sub>4</sub> <sup>b</sup>	NA	NA	NA	506–1,750	1,030
Arsenic	0.05 <sup>c</sup>	NA	NA	0.97–1.3	1.1
Molybdenum	0.10 <sup>c</sup>	NA	NA	2.3–3.7	2.9
Nitrate + Nitrite as Nitrogen	10 <sup>c</sup>	NA	NA	124–251	177
Selenium	0.041 <sup>d</sup>	0.007–0.085	0.072	<0.002–0.3	<0.05
Uranium	0.067 <sup>d</sup>	1.6–2.1	1.8	0.24–0.37	0.29
Vanadium	NA	0.5–0.75	0.55	0.59–2.8	1.3

<sup>a</sup> Ranges and median values are from the Baseline Risk Assessment (DOE 1995a), Table 3.1 (pre-remedial action).

<sup>b</sup> No longer considered a COC; included to understand nitrate behavior.

<sup>c</sup> U.S. Environmental Protection Agency groundwater standards for sites (40 CFR 192).

<sup>d</sup> Maximum background value, cleanup goal.

NA = not applicable

Mill tailings and other milling-related materials were removed during surface remediation at the Rifle sites. Surface remediation was completed by 1996, and tailings were stabilized in an engineered repository about 6 miles north of Rifle. Residual radioactive materials were removed down to, and in some cases, just below the groundwater surface. The excavations were backfilled with clean gravel and soil, and the surface was given 6 inches of topsoil and sown with seed mixtures.

Subsequent characterization completed at the New Rifle site as part of a pilot study for the removal of vanadium from the groundwater (DOE 2000) indicated that some residual soil contamination remains at that site below the water table. Analyses showed elevated concentrations of vanadium; several samples also showed residual concentrations of molybdenum, uranium, and arsenic. Most of these soils are associated with the location of a

former disposal pond and, to a lesser extent, a former tailings pile. From 2008 through 2010, the City of Rifle conducted activities within and to the east of these known contaminated soils during construction of the wastewater treatment facility. The water table was lowered by 5 to 8 feet in places. During this time, groundwater quality in several wells near the dewatering site had increased concentrations of vanadium, arsenic, and selenium, but by in large decreased to pre-dewatering concentrations within a year.

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## 3.0 Monitoring Program

### 3.1 Monitoring Network

Table 2 lists the sampling locations for wells and surface water locations that constitute the routine monitoring network at the Old Rifle processing site. The network consists of nine monitoring wells (six onsite wells and three background wells) and five surface water locations (Figure 1).

*Table 2. Summary of GCAP Monitoring Requirements for the Old Rifle Site*

Location	Monitoring Purpose	Analytes	Frequency
RFO-0305, RFO-0655	Center of plume <sup>a</sup> ; west side of ditch	Selenium, uranium, vanadium	Semiannually
RFO-0656	Center of plume; east side of ditch	Selenium, uranium, vanadium	Semiannually
RFO-0304, RFO-0309, RFO-0310	Farthest downgradient location; leading edge of plume	Selenium, uranium, vanadium	Semiannually
RFO-0292A, RFO-0658, RFN-0169	Background groundwater quality; upgradient monitoring well	Selenium, uranium, vanadium	Semiannually
RFO-0395, RFO-0398	Monitor surface water recharging aquifer; seep and onsite ditch	Selenium, uranium, vanadium	Semiannually
RFO-0294 (to replace RFO-0598), RFO-0396, RFO-0741	Monitor effects of site on river; surface water; upgradient of, adjacent to, and downgradient of site on Colorado River	Selenium, uranium, vanadium	Semiannually

<sup>a</sup> Based on uranium.

Table 3 lists the monitoring requirements for the New Rifle site described in the draft 2003 GCAP. The monitoring network currently consists of 17 monitoring wells at various locations and seven surface water sampling sites, including two river locations (Figure 2). The two Old Rifle background wells (RFO-0658 and RFO-0292A) and well RFN-0169 serve as background wells for the New Rifle site. Monitoring was conducted twice for the New Rifle site during CY 2012.

Table 3. Summary of GCAP Monitoring Requirements for the New Rifle Site

Location	Monitoring Purpose	Analytes	Frequency
RFN-0170, RFN-0172, RFN-0620	Monitor middle and leading edge of molybdenum, uranium, and nitrate plumes	Molybdenum, uranium, nitrate	Semiannually
RFN-0195, RFN-0201, RFN-0215, RFN-0216, RFN-0217, RFN-0590, RFN-0635, RFN-0658, RFN-0659, RFN-0664, RFN-0669, RFN-0670, RFN-0855	Monitor flushing in main body of plumes	Molybdenum, nitrate, uranium	
RFN-0169, along with RFO-292A and RFO-658	Monitor background	Molybdenum, nitrate, uranium	
RFN-0320, RFN-0322, RFN-0323, RFN-0324, RFN-0452, RFN-0453, RFN-0575	Monitor surface water to determine impact of groundwater discharge to surface water and ecological receptors	Molybdenum, nitrate, uranium, vanadium	
RFN-0215, RFN-0216, RFN-0217, RFN-0590, RFN-0658, RFN-0659, RFN-0664, RFN-0669, RFN-0670, RFN-0855	Monitor flushing in main body of plumes	Vanadium	

## 3.2 Results of the Monitoring Program

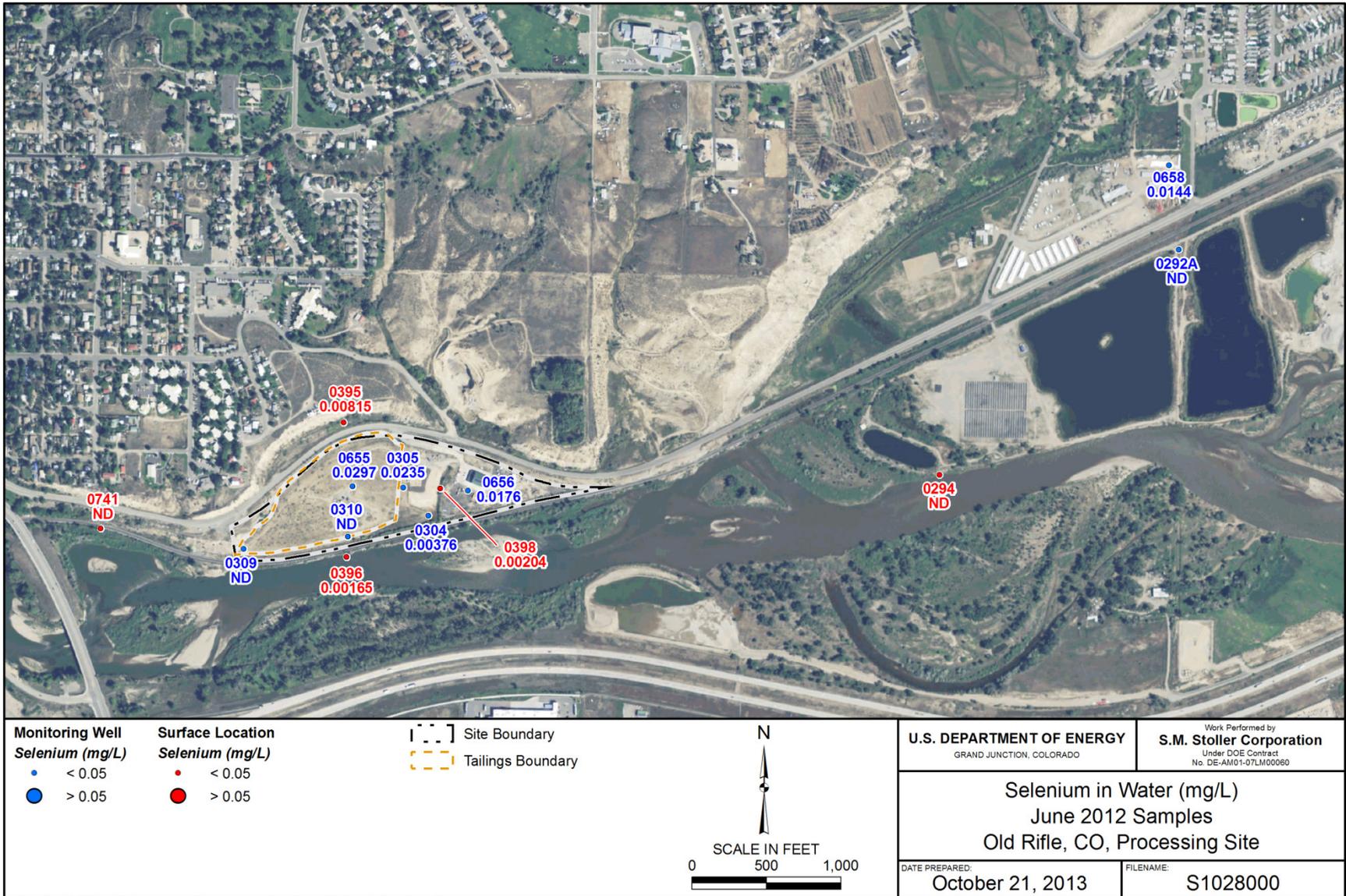
### 3.2.1 Old Rifle Site

#### 3.2.1.1 Surface Water

Results of CY 2012 surface water monitoring in the Colorado River (locations RFO-0294, RFO-0396, and RFO-0741) indicate that the water quality of the river adjacent to and downgradient of the Old Rifle site is indistinguishable from background water quality. This confirms the calculations included in the SOWP (DOE 1999a) demonstrating that groundwater discharged to the river would immediately undergo rapid mixing with river water. The two sampling events of the site ditch at RFO-0398 showed uranium levels of 0.014 mg/L and 0.016 mg/L; seep RFO-0395, which represents groundwater as a source of recharge to the alluvial aquifer, indicates that measurable amounts of uranium of 0.035 mg/L and 0.027 mg/L. Appendix C includes surface water results for this VMR monitoring period.

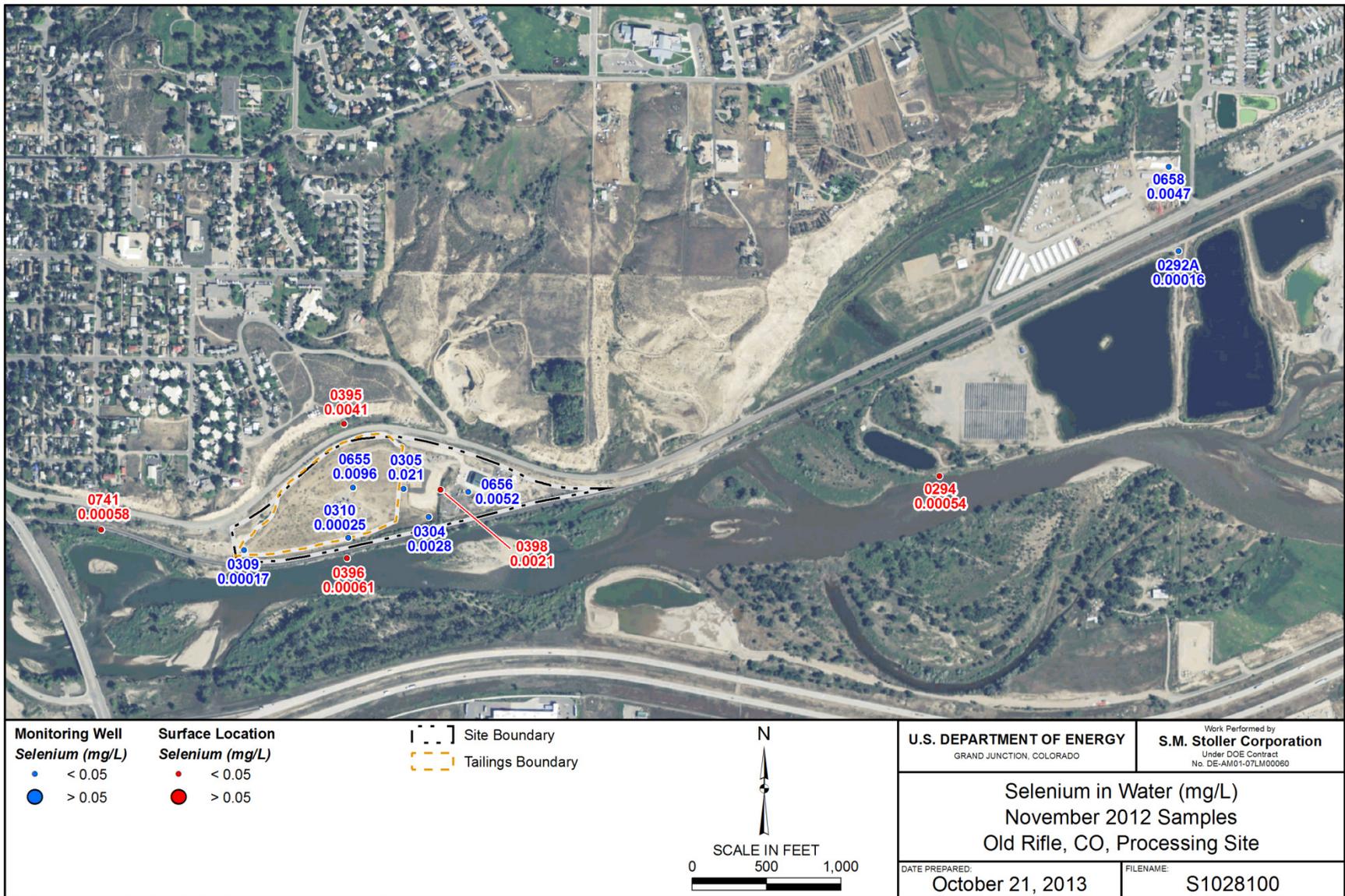
#### 3.2.1.2 Groundwater

Appendix C includes groundwater monitoring results for CY 2012. Figure 4 through Figure 9 present spot plots showing the distribution of COCs in groundwater at the Old Rifle site. Appendix A presents time-concentration graphs for wells sampled at both the Old and New Rifle sites. Table 4 presents ranges and means for monitoring results for the Old Rifle site for two periods—(1) 1998 and 1999, shortly after the completion of surface remediation, and (2) the most recent monitoring results, from June and November 2012. A comparison of these two groups of data shows that significant natural attenuation has occurred for selenium and vanadium after the surface cleanup ended, but little if any attenuation has occurred for uranium.



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Figure 4. Selenium in Water, June 2012 Samples, Old Rifle, Colorado, Processing Site



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Figure 5. Selenium in Water, November 2012 Samples, Old Rifle, Colorado, Processing Site

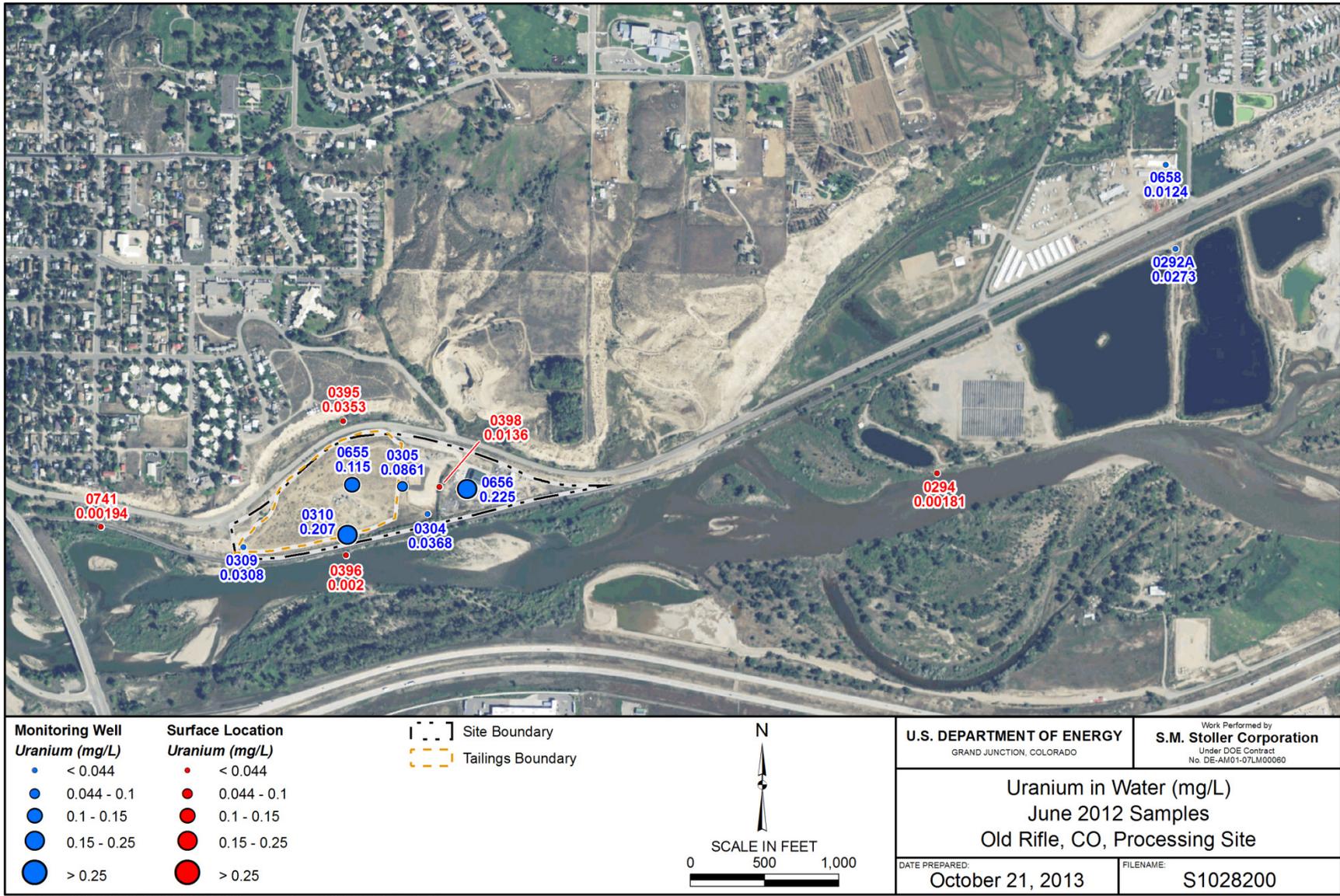


Figure 6. Uranium in Water, June 2012 Samples, Old Rifle, Colorado, Processing Site

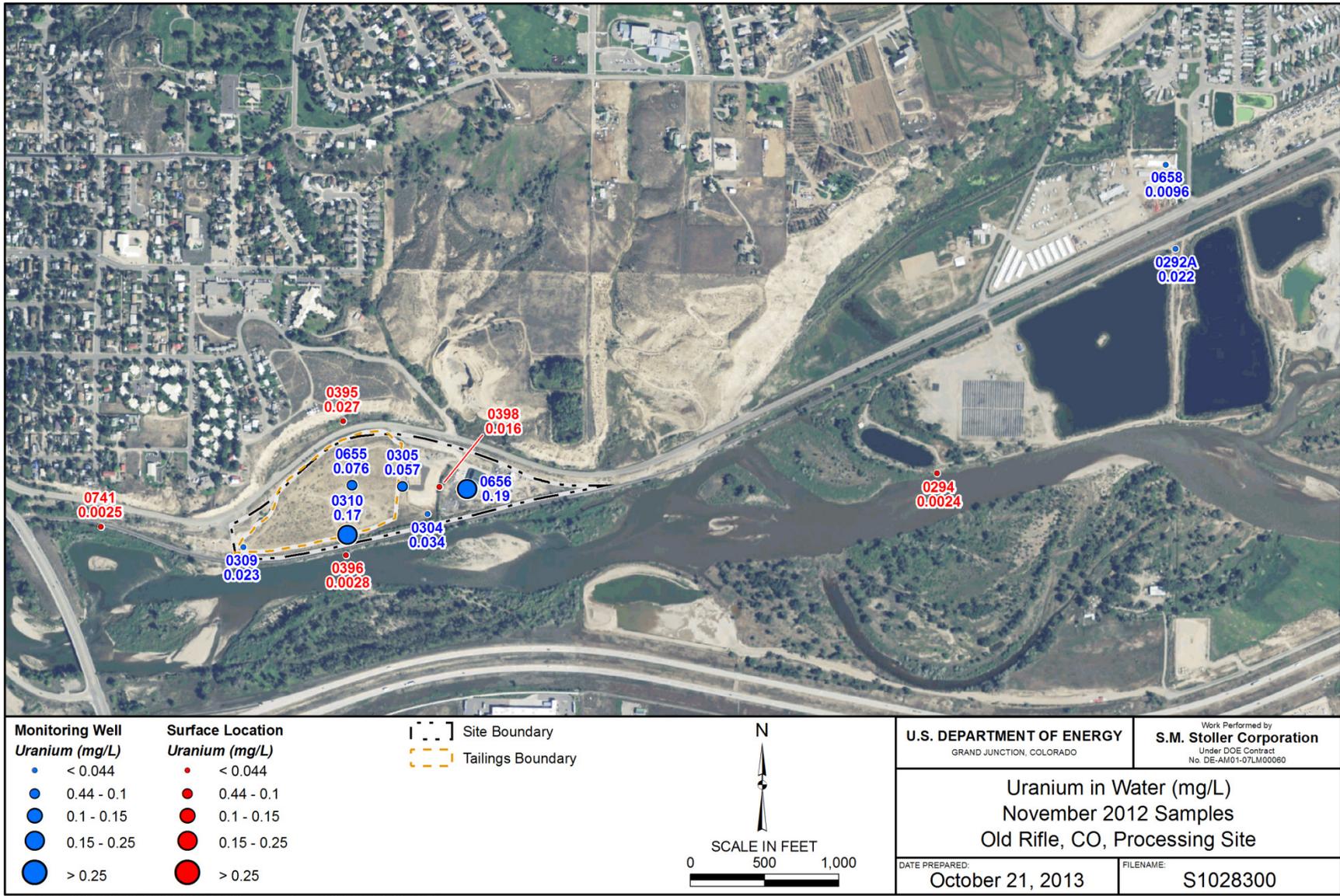
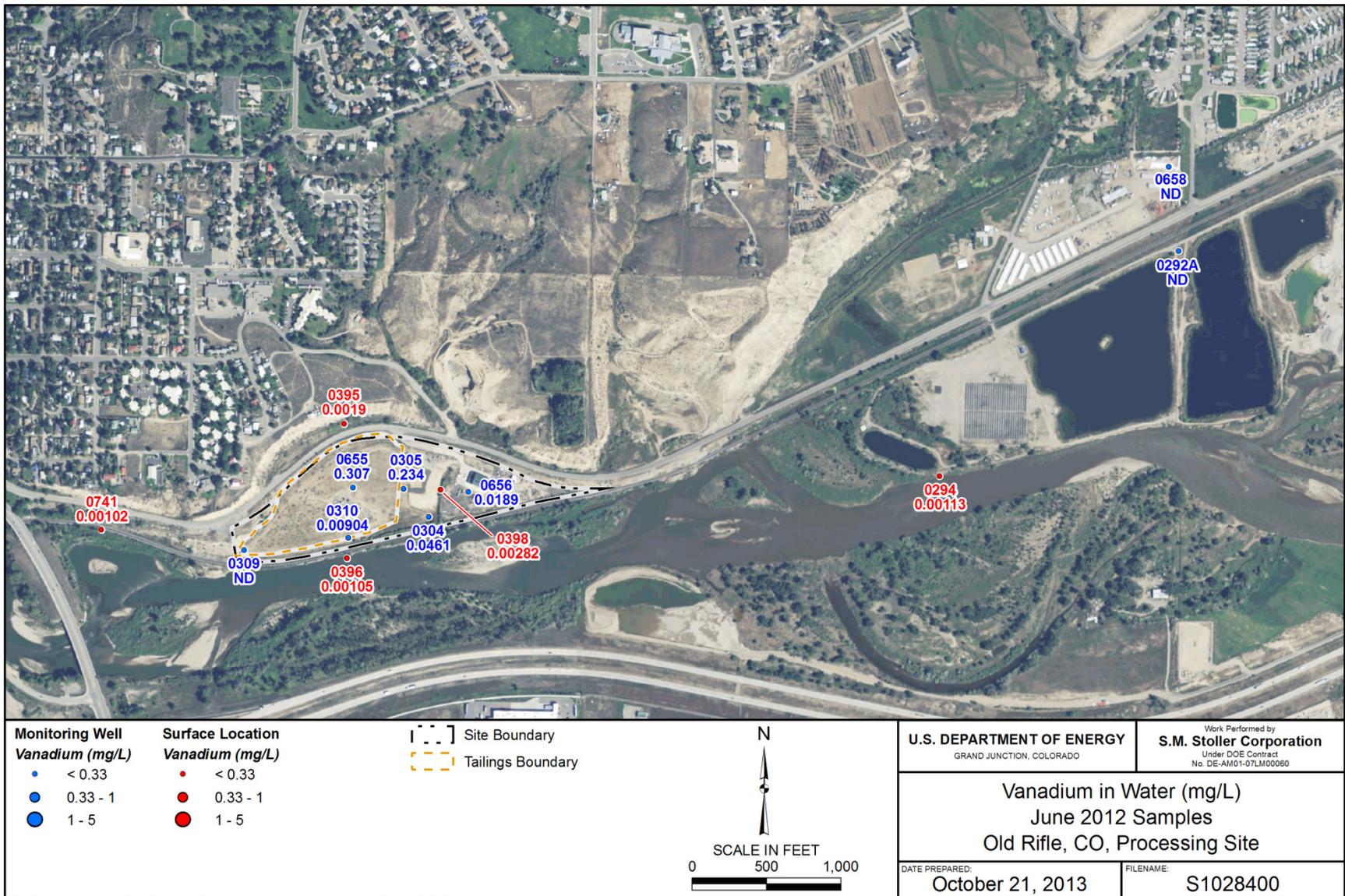


Figure 7. Uranium in Water, November 2012 Samples, Old Rifle, Colorado, Processing Site



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Figure 8. Vanadium in Water, June 2012 Samples, Old Rifle, Colorado, Processing Site

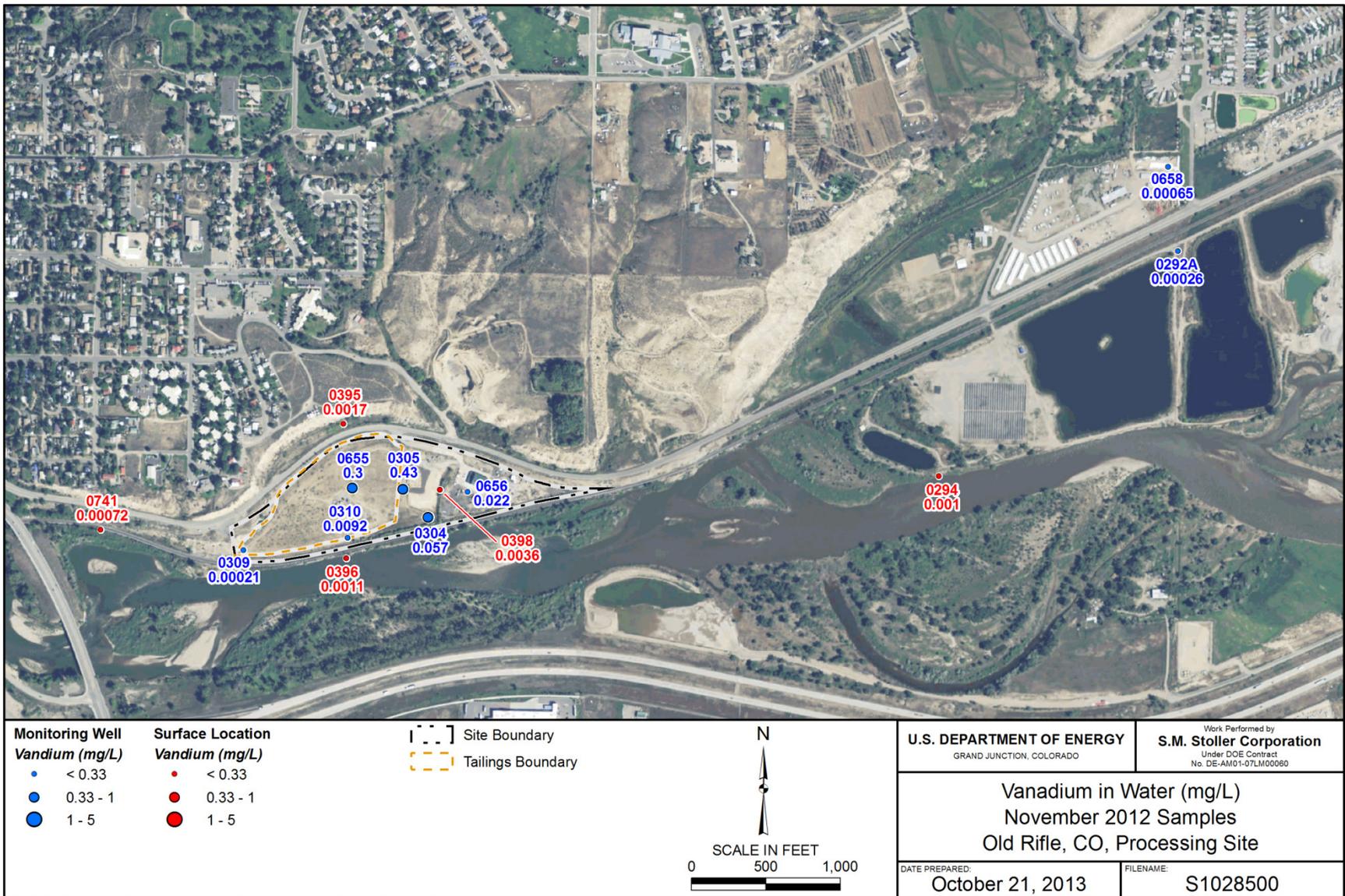


Figure 9. Vanadium in Water, November 2012 Samples, Old Rifle, Colorado, Processing Site

Table 4. Post-Surface-Remediation Groundwater Monitoring Results for the Old Rifle Site

	Benchmark	Range 1998–1999	Mean 1998–1999	Range June 2012 and Nov 2012	Mean June 2012 and Nov 2012
Selenium	0.05 <sup>a</sup>	<0.0001–0.122	0.023	0.0002–0.03	0.010
Uranium	0.044 <sup>b</sup>	0.0268–0.270	0.0997	0.023–0.225	0.104
Vanadium	0.33 <sup>c</sup>	<0.0006–0.799	0.2337	0.0002–0.43	0.120

Data are for wells RFO-0304, RFO-0305, RFO-0309, RFO-0310, RFO-0655, and RFO-0656

<sup>a</sup> U.S. Environmental Protection Agency Safe Drinking Water Act standard and approved alternate concentration limit; more recently, a maximum background concentration of 0.041 mg/L has been used as a benchmark, but the 2001 GCAP that received NRC concurrence cited 0.05 mg/L

<sup>b</sup> U.S. Environmental Protection Agency UMRCA groundwater standard (40 CFR 192)

<sup>c</sup> Risk-based concentration

Spot plots shown in Figure 4 through Figure 9 indicate that elevated uranium concentrations persist across the site, while selenium and vanadium distributions are somewhat more localized. The more limited distribution of and greater decreases in concentrations of vanadium and selenium, when compared to uranium, can likely be attributed to adsorption onto or precipitation within aquifer solids. Attenuation through immobilization rather than true flushing of the aquifer is probably the cause for decreases in concentrations of these COCs.

By contrast, uranium tends to be a highly mobile constituent and was expected to easily be flushed from site groundwater in solution. The model in the SOWP predicted that flushing of uranium would achieve MCLs within a 10-year period (DOE 1999b). The fact that uranium concentrations have not decreased significantly at the site may indicate that the inventory of uranium in the aquifer system was underestimated, that groundwater is not moving through the subsurface as rapidly as previously thought, or that the behavior of uranium in aquifer materials is more complicated than expected. The 2013 GCAP (DOE 2013b) revision addressed these and other questions.

### *Selenium*

In 2008 and 2009, the selenium concentrations for all wells were below the old maximum background level observed at the time (0.036 mg/L). In June 2010, the concentration in well RFO-0655 increased to 0.064 mg/L, nearly double the background level, and in June 2011, it increased further to 0.076 mg/L. Since then, the selenium concentration fell back to 0.012 mg/L, and ranged from 0.03 mg/L in June 2012 to 0.0096 in November 2012. Overall, the average concentration of 0.010 mg/L for wells is below the more recent maximum background concentration of 0.041 mg/L (observed in April 2010).

### *Uranium*

Uranium persists at the site. Uranium concentrations at most sampling locations continued to exceed the uranium MCL during CY 2012. The current average concentration of uranium is slightly higher than it was shortly after completion of surface remediation (Table 4). Time-concentration plots are ambiguous with respect to the attenuation of uranium. Portions of plots for some wells show increases, while others show decreases; plots for other wells appear to fluctuate around almost level concentrations.

Concentrations in well RFO-656 on the east side of the site, have increased since 2003, increased to 0.225 mg/L in June 2012, but decreased to 0.19 mg/L in November 2012. The reason for this increase and recent decrease is not clear. One suggestion is interaction of groundwater with concrete used for the construction of the City Maintenance facility. Alkalinity as total calcium carbonate in RFO-656 increased from 217 mg/L in November 2003 to 413 mg/L in November 2012. This may have mobilized uranium.

### ***Vanadium***

Table 4 indicates that currently the average concentration of vanadium in Old Rifle alluvial groundwater is below a previously established risk-based benchmark value of 0.33 mg/L. Only location RFO-0305 had a vanadium concentration that exceeded this value for the November 2012 event. Vanadium in samples from well RFO-0305 has increased after a sharp decline to below the benchmark value in June 2010 and remained slightly above the benchmark value in CY 2012. Vanadium concentrations in all wells are below the maximum values observed in wells from 1999.

#### ***3.2.1.3 ICs Monitoring***

The effectiveness of the ICs discussed in Section 1.3 is monitored in conjunction with groundwater monitoring. Changes in land use are noted during regular groundwater sampling events and recorded in trip reports. Scientists are present at the Old Rifle site for much of the year because of the ongoing IFRC studies, especially from May until November. No new construction was noted at the Old Rifle site in 2012. DOE and CDPHE indicated that radon abatement should be implemented in a small building at the radio control car park that was enclosed during the year. Ordinance 9, Uranium Mill Tailings Remedial Action Overlay Zone District, Series 2008, paragraph c, No. 8, requires the City manager to inform City managers about standard operating procedures, deed restrictions, and environmental covenants contained in the ordinance. The Rifle site lead received a written confirmation from the Rifle City manager on this requirement.

### **3.2.2 New Rifle Site**

#### ***3.2.2.1 Surface Water***

Appendix C includes surface water monitoring results for CY 2012. Two surface water locations at the New Rifle site (locations RFN-0322 and RFN-0324) represent Colorado River water. At the other five surface locations, three samples were collected from the wetland area ponds, and two samples were collected from the former Roaring Fork gravel ponds. These can be seen in the spot plots (Figure 10 through Figure 19) and in time-concentration graphs in Appendix A-2. Concentrations of molybdenum, nitrate, and uranium are above MCLs or background concentrations for some locations. Multiple ICs at the site ensure that there are no exposures that could result in unacceptable human health risks. Although ammonia is not a COC because concentrations dropped below values of concern for human health (calculated as 155 mg/L NH<sub>3</sub> as N for inhalation in a closed structure; DOE 1999b), it was kept as an analyte for comparison with nitrate. Ammonia levels remain above those acceptable for aquatic life. For a representative surface water pH of about 8, the acute ambient water quality criteria for ammonia (salmonids absent) is 8.4 mg/L as N (EPA 1999).

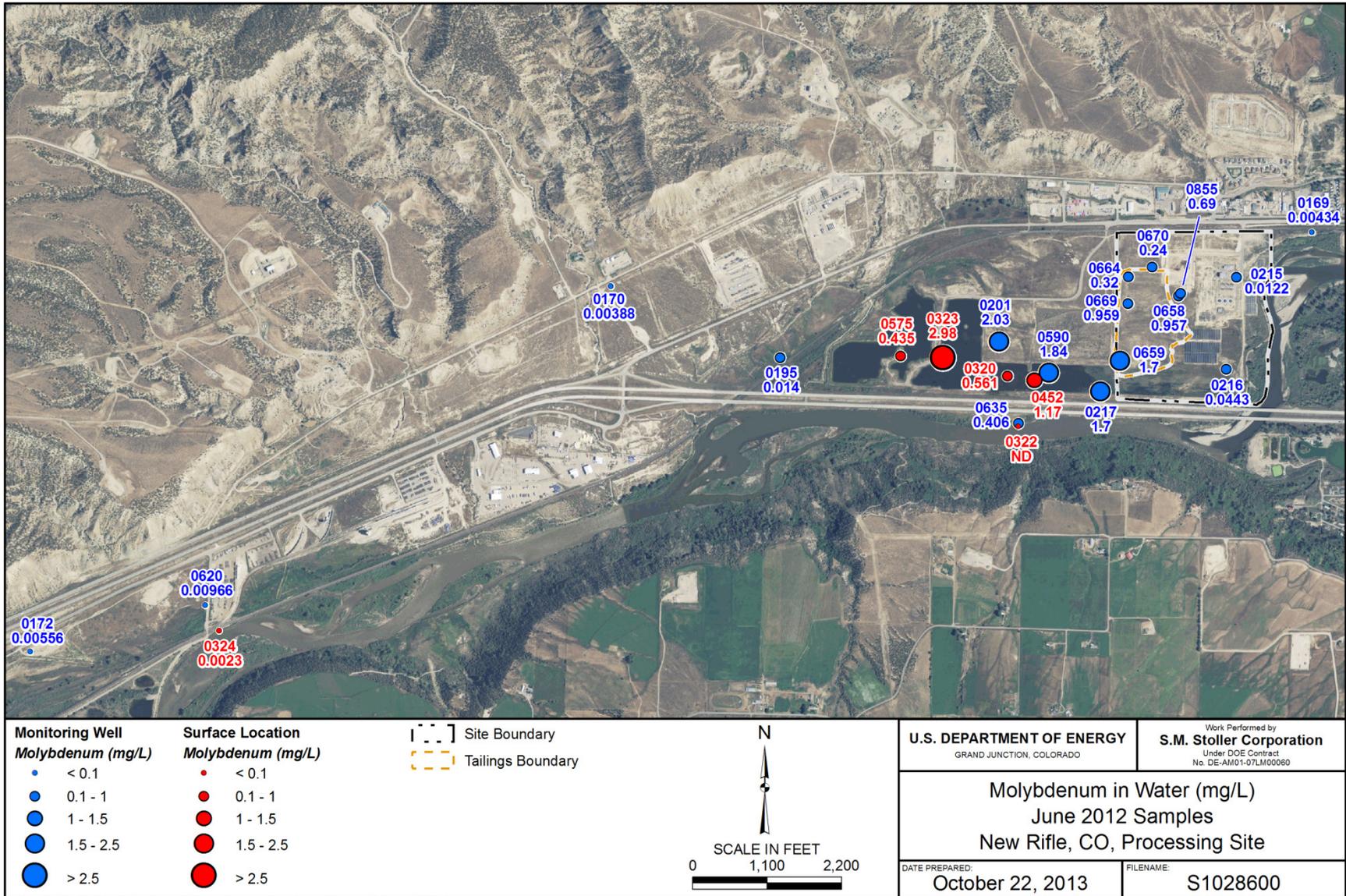
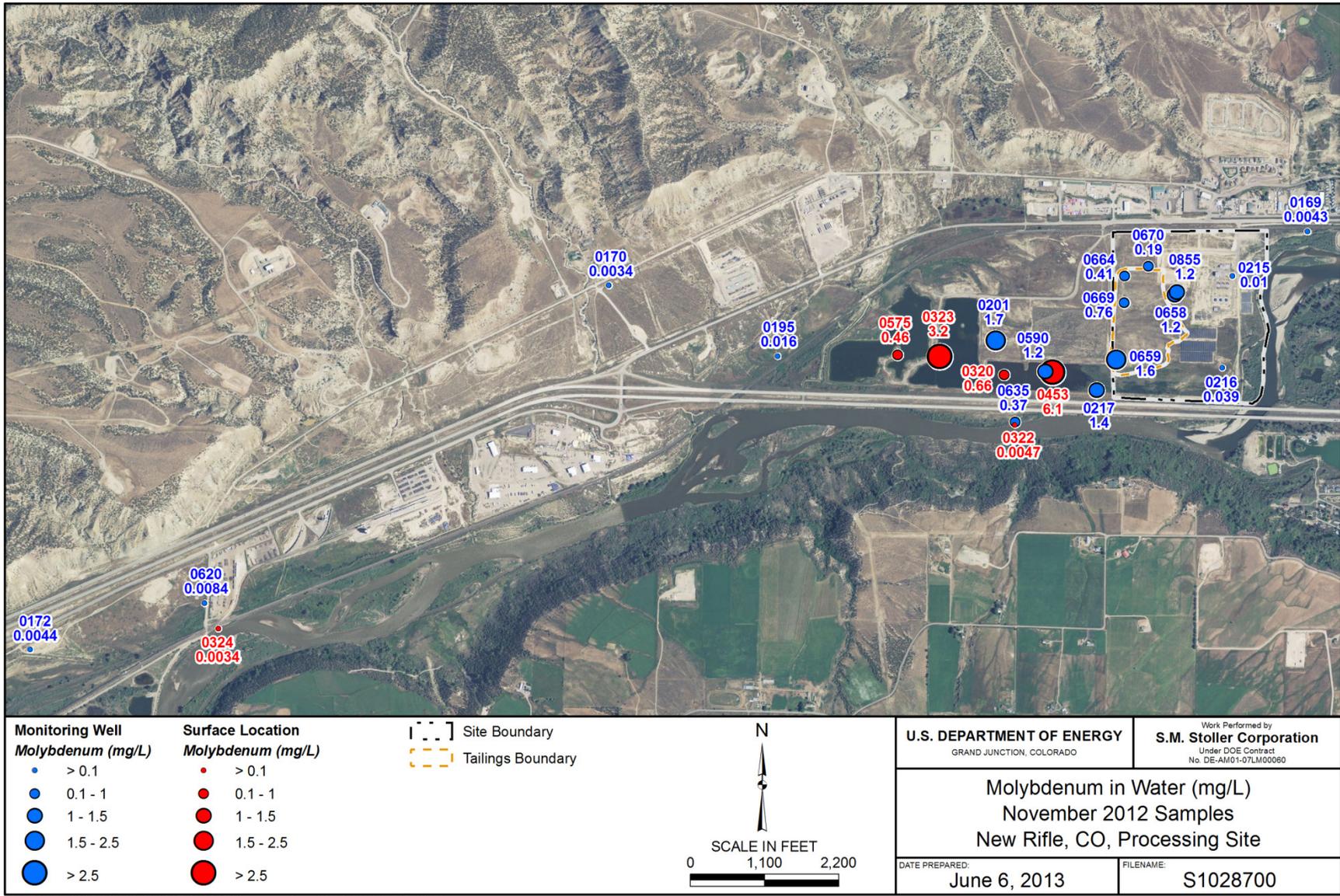


Figure 10. Molybdenum in Water, June 2012 Samples, New Rifle, Colorado, Processing Site



M:\LTS\111\0065\03\008\1\S10287\S1028700.mxd smithw 06/06/2013 11:37:36 AM

Figure 11. Molybdenum in Water, November 2012 Samples, New Rifle, Colorado, Processing Site



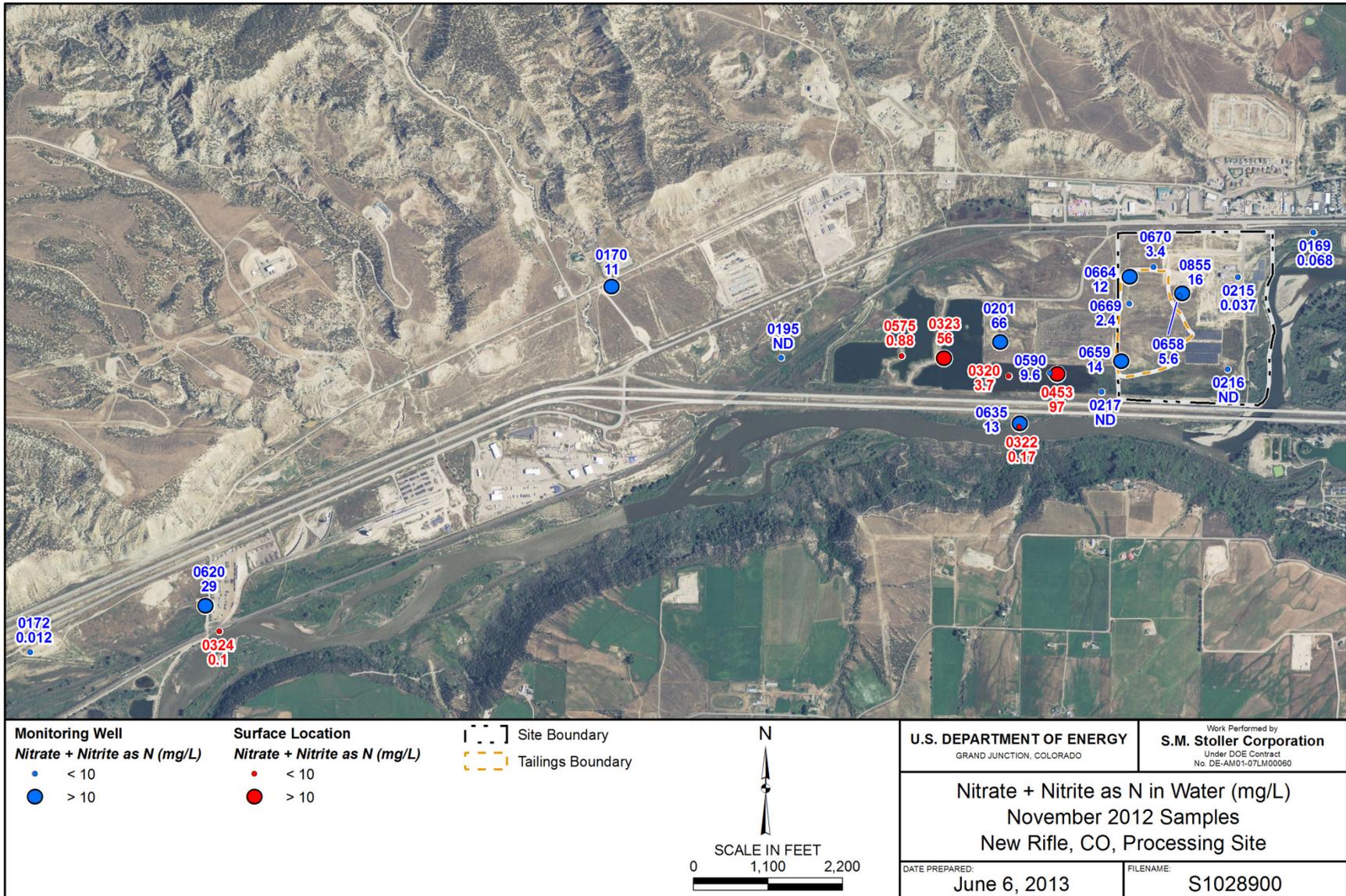


Figure 13. Nitrate+ Nitrite as N in Water, November 2012 Samples, New Rifle, Colorado, Processing Site

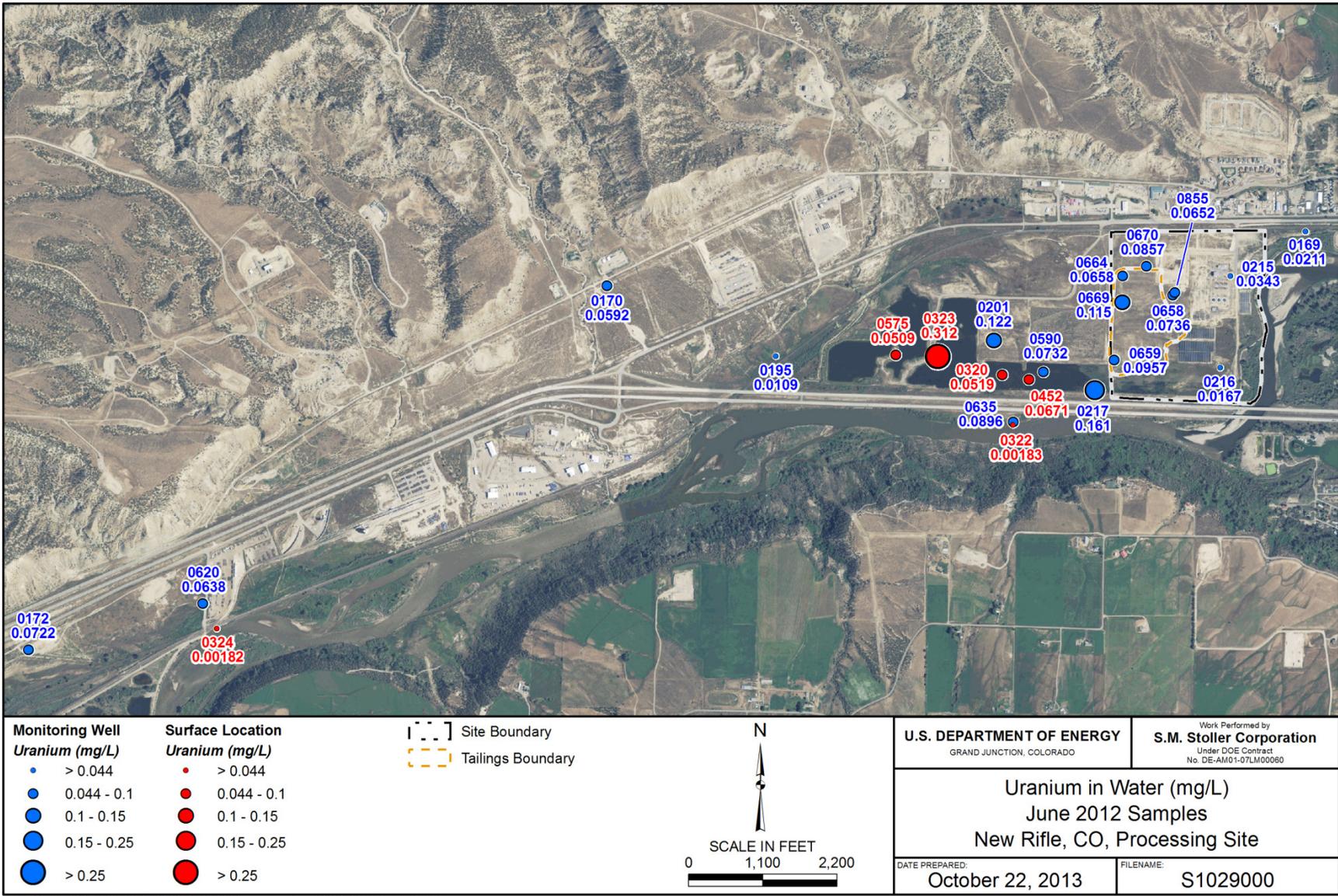


Figure 14. Uranium in Water, June 2012 Samples, New Rifle, Colorado, Processing Site

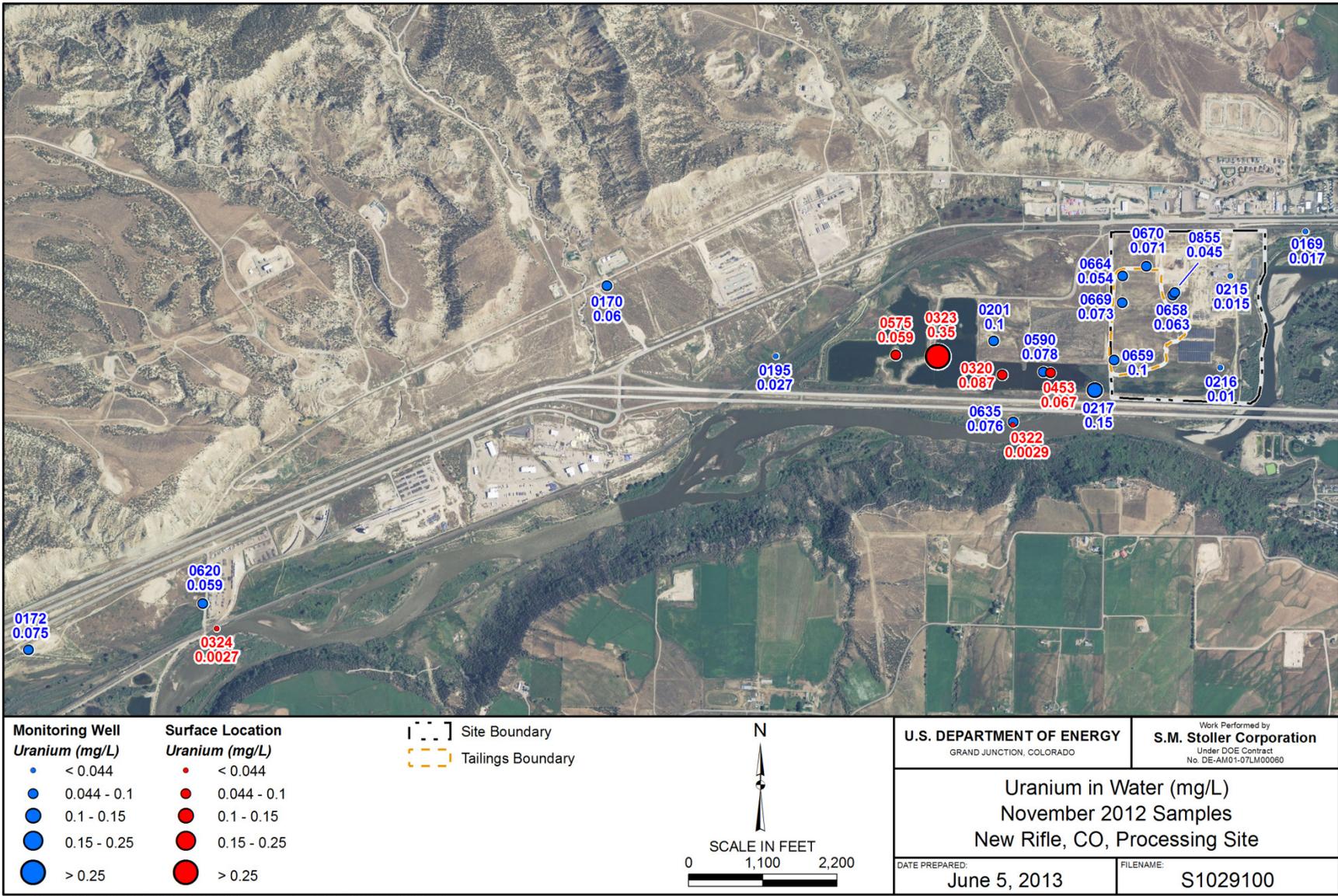


Figure 15. Uranium in Water, November 2012 Samples, New Rifle, Colorado, Processing Site

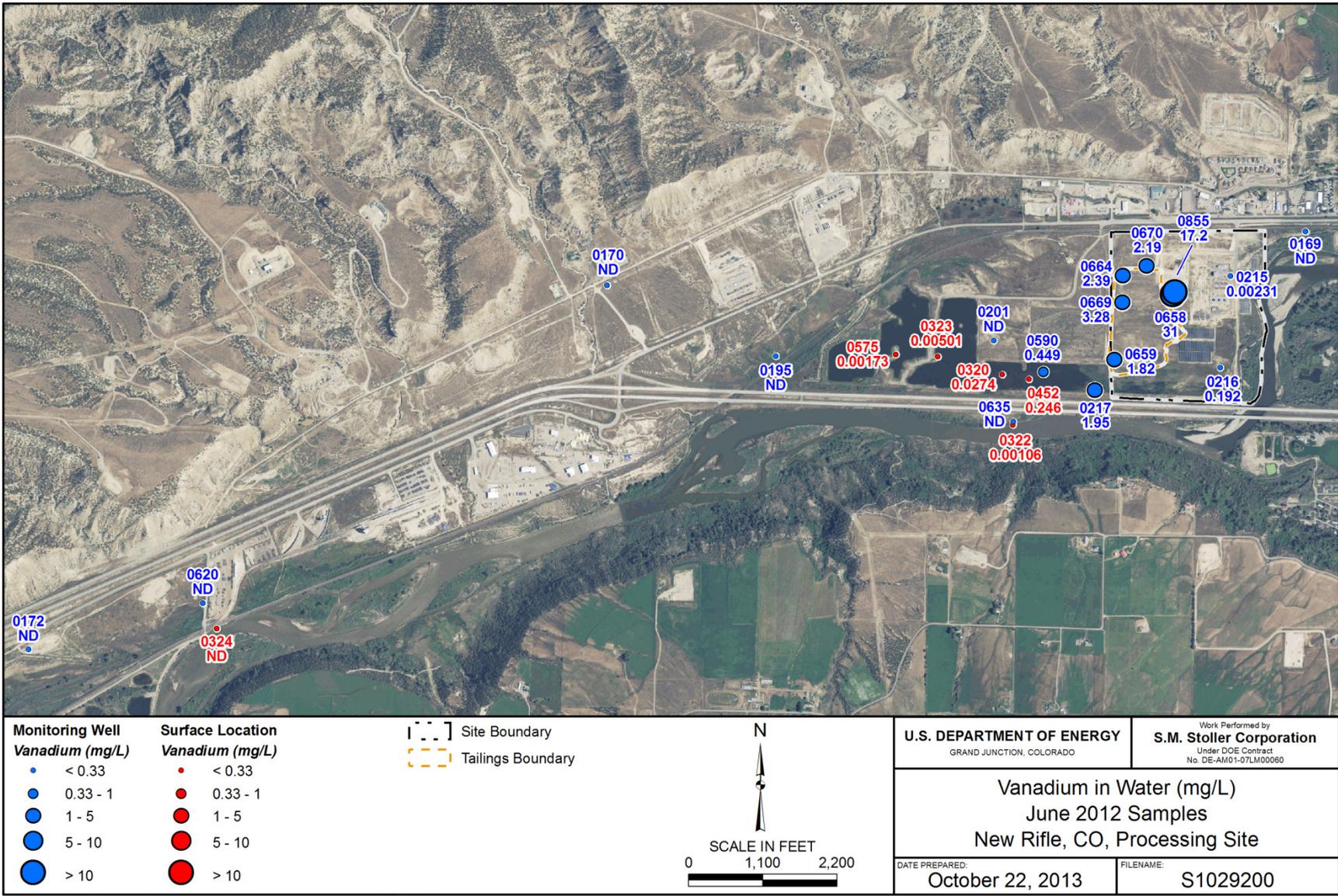


Figure 16. Vanadium in Water, June 2012 Samples, New Rifle, Colorado, Processing Site

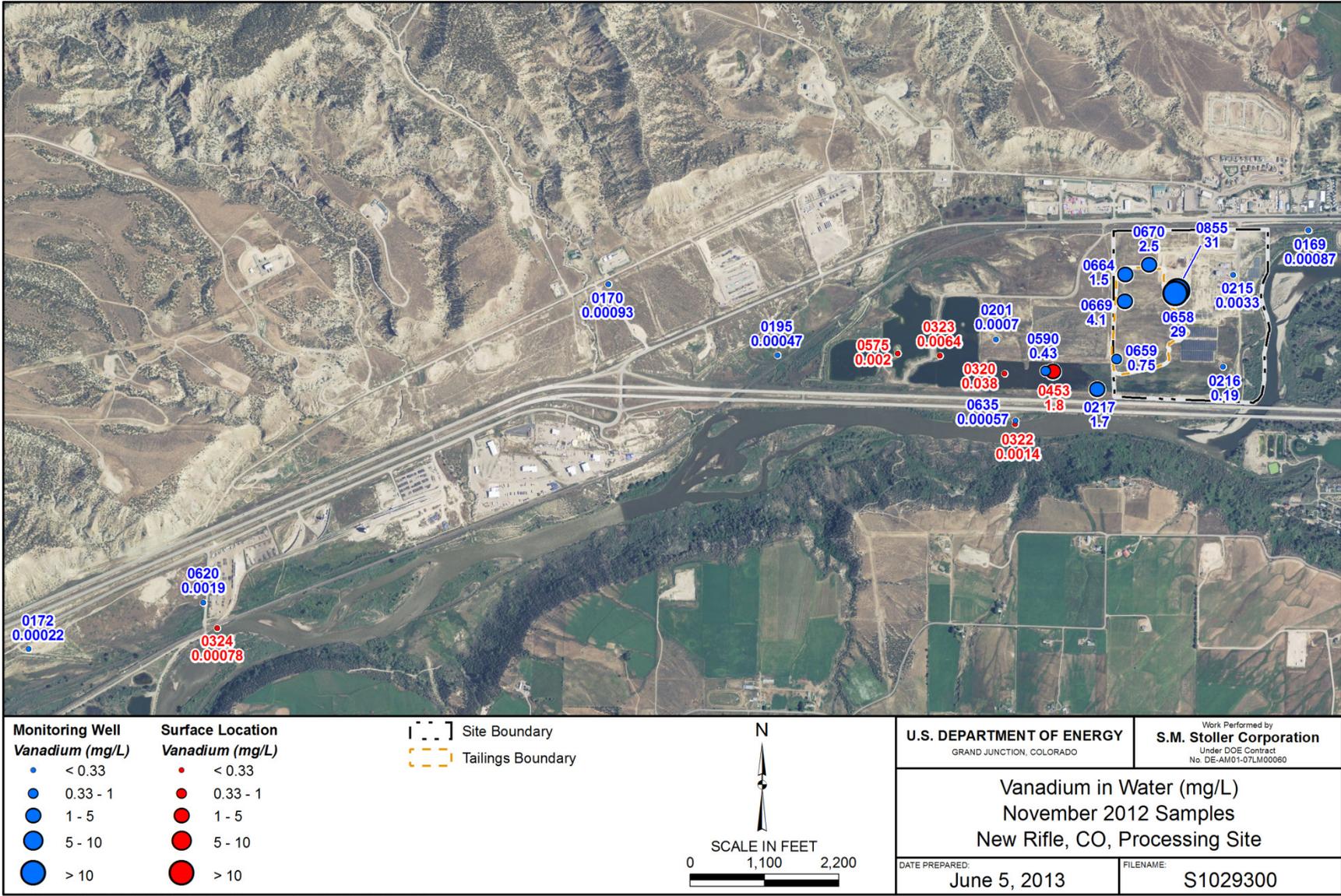


Figure 17. Vanadium in Water, November 2012 Samples, New Rifle, Colorado, Processing Site

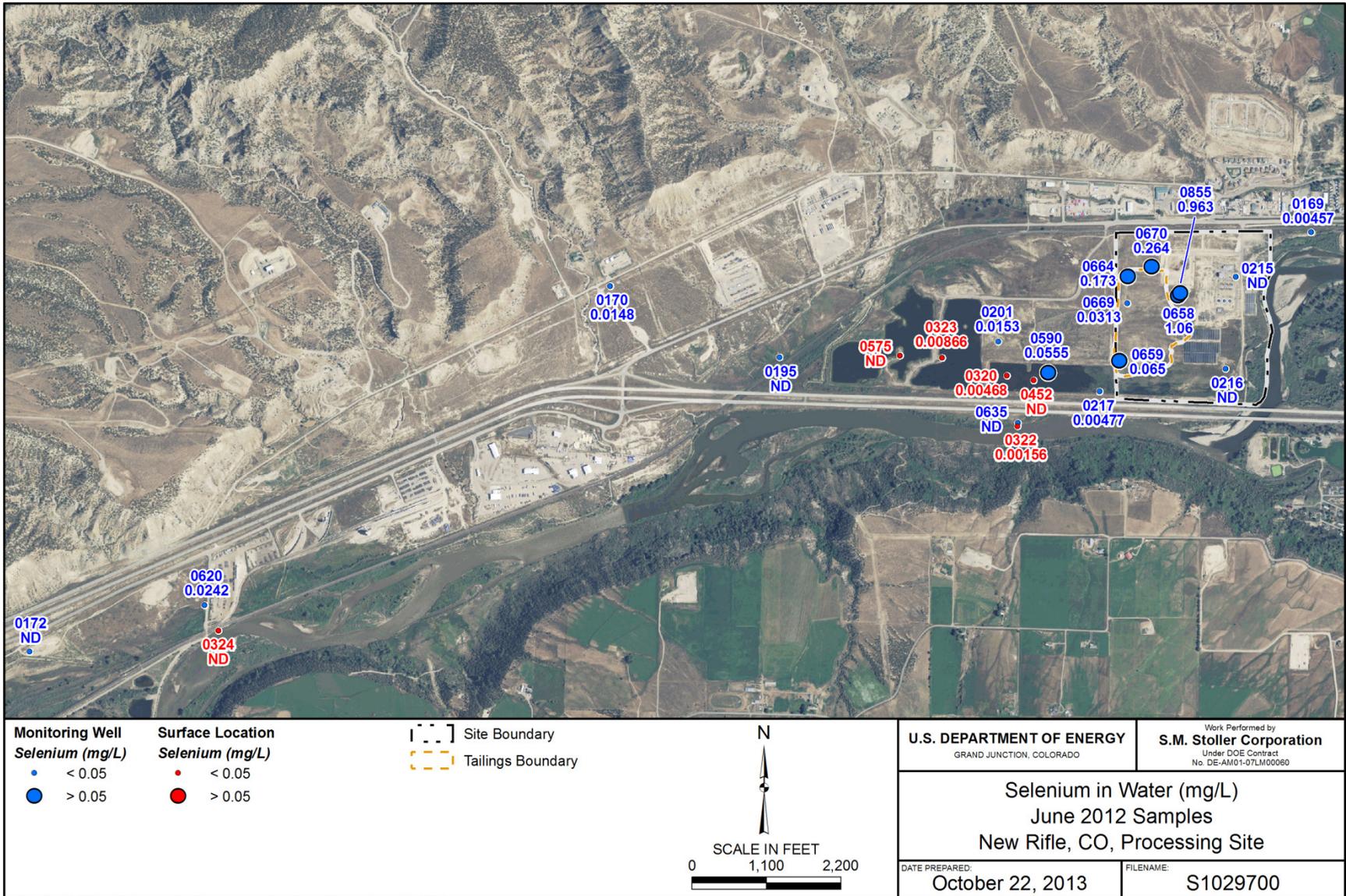
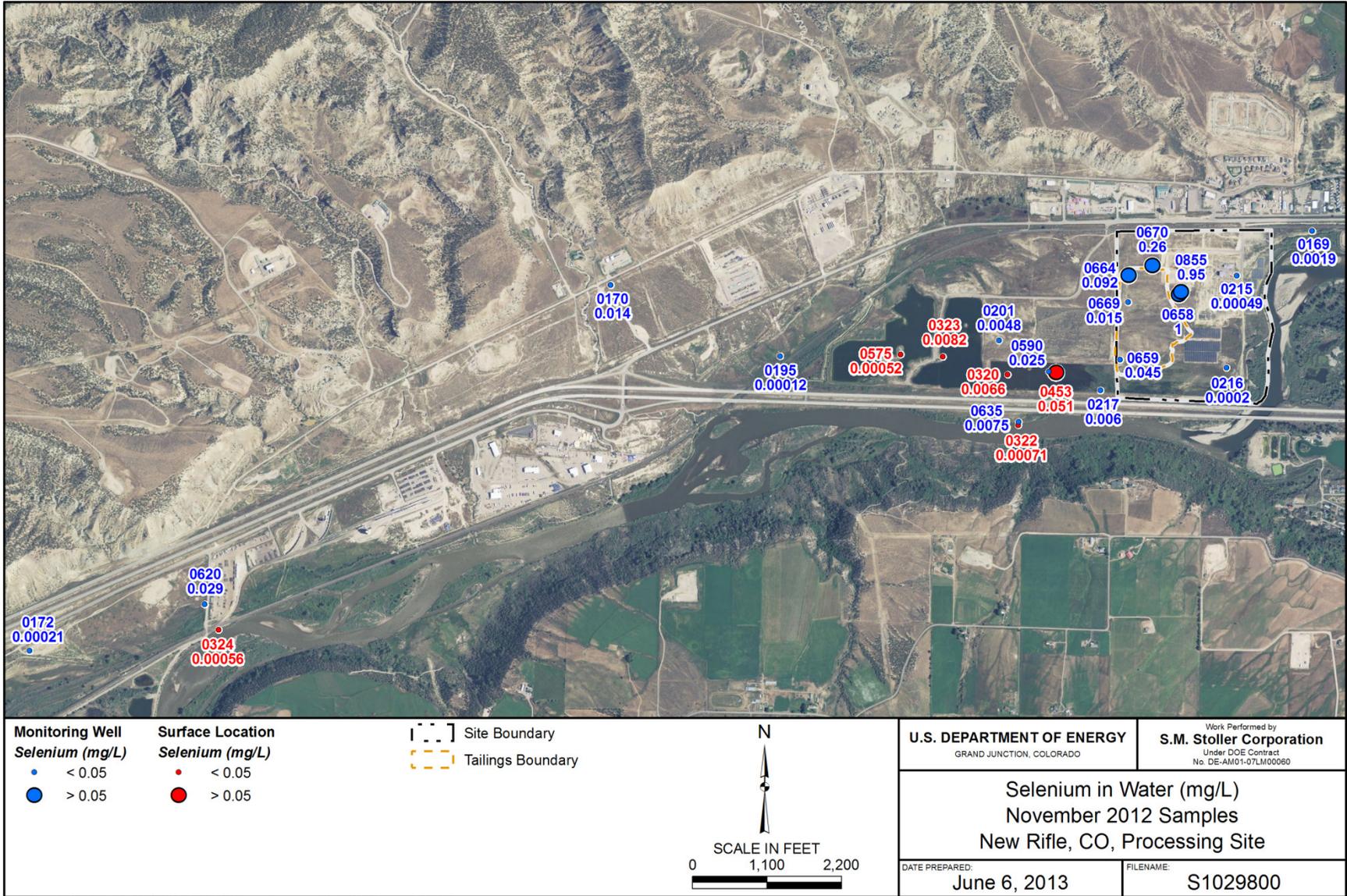


Figure 18. Selenium in Water, June 2012 Samples, New Rifle, Colorado, Processing Site



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Figure 19. Selenium in Water, November 2012 Samples, New Rifle, Colorado, Processing Site

The ecological risks for ammonia, molybdenum, nitrate, and uranium in ponds located in the wetland area (sample locations RFN-0320, RFN-0452, and RFN-0453) are not considered unacceptable because the ponds evaporate periodically and are therefore available for only occasional exposures. Location RFN-453 is often dry, and results may show high concentrations of COCs when water is present, as occurred in the November 2012 sample round. This is probably due to evaporation, which concentrated the dissolved solids in the pond. The large gravel pit ponds represented by locations RFN-0323 and RFN-0575 are essentially permanent features (though the eastern pond may lose a significant volume of water during dry periods). The eastern pond contains COCs and ammonia in excess of MCLs or ecological risk concentrations, respectively, but concentrations in the western pond are acceptable (although molybdenum, nitrate, and uranium showed slight increases during the November 2012 sample round).

With the exception of those for nitrate and ammonia, which display consistent downward trends, time-concentration plots for most constituents in pond waters do not show any pronounced trends. It therefore appears that natural attenuation is unlikely to reduce the concentrations appreciably in the near future. The lack of attenuation in pond waters is likely caused, in part, by evaporation of pond waters, which tends to concentrate the dissolved constituents. This is evidenced by the fact that some pond water concentrations are higher than the same constituents in groundwater from nearby wells, as shown on the spot plots (e.g., uranium in Figure 15).

### **3.2.2.2 Groundwater**

Groundwater beneath the New Rifle site was contaminated by former vanadium- and uranium-ore-processing operations that were ongoing from 1958 through 1972, from lignite ash processing from 1964 to 1967, and from vanadium processing (which did not produce tailings but may have sent milling solutions to settling ponds) from 1973 to 1984. Site field investigations have shown that the alluvial aquifer is the only aquifer affected by the former milling operations.

COCs previously identified in the alluvial aquifer at concentrations that exceed the 40 CFR 192 groundwater standards are arsenic, molybdenum, nitrate, selenium, and uranium. Fluoride levels have exceeded the Safe Drinking Water Act standard of 4 mg/L. Concentrations of ammonia, manganese, and vanadium have exceeded risk-based concentrations deemed acceptable for groundwater that is used for domestic purposes in a residential setting (DOE 1999b). Based on discussions with CDPHE, fluoride and manganese are of little concern at the site and were eliminated from the monitoring program. Concentrations of ammonia, arsenic, and selenium have declined below levels of concern for the most part, though analysis for these constituents has continued to a limited degree. Elevated concentrations of these constituents persist mainly in the vicinity of the former raffinate ponds (near wells RFN-0855 and RFN-0658) where contaminated soil is known to exist.

The following discussion focuses on the more widespread or persistent COCs—molybdenum, nitrate, uranium, and vanadium. Appendix C includes groundwater monitoring results for CY 2012. The most conspicuous feature in time-concentration plots of groundwater monitoring data for the last several years is a pronounced spike in concentrations of molybdenum, selenium, and vanadium in samples collected from well RFN-0855 (see graphs in Appendix A-2).

Concentrations of vanadium in samples from this well were more than an order of magnitude higher than in samples from other wells. This difference was attributed to mobilization of contaminants due to dewatering and excavation activities being conducted by the City of Rifle in association with construction of the City's wastewater treatment facility. Since that spike, concentrations of molybdenum and vanadium in wells RFN-0855 and RFN-658 have decreased significantly; molybdenum concentrations are below pre-construction values, but vanadium concentrations remain elevated above pre-construction values.

Other onsite wells displayed increases of certain constituents (e.g., uranium in RFN-0216 and RFN-0670; molybdenum in well RFN-0216). While some plots appear to show an overall declining trend (e.g., molybdenum and uranium for RFN-0195, RFN-0658; uranium for RFN-0669; nitrate for RFN-0590), uranium in well RFN 0217 shows a slightly increasing trend. Most importantly, COCs in most wells showed no particular trend.

From the spot plots, some COCs such as vanadium and selenium in New Rifle alluvial groundwater and surface water show less mobility and are restricted to areas near or slightly downgradient from the former mill site. Plumes for constituents that are more mobile, such as nitrate, molybdenum, and uranium, are more extensive. To evaluate this natural attenuation at the New Rifle site, in the past monitoring wells were assigned to one of three groupings—onsite, adjacent to site, or downgradient—for the purposes of computing statistics for analytical results. This convention will be maintained for this VMR.

Onsite wells are those within the site boundary. As noted, residual soil contamination does exist at the New Rifle site below the water table. This contamination is most likely to affect groundwater in direct contact with those soils (i.e., onsite wells) by serving as a persistent source of contamination to groundwater. Although onsite wells are all grouped together for the purpose of computing groundwater statistics and comparing the results to historical trends, three subgroups of onsite wells were recognized in previous VMRs based on patterns of time-concentration plots for the wells (Appendix A includes time-concentration plots). These patterns were interpreted as being related to the well locations and proximity to former source areas as discussed below.

Wells RFN-0169, RFN-0215, and RFN-216 are adjacent to the Colorado River and upgradient of the main source of site groundwater contamination—the former raffinate ponds and tailings pile. Concentrations of most COCs in these wells are low and have had limited variability over the past 10 years. A notable exception is well RFN-216, which in 2008 showed spikes in molybdenum, uranium, and vanadium concentrations (after dewatering occurred that area) that remained elevated in 2009 but subsequently declined. Groundwater concentrations in this area were likely influenced by the groundwater pumping that the City of Rifle conducted during the construction of infrastructure for the wastewater treatment plant.

Locations RFN-0658, RFN-0659, and RFN-0855 are in the footprint of the former raffinate ponds and tailings pile. Soil sampling conducted during the pilot study for vanadium at the site indicated that residual contamination exists in these areas and may have local influence on groundwater quality (DOE 2002). These locations are characterized by time-concentration plots with the highest concentrations of most COCs and the greatest degree of variability over time. For the most part, COCs in these wells exhibit no clear trends, except that concentrations decrease after the groundwater returns to normal elevations. Adsorption/desorption reactions

between groundwater and soils probably occur in this area, and groundwater concentrations are likely sensitive to fluctuations in the water table. As noted, due to the City's activities, concentrations for a number of COCs in well RFN-0855 increased sharply (for example, vanadium increased from 14 mg/L in 2007, before dewatering began, to 1,600 mg/L in 2009) but declined again in 2010 to levels below that of well RFN-0658, a trend that continued in 2012. It appears that these contaminant spikes affect groundwater only locally. To date, downgradient wells have shown no sign of contaminant increases.

The remaining onsite wells—RFN-0664, RFN-0669, and RFN-0670—are outside of the residual contamination area and do not show any apparent relationship to variations in groundwater elevations. Trends shown in time-concentration plots for these locations are more similar to those for offsite locations. They show some variability but overall gradually decrease in concentrations.

Contamination in offsite wells is attributed solely to the downgradient migration of dissolved contaminants in groundwater and not from direct contact with a primary residual source. The wells downgradient of the New Rifle site were split into two groups according to their location relative to the Roaring Fork gravel ponds. As described previously, the pumping operations at the gravel pit ponds affected groundwater flow direction, thus hydraulically separating those two groups of wells to some extent. Additionally, activities associated with wetland construction were more likely to influence the water quality of the wells adjacent to the site than that of the wells farther downgradient. These differences have lessened over time. Table 5 and Table 6 provide metrics for the three main groups of wells. Table 5 provides water quality benchmarks for comparison. The historical data provided in Table 1 are based on the combined results of data from wells on and adjacent to the site. Appendix A includes time-concentration plots for molybdenum, nitrate, uranium, and vanadium in the New Rifle wells.

*Table 5. Mean Concentrations in Groundwater—1998–1999:  
combined June 2012 and November 2012 for the New Rifle Site*

Contaminant (all units mg/L)	Benchmark	Onsite <sup>a</sup>		Adjacent to Site <sup>b</sup>		Downgradient <sup>c</sup>	
		1998–1999 mean	June 2012 and November 2012 mean	1998–1999 mean	June 2012 and November 2012 mean	1998–1999 mean	June 2012 and November 2012 mean
Molybdenum	0.1 <sup>d</sup>	2.50	0.625	1.928	1.29	0.037	0.007
Nitrate + Nitrite as Nitrogen	10 <sup>d</sup>	13.8	5.86	51.9	25.4	16.6	15.4
Uranium	0.067 <sup>e</sup>	0.101	0.061	0.097	0.106	0.0744	0.058
Vanadium	NA	5.68	7.94	0.037	0.567	<0.0001	0.0009

<sup>a</sup> Includes wells RFN-0215, RFN-216, RFN-0658, RFN-0659, RFN-0664, RFN-0669, RFN-0670, and RFN-0855 (not all wells were sampled for all analytes).

<sup>b</sup> Includes wells RFN-0201, RFN-0217, RFN-0590, and RFN-0635 (only wells RFN-0217 and RFN-0590 were sampled for vanadium).

<sup>c</sup> Includes wells RFN-0170, RFN-0172, RFN-0195, and RFN-620.

<sup>d</sup> U.S. Environmental Protection Agency UMTRCA groundwater standard (40 CFR 192).

<sup>e</sup> Maximum background value, cleanup goal.

NA = not applicable.

Table 6. Range of Concentrations in Groundwater—1998–1999; combined June 2012 and November 2012 for the New Rifle Site

Contaminant (all units mg/L)	Onsite <sup>a</sup>		Adjacent to Site <sup>b</sup>		Downgradient <sup>c</sup>	
	1998–1999 range	June 2012 and November 2012 range	1998–1999 range	June 2012 and November 2012 range	1998–1999 range	June 2012 and November 2012 range
Molybdenum	0.0237–6.84	0.01–1.7	0.61–3.15	0.37–2.03	0.0041–0.231	0.003–0.016
Nitrate + Nitrite as Nitrogen	<0.003–83.1	<0.01–16.0	0.089–188	<0.01–72.5	0.012–85.2	<0.01–72.5
Uranium	0.0103–0.284	0.01–0.115	0.0837–0.120	0.073–0.161	0.050–0.177	0.011–0.075
Vanadium	<0.001–25.3	0.002–31.0	<0.001–2.69	0.0006–1.95	0.00065–0.0018	0.0002– 0.0019

<sup>a</sup> Includes wells RFN-0215, RFN-0216, RFN-0658, RFN-0659, RFN-0664, RFN-0669, RFN-0670, and RFN-0855 (not all wells were sampled for all analytes).

<sup>b</sup> Includes wells RFN-0201, RFN-0217, RFN-0590, and RFN-0635

<sup>c</sup> Includes wells RFN-0170, RFN-0172, RFN-0195, and RFN-0620.

NA = not applicable

It is unclear whether site-related contamination is or has ever been present at well locations RFN-0170, -0620, or -0172. These locations have been included as part of the downgradient “plume” solely on the basis that uranium values have exceeded the groundwater standard in 40 CFR 192. However, the uranium concentrations observed at those locations have been in the same range as those reported in background (maximum observed at 0.067 mg/L, Table 5). Uranium in those wells does not display any clear increasing or decreasing trends (unlike location RFN-0195, which shows a steady decline in uranium concentrations). Well RFN-0195 shows a definite influence from site contamination (e.g., with elevated levels of molybdenum and nitrate). No other site-related constituents have been elevated in these downgradient wells except nitrate in well RFN-0620, which spiked in June 2012 to 72.5 mg/L and returned to the normal value around 28 mg/L afterward. The apparent decreases over time in mean concentrations and ranges for the downgradient wells reported in Table 5 and Table 6, respectively, is due exclusively to significant decreases in concentrations at location RFN-0195.

### ***Molybdenum***

Molybdenum has been one of the most widespread COCs due to its high mobility. It remains elevated in onsite and downgradient wells. Values in well RFN-0855 reached an all-time high of 18 mg/L in 2009, but the concentration decreased significantly in June 2010 to 1.8 mg/L and further decreased in 2012 to about 1 mg/L. Mean concentrations for all groups of wells have declined over time. Molybdenum in the portion of the plume downgradient of the former gravel ponds appears to have dissipated. However, the relatively high concentrations recently observed onsite suggest that a pulse of molybdenum could move downgradient.

The highest concentrations of molybdenum were detected in surface water location RFN-0323, the easternmost gravel pit pond, where concentrations were 2.98 mg/L in June 2012 and 3.20 mg/L in November 2012. Concentrations in the westernmost gravel pit pond at location RFN-0575 were significantly lower—0.435 mg/L in June and 0.460 mg/L in November. Surface water locations RFN-0320, RFN -0452, and RFN-0453 in the wetland area were also high. Concentrations in the June 2012 samples were 0.561 mg/L, 1.17 mg/L, and dry, respectively; for

the November event, concentrations were 0.660 mg/L, no record, and 6.10 mg/L, respectively. These values increased at all locations since 2011 except RFN-0452, which decreased slightly.

### ***Nitrate***

The highest concentrations of nitrate are immediately downgradient of the site, though the standard is exceeded as far downgradient as location RFN-0620. The source of much of the nitrate is likely the degradation of ammonia. Trends (or lack thereof) probably depend more on ammonia behavior than on natural flushing processes. Despite some increases of nitrate in individual wells 10 years ago, probably because of ammonia degradation, mean concentrations for all well groups have declined since then. With declines in ammonia to low levels, it appears that nitrate's trends have become less erratic, and concentrations are leveling out.

The highest concentrations of nitrate were detected in surface water location RFN-0323, the easternmost gravel pit pond. The June 2012 value was 57.5 mg/L, and the November 2012 concentration was 56 mg/L. These concentrations have been decreasing steadily since 2008 and generally decreasing since 2003. An exception is RFO-453, which increased from 3 mg/L in November 2011 to 97 mg/L in November 2012. Location RFN-0453 is frequently dry or contains little water.

### ***Uranium***

Uranium persists throughout the plume. The maximum background concentration of 0.067 mg/L is exceeded slightly as far downgradient as well RFN-0172. It is likely that uranium in these downgradient areas is not site-related and represents background conditions. Time-concentration plots for these downgradient wells show no clear trend except for RFN-0195, where concentrations have decreased continuously and significantly since 2005. Time-concentration plots for a number of the wells upgradient of the former gravel ponds show no well-defined trend (e.g., RFN-0659, RFN 0590, RFN-0664, and RFN-0670) but fluctuate over a fairly narrow concentration range. Mean concentrations in wells adjacent to the site are the same as they were more than 10 years ago. This distribution may reflect the disturbance caused by operation of the gravel ponds.

All surface pond concentrations exceeded the MCL or maximum background concentration except the large westernmost gravel pit pond, sample location RFN-0575, which has been below the maximum background concentration since 2005. The highest concentrations were in RFN-0323 at 0.312 mg/L in June 2012 and 0.350 mg/L in November 2012. Overall, uranium concentrations in the ponds have shown no decrease since 2000, when most analytical records began, except for RFN-0575, which has a longer record and shows a general decrease since sampling began in 1991.

### ***Vanadium***

In 2009, vanadium spiked to the highest concentration ever observed in well RFN 0855 (1,600 mg/L) in association with the City of Rifle's construction work and especially the dewatering of the area around RFN-0855. The concentration in RFN-0855 dropped back to 41 mg/L in November 2010 and, most recently, to 17.2 mg/L in June 2012 and 31 mg/L in November 2012. The vanadium concentration in adjacent well RFN-0658 (a shallow well only 5.4 ft deep) was 52 mg/L for a high in 2010 and has since fallen to 31 mg/L in June 2012 and

20 mg/L in November 2012. Elevated concentrations are observed only onsite and immediately downgradient of the site, as has been the case in past years.

The highest vanadium concentrations in surface water occurred in the most easterly wetland pond location RNF 0453 at 1.80 mg/L in November 2012. This location is frequently dry. Vanadium concentrations in the large gravel pit pond locations farther west were in the 0.002 mg/L to 0.006 mg/L range.

### **3.2.2.3 Institutional Controls Monitoring**

During regular groundwater sampling events, changes in land use at and downgradient of the New Rifle site were observed and recorded in trip reports. During CY 2012, DOE was in communication with property owners and various users of City-owned property regarding, among other topics, potential construction. These discussions included meetings with the City of Rifle about infrastructure improvements along the northern and western side of the property; Williams Exploration and Production; the Western Colorado Research Center; and Cacaloco, a composting operation. The discussions covered the impacts that the parties' activities may have on the site groundwater geochemistry. Currently, the City has terminated the Cacaloco land use permit and is processing any remaining composting material. Little activity has occurred this year with the switch grass plot being grown by the Western Colorado Research Center.

DOE noted activities at the New Rifle processing site during the annual inspection of the disposal cell that occurred in June 2012. The City has completed installation of a water line along the northern and western side of the property and has paved an access road along part of this corridor. This construction supports planned business development in this area. The city manager is required in Ordinance 9 Series 2008 (the Uranium Mill Tailings Remedial Action Overlay Zone District), paragraph c, no. 8, to inform City officials about standard operating procedures, deed restrictions, and environmental covenants contained in the ordinance. A written confirmation was received by the Rifle site lead from the Rifle City Manager on this requirement.

### **3.2.3 Mann-Kendall Test for Trend for New Rifle**

Another method of data evaluation is the nonparametric Mann-Kendall test for trend (Gilbert 1987). See Appendix B of this document for this evaluation. The test does not require any particular data distribution and will accommodate missing values and data reported as less than the detection limit. Essentially, it analyzes a series of data by subtracting the values of data collected earlier from those of later data. The method results in a test statistic that is a positive or negative (indicating an increasing or decreasing trend) and is used to estimate the probability that the trend is real.

As a preliminary analysis, several wells from the New Rifle site were selected for application of the Mann-Kendall test based on their locations with respect to the uranium and molybdenum plumes. The test was applied to uranium and molybdenum concentrations because these COCs are the most widespread and the most mobile. Additionally, they are not affected by geochemical transformation processes, as are ammonia and nitrate. Wells RFN-0664 and RFN-0669 are from two onsite locations near the original plume source areas (raffinate ponds and tailings piles). Well RFN-0201 is immediately downgradient of the site and upgradient of the Roaring Fork ponds; well RFN-0195 is immediately downgradient of the ponds.

Onsite well RFN-0664 shows a strongly decreasing trend (at the 95 percent confidence level) for uranium and molybdenum. Onsite well RFN-0669 shows a strongly decreasing trend for molybdenum (at the 95 percent confidence level) and a lesser downward trend (at the 90 percent confidence level) for uranium. Downgradient wells RFN-0201 and RFN-0195 show strongly decreasing trends for uranium and molybdenum (at the 95 percent confidence level). These results suggest that natural attenuation for these two COCs is progressing at these locations and that the main portions of the uranium and molybdenum plumes are moving offsite into the adjacent downgradient area.

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## 4.0 Results and Conclusions

Concentrations of vanadium at the Old Rifle site continue to decrease, except for a minor increase in RFO-305; selenium concentrations, which had been increasing during 2010 and into 2011, resumed their overall decreasing trend. Uranium concentrations continue to display no consistent trends and have not declined since 1998. The modeling results from 1998 indicated that uranium would meet its groundwater standard across the site within 10 years; this has not been achieved. All wells except RFO-0309 exceed the uranium MCL of 0.044 mg/L or the maximum background concentration of 0.067 mg/L. The vanadium benchmark of 0.33 mg/L is currently exceeded at one well; no wells currently exceed the selenium benchmark of 0.05 mg/L. Selenium and vanadium compliance goals have been met based on the site-wide averages. Time-concentrations plots in Appendix A-1 indicate that these two COCs, uranium and vanadium, have been relatively stable in Old Rifle wells for the last few years of monitoring.

Contaminant plumes for a number of COCs associated with the New Rifle site have been decreasing in general and moving downgradient over time. The only significant COCs in terms of concentration and distribution are molybdenum, nitrate, uranium, and vanadium. The highest concentrations over the last few years for nitrate and uranium were detected downgradient of the site. Overall, nitrate concentrations, which had been increasing in response to ammonia degradation, have been declining since 2007. The uranium standard was exceeded over the entire extent of the alluvial aquifer, although it is not clear if all contamination is site-related in the far western wells. Concentrations appear to be nearly constant for most downgradient wells; an exception is RFN-0195, which has decreased steadily from 0.17 mg/L in 2005 to a mean of 0.019 in 2012. The highest concentrations of molybdenum were found downgradient, especially in the ponds; the highest vanadium concentrations remain onsite. Significant fluctuations in molybdenum, vanadium, and uranium were noted in several onsite wells over the last few sampling rounds, due to the City of Rifle's dewatering activities on the eastern part of the site. These fluctuations appear to be stabilizing with the cessation of dewatering.

With the number of variables that can affect the distribution of contaminants in the alluvial aquifer at New Rifle, it may be too early to determine the effectiveness of natural attenuation at the site. However, data collected for the site indicated that some COCs were decreasing, but others were not attenuating. Some individual wells may display increasing concentrations for certain COCs, but this is to be expected as the plume centers migrate downgradient away from the site. On the basis of combined spatial and temporal data, plume centers for nitrate and uranium appear to have already moved offsite, but they remain within the IC boundary and continue to dissipate downgradient. Highest concentrations of molybdenum were both onsite and offsite in the ponds. Portions of the molybdenum and uranium plumes downgradient of the former gravel ponds seem to have dissipated; however, elevated upgradient concentrations could eventually recontaminate these areas as they move downgradient. Arsenic and selenium displayed little mobility and will probably remain confined to site groundwater. Vanadium, also relatively immobile, has migrated offsite, but only to a very limited degree.

Neither the Old Rifle site's nor the New Rifle site's groundwater discharge was affecting surface water quality of the Colorado River. ICs are effectively preventing inappropriate use of groundwater. Presently, the selected compliance strategies at both sites appear to be adequately protective. However, because the natural attenuation of uranium in groundwater at the Old Rifle processing site is not decreasing as modeling predicted, DOE, in consultation with CDPHE, has prepared a revised GCAP (DOE 2013b). Additionally, because COCs at the New Rifle processing site are consistently appearing in concentrations above MCLs in downgradient gravel pit ponds and other trends do not show predicted decreases, the GCAP for New Rifle was also revised in 2013 (DOE 2013a).

## 5.0 References

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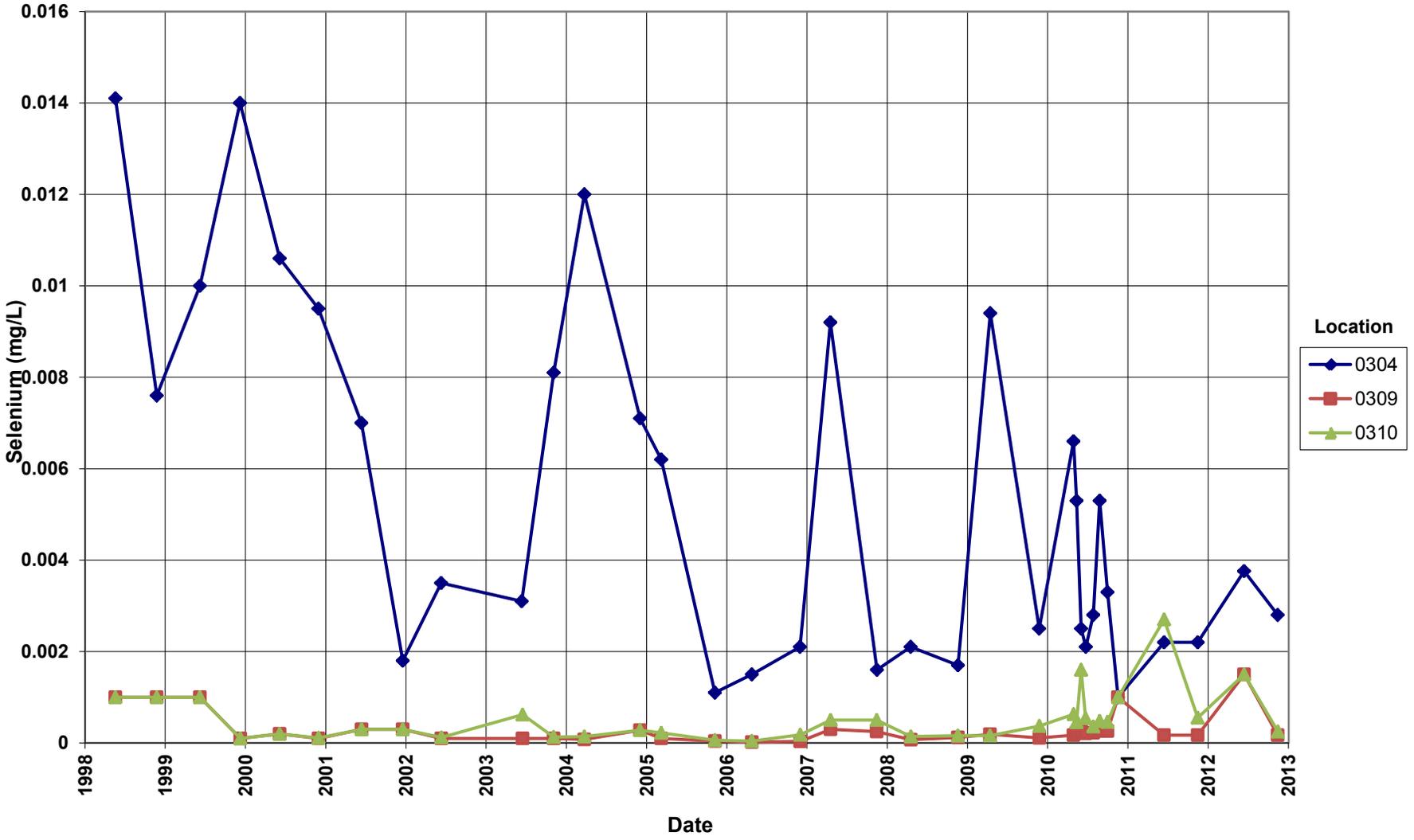
Hollander, M., and D.A. Wolfe, 1973. *Nonparametric Statistical Methods*, Wiley, New York.

## **Appendix A-1**

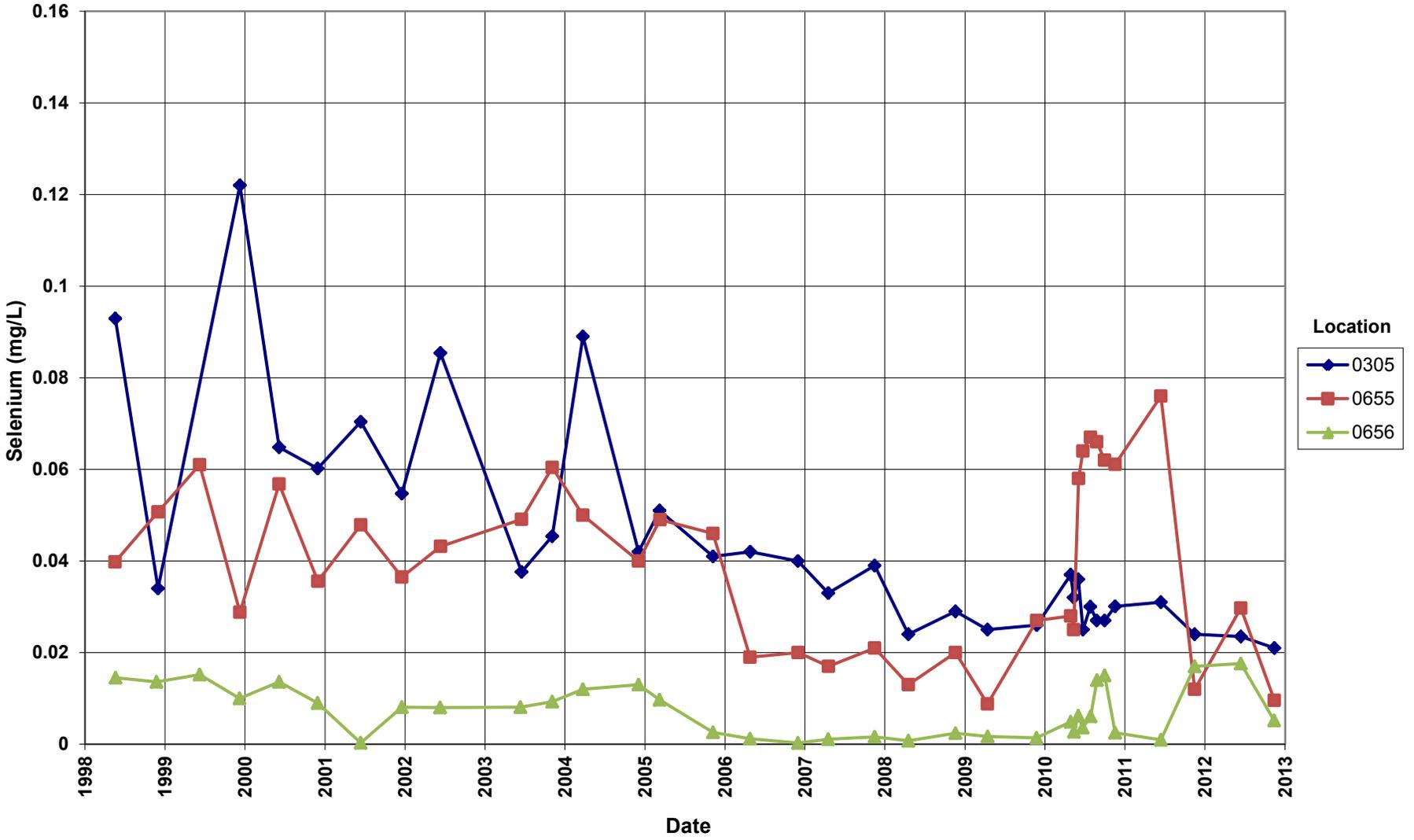
### **Time-Concentration Plots for Wells at the Old Rifle Site**

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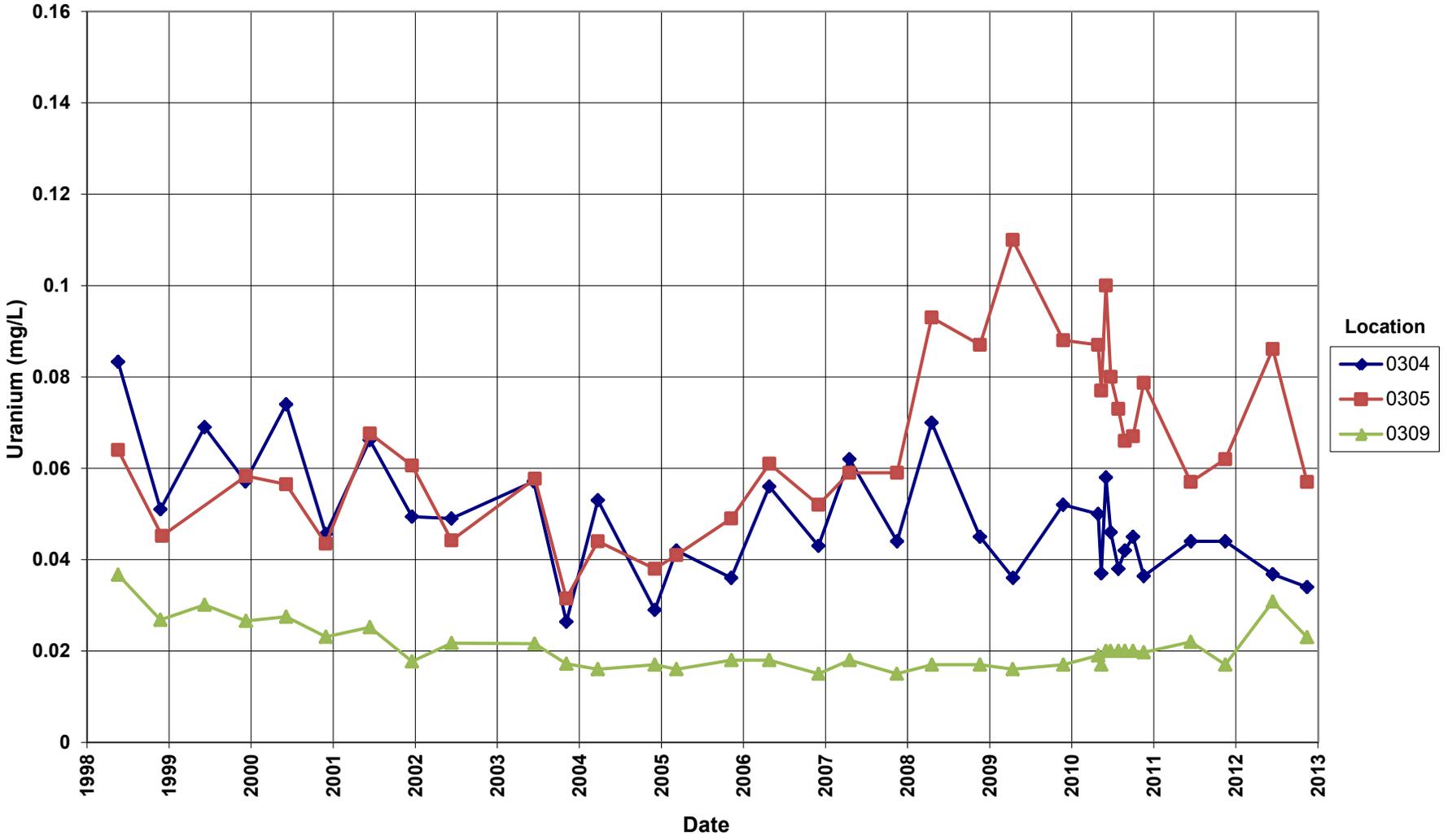
# Rifle Old Processing Site Selenium Concentration



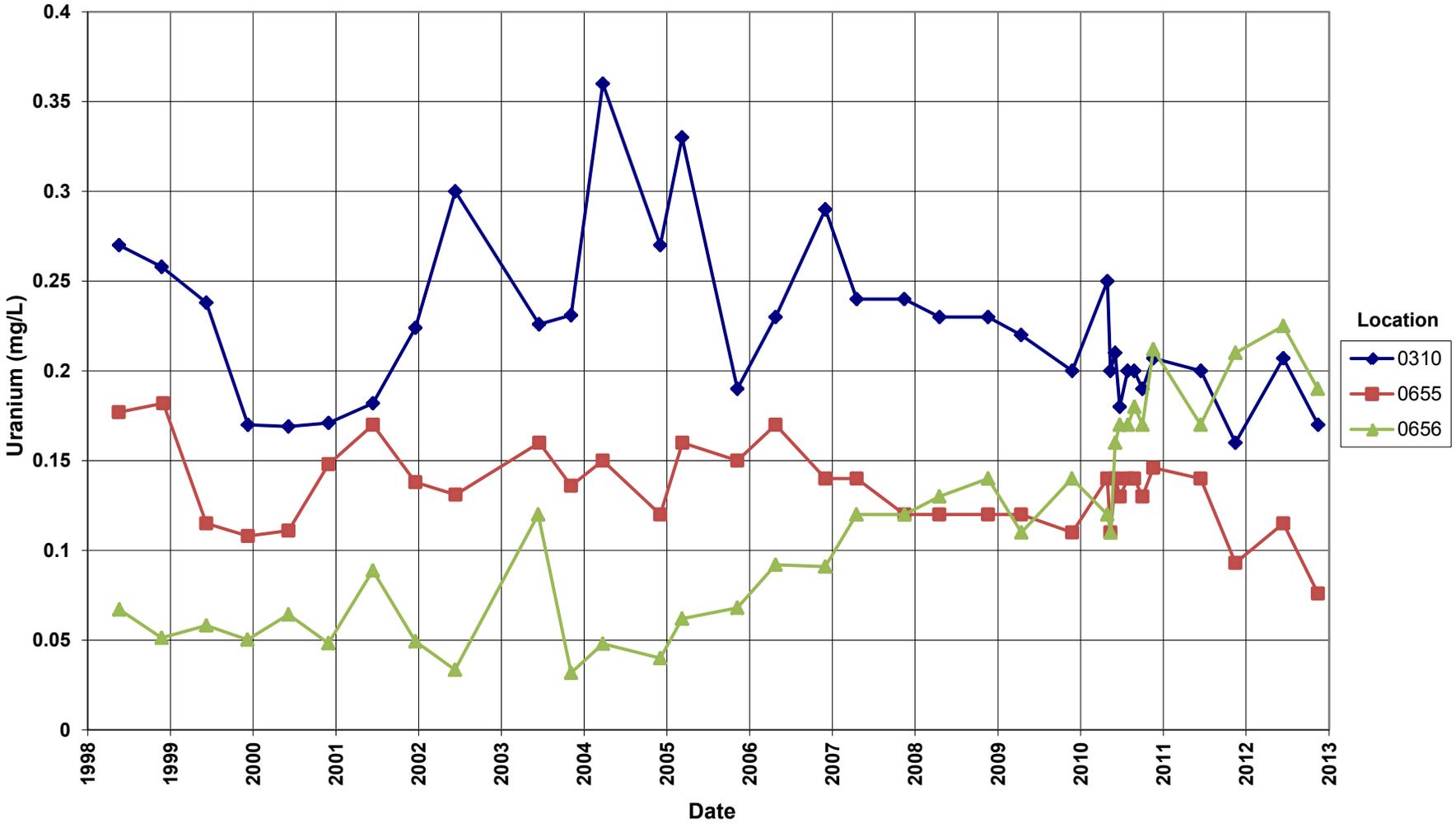
# Rifle Old Processing Site Selenium Concentration



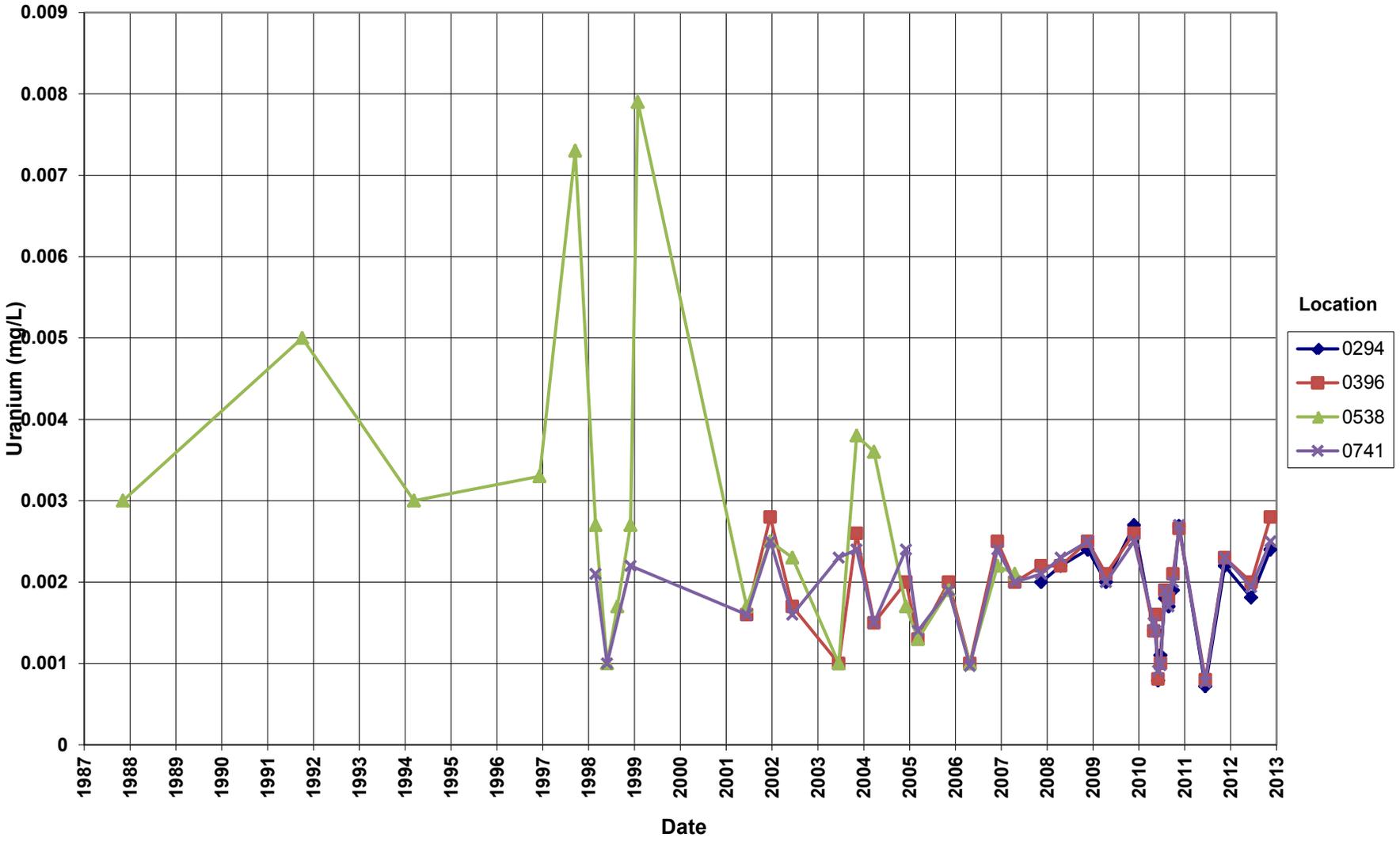
# Rifle Old Processing Site Uranium Concentration



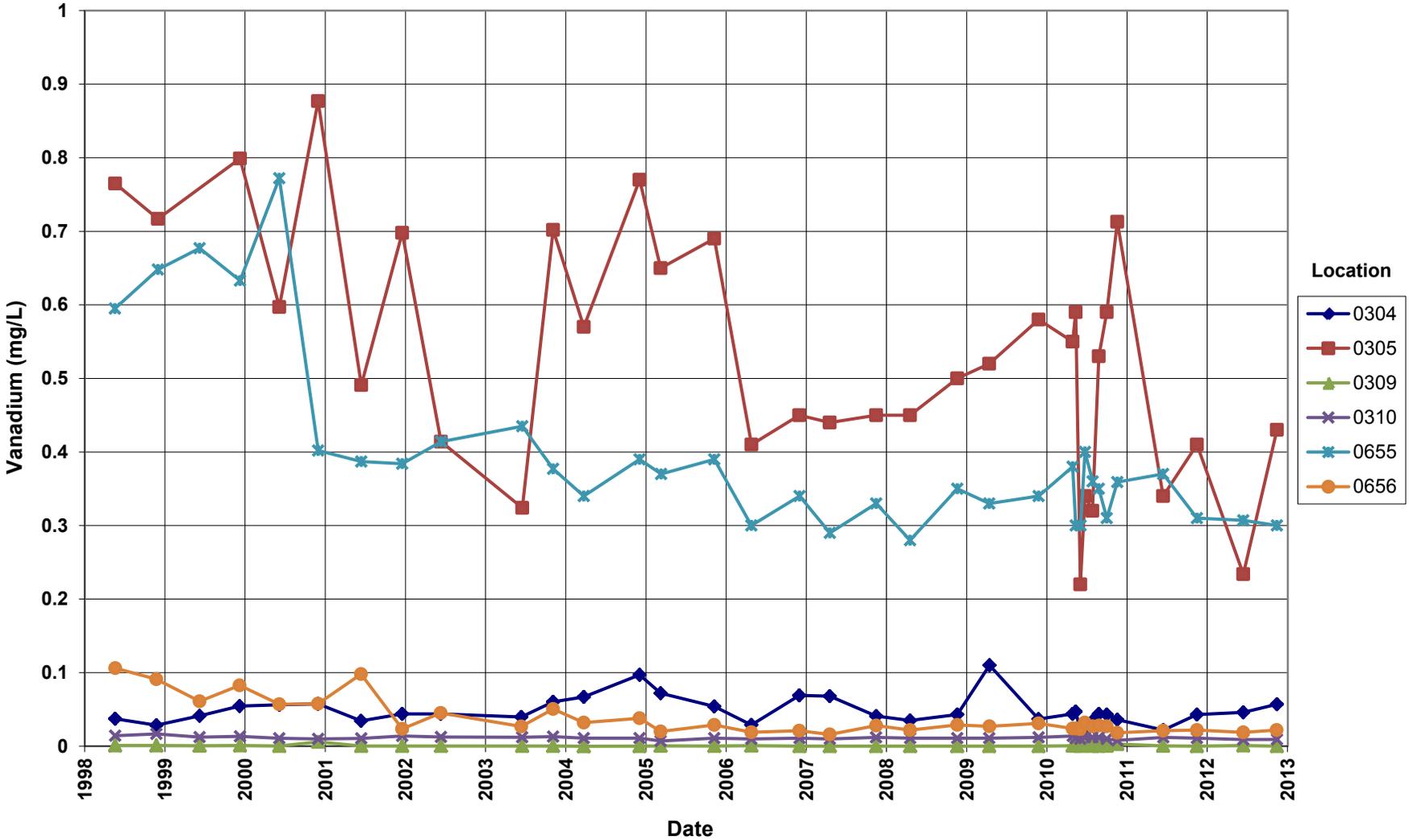
# Rifle Old Processing Site Uranium Concentration



# Rifle Old Processing Site Uranium Concentration



## Rifle Old Processing Site Vanadium Concentration

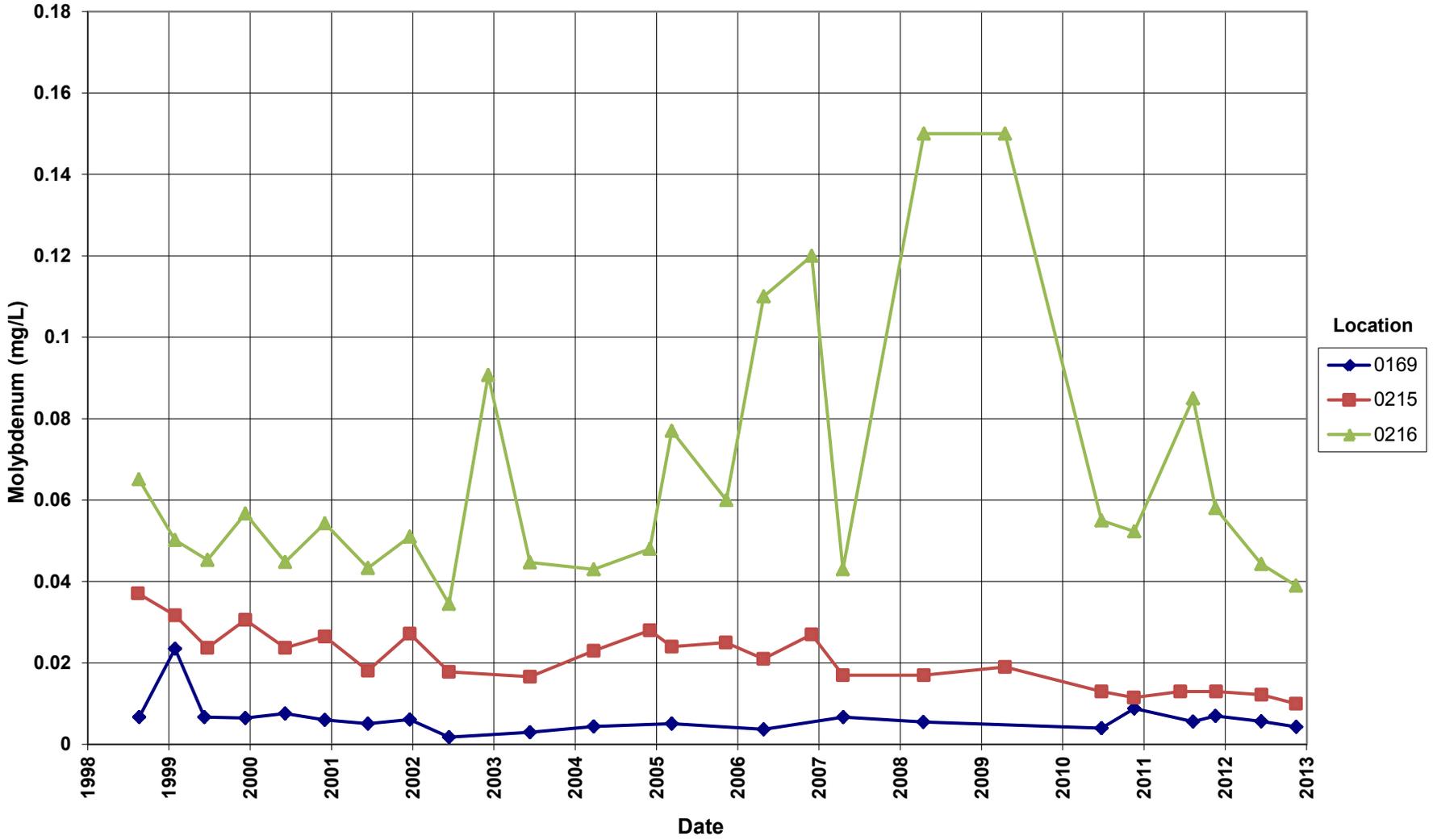


## **Appendix A-2**

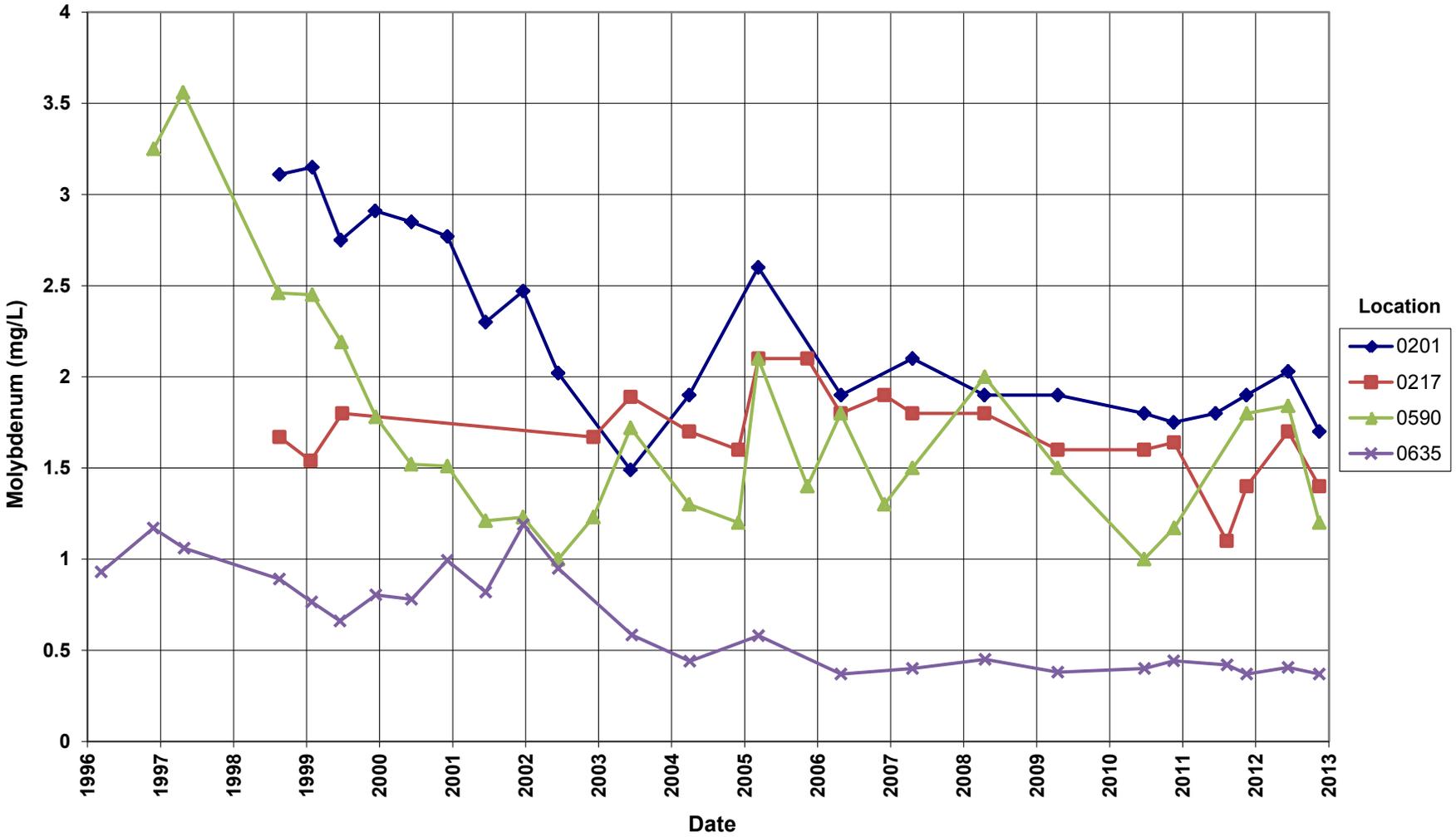
### **Time-Concentration Plots for Wells at the New Rifle Site**

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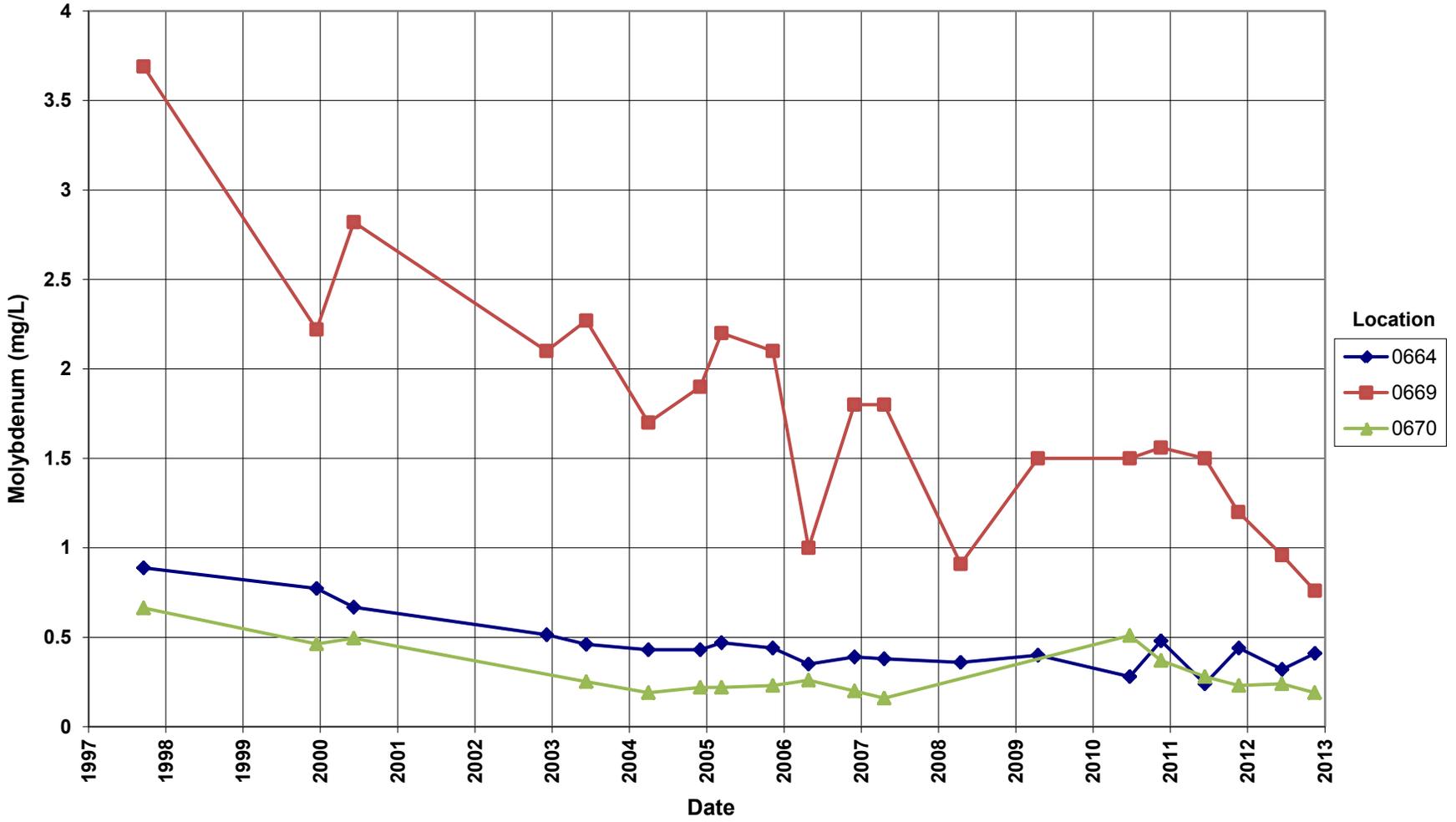
# Rifle New Processing Site Molybdenum Concentration



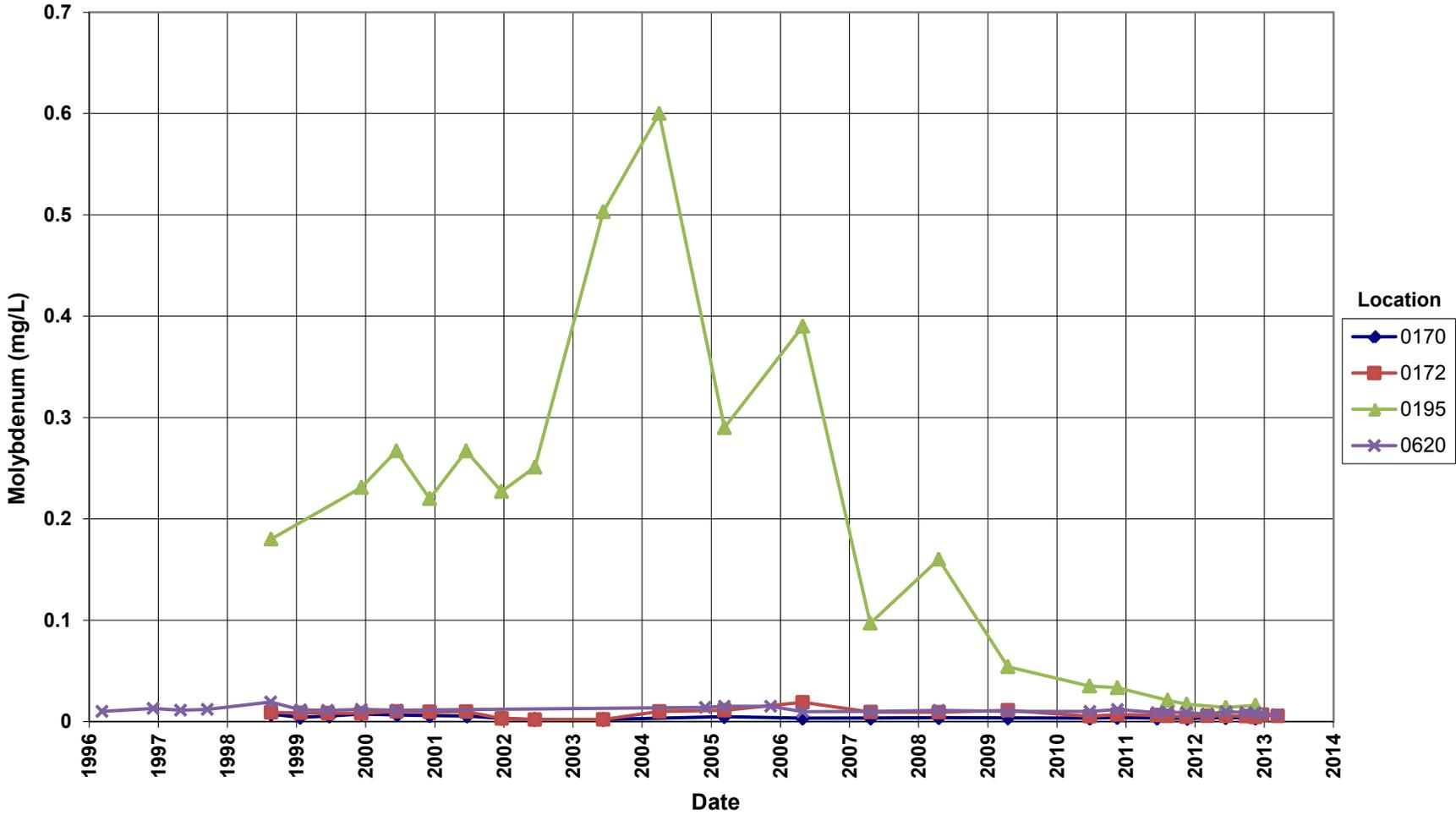
## Rifle New Processing Site Molybdenum Concentration



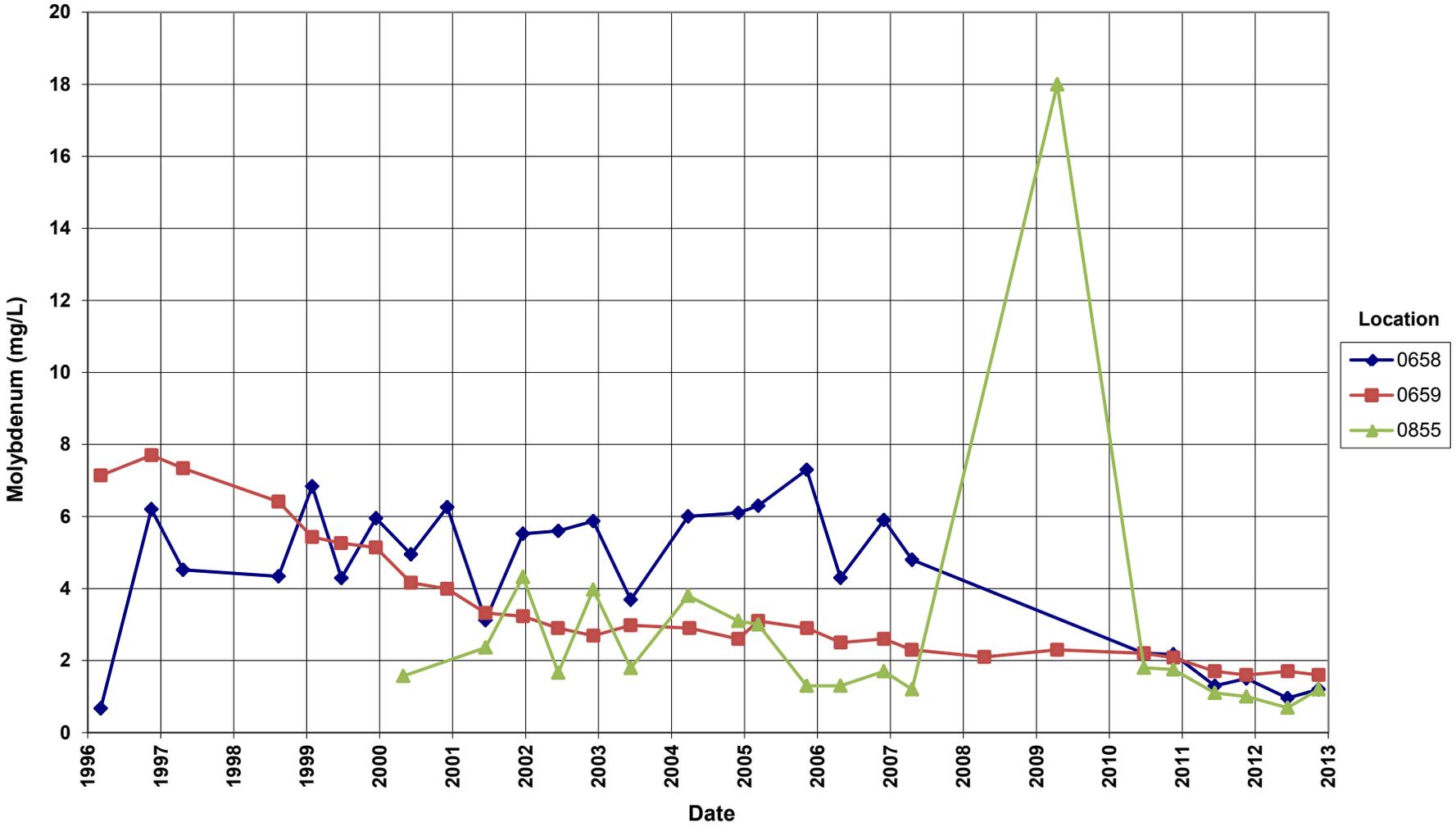
# Rifle New Processing Site Molybdenum Concentration



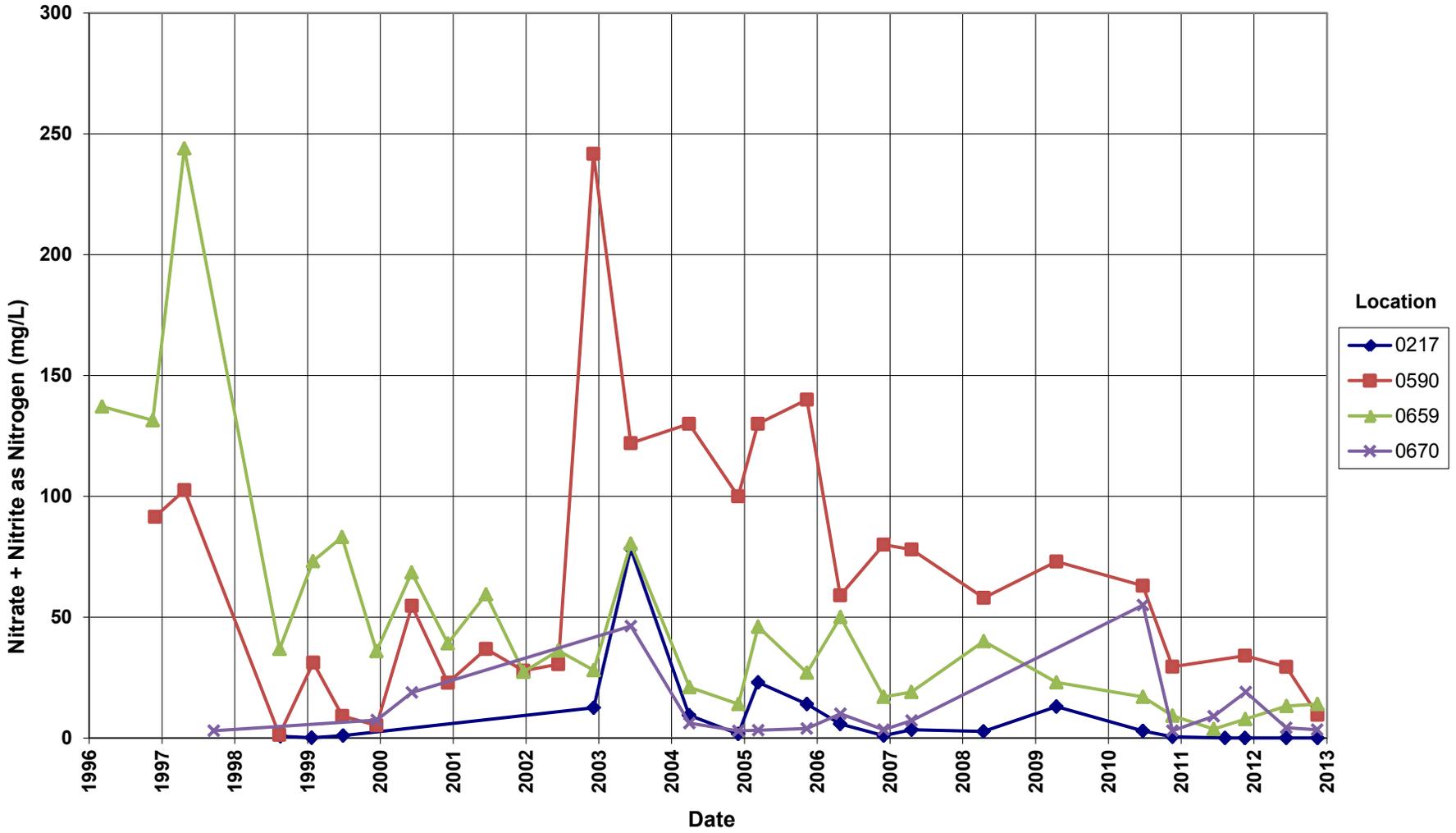
# Rifle New Processing Site Molybdenum Concentration



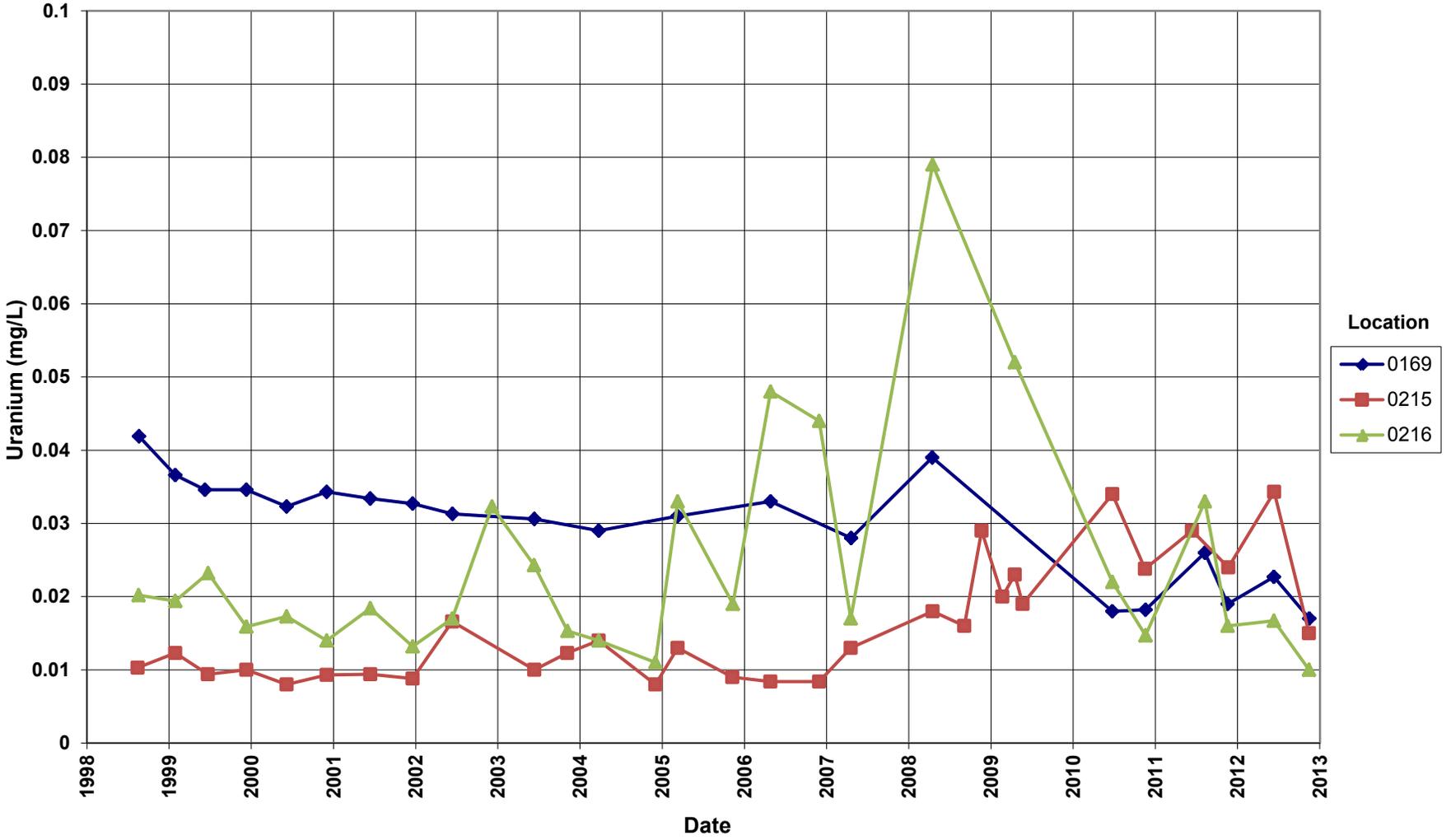
# Rifle New Processing Site Molybdenum Concentration



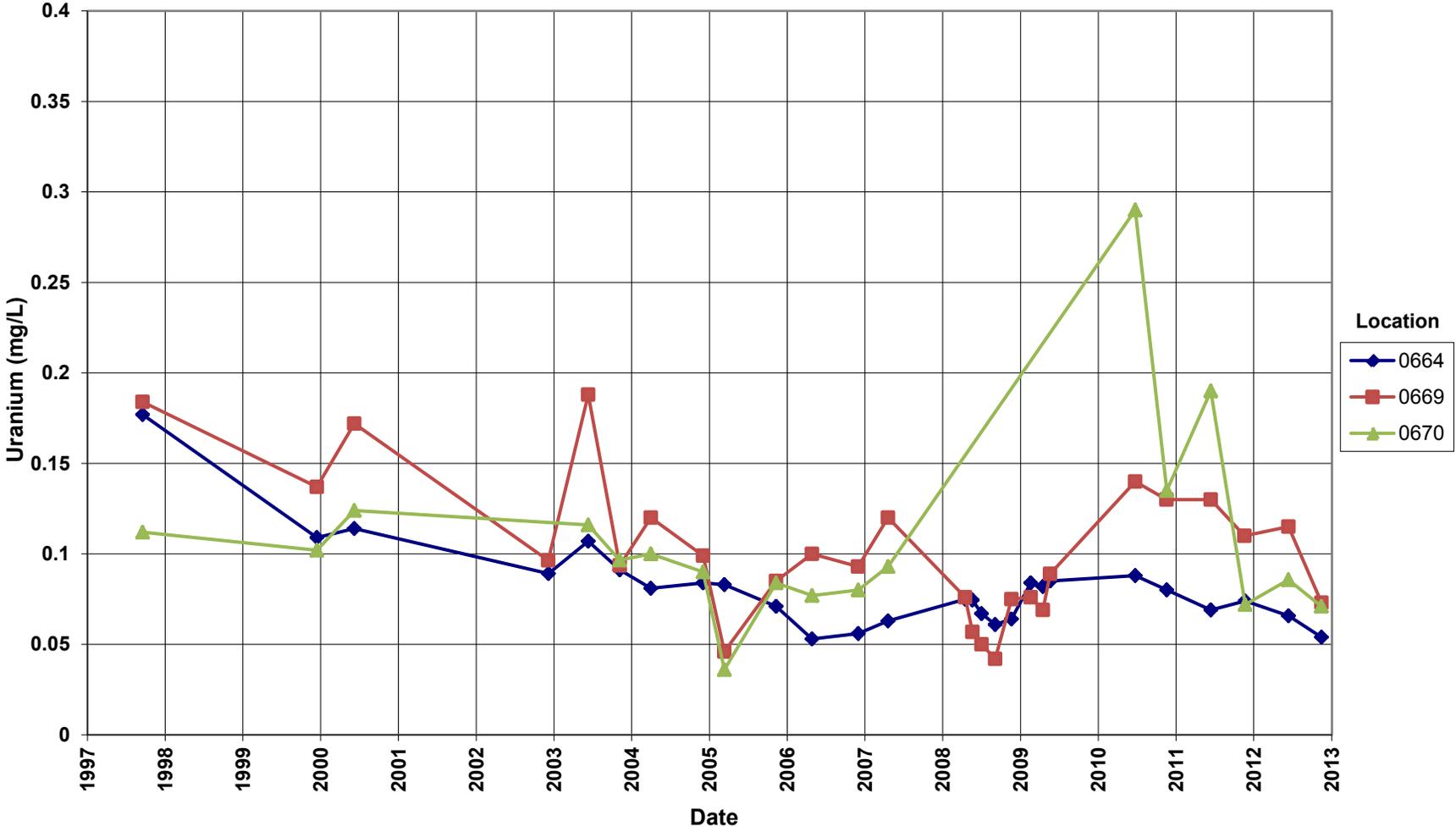
## Rifle New Processing Site Nitrate + Nitrite as Nitrogen Concentration



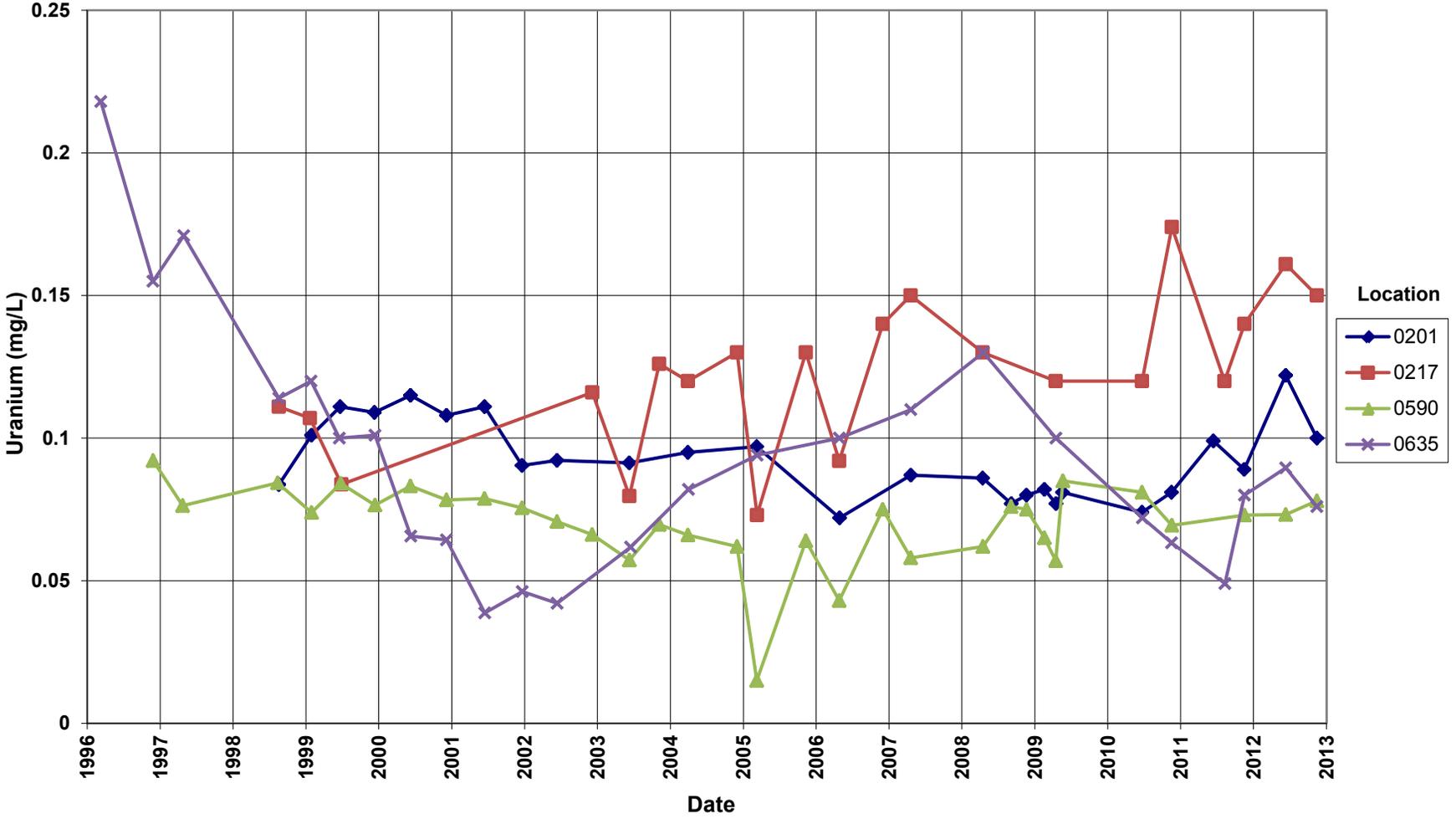
# Rifle New Processing Site Uranium Concentration



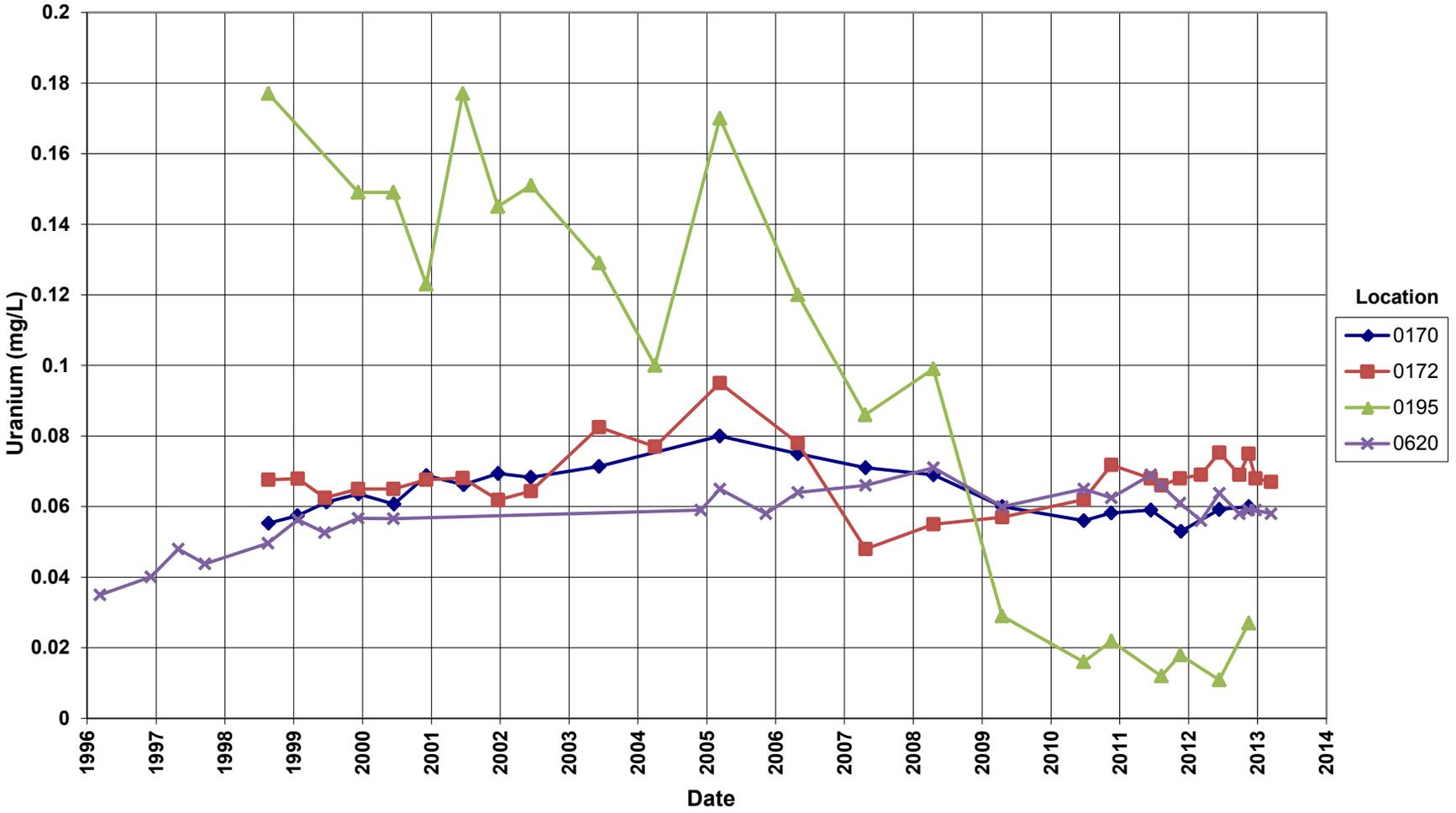
# Rifle New Processing Site Uranium Concentration



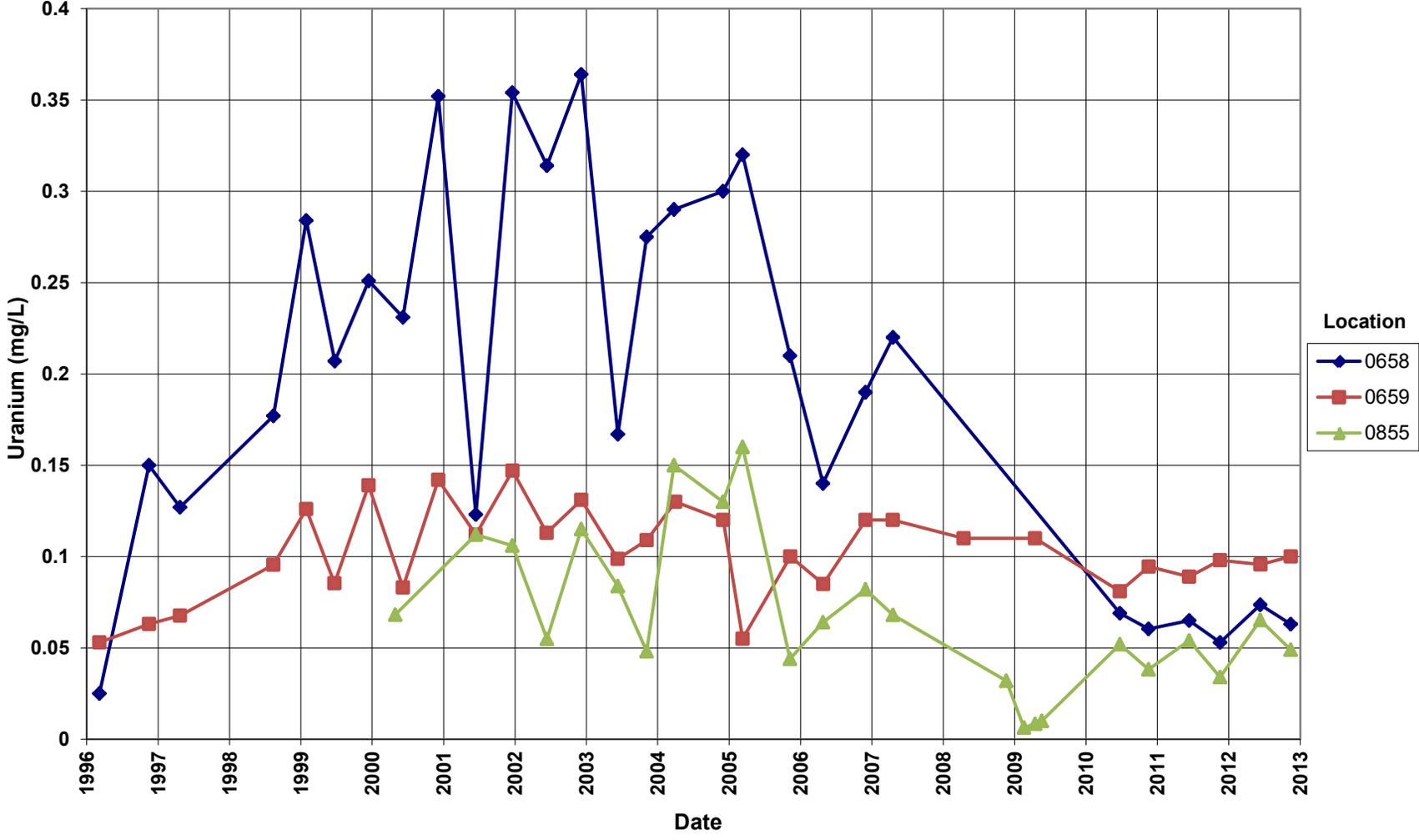
# Rifle New Processing Site Uranium Concentration



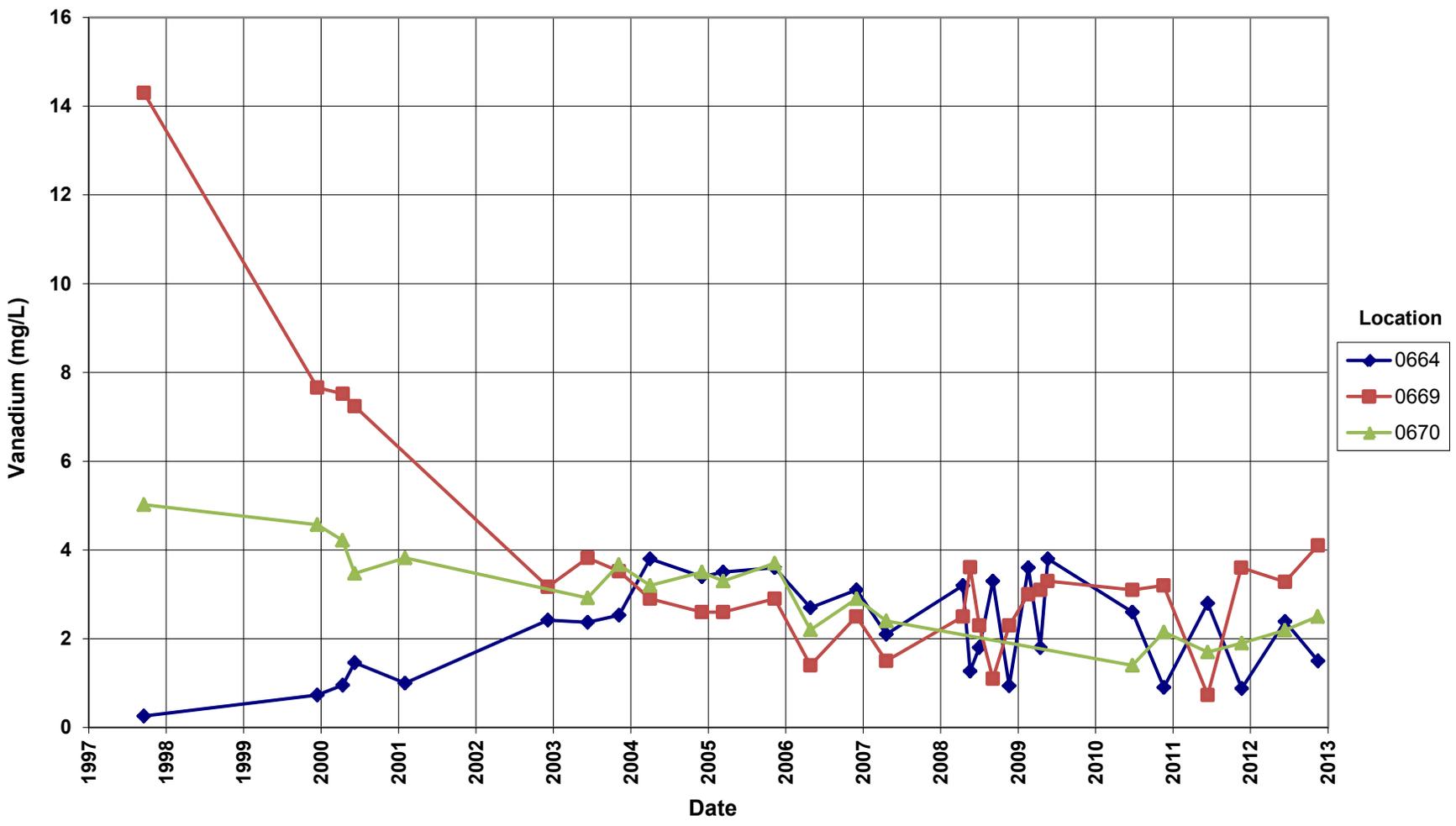
# Rifle New Processing Site Uranium Concentration



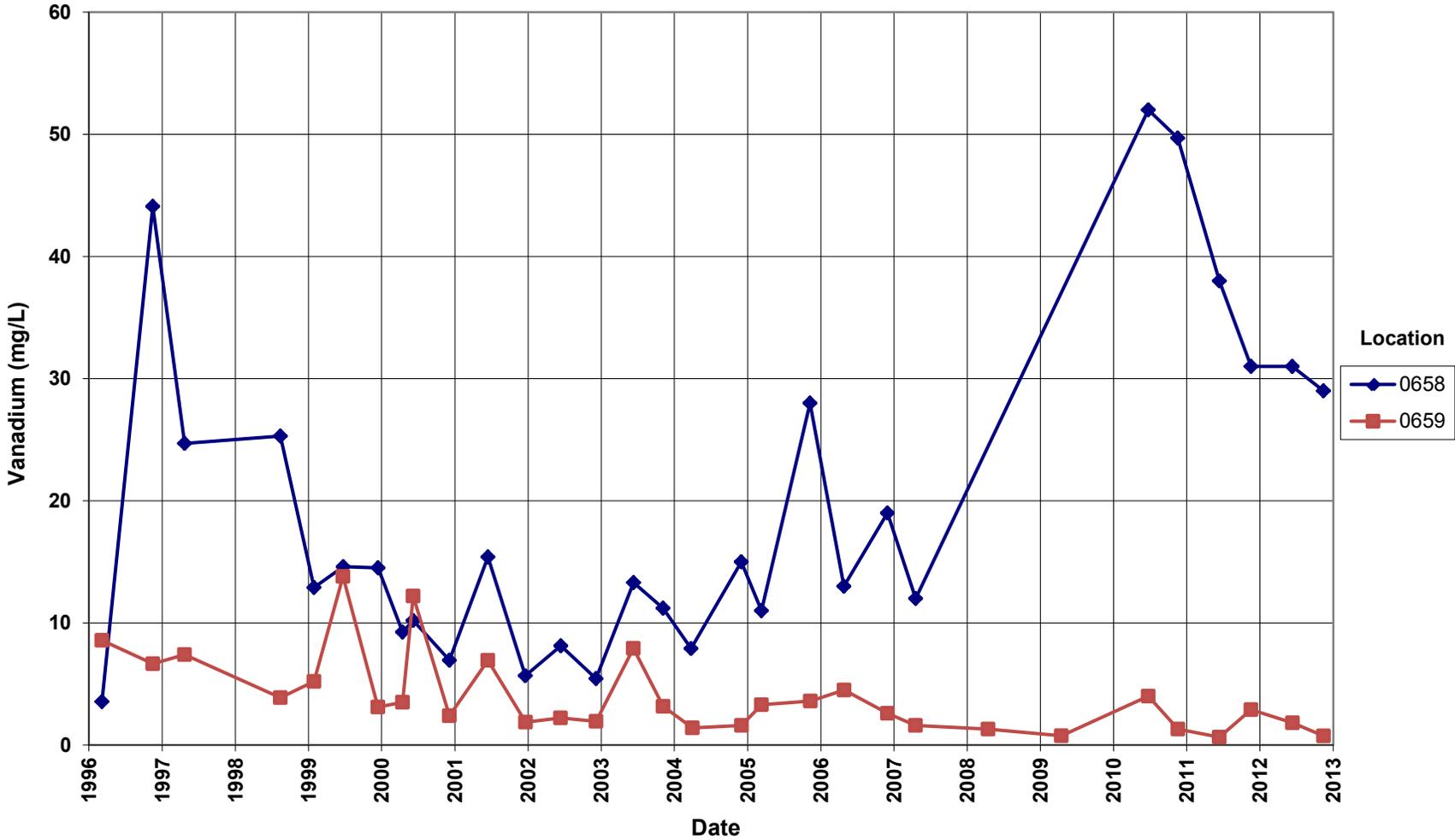
# Rifle New Processing Site Uranium Concentration



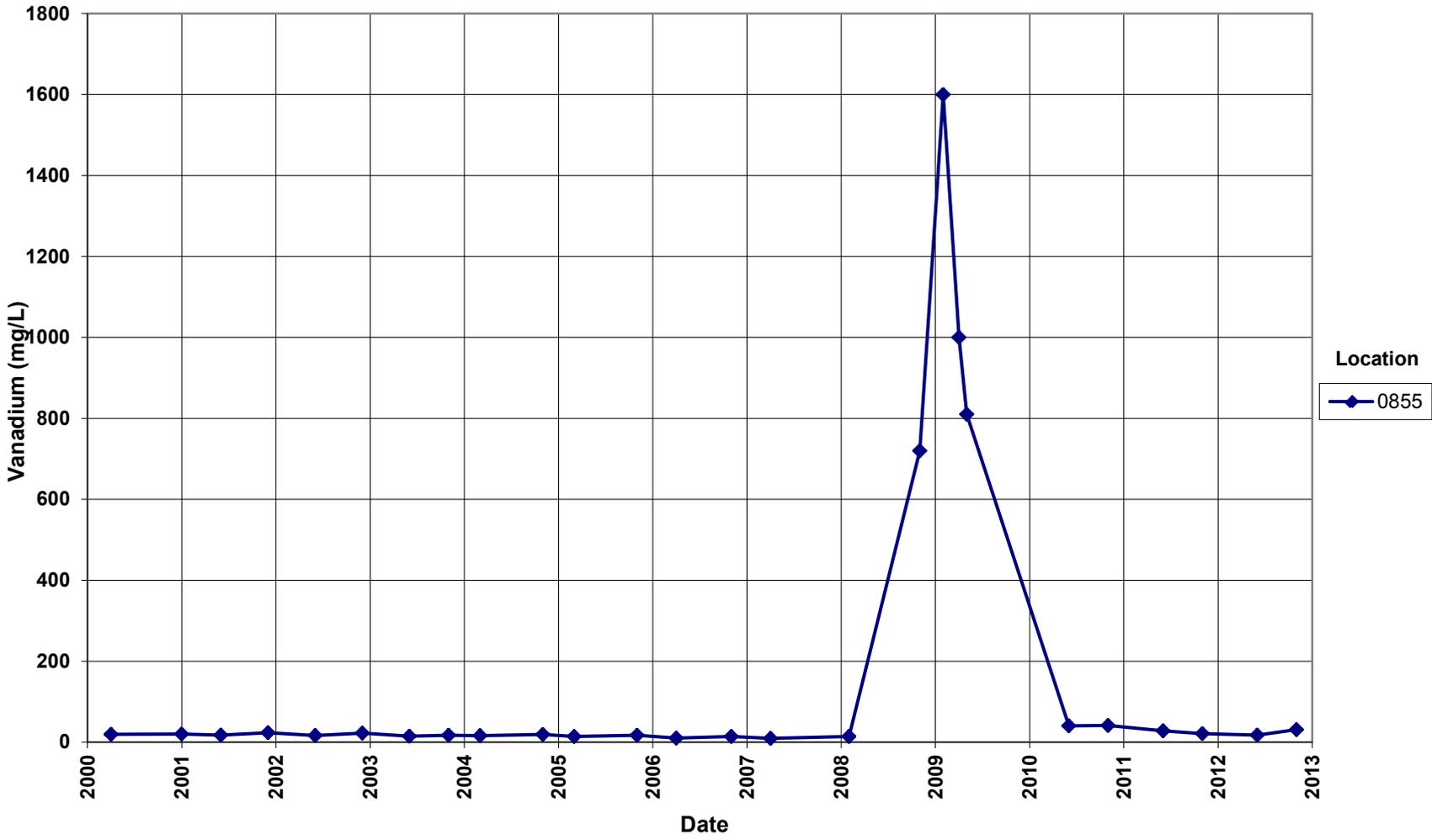
# Rifle New Processing Site Vanadium Concentration



### Rifle New Processing Site Vanadium Concentration



# Rifle New Processing Site Vanadium Concentration

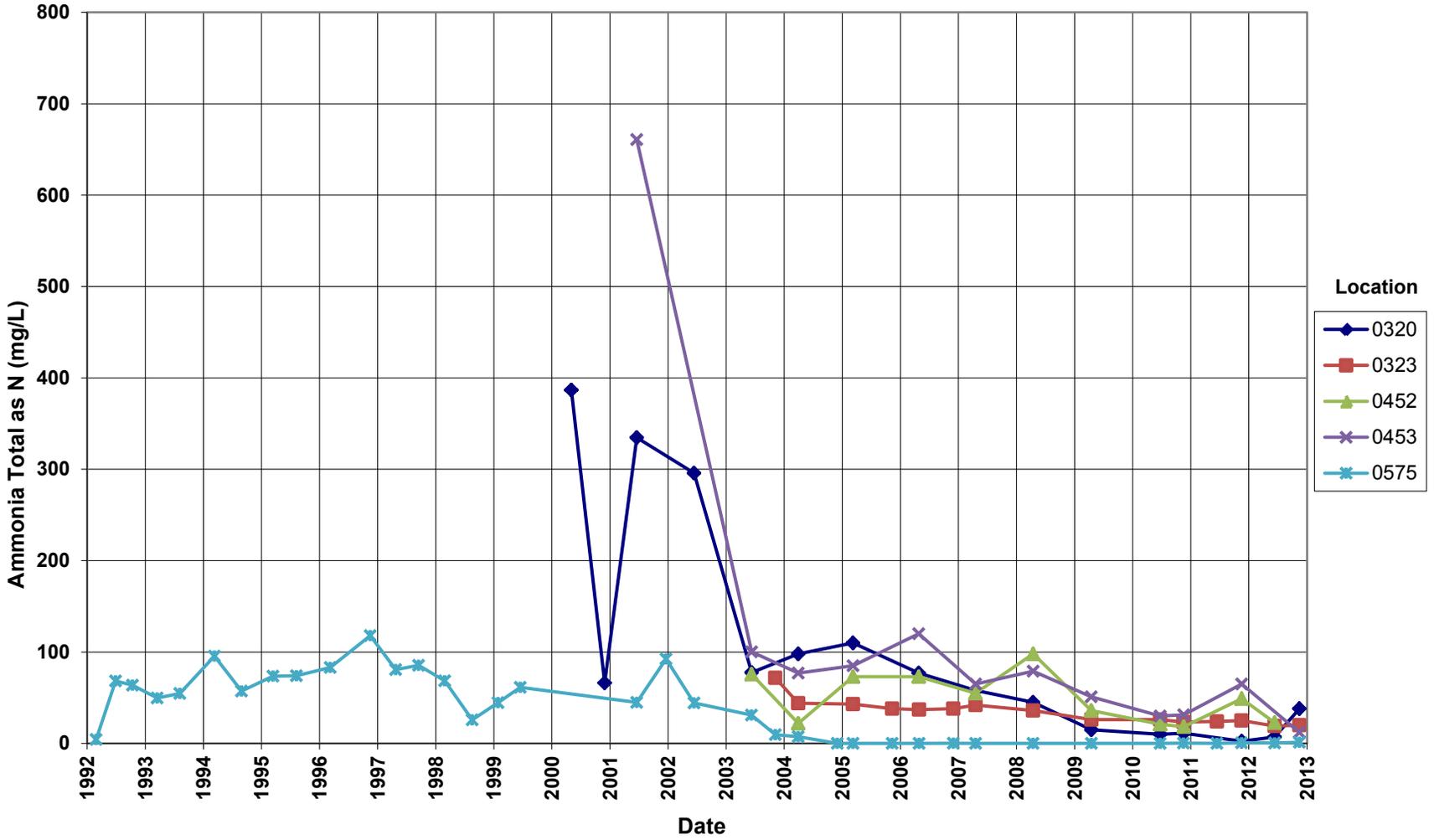


**Appendix A-3**

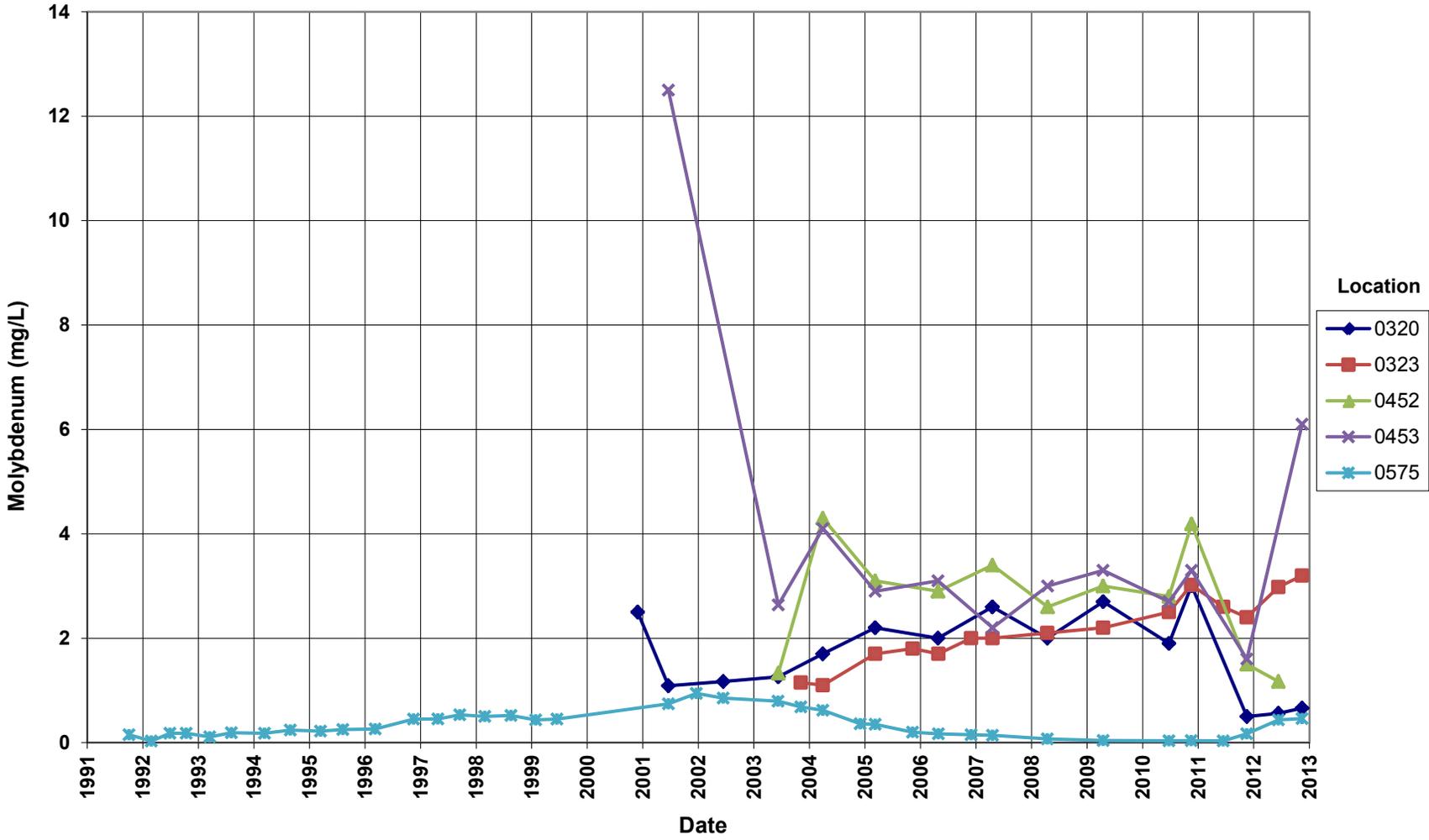
**New Rifle Ponds**

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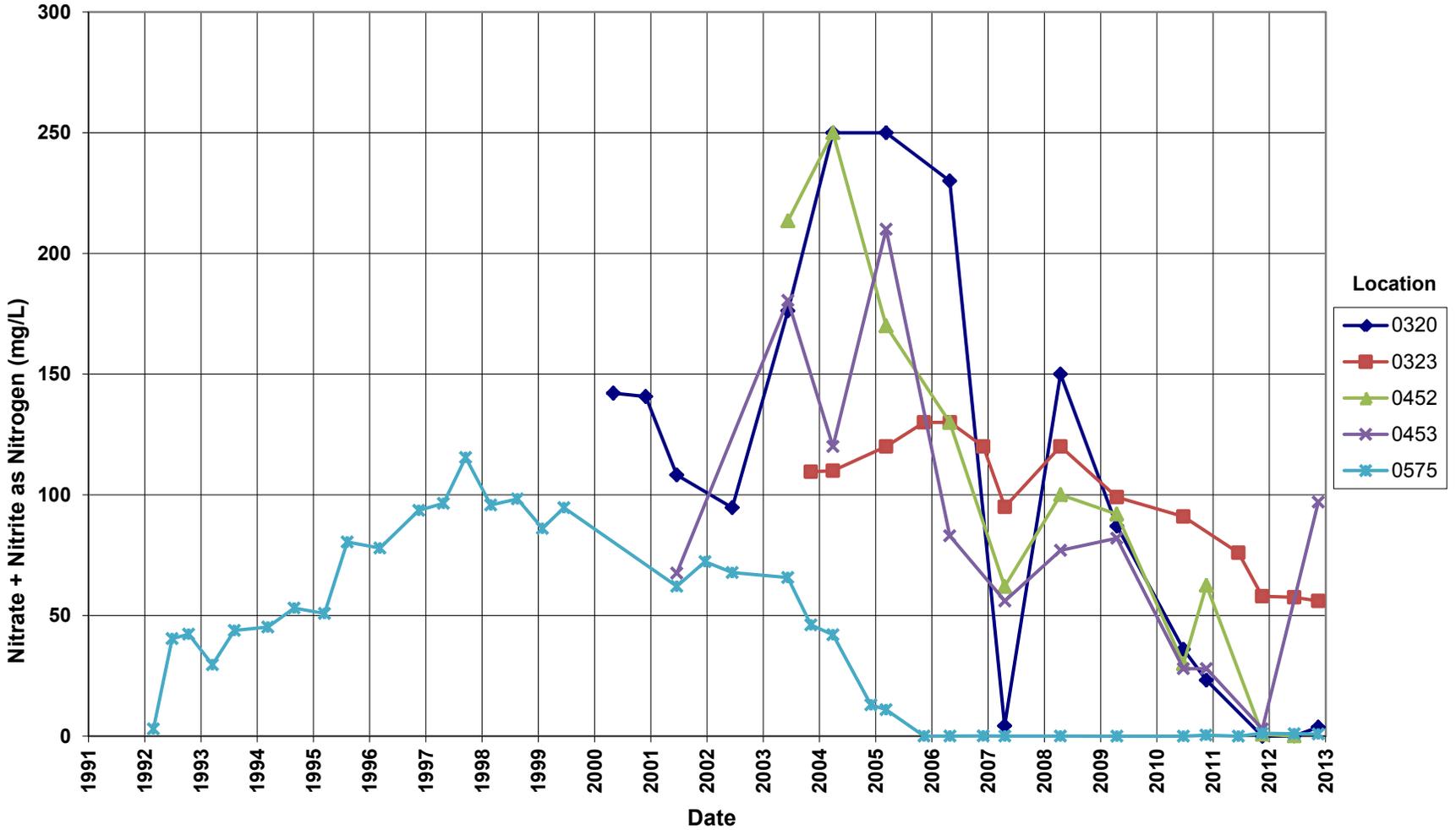
## Rifle New Processing Site Ammonia Total as N Concentration



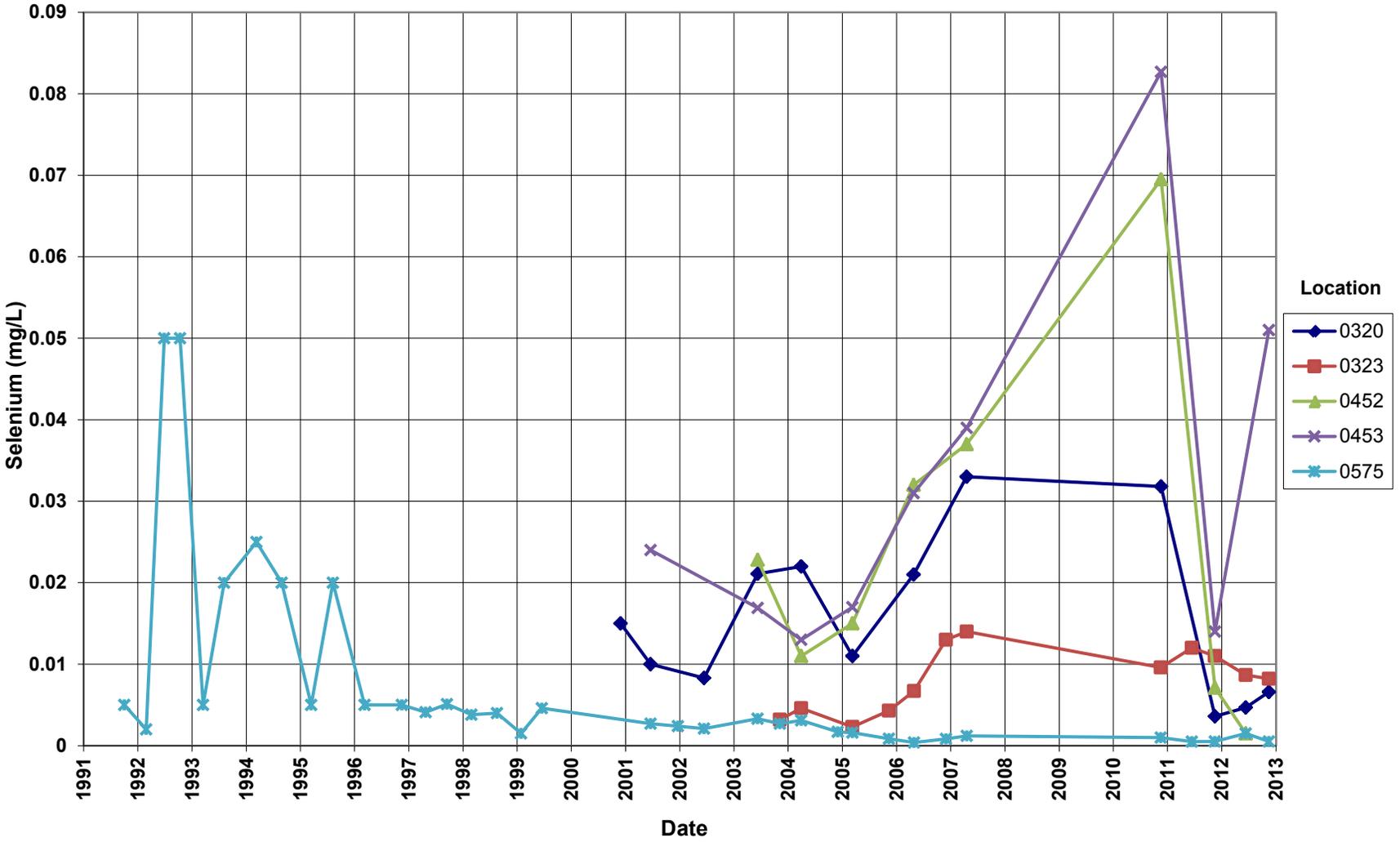
# Rifle New Processing Site Molybdenum Concentration



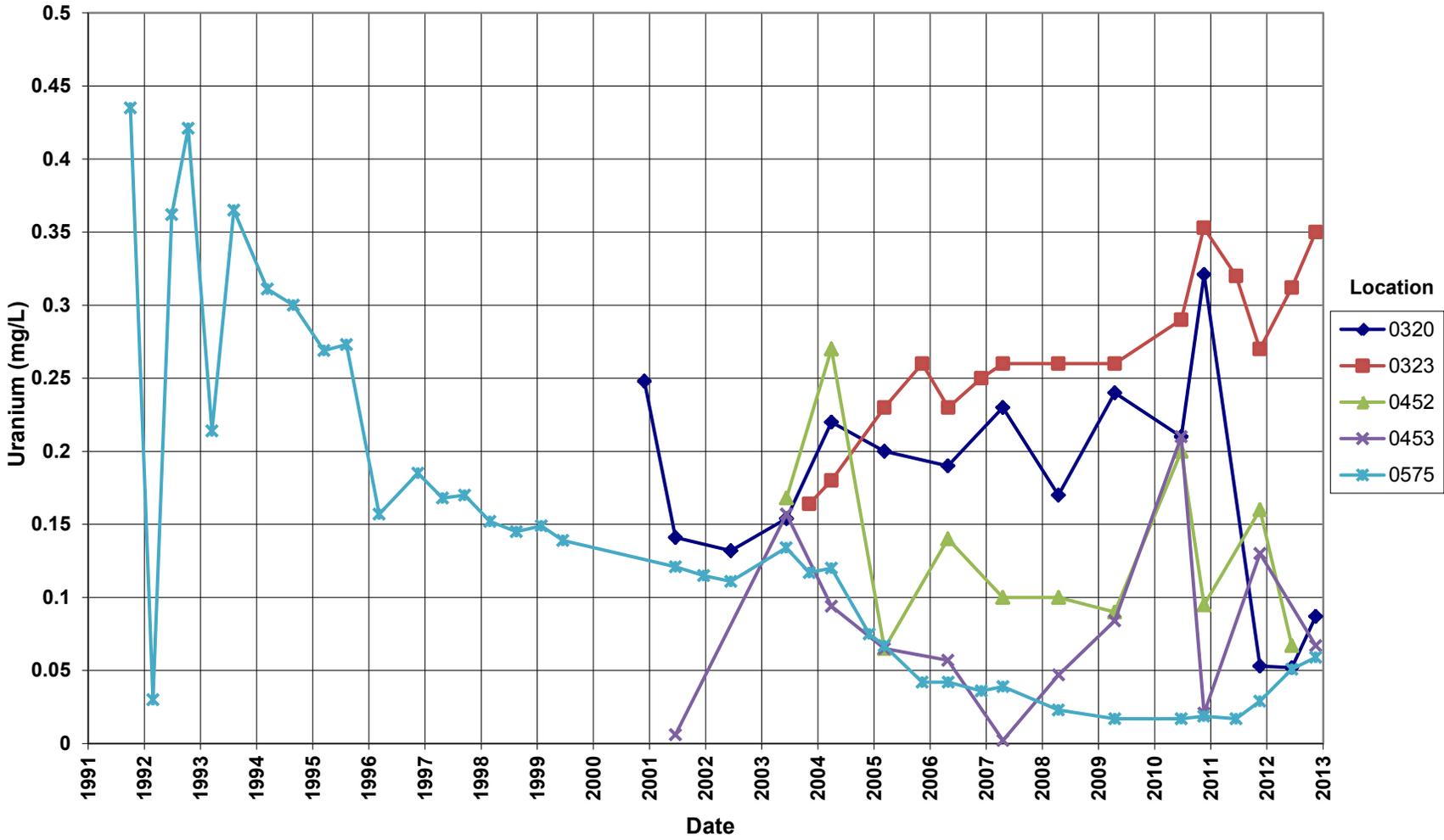
## Rifle New Processing Site Nitrate + Nitrite as Nitrogen Concentration



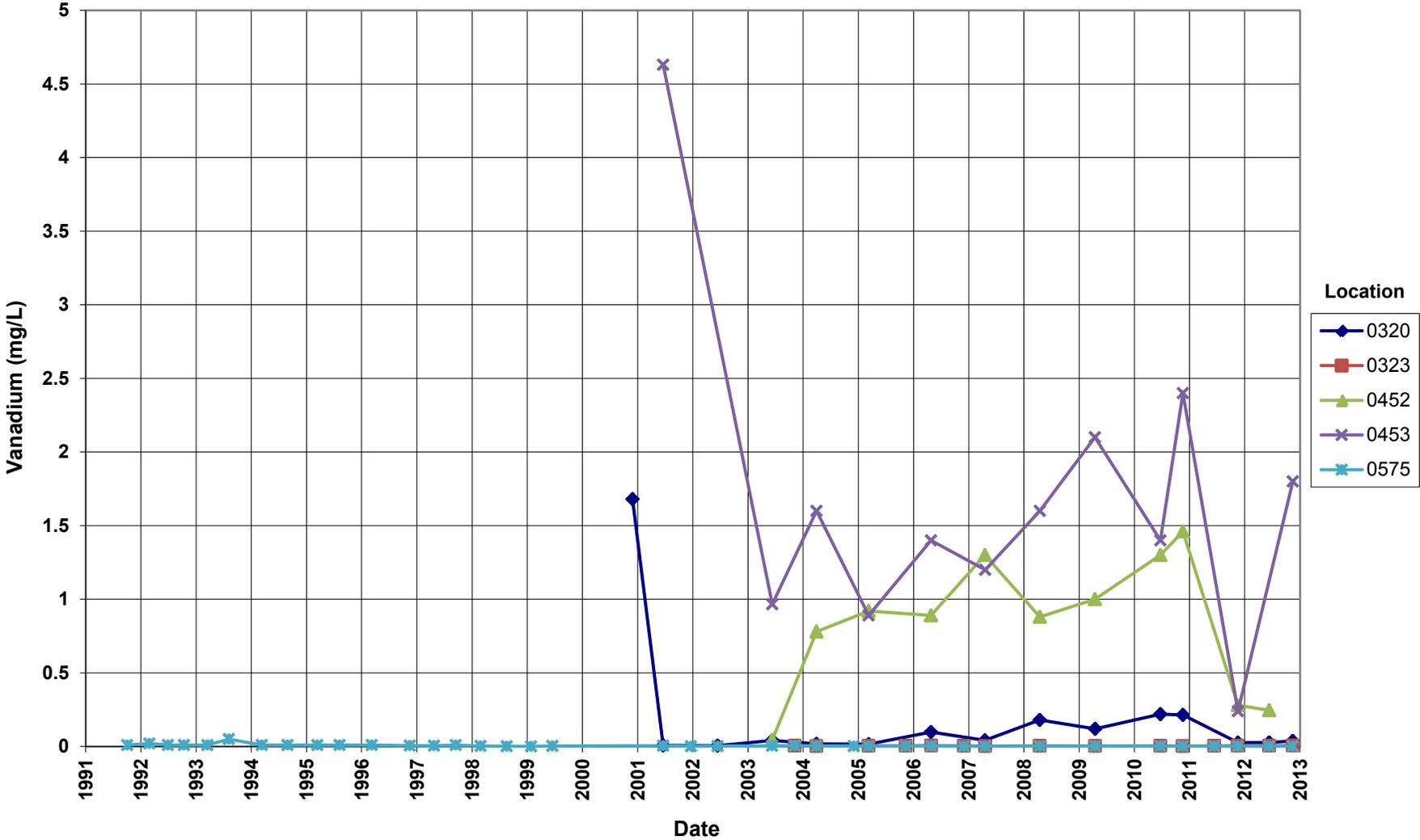
## Rifle New Processing Site Selenium Concentration



## Rifle New Processing Site Uranium Concentration



# Rifle New Processing Site Vanadium Concentration



## **Appendix B**

### **Application of the Mann-Kendall Test to New Rifle Monitoring Data**

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The Visual Sample Plan (VSP) computer module used for the trend analysis is the nonparametric Mann-Kendall test for trend (Gilbert 1987). In this procedure, missing values are allowed, and the data need not conform to any particular distribution. In this Mann-Kendall test, only the relative magnitudes of the data, rather than the measured values, are used.

A one-tailed test is used because it is desired to test the null hypothesis,  $H_0$ , of no trend against the alternative hypothesis,  $H_A$ , of a downward trend. If no trend is detected, then it is desired to test the null hypothesis,  $H_0$ , of no trend against the alternative hypothesis,  $H_A$ , of an upward trend.

Alpha ( $\alpha$ ) is often called the level of significance. It is also referred to as a Type I error. For  $\alpha = .05$ , this would be a 5 percent probability of rejecting the null hypothesis when the null hypothesis is true (i.e., there is a 5 percent probability of concluding there is a trend when no trend is present). In table format, the Type I and Type II errors can be expressed as shown in Table B-1.

*Table B-1. Type I and Type II Errors*

	<b>Hypothesis is correct</b>	<b>Hypothesis is incorrect</b>
Hypothesis is accepted	Correct decision	Type II error ( $\beta$ )
Hypothesis is rejected	Type I error ( $\alpha$ )	Correct decision

Table A18 (Gilbert 1987) gives probability values only for  $n$  less than or equal to 10. An extension of this table up to  $n = 40$  is given in Table A.21 in Hollander and Wolfe (1973) and has been incorporated into the VSP.

The VSP module was used to analyze monitoring data collected from four wells at the New Rifle site. Results are based on data collected since surface remediation was completed in 1998. Data for both uranium and molybdenum were used in the analysis. Table B-2 summarizes the results. All trends are down at the 5% level of significance ( $\alpha = 0.05$ ) except uranium at location RFN-0669. The trend for uranium at location RFN-0669 is down at the 10% level of significance ( $\alpha = 0.10$ ).

*Table B-2. Summary of Mann-Kendall Test Results for Selected Wells at the New Rifle Site*

<b>Location</b>	<b>Uranium Trend</b>	<b>Alpha</b>	<b>Molybdenum Trend</b>	<b>Alpha</b>
RFN-0195	Down	5%	Down	5%
RFN-0201	Down	5%	Down	5%
RFN-0664	Down	5%	Down	5%
RFN-0669	None	5%	Down	5%
RFN-0669	Down	10%		

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## **Appendix C**

### **Groundwater and Surface Water Monitoring Results for CY 2012**

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**Surface Water Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Result	Qualifiers			Detection Limit
			Date	ID		Lab	Data	QA	
Alkalinity, Total (As CaCO3)	mg/L	0320	06/11/2012	N001	84			#	
Alkalinity, Total (As CaCO3)	mg/L	0320	11/14/2012	N001	125			#	
Alkalinity, Total (As CaCO3)	mg/L	0322	06/11/2012	N001	100			#	
Alkalinity, Total (As CaCO3)	mg/L	0322	11/14/2012	N001	72			#	
Alkalinity, Total (As CaCO3)	mg/L	0323	06/11/2012	N001	190			#	
Alkalinity, Total (As CaCO3)	mg/L	0323	11/14/2012	N001	165			#	
Alkalinity, Total (As CaCO3)	mg/L	0324	06/12/2012	N001	186			#	
Alkalinity, Total (As CaCO3)	mg/L	0324	11/14/2012	N001	145			#	
Alkalinity, Total (As CaCO3)	mg/L	0452	06/11/2012	N001	107			#	
Alkalinity, Total (As CaCO3)	mg/L	0453	11/14/2012	N001	70			#	
Alkalinity, Total (As CaCO3)	mg/L	0575	06/11/2012	N001	154			#	
Alkalinity, Total (As CaCO3)	mg/L	0575	11/14/2012	N001	100			#	
Ammonia Total as N	mg/L	0320	06/11/2012	N001	7.13			#	0.17
Ammonia Total as N	mg/L	0320	11/14/2012	N001	38			#	1
Ammonia Total as N	mg/L	0322	06/11/2012	N001	0.0811	J		#	0.017
Ammonia Total as N	mg/L	0322	11/14/2012	N001	0.21			#	0.1
Ammonia Total as N	mg/L	0323	06/11/2012	N001	19			#	0.85
Ammonia Total as N	mg/L	0323	11/14/2012	N001	20			#	1
Ammonia Total as N	mg/L	0324	06/12/2012	N001	0.0792	J		#	0.017
Ammonia Total as N	mg/L	0324	11/14/2012	N001	0.1	U		#	0.1
Ammonia Total as N	mg/L	0452	06/11/2012	N001	22.7			#	0.85
Ammonia Total as N	mg/L	0453	11/14/2012	N001	12			#	1
Ammonia Total as N	mg/L	0575	06/11/2012	N001	0.559			#	0.017
Ammonia Total as N	mg/L	0575	11/14/2012	N001	1.3			#	0.1
Arsenic	mg/L	0320	06/11/2012	N001	0.0104			#	0.0017
Arsenic	mg/L	0320	11/14/2012	N001	0.0038			#	0.000074
Arsenic	mg/L	0322	06/11/2012	N001	0.00309	B		#	0.0017

**Surface Water Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Result	Qualifiers			Detection Limit
			Date	ID		Lab	Data	QA	
Arsenic	mg/L	0322	11/14/2012	N001	0.00045			#	0.000015
Arsenic	mg/L	0323	06/11/2012	N001	0.0017	U		#	0.0017
Arsenic	mg/L	0323	11/14/2012	N001	0.0017			#	0.00015
Arsenic	mg/L	0324	06/12/2012	N001	0.0017	U		#	0.0017
Arsenic	mg/L	0324	11/14/2012	N001	0.0004			#	0.000015
Arsenic	mg/L	0452	06/11/2012	N001	0.0179			#	0.0017
Arsenic	mg/L	0453	11/14/2012	N001	0.026			#	0.000074
Arsenic	mg/L	0575	06/11/2012	N001	0.00399	B		#	0.0017
Arsenic	mg/L	0575	11/14/2012	N001	0.0031			#	0.000015
Molybdenum	mg/L	0320	06/11/2012	N001	0.561			#	0.00165
Molybdenum	mg/L	0320	11/14/2012	N001	0.66			#	0.00016
Molybdenum	mg/L	0322	06/11/2012	N001	0.00262	B	U	#	0.000165
Molybdenum	mg/L	0322	11/14/2012	N001	0.0047			#	0.000032
Molybdenum	mg/L	0323	06/11/2012	N001	2.98			#	0.0165
Molybdenum	mg/L	0323	11/14/2012	N001	3.2			#	0.00032
Molybdenum	mg/L	0324	06/12/2012	N001	0.0023	B		#	0.000165
Molybdenum	mg/L	0324	11/14/2012	N001	0.0034			#	0.000032
Molybdenum	mg/L	0452	06/11/2012	N001	1.17			#	0.0165
Molybdenum	mg/L	0453	11/14/2012	N001	6.1			#	0.0016
Molybdenum	mg/L	0575	06/11/2012	N001	0.435			#	0.00165
Molybdenum	mg/L	0575	11/14/2012	N001	0.46			#	0.000032
Nitrate + Nitrite as Nitrogen	mg/L	0320	06/11/2012	N001	0.0915	J		#	0.085
Nitrate + Nitrite as Nitrogen	mg/L	0320	11/14/2012	N001	3.7			#	0.05
Nitrate + Nitrite as Nitrogen	mg/L	0322	06/11/2012	N001	0.017	U		#	0.017
Nitrate + Nitrite as Nitrogen	mg/L	0322	11/14/2012	N001	0.17			#	0.01
Nitrate + Nitrite as Nitrogen	mg/L	0323	06/11/2012	N001	57.5			#	0.85
Nitrate + Nitrite as Nitrogen	mg/L	0323	11/14/2012	N001	56			#	0.5

**Surface Water Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Result	Qualifiers			Detection Limit
			Date	ID		Lab	Data	QA	
Nitrate + Nitrite as Nitrogen	mg/L	0324	06/12/2012	N001	0.017	U		#	0.017
Nitrate + Nitrite as Nitrogen	mg/L	0324	11/14/2012	N001	0.1			#	0.01
Nitrate + Nitrite as Nitrogen	mg/L	0452	06/11/2012	N001	0.085	U		#	0.085
Nitrate + Nitrite as Nitrogen	mg/L	0453	11/14/2012	N001	97			#	0.5
Nitrate + Nitrite as Nitrogen	mg/L	0575	06/11/2012	N001	1.02			#	0.085
Nitrate + Nitrite as Nitrogen	mg/L	0575	11/14/2012	N001	0.88			#	0.01
Oxidation Reduction Potential	mV	0320	06/11/2012	N001	85.5			#	
Oxidation Reduction Potential	mV	0320	11/14/2012	N001	-235			#	
Oxidation Reduction Potential	mV	0322	06/11/2012	N001	74.8			#	
Oxidation Reduction Potential	mV	0322	11/14/2012	N001	-12.5			#	
Oxidation Reduction Potential	mV	0323	06/11/2012	N001	84.8			#	
Oxidation Reduction Potential	mV	0323	11/14/2012	N001	-280			#	
Oxidation Reduction Potential	mV	0324	06/12/2012	N001	65			#	
Oxidation Reduction Potential	mV	0324	11/14/2012	N001	75.5			#	
Oxidation Reduction Potential	mV	0452	06/11/2012	N001	116			#	
Oxidation Reduction Potential	mV	0453	11/14/2012	N001	-90			#	
Oxidation Reduction Potential	mV	0575	06/11/2012	N001	29.1			#	
Oxidation Reduction Potential	mV	0575	11/14/2012	N001	-315			#	
pH	s.u.	0320	06/11/2012	N001	8.25			#	
pH	s.u.	0320	11/14/2012	N001	8.01			#	
pH	s.u.	0322	06/11/2012	N001	8.33			#	
pH	s.u.	0322	11/14/2012	N001	8.39			#	
pH	s.u.	0323	06/11/2012	N001	8.01			#	
pH	s.u.	0323	11/14/2012	N001	8.11			#	
pH	s.u.	0324	06/12/2012	N001	8.2			#	
pH	s.u.	0324	11/14/2012	N001	8.48			#	
pH	s.u.	0452	06/11/2012	N001	7.87			#	

**Surface Water Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Result	Qualifiers			Detection Limit
			Date	ID		Lab	Data	QA	
pH	s.u.	0453	11/14/2012	N001	7.49			#	
pH	s.u.	0575	06/11/2012	N001	9.67			#	
pH	s.u.	0575	11/14/2012	N001	8.74			#	
Selenium	mg/L	0320	06/11/2012	N001	0.00468	B		#	0.0015
Selenium	mg/L	0320	11/14/2012	N001	0.0066			#	0.00016
Selenium	mg/L	0322	06/11/2012	N001	0.00156	B		#	0.0015
Selenium	mg/L	0322	11/14/2012	N001	0.00071			#	0.000032
Selenium	mg/L	0323	06/11/2012	N001	0.00866			#	0.0015
Selenium	mg/L	0323	11/14/2012	N001	0.0082			#	0.00032
Selenium	mg/L	0324	06/12/2012	N001	0.0015	U		#	0.0015
Selenium	mg/L	0324	11/14/2012	N001	0.00056			#	0.000032
Selenium	mg/L	0452	06/11/2012	N001	0.0015	U		#	0.0015
Selenium	mg/L	0453	11/14/2012	N001	0.051			#	0.00016
Selenium	mg/L	0575	06/11/2012	N001	0.0015	U		#	0.0015
Selenium	mg/L	0575	11/14/2012	N001	0.00052			#	0.000032
Specific Conductance	umhos/cm	0320	06/11/2012	N001	4890			#	
Specific Conductance	umhos/cm	0320	11/14/2012	N001	6325			#	
Specific Conductance	umhos/cm	0322	06/11/2012	N001	803			#	
Specific Conductance	umhos/cm	0322	11/14/2012	N001	1461			#	
Specific Conductance	umhos/cm	0323	06/11/2012	N001	8083			#	
Specific Conductance	umhos/cm	0323	11/14/2012	N001	7600			#	
Specific Conductance	umhos/cm	0324	06/12/2012	N001	829			#	
Specific Conductance	umhos/cm	0324	11/14/2012	N001	1426			#	
Specific Conductance	umhos/cm	0452	06/11/2012	N001	11305			#	
Specific Conductance	umhos/cm	0453	11/14/2012	N001	5975			#	
Specific Conductance	umhos/cm	0575	06/11/2012	N001	3577			#	
Specific Conductance	umhos/cm	0575	11/14/2012	N001	4475			#	

**Surface Water Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Result	Qualifiers			Detection Limit
			Date	ID		Lab	Data	QA	
Temperature	C	0320	06/11/2012	N001	25.88			#	
Temperature	C	0320	11/14/2012	N001	10.8			#	
Temperature	C	0322	06/11/2012	N001	15.46			#	
Temperature	C	0322	11/14/2012	N001	4.9			#	
Temperature	C	0323	06/11/2012	N001	23.27			#	
Temperature	C	0323	11/14/2012	N001	8.2			#	
Temperature	C	0324	06/12/2012	N001	15.65			#	
Temperature	C	0324	11/14/2012	N001	5.93			#	
Temperature	C	0452	06/11/2012	N001	26.56			#	
Temperature	C	0453	11/14/2012	N001	10.2			#	
Temperature	C	0575	06/11/2012	N001	21.51			#	
Temperature	C	0575	11/14/2012	N001	6.8			#	
Turbidity	NTU	0320	06/11/2012	N001	9.84			#	
Turbidity	NTU	0320	11/14/2012	N001	4.53			#	
Turbidity	NTU	0322	06/11/2012	N001	8.89			#	
Turbidity	NTU	0322	11/14/2012	N001	6.57			#	
Turbidity	NTU	0323	06/11/2012	N001	4.89			#	
Turbidity	NTU	0323	11/14/2012	N001	4.53			#	
Turbidity	NTU	0324	06/12/2012	N001	6.69			#	
Turbidity	NTU	0324	11/14/2012	N001	5.55			#	
Turbidity	NTU	0452	06/11/2012	N001	8.29			#	
Turbidity	NTU	0453	11/14/2012	N001	4.53			#	
Turbidity	NTU	0575	06/11/2012	N001	4.78			#	
Turbidity	NTU	0575	11/14/2012	N001	8.63			#	
Uranium	mg/L	0320	06/11/2012	N001	0.0519			#	0.000067
Uranium	mg/L	0320	11/14/2012	N001	0.087			#	0.000015
Uranium	mg/L	0322	06/11/2012	N001	0.00183			#	0.000067

**Surface Water Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Result	Qualifiers		Detection Limit
						Lab	Data QA	
Uranium	mg/L	0322	11/14/2012	N001	0.0029		#	0.000029
Uranium	mg/L	0323	06/11/2012	N001	0.312		#	0.000335
Uranium	mg/L	0323	11/14/2012	N001	0.35		#	0.000029
Uranium	mg/L	0324	06/12/2012	N001	0.00182		#	0.000067
Uranium	mg/L	0324	11/14/2012	N001	0.0027		#	0.000029
Uranium	mg/L	0452	06/11/2012	N001	0.0671		#	0.000067
Uranium	mg/L	0453	11/14/2012	N001	0.067		#	0.000015
Uranium	mg/L	0575	06/11/2012	N001	0.0509		#	0.000067
Uranium	mg/L	0575	11/14/2012	N001	0.059		#	0.000029
Vanadium	mg/L	0320	06/11/2012	N001	0.0274		#	0.001
Vanadium	mg/L	0320	11/14/2012	N001	0.038		#	0.000076
Vanadium	mg/L	0322	06/11/2012	N001	0.00106	B	#	0.001
Vanadium	mg/L	0322	11/14/2012	N001	0.0014		#	0.000015
Vanadium	mg/L	0323	06/11/2012	N001	0.00501		#	0.001
Vanadium	mg/L	0323	11/14/2012	N001	0.0064		#	0.00015
Vanadium	mg/L	0324	06/12/2012	N001	0.001	U	#	0.001
Vanadium	mg/L	0324	11/14/2012	N001	0.00078		#	0.000015
Vanadium	mg/L	0452	06/11/2012	N001	0.246		#	0.001
Vanadium	mg/L	0453	11/14/2012	N001	1.8		#	0.000076
Vanadium	mg/L	0575	06/11/2012	N001	0.00173	B	#	0.001
Vanadium	mg/L	0575	11/14/2012	N001	0.002		#	0.000015

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

**LAB QUALIFIERS:**

- \* Replicate analysis not within control limits.
- > Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic: Analyte also found in method blank.
- C Pesticide result confirmed by GC-MS.
- D Analyte determined in diluted sample.

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

DATA QUALIFIERS:

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

QA QUALIFIER:

# Validated according to quality assurance guidelines.

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
							Lab	Data QA	
Alkalinity, Total (As CaCO3)	mg/L	0169	06/11/2012	N001	3.13 - 18.13	508	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0169	11/15/2012	N001	3.13 - 18.13	460	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0170	06/11/2012	N001	92.23 - 112.23	586	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0170	11/15/2012	N001	92.23 - 112.23	522	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0172	03/06/2012	N001	6.98 - 31.98	860	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0172	06/12/2012	N001	6.98 - 31.98	752	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0172	09/26/2012	N001	6.98 - 31.98	802	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0172	11/14/2012	N001	6.98 - 31.98	730	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0172	12/21/2012	N001	6.98 - 31.98	860	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0195	06/11/2012	N001	5.29 - 25.29	471	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0195	11/15/2012	N001	5.29 - 25.29	306	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0201	06/11/2012	N001	7.35 - 22.35	286	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0201	11/14/2012	N001	7.35 - 22.35	295	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0215	06/12/2012	N001	6.84 - 21.84	326	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0215	11/14/2012	N001	6.84 - 21.84	244	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0216	06/11/2012	N001	5.5 - 20.5	268	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0216	11/14/2012	N001	5.5 - 20.5	175	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0217	06/11/2012	N001	7.4 - 22.4	207	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0217	11/14/2012	N001	7.4 - 22.4	215	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0590	06/11/2012	N001	5.21 - 19.21	298	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0590	11/14/2012	N001	5.21 - 19.21	300	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0609	11/14/2012	N001	6 - 21	420	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0620	03/06/2012	N001	6.7 - 10.7	540	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0620	06/12/2012	N001	6.7 - 10.7	525	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0620	09/26/2012	N001	6.7 - 10.7	535	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0620	11/14/2012	N001	6.7 - 10.7	540	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0620	12/21/2012	N001	6.7 - 10.7	520	F	#	

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit
			Date	ID			Lab	Data	QA	
Alkalinity, Total (As CaCO3)	mg/L	0635	06/11/2012	N001	12 - 17	362		F	#	
Alkalinity, Total (As CaCO3)	mg/L	0635	11/14/2012	N001	12 - 17	289		F	#	
Alkalinity, Total (As CaCO3)	mg/L	0658	06/11/2012	N001	.5 - 5.5	318		F	#	
Alkalinity, Total (As CaCO3)	mg/L	0658	11/13/2012	N001	.5 - 5.5	299		F	#	
Alkalinity, Total (As CaCO3)	mg/L	0659	06/12/2012	N001	.5 - 10.5	183		F	#	
Alkalinity, Total (As CaCO3)	mg/L	0659	11/14/2012	N001	.5 - 10.5	203		F	#	
Alkalinity, Total (As CaCO3)	mg/L	0664	06/12/2012	N001	7.7 - 14.7	404		F	#	
Alkalinity, Total (As CaCO3)	mg/L	0664	11/14/2012	N001	7.7 - 14.7	384		F	#	
Alkalinity, Total (As CaCO3)	mg/L	0669	06/12/2012	N001	4 - 10.6	459		FQ	#	
Alkalinity, Total (As CaCO3)	mg/L	0669	11/14/2012	N001	4 - 10.6	372		FQ	#	
Alkalinity, Total (As CaCO3)	mg/L	0670	06/11/2012	N001	5.2 - 12.2	400		F	#	
Alkalinity, Total (As CaCO3)	mg/L	0670	11/13/2012	N001	5.2 - 12.2	387		F	#	
Alkalinity, Total (As CaCO3)	mg/L	0680	11/15/2012	N001	5 - 10	219		F	#	
Alkalinity, Total (As CaCO3)	mg/L	0689	06/13/2012	N001	4.5 - 9.38	329		FQ	#	
Alkalinity, Total (As CaCO3)	mg/L	0690	06/13/2012	N001	4.61 - 9.49	406		FQ	#	
Alkalinity, Total (As CaCO3)	mg/L	0855	06/11/2012	N001	6 - 11	301		F	#	
Alkalinity, Total (As CaCO3)	mg/L	0855	11/13/2012	N001	6 - 11	270		F	#	
Ammonia Total as N	mg/L	0169	06/11/2012	N001	3.13 - 18.13	0.0781	J	F	#	0.017
Ammonia Total as N	mg/L	0169	06/11/2012	N002	3.13 - 18.13	0.033	J	F	#	0.017
Ammonia Total as N	mg/L	0169	11/15/2012	N001	3.13 - 18.13	0.1	UN	FJ	#	0.1
Ammonia Total as N	mg/L	0170	06/11/2012	N001	92.23 - 112.23	0.502		F	#	0.017
Ammonia Total as N	mg/L	0170	11/15/2012	N001	92.23 - 112.23	0.21		F	#	0.1
Ammonia Total as N	mg/L	0172	06/12/2012	N001	6.98 - 31.98	0.166		F	#	0.017
Ammonia Total as N	mg/L	0172	06/12/2012	N002	6.98 - 31.98	0.132		F	#	0.017
Ammonia Total as N	mg/L	0172	11/14/2012	N001	6.98 - 31.98	0.1	U	F	#	0.1
Ammonia Total as N	mg/L	0195	06/11/2012	N001	5.29 - 25.29	0.189		F	#	0.017
Ammonia Total as N	mg/L	0195	11/15/2012	N001	5.29 - 25.29	0.1	U	F	#	0.1

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
							Lab	Data QA	
Ammonia Total as N	mg/L	0201	06/11/2012	N001	7.35 - 22.35	73.5		F #	0.85
Ammonia Total as N	mg/L	0201	11/14/2012	N001	7.35 - 22.35	89		F #	5
Ammonia Total as N	mg/L	0215	06/12/2012	N001	6.84 - 21.84	2.36		F #	0.085
Ammonia Total as N	mg/L	0215	11/14/2012	N001	6.84 - 21.84	0.58		F #	0.1
Ammonia Total as N	mg/L	0216	06/11/2012	N001	5.5 - 20.5	4.67		F #	0.085
Ammonia Total as N	mg/L	0216	11/14/2012	N001	5.5 - 20.5	5.8		F #	0.2
Ammonia Total as N	mg/L	0217	06/11/2012	N001	7.4 - 22.4	35		F #	0.85
Ammonia Total as N	mg/L	0217	11/14/2012	N001	7.4 - 22.4	46		F #	2
Ammonia Total as N	mg/L	0590	06/11/2012	N001	5.21 - 19.21	132		F #	1.7
Ammonia Total as N	mg/L	0590	11/14/2012	N001	5.21 - 19.21	180		F #	5
Ammonia Total as N	mg/L	0609	11/14/2012	0001	6 - 21	0.2		F #	0.1
Ammonia Total as N	mg/L	0620	06/12/2012	N001	6.7 - 10.7	0.172		F #	0.017
Ammonia Total as N	mg/L	0620	11/14/2012	N001	6.7 - 10.7	0.1	U	F #	0.1
Ammonia Total as N	mg/L	0620	11/14/2012	N002	6.7 - 10.7	0.1	U	F #	0.1
Ammonia Total as N	mg/L	0635	06/11/2012	N001	12 - 17	72.5		F #	1.7
Ammonia Total as N	mg/L	0635	11/14/2012	N001	12 - 17	90		F #	5
Ammonia Total as N	mg/L	0658	06/11/2012	N001	.5 - 5.5	40.2		F #	0.85
Ammonia Total as N	mg/L	0658	11/13/2012	N001	.5 - 5.5	49		F #	2
Ammonia Total as N	mg/L	0659	06/12/2012	N001	.5 - 10.5	16.1		F #	0.17
Ammonia Total as N	mg/L	0659	11/14/2012	N001	.5 - 10.5	39		F #	1
Ammonia Total as N	mg/L	0664	06/12/2012	N001	7.7 - 14.7	29.3		F #	0.85
Ammonia Total as N	mg/L	0664	11/14/2012	N001	7.7 - 14.7	32		F #	2
Ammonia Total as N	mg/L	0669	06/12/2012	N001	4 - 10.6	74.2		FQ #	1.7
Ammonia Total as N	mg/L	0669	11/14/2012	0001	4 - 10.6	77		FQ #	2
Ammonia Total as N	mg/L	0670	06/11/2012	N001	5.2 - 12.2	14.2		F #	0.17
Ammonia Total as N	mg/L	0670	11/13/2012	N001	5.2 - 12.2	16		F #	1
Ammonia Total as N	mg/L	0680	11/15/2012	N001	5 - 10	50		F #	2

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit
							Lab	Data	QA	
Ammonia Total as N	mg/L	0689	06/13/2012	0001	4.5 - 9.38	1.28		FQ	#	0.017
Ammonia Total as N	mg/L	0690	06/13/2012	0001	4.61 - 9.49	0.756		FQ	#	0.017
Ammonia Total as N	mg/L	0855	06/11/2012	N001	6 - 11	31.9		F	#	1.7
Ammonia Total as N	mg/L	0855	11/13/2012	N001	6 - 11	34		F	#	1
Ammonia Total as N	mg/L	0855	11/13/2012	N002	6 - 11	36		F	#	1
Arsenic	mg/L	0169	06/11/2012	N001	3.13 - 18.13	0.0017	U	F	#	0.0017
Arsenic	mg/L	0169	06/11/2012	N002	3.13 - 18.13	0.0017	U	F	#	0.0017
Arsenic	mg/L	0169	11/15/2012	N001	3.13 - 18.13	0.00049		F	#	0.000015
Arsenic	mg/L	0170	06/11/2012	N001	92.23 - 112.23	0.0017	U	F	#	0.0017
Arsenic	mg/L	0170	11/15/2012	N001	92.23 - 112.23	0.0003		F	#	0.000015
Arsenic	mg/L	0172	03/06/2012	N001	6.98 - 31.98	0.0046		F	#	0.000015
Arsenic	mg/L	0172	03/06/2012	N002	6.98 - 31.98	0.0047		F	#	0.000015
Arsenic	mg/L	0172	06/12/2012	N001	6.98 - 31.98	0.00688		F	#	0.0017
Arsenic	mg/L	0172	06/12/2012	N002	6.98 - 31.98	0.00238	B	F	#	0.0017
Arsenic	mg/L	0172	09/26/2012	N001	6.98 - 31.98	0.0057		F	#	0.00003
Arsenic	mg/L	0172	09/26/2012	N002	6.98 - 31.98	0.0057		F	#	0.00003
Arsenic	mg/L	0172	11/14/2012	N001	6.98 - 31.98	0.0055		F	#	0.000015
Arsenic	mg/L	0172	12/21/2012	N003	6.98 - 31.98	0.0059		F	#	0.00003
Arsenic	mg/L	0172	12/21/2012	N004	6.98 - 31.98	0.0059		F	#	0.00003
Arsenic	mg/L	0195	06/11/2012	N001	5.29 - 25.29	0.00552		F	#	0.0017
Arsenic	mg/L	0195	11/15/2012	N001	5.29 - 25.29	0.00093		F	#	0.000015
Arsenic	mg/L	0201	06/11/2012	N001	7.35 - 22.35	0.0017	U	F	#	0.0017
Arsenic	mg/L	0201	11/14/2012	N001	7.35 - 22.35	0.00049		F	#	0.000015
Arsenic	mg/L	0215	06/12/2012	N001	6.84 - 21.84	0.00831		F	#	0.0017
Arsenic	mg/L	0215	11/14/2012	N001	6.84 - 21.84	0.00046		F	#	0.000015
Arsenic	mg/L	0216	06/11/2012	N001	5.5 - 20.5	0.0261		F	#	0.0017
Arsenic	mg/L	0216	11/14/2012	N001	5.5 - 20.5	0.024		F	#	0.00015

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit
							Lab	Data	QA	
Arsenic	mg/L	0217	06/11/2012	N001	7.4 - 22.4	0.0117		F	#	0.0017
Arsenic	mg/L	0217	11/14/2012	N001	7.4 - 22.4	0.00078		F	#	0.000074
Arsenic	mg/L	0590	06/11/2012	N001	5.21 - 19.21	0.0017	U	F	#	0.0017
Arsenic	mg/L	0590	11/14/2012	N001	5.21 - 19.21	0.0011		F	#	0.000074
Arsenic	mg/L	0609	11/14/2012	0001	6 - 21	0.00054		F	#	0.000015
Arsenic	mg/L	0620	03/06/2012	N001	6.7 - 10.7	0.00044		F	#	0.000015
Arsenic	mg/L	0620	06/12/2012	N001	6.7 - 10.7	0.0017	U	F	#	0.0017
Arsenic	mg/L	0620	09/26/2012	N001	6.7 - 10.7	0.00061		F	#	0.00003
Arsenic	mg/L	0620	11/14/2012	N001	6.7 - 10.7	0.00052		F	#	0.000015
Arsenic	mg/L	0620	11/14/2012	N002	6.7 - 10.7	0.00053		F	#	0.000015
Arsenic	mg/L	0620	12/21/2012	N003	6.7 - 10.7	0.00066		F	#	0.00003
Arsenic	mg/L	0635	06/11/2012	N001	12 - 17	0.0017	U	F	#	0.0017
Arsenic	mg/L	0635	11/14/2012	N001	12 - 17	0.00026		F	#	0.000015
Arsenic	mg/L	0658	06/11/2012	N001	.5 - 5.5	0.103		F	#	0.017
Arsenic	mg/L	0658	11/13/2012	N001	.5 - 5.5	0.067		F	#	0.0015
Arsenic	mg/L	0659	06/12/2012	N001	.5 - 10.5	0.0344		F	#	0.0017
Arsenic	mg/L	0659	11/14/2012	N001	.5 - 10.5	0.01		F	#	0.00074
Arsenic	mg/L	0664	06/12/2012	N001	7.7 - 14.7	0.0119		F	#	0.0017
Arsenic	mg/L	0664	11/14/2012	N001	7.7 - 14.7	0.0024		F	#	0.000074
Arsenic	mg/L	0669	06/12/2012	N001	4 - 10.6	0.00602		FQ	#	0.0017
Arsenic	mg/L	0669	11/14/2012	0001	4 - 10.6	0.0084		FQ	#	0.00074
Arsenic	mg/L	0670	06/11/2012	N001	5.2 - 12.2	0.00384	B	F	#	0.0017
Arsenic	mg/L	0670	11/13/2012	N001	5.2 - 12.2	0.0049		F	#	0.00015
Arsenic	mg/L	0680	11/15/2012	N001	5 - 10	0.003		F	#	0.00015
Arsenic	mg/L	0689	06/13/2012	0001	4.5 - 9.38	0.0123		FQ	#	0.0017
Arsenic	mg/L	0690	06/13/2012	0001	4.61 - 9.49	0.00431	B	FQ	#	0.0017
Arsenic	mg/L	0855	06/11/2012	N001	6 - 11	0.273		F	#	0.017

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit
			Date	ID			Lab	Data	QA	
Arsenic	mg/L	0855	11/13/2012	N001	6 - 11	0.68	F	#		0.0015
Arsenic	mg/L	0855	11/13/2012	N002	6 - 11	0.7	F	#		0.0015
Molybdenum	mg/L	0169	06/11/2012	N001	3.13 - 18.13	0.00434	JF	#		0.000165
Molybdenum	mg/L	0169	06/11/2012	N002	3.13 - 18.13	0.00566	F	#		0.000165
Molybdenum	mg/L	0169	11/15/2012	N001	3.13 - 18.13	0.0043	F	#		0.000032
Molybdenum	mg/L	0170	06/11/2012	N001	92.23 - 112.23	0.00388	F	#		0.000165
Molybdenum	mg/L	0170	11/15/2012	N001	92.23 - 112.23	0.0034	F	#		0.000032
Molybdenum	mg/L	0172	03/06/2012	N001	6.98 - 31.98	0.0056	F	#		0.00032
Molybdenum	mg/L	0172	03/06/2012	N002	6.98 - 31.98	0.0054	F	#		0.00032
Molybdenum	mg/L	0172	06/12/2012	N001	6.98 - 31.98	0.00556	F	#		0.000165
Molybdenum	mg/L	0172	06/12/2012	N002	6.98 - 31.98	0.00558	F	#		0.000165
Molybdenum	mg/L	0172	09/26/2012	N001	6.98 - 31.98	0.0053	F	#		0.00032
Molybdenum	mg/L	0172	09/26/2012	N002	6.98 - 31.98	0.0042	F	#		0.00032
Molybdenum	mg/L	0172	11/14/2012	N001	6.98 - 31.98	0.0044	F	#		0.000032
Molybdenum	mg/L	0172	12/21/2012	N003	6.98 - 31.98	0.0067	F	#		0.00032
Molybdenum	mg/L	0172	12/21/2012	N004	6.98 - 31.98	0.0057	F	#		0.00032
Molybdenum	mg/L	0195	06/11/2012	N001	5.29 - 25.29	0.014	F	#		0.000165
Molybdenum	mg/L	0195	11/15/2012	N001	5.29 - 25.29	0.016	F	#		0.000032
Molybdenum	mg/L	0201	06/11/2012	N001	7.35 - 22.35	2.03	F	#		0.0165
Molybdenum	mg/L	0201	11/14/2012	N001	7.35 - 22.35	1.7	F	#		0.00032
Molybdenum	mg/L	0215	06/12/2012	N001	6.84 - 21.84	0.0122	F	#		0.000165
Molybdenum	mg/L	0215	11/14/2012	N001	6.84 - 21.84	0.01	F	#		0.000032
Molybdenum	mg/L	0216	06/11/2012	N001	5.5 - 20.5	0.0443	F	#		0.000165
Molybdenum	mg/L	0216	11/14/2012	N001	5.5 - 20.5	0.039	F	#		0.00032
Molybdenum	mg/L	0217	06/11/2012	N001	7.4 - 22.4	1.7	JF	#		0.0165
Molybdenum	mg/L	0217	11/14/2012	N001	7.4 - 22.4	1.4	F	#		0.0016
Molybdenum	mg/L	0590	06/11/2012	N001	5.21 - 19.21	1.84	F	#		0.0165

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
							Lab	Data QA	
Molybdenum	mg/L	0590	11/14/2012	N001	5.21 - 19.21	1.2		F #	0.00016
Molybdenum	mg/L	0609	11/14/2012	0001	6 - 21	0.014		F #	0.000032
Molybdenum	mg/L	0620	03/06/2012	N001	6.7 - 10.7	0.0074		F #	0.00032
Molybdenum	mg/L	0620	06/12/2012	N001	6.7 - 10.7	0.00966		F #	0.000165
Molybdenum	mg/L	0620	09/26/2012	N001	6.7 - 10.7	0.0088		F #	0.00032
Molybdenum	mg/L	0620	11/14/2012	N001	6.7 - 10.7	0.0084		F #	0.000032
Molybdenum	mg/L	0620	11/14/2012	N002	6.7 - 10.7	0.0082		F #	0.000032
Molybdenum	mg/L	0620	12/21/2012	N003	6.7 - 10.7	0.0075		F #	0.00032
Molybdenum	mg/L	0635	06/11/2012	N001	12 - 17	0.406		F #	0.00165
Molybdenum	mg/L	0635	11/14/2012	N001	12 - 17	0.37		F #	0.000032
Molybdenum	mg/L	0658	06/11/2012	N001	.5 - 5.5	0.957		F #	0.0033
Molybdenum	mg/L	0658	11/13/2012	N001	.5 - 5.5	1.2		F #	0.0032
Molybdenum	mg/L	0659	06/12/2012	N001	.5 - 10.5	1.7		F #	0.0165
Molybdenum	mg/L	0659	11/14/2012	N001	.5 - 10.5	1.6		F #	0.0016
Molybdenum	mg/L	0664	06/12/2012	N001	7.7 - 14.7	0.32		F #	0.00165
Molybdenum	mg/L	0664	11/14/2012	N001	7.7 - 14.7	0.41		F #	0.00016
Molybdenum	mg/L	0669	06/12/2012	N001	4 - 10.6	0.959		FQ #	0.0033
Molybdenum	mg/L	0669	11/14/2012	0001	4 - 10.6	0.76		FQ #	0.0016
Molybdenum	mg/L	0670	06/11/2012	N001	5.2 - 12.2	0.24		F #	0.000825
Molybdenum	mg/L	0670	11/13/2012	N001	5.2 - 12.2	0.19		F #	0.00032
Molybdenum	mg/L	0680	11/15/2012	N001	5 - 10	2		F #	0.00032
Molybdenum	mg/L	0689	06/13/2012	0001	4.5 - 9.38	0.252		FQ #	0.00165
Molybdenum	mg/L	0690	06/13/2012	0001	4.61 - 9.49	0.155		FQ #	0.00033
Molybdenum	mg/L	0855	06/11/2012	N001	6 - 11	0.69		F #	0.0033
Molybdenum	mg/L	0855	11/13/2012	N001	6 - 11	1.2		F #	0.0032
Molybdenum	mg/L	0855	11/13/2012	N002	6 - 11	1.2		F #	0.0032
Nitrate + Nitrite as Nitrogen	mg/L	0169	06/11/2012	N001	3.13 - 18.13	0.234	J	F #	0.085

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit
			Date	ID			Lab	Data	QA	
Nitrate + Nitrite as Nitrogen	mg/L	0169	06/11/2012	N002	3.13 - 18.13	0.222	J	F	#	0.085
Nitrate + Nitrite as Nitrogen	mg/L	0169	11/15/2012	N001	3.13 - 18.13	0.068		F	#	0.01
Nitrate + Nitrite as Nitrogen	mg/L	0170	06/11/2012	N001	92.23 - 112.23	10.9		F	#	0.17
Nitrate + Nitrite as Nitrogen	mg/L	0170	11/15/2012	N001	92.23 - 112.23	11		F	#	0.1
Nitrate + Nitrite as Nitrogen	mg/L	0172	06/12/2012	N001	6.98 - 31.98	0.085	U	F	#	0.085
Nitrate + Nitrite as Nitrogen	mg/L	0172	06/12/2012	N002	6.98 - 31.98	0.085	U	F	#	0.085
Nitrate + Nitrite as Nitrogen	mg/L	0172	11/14/2012	N001	6.98 - 31.98	0.012		F	#	0.01
Nitrate + Nitrite as Nitrogen	mg/L	0195	06/11/2012	N001	5.29 - 25.29	0.085	U	F	#	0.085
Nitrate + Nitrite as Nitrogen	mg/L	0195	11/15/2012	N001	5.29 - 25.29	0.01	U	F	#	0.01
Nitrate + Nitrite as Nitrogen	mg/L	0201	06/11/2012	N001	7.35 - 22.35	72.5		F	#	0.85
Nitrate + Nitrite as Nitrogen	mg/L	0201	11/14/2012	N001	7.35 - 22.35	66		F	#	0.5
Nitrate + Nitrite as Nitrogen	mg/L	0215	06/12/2012	N001	6.84 - 21.84	0.017	U	F	#	0.017
Nitrate + Nitrite as Nitrogen	mg/L	0215	11/14/2012	N001	6.84 - 21.84	0.037		F	#	0.01
Nitrate + Nitrite as Nitrogen	mg/L	0216	06/11/2012	N001	5.5 - 20.5	0.085	U	F	#	0.085
Nitrate + Nitrite as Nitrogen	mg/L	0216	11/14/2012	N001	5.5 - 20.5	0.01	U	F	#	0.01
Nitrate + Nitrite as Nitrogen	mg/L	0217	06/11/2012	N001	7.4 - 22.4	0.017	U	F	#	0.017
Nitrate + Nitrite as Nitrogen	mg/L	0217	11/14/2012	N001	7.4 - 22.4	0.01	U	F	#	0.01
Nitrate + Nitrite as Nitrogen	mg/L	0590	06/11/2012	N001	5.21 - 19.21	29.4		F	#	0.85
Nitrate + Nitrite as Nitrogen	mg/L	0590	11/14/2012	N001	5.21 - 19.21	9.6		F	#	0.1
Nitrate + Nitrite as Nitrogen	mg/L	0609	11/14/2012	0001	6 - 21	0.36		F	#	0.01
Nitrate + Nitrite as Nitrogen	mg/L	0620	06/12/2012	N001	6.7 - 10.7	72.5		F	#	0.85
Nitrate + Nitrite as Nitrogen	mg/L	0620	11/14/2012	N001	6.7 - 10.7	29		F	#	0.2
Nitrate + Nitrite as Nitrogen	mg/L	0620	11/14/2012	N002	6.7 - 10.7	30		F	#	0.2
Nitrate + Nitrite as Nitrogen	mg/L	0635	06/11/2012	N001	12 - 17	12.7		F	#	0.17
Nitrate + Nitrite as Nitrogen	mg/L	0635	11/14/2012	N001	12 - 17	13		F	#	0.1
Nitrate + Nitrite as Nitrogen	mg/L	0658	06/11/2012	N001	.5 - 5.5	0.855		F	#	0.085
Nitrate + Nitrite as Nitrogen	mg/L	0658	11/13/2012	N001	.5 - 5.5	5.6		F	#	0.05

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
							Lab	Data QA	
Nitrate + Nitrite as Nitrogen	mg/L	0659	06/12/2012	N001	.5 - 10.5	13.2	F	#	0.17
Nitrate + Nitrite as Nitrogen	mg/L	0659	11/14/2012	N001	.5 - 10.5	14	F	#	0.1
Nitrate + Nitrite as Nitrogen	mg/L	0664	06/12/2012	N001	7.7 - 14.7	15.6	F	#	0.85
Nitrate + Nitrite as Nitrogen	mg/L	0664	11/14/2012	N001	7.7 - 14.7	12	F	#	0.2
Nitrate + Nitrite as Nitrogen	mg/L	0669	06/12/2012	N001	4 - 10.6	0.965	FQ	#	0.085
Nitrate + Nitrite as Nitrogen	mg/L	0669	11/14/2012	0001	4 - 10.6	2.4	FQ	#	0.05
Nitrate + Nitrite as Nitrogen	mg/L	0670	06/11/2012	N001	5.2 - 12.2	4.24	F	#	0.17
Nitrate + Nitrite as Nitrogen	mg/L	0670	11/13/2012	N001	5.2 - 12.2	3.4	F	#	0.05
Nitrate + Nitrite as Nitrogen	mg/L	0680	11/15/2012	N001	5 - 10	24	F	#	0.2
Nitrate + Nitrite as Nitrogen	mg/L	0689	06/13/2012	0001	4.5 - 9.38	29.3	FQ	#	0.85
Nitrate + Nitrite as Nitrogen	mg/L	0690	06/13/2012	0001	4.61 - 9.49	1.4	FQ	#	0.085
Nitrate + Nitrite as Nitrogen	mg/L	0855	06/11/2012	N001	6 - 11	5.3	F	#	0.085
Nitrate + Nitrite as Nitrogen	mg/L	0855	11/13/2012	N001	6 - 11	16	F	#	0.1
Nitrate + Nitrite as Nitrogen	mg/L	0855	11/13/2012	N002	6 - 11	14	F	#	0.1
Oxidation Reduction Potential	mV	0169	06/11/2012	N001	3.13 - 18.13	53.9	F	#	
Oxidation Reduction Potential	mV	0169	11/15/2012	N001	3.13 - 18.13	37.6	F	#	
Oxidation Reduction Potential	mV	0170	06/11/2012	N001	92.23 - 112.23	146	F	#	
Oxidation Reduction Potential	mV	0170	11/15/2012	N001	92.23 - 112.23	155.7	F	#	
Oxidation Reduction Potential	mV	0172	03/06/2012	N001	6.98 - 31.98	-57	F	#	
Oxidation Reduction Potential	mV	0172	06/12/2012	N001	6.98 - 31.98	-86.7	F	#	
Oxidation Reduction Potential	mV	0172	09/26/2012	N001	6.98 - 31.98	-76.2	F	#	
Oxidation Reduction Potential	mV	0172	11/14/2012	N001	6.98 - 31.98	-154.4	F	#	
Oxidation Reduction Potential	mV	0172	12/21/2012	N001	6.98 - 31.98	-80	F	#	
Oxidation Reduction Potential	mV	0195	06/11/2012	N001	5.29 - 25.29	-15.4	F	#	
Oxidation Reduction Potential	mV	0195	11/15/2012	N001	5.29 - 25.29	-3	F	#	
Oxidation Reduction Potential	mV	0201	06/11/2012	N001	7.35 - 22.35	138.3	F	#	
Oxidation Reduction Potential	mV	0201	11/14/2012	N001	7.35 - 22.35	-130	F	#	

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
							Lab	Data QA	
Oxidation Reduction Potential	mV	0215	06/12/2012	N001	6.84 - 21.84	41.7		F #	
Oxidation Reduction Potential	mV	0215	11/14/2012	N001	6.84 - 21.84	-15		F #	
Oxidation Reduction Potential	mV	0216	06/11/2012	N001	5.5 - 20.5	-15.8		F #	
Oxidation Reduction Potential	mV	0216	11/14/2012	N001	5.5 - 20.5	-150		F #	
Oxidation Reduction Potential	mV	0217	06/11/2012	N001	7.4 - 22.4	152.5		F #	
Oxidation Reduction Potential	mV	0217	11/14/2012	N001	7.4 - 22.4	-95		F #	
Oxidation Reduction Potential	mV	0590	06/11/2012	N001	5.21 - 19.21	174.8		F #	
Oxidation Reduction Potential	mV	0590	11/14/2012	N001	5.21 - 19.21	-50		F #	
Oxidation Reduction Potential	mV	0609	11/14/2012	N001	6 - 21	76.2		F #	
Oxidation Reduction Potential	mV	0620	03/06/2012	N001	6.7 - 10.7	43		F #	
Oxidation Reduction Potential	mV	0620	06/12/2012	N001	6.7 - 10.7	0.2		F #	
Oxidation Reduction Potential	mV	0620	09/26/2012	N001	6.7 - 10.7	17.1		F #	
Oxidation Reduction Potential	mV	0620	11/14/2012	N001	6.7 - 10.7	68.1		F #	
Oxidation Reduction Potential	mV	0620	12/21/2012	N001	6.7 - 10.7	40		F #	
Oxidation Reduction Potential	mV	0635	06/11/2012	N001	12 - 17	139.7		F #	
Oxidation Reduction Potential	mV	0635	11/14/2012	N001	12 - 17	64.3		F #	
Oxidation Reduction Potential	mV	0658	06/11/2012	N001	.5 - 5.5	155.7		F #	
Oxidation Reduction Potential	mV	0658	11/13/2012	N001	.5 - 5.5	102.3		F #	
Oxidation Reduction Potential	mV	0659	06/12/2012	N001	.5 - 10.5	98.8		F #	
Oxidation Reduction Potential	mV	0659	11/14/2012	N001	.5 - 10.5	-55		F #	
Oxidation Reduction Potential	mV	0664	06/12/2012	N001	7.7 - 14.7	101.1		F #	
Oxidation Reduction Potential	mV	0664	11/14/2012	N001	7.7 - 14.7	-80		F #	
Oxidation Reduction Potential	mV	0669	06/12/2012	N001	4 - 10.6	105.4		FQ #	
Oxidation Reduction Potential	mV	0669	11/14/2012	N001	4 - 10.6	-35		FQ #	
Oxidation Reduction Potential	mV	0670	06/11/2012	N001	5.2 - 12.2	135.7		F #	
Oxidation Reduction Potential	mV	0670	11/13/2012	N001	5.2 - 12.2	91.6		F #	
Oxidation Reduction Potential	mV	0680	11/15/2012	N001	5 - 10	87.2		F #	

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
							Lab	Data QA	
Oxidation Reduction Potential	mV	0689	06/13/2012	N001	4.5 - 9.38	215.6		FQ #	
Oxidation Reduction Potential	mV	0690	06/13/2012	N001	4.61 - 9.49	174.9		FQ #	
Oxidation Reduction Potential	mV	0855	06/11/2012	N001	6 - 11	117.7		F #	
Oxidation Reduction Potential	mV	0855	11/13/2012	N001	6 - 11	106.3		F #	
pH	s.u.	0169	06/11/2012	N001	3.13 - 18.13	6.93		F #	
pH	s.u.	0169	11/15/2012	N001	3.13 - 18.13	6.98		F #	
pH	s.u.	0170	06/11/2012	N001	92.23 - 112.23	6.93		F #	
pH	s.u.	0170	11/15/2012	N001	92.23 - 112.23	6.94		F #	
pH	s.u.	0172	03/06/2012	N001	6.98 - 31.98	6.87		F #	
pH	s.u.	0172	06/12/2012	N001	6.98 - 31.98	6.9		F #	
pH	s.u.	0172	09/26/2012	N001	6.98 - 31.98	6.74		F #	
pH	s.u.	0172	11/14/2012	N001	6.98 - 31.98	6.91		F #	
pH	s.u.	0172	12/21/2012	N001	6.98 - 31.98	7.15		F #	
pH	s.u.	0195	06/11/2012	N001	5.29 - 25.29	6.88		F #	
pH	s.u.	0195	11/15/2012	N001	5.29 - 25.29	6.96		F #	
pH	s.u.	0201	06/11/2012	N001	7.35 - 22.35	6.75		F #	
pH	s.u.	0201	11/14/2012	N001	7.35 - 22.35	6.77		F #	
pH	s.u.	0215	06/12/2012	N001	6.84 - 21.84	7.15		F #	
pH	s.u.	0215	11/14/2012	N001	6.84 - 21.84	7.28		F #	
pH	s.u.	0216	06/11/2012	N001	5.5 - 20.5	7.47		F #	
pH	s.u.	0216	11/14/2012	N001	5.5 - 20.5	7.41		F #	
pH	s.u.	0217	06/11/2012	N001	7.4 - 22.4	6.78		F #	
pH	s.u.	0217	11/14/2012	N001	7.4 - 22.4	6.8		F #	
pH	s.u.	0590	06/11/2012	N001	5.21 - 19.21	6.65		F #	
pH	s.u.	0590	11/14/2012	N001	5.21 - 19.21	6.67		F #	
pH	s.u.	0609	11/14/2012	N001	6 - 21	6.98		F #	
pH	s.u.	0620	03/06/2012	N001	6.7 - 10.7	7.04		F #	

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit
							Lab	Data	QA	
pH	s.u.	0620	06/12/2012	N001	6.7 - 10.7	7		F	#	
pH	s.u.	0620	09/26/2012	N001	6.7 - 10.7	6.87		F	#	
pH	s.u.	0620	11/14/2012	N001	6.7 - 10.7	7.14		F	#	
pH	s.u.	0620	12/21/2012	N001	6.7 - 10.7	7.29		F	#	
pH	s.u.	0635	06/11/2012	N001	12 - 17	6.73		F	#	
pH	s.u.	0635	11/14/2012	N001	12 - 17	6.79		F	#	
pH	s.u.	0658	06/11/2012	N001	.5 - 5.5	6.79		F	#	
pH	s.u.	0658	11/13/2012	N001	.5 - 5.5	6.79		F	#	
pH	s.u.	0659	06/12/2012	N001	.5 - 10.5	6.92		F	#	
pH	s.u.	0659	11/14/2012	N001	.5 - 10.5	6.97		F	#	
pH	s.u.	0664	06/12/2012	N001	7.7 - 14.7	6.94		F	#	
pH	s.u.	0664	11/14/2012	N001	7.7 - 14.7	6.85		F	#	
pH	s.u.	0669	06/12/2012	N001	4 - 10.6	6.89		FQ	#	
pH	s.u.	0669	11/14/2012	N001	4 - 10.6	6.94		FQ	#	
pH	s.u.	0670	06/11/2012	N001	5.2 - 12.2	6.91		F	#	
pH	s.u.	0670	11/13/2012	N001	5.2 - 12.2	6.97		F	#	
pH	s.u.	0680	11/15/2012	N001	5 - 10	6.81		F	#	
pH	s.u.	0689	06/13/2012	N001	4.5 - 9.38	7.03		FQ	#	
pH	s.u.	0690	06/13/2012	N001	4.61 - 9.49	7.05		FQ	#	
pH	s.u.	0855	06/11/2012	N001	6 - 11	6.81		F	#	
pH	s.u.	0855	11/13/2012	N001	6 - 11	6.54		F	#	
Selenium	mg/L	0169	06/11/2012	N001	3.13 - 18.13	0.00457	B	F	#	0.0015
Selenium	mg/L	0169	06/11/2012	N002	3.13 - 18.13	0.00429	B	F	#	0.0015
Selenium	mg/L	0169	11/15/2012	N001	3.13 - 18.13	0.0019		F	#	0.000032
Selenium	mg/L	0170	06/11/2012	N001	92.23 - 112.23	0.0148		F	#	0.0015
Selenium	mg/L	0170	11/15/2012	N001	92.23 - 112.23	0.014		F	#	0.000032
Selenium	mg/L	0172	03/06/2012	N001	6.98 - 31.98	0.00031		F	#	0.000032

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit
							Lab	Data	QA	
Selenium	mg/L	0172	03/06/2012	N002	6.98 - 31.98	0.00031		F	#	0.000032
Selenium	mg/L	0172	06/12/2012	N001	6.98 - 31.98	0.0075	U	F	#	0.0075
Selenium	mg/L	0172	06/12/2012	N002	6.98 - 31.98	0.0075	U	F	#	0.0075
Selenium	mg/L	0172	09/26/2012	N001	6.98 - 31.98	0.00026		F	#	0.000065
Selenium	mg/L	0172	09/26/2012	N002	6.98 - 31.98	0.00025		F	#	0.000065
Selenium	mg/L	0172	11/14/2012	N001	6.98 - 31.98	0.00021		F	#	0.000032
Selenium	mg/L	0172	12/21/2012	N003	6.98 - 31.98	0.00023		F	#	0.000065
Selenium	mg/L	0172	12/21/2012	N004	6.98 - 31.98	0.00043		F	#	0.000065
Selenium	mg/L	0195	06/11/2012	N001	5.29 - 25.29	0.0015	U	F	#	0.0015
Selenium	mg/L	0195	11/15/2012	N001	5.29 - 25.29	0.00012		F	#	0.000032
Selenium	mg/L	0201	06/11/2012	N001	7.35 - 22.35	0.0153		F	#	0.0015
Selenium	mg/L	0201	11/14/2012	N001	7.35 - 22.35	0.0048		F	#	0.000032
Selenium	mg/L	0215	06/12/2012	N001	6.84 - 21.84	0.0015	U	F	#	0.0015
Selenium	mg/L	0215	11/14/2012	N001	6.84 - 21.84	0.00049		F	#	0.000032
Selenium	mg/L	0216	06/11/2012	N001	5.5 - 20.5	0.0015	U	F	#	0.0015
Selenium	mg/L	0216	11/14/2012	N001	5.5 - 20.5	0.0002		F	#	0.000032
Selenium	mg/L	0217	06/11/2012	N001	7.4 - 22.4	0.00477	B	F	#	0.0015
Selenium	mg/L	0217	11/14/2012	N001	7.4 - 22.4	0.006		F	#	0.00016
Selenium	mg/L	0590	06/11/2012	N001	5.21 - 19.21	0.0555		F	#	0.0015
Selenium	mg/L	0590	11/14/2012	N001	5.21 - 19.21	0.025		F	#	0.00016
Selenium	mg/L	0609	11/14/2012	0001	6 - 21	0.0024		F	#	0.000032
Selenium	mg/L	0620	03/06/2012	N001	6.7 - 10.7	0.027		F	#	0.000032
Selenium	mg/L	0620	06/12/2012	N001	6.7 - 10.7	0.0242		F	#	0.0015
Selenium	mg/L	0620	09/26/2012	N001	6.7 - 10.7	0.027		F	#	0.000065
Selenium	mg/L	0620	11/14/2012	N001	6.7 - 10.7	0.029		F	#	0.000032
Selenium	mg/L	0620	11/14/2012	N002	6.7 - 10.7	0.028		F	#	0.000032
Selenium	mg/L	0620	12/21/2012	N003	6.7 - 10.7	0.028		F	#	0.000065

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit
			Date	ID			Lab	Data	QA	
Selenium	mg/L	0635	06/11/2012	N001	12 - 17	0.0015	U	F	#	0.0015
Selenium	mg/L	0635	11/14/2012	N001	12 - 17	0.0075		F	#	0.000032
Selenium	mg/L	0658	06/11/2012	N001	.5 - 5.5	1.06		F	#	0.03
Selenium	mg/L	0658	11/13/2012	N001	.5 - 5.5	1		F	#	0.0032
Selenium	mg/L	0659	06/12/2012	N001	.5 - 10.5	0.065		F	#	0.0015
Selenium	mg/L	0659	11/14/2012	N001	.5 - 10.5	0.045		F	#	0.0016
Selenium	mg/L	0664	06/12/2012	N001	7.7 - 14.7	0.173		F	#	0.015
Selenium	mg/L	0664	11/14/2012	N001	7.7 - 14.7	0.092		F	#	0.00016
Selenium	mg/L	0669	06/12/2012	N001	4 - 10.6	0.0313		FQ	#	0.0015
Selenium	mg/L	0669	11/14/2012	0001	4 - 10.6	0.015		FQ	#	0.0016
Selenium	mg/L	0670	06/11/2012	N001	5.2 - 12.2	0.264		F	#	0.0075
Selenium	mg/L	0670	11/13/2012	N001	5.2 - 12.2	0.26		F	#	0.00032
Selenium	mg/L	0680	11/15/2012	N001	5 - 10	0.0029		F	#	0.00032
Selenium	mg/L	0689	06/13/2012	0001	4.5 - 9.38	0.812		FQ	#	0.015
Selenium	mg/L	0690	06/13/2012	0001	4.61 - 9.49	0.0714		FQ	#	0.0015
Selenium	mg/L	0855	06/11/2012	N001	6 - 11	0.963		F	#	0.03
Selenium	mg/L	0855	11/13/2012	N001	6 - 11	0.95		F	#	0.0032
Selenium	mg/L	0855	11/13/2012	N002	6 - 11	0.98		F	#	0.0032
Specific Conductance	umhos/cm	0169	06/11/2012	N001	3.13 - 18.13	2026		F	#	
Specific Conductance	umhos/cm	0169	11/15/2012	N001	3.13 - 18.13	1848		F	#	
Specific Conductance	umhos/cm	0170	06/11/2012	N001	92.23 - 112.23	3095		F	#	
Specific Conductance	umhos/cm	0170	11/15/2012	N001	92.23 - 112.23	3153		F	#	
Specific Conductance	umhos/cm	0172	03/06/2012	N001	6.98 - 31.98	18100		F	#	
Specific Conductance	umhos/cm	0172	06/12/2012	N001	6.98 - 31.98	18736		F	#	
Specific Conductance	umhos/cm	0172	09/26/2012	N001	6.98 - 31.98	17673		F	#	
Specific Conductance	umhos/cm	0172	11/14/2012	N001	6.98 - 31.98	19381		F	#	
Specific Conductance	umhos/cm	0172	12/21/2012	N001	6.98 - 31.98	16520		F	#	

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
							Lab	Data QA	
Specific Conductance	umhos/cm	0195	06/11/2012	N001	5.29 - 25.29	1233		F #	
Specific Conductance	umhos/cm	0195	11/15/2012	N001	5.29 - 25.29	1521		F #	
Specific Conductance	umhos/cm	0201	06/11/2012	N001	7.35 - 22.35	4205		F #	
Specific Conductance	umhos/cm	0201	11/14/2012	N001	7.35 - 22.35	3930		F #	
Specific Conductance	umhos/cm	0215	06/12/2012	N001	6.84 - 21.84	1721		F #	
Specific Conductance	umhos/cm	0215	11/14/2012	N001	6.84 - 21.84	1240		F #	
Specific Conductance	umhos/cm	0216	06/11/2012	N001	5.5 - 20.5	909		F #	
Specific Conductance	umhos/cm	0216	11/14/2012	N001	5.5 - 20.5	935		F #	
Specific Conductance	umhos/cm	0217	06/11/2012	N001	7.4 - 22.4	3347		F #	
Specific Conductance	umhos/cm	0217	11/14/2012	N001	7.4 - 22.4	3030		F #	
Specific Conductance	umhos/cm	0590	06/11/2012	N001	5.21 - 19.21	5201		F #	
Specific Conductance	umhos/cm	0590	11/14/2012	N001	5.21 - 19.21	4885		F #	
Specific Conductance	umhos/cm	0609	11/14/2012	N001	6 - 21	1843		F #	
Specific Conductance	umhos/cm	0620	03/06/2012	N001	6.7 - 10.7	6744		F #	
Specific Conductance	umhos/cm	0620	06/12/2012	N001	6.7 - 10.7	6574		F #	
Specific Conductance	umhos/cm	0620	09/26/2012	N001	6.7 - 10.7	6571		F #	
Specific Conductance	umhos/cm	0620	11/14/2012	N001	6.7 - 10.7	6772		F #	
Specific Conductance	umhos/cm	0620	12/21/2012	N001	6.7 - 10.7	6700		F #	
Specific Conductance	umhos/cm	0635	06/11/2012	N001	12 - 17	4143		F #	
Specific Conductance	umhos/cm	0635	11/14/2012	N001	12 - 17	4023		F #	
Specific Conductance	umhos/cm	0658	06/11/2012	N001	.5 - 5.5	2831		F #	
Specific Conductance	umhos/cm	0658	11/13/2012	N001	.5 - 5.5	2967		F #	
Specific Conductance	umhos/cm	0659	06/12/2012	N001	.5 - 10.5	3453		F #	
Specific Conductance	umhos/cm	0659	11/14/2012	N001	.5 - 10.5	3175		F #	
Specific Conductance	umhos/cm	0664	06/12/2012	N001	7.7 - 14.7	2408		F #	
Specific Conductance	umhos/cm	0664	11/14/2012	N001	7.7 - 14.7	2195		F #	
Specific Conductance	umhos/cm	0669	06/12/2012	N001	4 - 10.6	2794		FQ #	

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
							Lab	Data QA	
Specific Conductance	umhos/cm	0669	11/14/2012	N001	4 - 10.6	2305		FQ #	
Specific Conductance	umhos/cm	0670	06/11/2012	N001	5.2 - 12.2	2238		F #	
Specific Conductance	umhos/cm	0670	11/13/2012	N001	5.2 - 12.2	2273		F #	
Specific Conductance	umhos/cm	0680	11/15/2012	N001	5 - 10	3670		F #	
Specific Conductance	umhos/cm	0689	06/13/2012	N001	4.5 - 9.38	2172		FQ #	
Specific Conductance	umhos/cm	0690	06/13/2012	N001	4.61 - 9.49	1957		FQ #	
Specific Conductance	umhos/cm	0855	06/11/2012	N001	6 - 11	2486		F #	
Specific Conductance	umhos/cm	0855	11/13/2012	N001	6 - 11	3262		F #	
Temperature	C	0169	06/11/2012	N001	3.13 - 18.13	14.33		F #	
Temperature	C	0169	11/15/2012	N001	3.13 - 18.13	15.5		F #	
Temperature	C	0170	06/11/2012	N001	92.23 - 112.23	14.96		F #	
Temperature	C	0170	11/15/2012	N001	92.23 - 112.23	13.57		F #	
Temperature	C	0172	03/06/2012	N001	6.98 - 31.98	12.61		F #	
Temperature	C	0172	06/12/2012	N001	6.98 - 31.98	14.51		F #	
Temperature	C	0172	09/26/2012	N001	6.98 - 31.98	14.19		F #	
Temperature	C	0172	11/14/2012	N001	6.98 - 31.98	13.83		F #	
Temperature	C	0172	12/21/2012	N001	6.98 - 31.98	11.7		F #	
Temperature	C	0195	06/11/2012	N001	5.29 - 25.29	10.93		F #	
Temperature	C	0195	11/15/2012	N001	5.29 - 25.29	13.7		F #	
Temperature	C	0201	06/11/2012	N001	7.35 - 22.35	13.93		F #	
Temperature	C	0201	11/14/2012	N001	7.35 - 22.35	15		F #	
Temperature	C	0215	06/12/2012	N001	6.84 - 21.84	12.56		F #	
Temperature	C	0215	11/14/2012	N001	6.84 - 21.84	14.1		F #	
Temperature	C	0216	06/11/2012	N001	5.5 - 20.5	12.98		F #	
Temperature	C	0216	11/14/2012	N001	5.5 - 20.5	14.6		F #	
Temperature	C	0217	06/11/2012	N001	7.4 - 22.4	11.43		F #	
Temperature	C	0217	11/14/2012	N001	7.4 - 22.4	11.5		F #	

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
							Lab	Data QA	
Temperature	C	0590	06/11/2012	N001	5.21 - 19.21	13.43		F #	
Temperature	C	0590	11/14/2012	N001	5.21 - 19.21	12.6		F #	
Temperature	C	0609	11/14/2012	N001	6 - 21	10.82		F #	
Temperature	C	0620	03/06/2012	N001	6.7 - 10.7	8.74		F #	
Temperature	C	0620	06/12/2012	N001	6.7 - 10.7	14.92		F #	
Temperature	C	0620	09/26/2012	N001	6.7 - 10.7	16.53		F #	
Temperature	C	0620	11/14/2012	N001	6.7 - 10.7	14.55		F #	
Temperature	C	0620	12/21/2012	N001	6.7 - 10.7	10.3		F #	
Temperature	C	0635	06/11/2012	N001	12 - 17	11.89		F #	
Temperature	C	0635	11/14/2012	N001	12 - 17	12.53		F #	
Temperature	C	0658	06/11/2012	N001	.5 - 5.5	14.56		F #	
Temperature	C	0658	11/13/2012	N001	.5 - 5.5	14.65		F #	
Temperature	C	0659	06/12/2012	N001	.5 - 10.5	16.5		F #	
Temperature	C	0659	11/14/2012	N001	.5 - 10.5	14		F #	
Temperature	C	0664	06/12/2012	N001	7.7 - 14.7	15.44		F #	
Temperature	C	0664	11/14/2012	N001	7.7 - 14.7	13.8		F #	
Temperature	C	0669	06/12/2012	N001	4 - 10.6	14.23		FQ #	
Temperature	C	0669	11/14/2012	N001	4 - 10.6	13.5		FQ #	
Temperature	C	0670	06/11/2012	N001	5.2 - 12.2	13.5		F #	
Temperature	C	0670	11/13/2012	N001	5.2 - 12.2	15.29		F #	
Temperature	C	0680	11/15/2012	N001	5 - 10	15.13		F #	
Temperature	C	0689	06/13/2012	N001	4.5 - 9.38	16.16		FQ #	
Temperature	C	0690	06/13/2012	N001	4.61 - 9.49	15.69		FQ #	
Temperature	C	0855	06/11/2012	N001	6 - 11	16.44		F #	
Temperature	C	0855	11/13/2012	N001	6 - 11	15.31		F #	
Turbidity	NTU	0169	06/11/2012	N001	3.13 - 18.13	5.24		F #	
Turbidity	NTU	0169	11/15/2012	N001	3.13 - 18.13	1.25		F #	

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
							Lab	Data QA	
Turbidity	NTU	0170	06/11/2012	N001	92.23 - 112.23	6.61		F #	
Turbidity	NTU	0170	11/15/2012	N001	92.23 - 112.23	2.61		F #	
Turbidity	NTU	0172	03/06/2012	N001	6.98 - 31.98	1.5		F #	
Turbidity	NTU	0172	06/12/2012	N001	6.98 - 31.98	2.4		F #	
Turbidity	NTU	0172	09/26/2012	N001	6.98 - 31.98	8.55		F #	
Turbidity	NTU	0172	11/14/2012	N001	6.98 - 31.98	2.76		F #	
Turbidity	NTU	0172	12/21/2012	N001	6.98 - 31.98	2.13		F #	
Turbidity	NTU	0195	06/11/2012	N001	5.29 - 25.29	1.65		F #	
Turbidity	NTU	0195	11/15/2012	N001	5.29 - 25.29	4.32		F #	
Turbidity	NTU	0201	06/11/2012	N001	7.35 - 22.35	2.44		F #	
Turbidity	NTU	0201	11/14/2012	N001	7.35 - 22.35	1.09		F #	
Turbidity	NTU	0215	06/12/2012	N001	6.84 - 21.84	2.79		F #	
Turbidity	NTU	0215	11/14/2012	N001	6.84 - 21.84	0.91		F #	
Turbidity	NTU	0216	06/11/2012	N001	5.5 - 20.5	8.19		F #	
Turbidity	NTU	0216	11/14/2012	N001	5.5 - 20.5	1.95		F #	
Turbidity	NTU	0217	06/11/2012	N001	7.4 - 22.4	5.99		F #	
Turbidity	NTU	0217	11/14/2012	N001	7.4 - 22.4	2.01		F #	
Turbidity	NTU	0590	06/11/2012	N001	5.21 - 19.21	5.92		F #	
Turbidity	NTU	0590	11/14/2012	N001	5.21 - 19.21	2.12		F #	
Turbidity	NTU	0609	11/14/2012	N001	6 - 21	45.2		F #	
Turbidity	NTU	0620	03/06/2012	N001	6.7 - 10.7	6.78		F #	
Turbidity	NTU	0620	06/12/2012	N001	6.7 - 10.7	3.09		F #	
Turbidity	NTU	0620	09/26/2012	N001	6.7 - 10.7	4.89		F #	
Turbidity	NTU	0620	11/14/2012	N001	6.7 - 10.7	2.16		F #	
Turbidity	NTU	0620	12/21/2012	N001	6.7 - 10.7	3.84		F #	
Turbidity	NTU	0635	06/11/2012	N001	12 - 17	8.3		F #	
Turbidity	NTU	0635	11/14/2012	N001	12 - 17	1.75		F #	

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
							Lab	Data QA	
Turbidity	NTU	0658	06/11/2012	N001	.5 - 5.5	4.84	F	#	
Turbidity	NTU	0658	11/13/2012	N001	.5 - 5.5	4.77	F	#	
Turbidity	NTU	0659	06/12/2012	N001	.5 - 10.5	4.09	F	#	
Turbidity	NTU	0659	11/14/2012	N001	.5 - 10.5	5.48	F	#	
Turbidity	NTU	0664	06/12/2012	N001	7.7 - 14.7	6.94	F	#	
Turbidity	NTU	0664	11/14/2012	N001	7.7 - 14.7	9.85	F	#	
Turbidity	NTU	0669	06/12/2012	N001	4 - 10.6	8.32	FQ	#	
Turbidity	NTU	0669	11/14/2012	N001	4 - 10.6	30.5	FQ	#	
Turbidity	NTU	0670	06/11/2012	N001	5.2 - 12.2	3.91	F	#	
Turbidity	NTU	0670	11/13/2012	N001	5.2 - 12.2	6.66	F	#	
Turbidity	NTU	0680	11/15/2012	N001	5 - 10	4.8	F	#	
Turbidity	NTU	0689	06/13/2012	N001	4.5 - 9.38	96.7	FQ	#	
Turbidity	NTU	0690	06/13/2012	N001	4.61 - 9.49	90.5	FQ	#	
Turbidity	NTU	0855	06/11/2012	N001	6 - 11	3.85	F	#	
Turbidity	NTU	0855	11/13/2012	N001	6 - 11	5.83	F	#	
Uranium	mg/L	0169	06/11/2012	N001	3.13 - 18.13	0.0211	F	#	0.000067
Uranium	mg/L	0169	06/11/2012	N002	3.13 - 18.13	0.0227	F	#	0.000067
Uranium	mg/L	0169	11/15/2012	N001	3.13 - 18.13	0.017	F	#	0.0000029
Uranium	mg/L	0170	06/11/2012	N001	92.23 - 112.23	0.0592	F	#	0.000067
Uranium	mg/L	0170	11/15/2012	N001	92.23 - 112.23	0.06	F	#	0.0000029
Uranium	mg/L	0172	03/06/2012	N001	6.98 - 31.98	0.067	F	#	0.000029
Uranium	mg/L	0172	03/06/2012	N002	6.98 - 31.98	0.069	F	#	0.000029
Uranium	mg/L	0172	06/12/2012	N001	6.98 - 31.98	0.0722	F	#	0.000067
Uranium	mg/L	0172	06/12/2012	N002	6.98 - 31.98	0.0753	F	#	0.000067
Uranium	mg/L	0172	09/26/2012	N001	6.98 - 31.98	0.069	F	#	0.000029
Uranium	mg/L	0172	09/26/2012	N002	6.98 - 31.98	0.068	F	#	0.000029
Uranium	mg/L	0172	11/14/2012	N001	6.98 - 31.98	0.075	F	#	0.0000029

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
							Lab	Data QA	
Uranium	mg/L	0172	12/21/2012	N003	6.98 - 31.98	0.068	F	#	0.000029
Uranium	mg/L	0172	12/21/2012	N004	6.98 - 31.98	0.066	F	#	0.000029
Uranium	mg/L	0195	06/11/2012	N001	5.29 - 25.29	0.0109	F	#	0.000067
Uranium	mg/L	0195	11/15/2012	N001	5.29 - 25.29	0.027	F	#	0.0000029
Uranium	mg/L	0201	06/11/2012	N001	7.35 - 22.35	0.122	F	#	0.000335
Uranium	mg/L	0201	11/14/2012	N001	7.35 - 22.35	0.1	F	#	0.000029
Uranium	mg/L	0215	06/12/2012	N001	6.84 - 21.84	0.0343	F	#	0.000067
Uranium	mg/L	0215	11/14/2012	N001	6.84 - 21.84	0.015	F	#	0.0000029
Uranium	mg/L	0216	06/11/2012	N001	5.5 - 20.5	0.0167	F	#	0.000067
Uranium	mg/L	0216	11/14/2012	N001	5.5 - 20.5	0.01	F	#	0.000029
Uranium	mg/L	0217	06/11/2012	N001	7.4 - 22.4	0.161	F	#	0.000335
Uranium	mg/L	0217	11/14/2012	N001	7.4 - 22.4	0.15	F	#	0.00015
Uranium	mg/L	0590	06/11/2012	N001	5.21 - 19.21	0.0732	F	#	0.000067
Uranium	mg/L	0590	11/14/2012	N001	5.21 - 19.21	0.078	F	#	0.000015
Uranium	mg/L	0609	11/14/2012	0001	6 - 21	0.03	F	#	0.0000029
Uranium	mg/L	0620	03/06/2012	N001	6.7 - 10.7	0.056	F	#	0.000029
Uranium	mg/L	0620	06/12/2012	N001	6.7 - 10.7	0.0638	F	#	0.000067
Uranium	mg/L	0620	09/26/2012	N001	6.7 - 10.7	0.058	F	#	0.000029
Uranium	mg/L	0620	11/14/2012	N001	6.7 - 10.7	0.059	F	#	0.0000029
Uranium	mg/L	0620	11/14/2012	N002	6.7 - 10.7	0.059	F	#	0.0000029
Uranium	mg/L	0620	12/21/2012	N003	6.7 - 10.7	0.059	F	#	0.000029
Uranium	mg/L	0635	06/11/2012	N001	12 - 17	0.0896	F	#	0.000067
Uranium	mg/L	0635	11/14/2012	N001	12 - 17	0.076	F	#	0.0000029
Uranium	mg/L	0658	06/11/2012	N001	.5 - 5.5	0.0736	F	#	0.000067
Uranium	mg/L	0658	11/13/2012	N001	.5 - 5.5	0.063	F	#	0.00029
Uranium	mg/L	0659	06/12/2012	N001	.5 - 10.5	0.0957	F	#	0.000067
Uranium	mg/L	0659	11/14/2012	N001	.5 - 10.5	0.1	F	#	0.00015

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit
							Lab	Data	QA	
Uranium	mg/L	0664	06/12/2012	N001	7.7 - 14.7	0.0658		F	#	0.000067
Uranium	mg/L	0664	11/14/2012	N001	7.7 - 14.7	0.054		F	#	0.000015
Uranium	mg/L	0669	06/12/2012	N001	4 - 10.6	0.115		FQ	#	0.00067
Uranium	mg/L	0669	11/14/2012	0001	4 - 10.6	0.073		FQ	#	0.00015
Uranium	mg/L	0670	06/11/2012	N001	5.2 - 12.2	0.0857		F	#	0.000067
Uranium	mg/L	0670	11/13/2012	N001	5.2 - 12.2	0.071		F	#	0.000029
Uranium	mg/L	0680	11/15/2012	N001	5 - 10	0.099		F	#	0.000029
Uranium	mg/L	0689	06/13/2012	0001	4.5 - 9.38	0.0513		FQ	#	0.000067
Uranium	mg/L	0690	06/13/2012	0001	4.61 - 9.49	0.037		FQ	#	0.000067
Uranium	mg/L	0855	06/11/2012	N001	6 - 11	0.0652		F	#	0.000067
Uranium	mg/L	0855	11/13/2012	N001	6 - 11	0.045		F	#	0.00029
Uranium	mg/L	0855	11/13/2012	N002	6 - 11	0.049		F	#	0.00029
Vanadium	mg/L	0169	06/11/2012	N001	3.13 - 18.13	0.001	U	F	#	0.001
Vanadium	mg/L	0169	06/11/2012	N002	3.13 - 18.13	0.00114	B	F	#	0.001
Vanadium	mg/L	0169	11/15/2012	N001	3.13 - 18.13	0.00087		F	#	0.000015
Vanadium	mg/L	0170	06/11/2012	N001	92.23 - 112.23	0.001	U	F	#	0.001
Vanadium	mg/L	0170	11/15/2012	N001	92.23 - 112.23	0.00093		F	#	0.000015
Vanadium	mg/L	0172	06/12/2012	N001	6.98 - 31.98	0.001	U	F	#	0.001
Vanadium	mg/L	0172	06/12/2012	N002	6.98 - 31.98	0.001	U	F	#	0.001
Vanadium	mg/L	0172	11/14/2012	N001	6.98 - 31.98	0.00022	B	F	#	0.000015
Vanadium	mg/L	0195	06/11/2012	N001	5.29 - 25.29	0.001	U	F	#	0.001
Vanadium	mg/L	0195	11/15/2012	N001	5.29 - 25.29	0.00047		F	#	0.000015
Vanadium	mg/L	0201	06/11/2012	N001	7.35 - 22.35	0.001	U	F	#	0.001
Vanadium	mg/L	0201	11/14/2012	N001	7.35 - 22.35	0.0007		F	#	0.000015
Vanadium	mg/L	0215	06/12/2012	N001	6.84 - 21.84	0.00231	B	F	#	0.001
Vanadium	mg/L	0215	11/14/2012	N001	6.84 - 21.84	0.0033		F	#	0.000015
Vanadium	mg/L	0216	06/11/2012	N001	5.5 - 20.5	0.192		F	#	0.001

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFN01, Rifle New Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
							Lab	Data QA	
Vanadium	mg/L	0216	11/14/2012	N001	5.5 - 20.5	0.19		F #	0.00015
Vanadium	mg/L	0217	06/11/2012	N001	7.4 - 22.4	1.95		F #	0.001
Vanadium	mg/L	0217	11/14/2012	N001	7.4 - 22.4	1.7		F #	0.00076
Vanadium	mg/L	0590	06/11/2012	N001	5.21 - 19.21	0.449		F #	0.001
Vanadium	mg/L	0590	11/14/2012	N001	5.21 - 19.21	0.43		F #	0.000076
Vanadium	mg/L	0609	11/14/2012	0001	6 - 21	0.0023		F #	0.000015
Vanadium	mg/L	0620	06/12/2012	N001	6.7 - 10.7	0.001	U	F #	0.001
Vanadium	mg/L	0620	11/14/2012	N001	6.7 - 10.7	0.0019		F #	0.000015
Vanadium	mg/L	0620	11/14/2012	N002	6.7 - 10.7	0.0018		F #	0.000015
Vanadium	mg/L	0635	06/11/2012	N001	12 - 17	0.001	U	F #	0.001
Vanadium	mg/L	0635	11/14/2012	N001	12 - 17	0.00057		F #	0.000015
Vanadium	mg/L	0658	06/11/2012	N001	.5 - 5.5	31		F #	0.01
Vanadium	mg/L	0658	11/13/2012	N001	.5 - 5.5	29		F #	0.0015
Vanadium	mg/L	0659	06/12/2012	N001	.5 - 10.5	1.82		F #	0.001
Vanadium	mg/L	0659	11/14/2012	N001	.5 - 10.5	0.75		F #	0.00076
Vanadium	mg/L	0664	06/12/2012	N001	7.7 - 14.7	2.39		F #	0.001
Vanadium	mg/L	0664	11/14/2012	N001	7.7 - 14.7	1.5		F #	0.000076
Vanadium	mg/L	0669	06/12/2012	N001	4 - 10.6	3.28		FQ #	0.001
Vanadium	mg/L	0669	11/14/2012	0001	4 - 10.6	4.1		FQ #	0.00076
Vanadium	mg/L	0670	06/11/2012	N001	5.2 - 12.2	2.19		F #	0.001
Vanadium	mg/L	0670	11/13/2012	N001	5.2 - 12.2	2.5		F #	0.00015
Vanadium	mg/L	0680	11/15/2012	N001	5 - 10	0.041		F #	0.00015
Vanadium	mg/L	0689	06/13/2012	0001	4.5 - 9.38	6.42		FQ #	0.001
Vanadium	mg/L	0690	06/13/2012	0001	4.61 - 9.49	2.88		FQ #	0.001
Vanadium	mg/L	0855	06/11/2012	N001	6 - 11	17.2		F #	0.005
Vanadium	mg/L	0855	11/13/2012	N001	6 - 11	31		F #	0.0015
Vanadium	mg/L	0855	11/13/2012	N002	6 - 11	31		F #	0.0015

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

LAB QUALIFIERS:

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

DATA QUALIFIERS:

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

QA QUALIFIER:

- # Validated according to quality assurance guidelines.

**Surface Water Quality Data by Parameter (USEE205) FOR SITE RFO01, Rifle Old Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Result	Qualifiers		Detection Limit
			Date	ID		Lab	Data QA	
Alkalinity, Total (As CaCO3)	mg/L	0294	06/12/2012	N001	112		#	
Alkalinity, Total (As CaCO3)	mg/L	0294	11/12/2012	N001	144		#	
Alkalinity, Total (As CaCO3)	mg/L	0395	06/13/2012	N001	359		#	
Alkalinity, Total (As CaCO3)	mg/L	0395	11/12/2012	0001	298		#	
Alkalinity, Total (As CaCO3)	mg/L	0396	06/13/2012	N001	84		#	
Alkalinity, Total (As CaCO3)	mg/L	0396	11/13/2012	N001	99		#	
Alkalinity, Total (As CaCO3)	mg/L	0398	06/13/2012	N001	186		#	
Alkalinity, Total (As CaCO3)	mg/L	0398	11/12/2012	N001	243		#	
Alkalinity, Total (As CaCO3)	mg/L	0741	06/13/2012	N001	85		#	
Alkalinity, Total (As CaCO3)	mg/L	0741	11/13/2012	N001	138		#	
Oxidation Reduction Potential	mV	0294	06/12/2012	N001	93.4		#	
Oxidation Reduction Potential	mV	0294	11/12/2012	N001	51.5		#	
Oxidation Reduction Potential	mV	0395	06/13/2012	N001	106.8		#	
Oxidation Reduction Potential	mV	0395	11/12/2012	N001	164		#	
Oxidation Reduction Potential	mV	0396	06/13/2012	N001	175		#	
Oxidation Reduction Potential	mV	0396	11/13/2012	N001	45		#	
Oxidation Reduction Potential	mV	0398	06/13/2012	N001	225		#	
Oxidation Reduction Potential	mV	0398	11/12/2012	N001	177		#	
Oxidation Reduction Potential	mV	0741	11/13/2012	N001	206		#	
pH	s.u.	0294	06/12/2012	N001	8.76		#	
pH	s.u.	0294	11/12/2012	N001	8.93		#	
pH	s.u.	0395	06/13/2012	N001	7.39		#	
pH	s.u.	0395	11/12/2012	N001	7.77		#	
pH	s.u.	0396	06/13/2012	N001	8.61		#	
pH	s.u.	0396	11/13/2012	N001	8.27		#	
pH	s.u.	0398	06/13/2012	N001	7.52		#	
pH	s.u.	0398	11/12/2012	N001	8.28		#	

**Surface Water Quality Data by Parameter (USEE205) FOR SITE RFO01, Rifle Old Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Result	Qualifiers		Detection Limit
			Date	ID		Lab	Data QA	
pH	s.u.	0741	06/13/2012	N001	8.43		#	
pH	s.u.	0741	11/13/2012	N001	6.94		#	
Selenium	mg/L	0294	06/12/2012	N001	0.0015	U	#	0.0015
Selenium	mg/L	0294	11/12/2012	N001	0.00054		#	0.000032
Selenium	mg/L	0395	06/13/2012	N001	0.00815		#	0.0015
Selenium	mg/L	0395	11/12/2012	0001	0.0041		#	0.000032
Selenium	mg/L	0396	06/13/2012	N001	0.00165	B	#	0.0015
Selenium	mg/L	0396	11/13/2012	N001	0.00061		#	0.000032
Selenium	mg/L	0398	06/13/2012	N001	0.00204	B	#	0.0015
Selenium	mg/L	0398	11/12/2012	N001	0.0021		#	0.000032
Selenium	mg/L	0741	06/13/2012	N001	0.0015	U	#	0.0015
Selenium	mg/L	0741	11/13/2012	N001	0.00058		#	0.000032
Specific Conductance	umhos/cm	0294	06/12/2012	N001	855		#	
Specific Conductance	umhos/cm	0294	11/12/2012	N001	1282		#	
Specific Conductance	umhos/cm	0395	06/13/2012	N001	1569		#	
Specific Conductance	umhos/cm	0395	11/12/2012	N001	1267		#	
Specific Conductance	umhos/cm	0396	06/13/2012	N001	940		#	
Specific Conductance	umhos/cm	0396	11/13/2012	N001	1473		#	
Specific Conductance	umhos/cm	0398	06/13/2012	N001	1430		#	
Specific Conductance	umhos/cm	0398	11/12/2012	N001	1570		#	
Specific Conductance	umhos/cm	0741	06/13/2012	N001	915		#	
Specific Conductance	umhos/cm	0741	11/13/2012	N001	1495		#	
Temperature	C	0294	06/12/2012	N001	19.04		#	
Temperature	C	0294	11/12/2012	N001	5.67		#	
Temperature	C	0395	06/13/2012	N001	27.57		#	
Temperature	C	0395	11/12/2012	N001	12.77		#	
Temperature	C	0396	06/13/2012	N001	20.5		#	

**Surface Water Quality Data by Parameter (USEE205) FOR SITE RFO01, Rifle Old Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Result	Qualifiers		Detection Limit
			Date	ID		Lab	Data QA	
Temperature	C	0396	11/13/2012	N001	5.64		#	
Temperature	C	0398	06/13/2012	N001	14.1		#	
Temperature	C	0398	11/12/2012	N001	9.36		#	
Temperature	C	0741	06/13/2012	N001	21		#	
Temperature	C	0741	11/13/2012	N001	2.57		#	
Turbidity	NTU	0294	06/12/2012	N001	5.32		#	
Turbidity	NTU	0294	11/12/2012	N001	9.24		#	
Turbidity	NTU	0395	06/13/2012	N001	6.58		#	
Turbidity	NTU	0395	11/12/2012	N001	13		#	
Turbidity	NTU	0396	06/13/2012	N001	4.82		#	
Turbidity	NTU	0396	11/13/2012	N001	5.44		#	
Turbidity	NTU	0398	06/13/2012	N001	4.93		#	
Turbidity	NTU	0398	11/12/2012	N001	1.43		#	
Turbidity	NTU	0741	06/13/2012	N001	5.43		#	
Turbidity	NTU	0741	11/13/2012	N001	4.5		#	
Uranium	mg/L	0294	06/12/2012	N001	0.00181		#	0.000067
Uranium	mg/L	0294	11/12/2012	N001	0.0024		#	0.000029
Uranium	mg/L	0395	06/13/2012	N001	0.0353		#	0.000067
Uranium	mg/L	0395	11/12/2012	0001	0.027		#	0.000029
Uranium	mg/L	0396	06/13/2012	N001	0.002		#	0.000067
Uranium	mg/L	0396	11/13/2012	N001	0.0028		#	0.000029
Uranium	mg/L	0398	06/13/2012	N001	0.0136		#	0.000067
Uranium	mg/L	0398	11/12/2012	N001	0.016		#	0.000029
Uranium	mg/L	0741	06/13/2012	N001	0.00194		#	0.000067
Uranium	mg/L	0741	11/13/2012	N001	0.0025		#	0.000029
Vanadium	mg/L	0294	06/12/2012	N001	0.00113	B	#	0.001
Vanadium	mg/L	0294	11/12/2012	N001	0.001		#	0.000015

**Surface Water Quality Data by Parameter (USEE205) FOR SITE RFO01, Rifle Old Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Result	Qualifiers		Detection Limit
			Date	ID		Lab	Data QA	
Vanadium	mg/L	0395	06/13/2012	N001	0.0019	B	#	0.001
Vanadium	mg/L	0395	11/12/2012	0001	0.0017		#	0.000015
Vanadium	mg/L	0396	06/13/2012	N001	0.00105	B	#	0.001
Vanadium	mg/L	0396	11/13/2012	N001	0.0011		#	0.000015
Vanadium	mg/L	0398	06/13/2012	N001	0.00282	B	#	0.001
Vanadium	mg/L	0398	11/12/2012	N001	0.0036		#	0.000015
Vanadium	mg/L	0741	06/13/2012	N001	0.00102	B	#	0.001
Vanadium	mg/L	0741	11/13/2012	N001	0.00072		#	0.000015

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

**LAB QUALIFIERS:**

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

**DATA QUALIFIERS:**

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

**QA QUALIFIER:**

- # Validated according to quality assurance guidelines.

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFO01, Rifle Old Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
			Date	ID			Lab	Data QA	
Alkalinity, Total (As CaCO3)	mg/L	0292A	06/12/2012	N001	10.5 - 20.5	454	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0292A	11/12/2012	N001	10.5 - 20.5	465	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0304	06/13/2012	N001	13.2 - 18.2	268	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0304	11/13/2012	N001	13.2 - 18.2	281	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0305	06/13/2012	N001	13.76 - 18.76	315	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0305	11/13/2012	N001	13.76 - 18.76	342	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0309	06/13/2012	N001	16.93 - 21.93	343	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0309	11/13/2012	N001	16.93 - 21.93	375	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0310	06/13/2012	N001	17.93 - 22.93	390	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0655	06/13/2012	N001	13.6 - 23.6	440	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0655	11/13/2012	N001	13.6 - 23.6	433	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0656	06/13/2012	N001	6.35 - 21.35	329	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0656	11/12/2012	N001	6.35 - 21.35	413	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0658	06/12/2012	N001	2.3 - 17.3	370	F	#	
Alkalinity, Total (As CaCO3)	mg/L	0658	11/12/2012	N001	2.3 - 17.3	350	F	#	
Oxidation Reduction Potential	mV	0292A	06/12/2012	N001	10.5 - 20.5	56	F	#	
Oxidation Reduction Potential	mV	0292A	11/12/2012	N001	10.5 - 20.5	0.4	F	#	
Oxidation Reduction Potential	mV	0304	06/13/2012	N001	13.2 - 18.2	220	F	#	
Oxidation Reduction Potential	mV	0304	11/13/2012	N001	13.2 - 18.2	0.3	F	#	
Oxidation Reduction Potential	mV	0305	06/13/2012	N001	13.76 - 18.76	220	F	#	
Oxidation Reduction Potential	mV	0305	11/13/2012	N001	13.76 - 18.76	16.6	F	#	
Oxidation Reduction Potential	mV	0309	06/13/2012	N001	16.93 - 21.93	85	F	#	
Oxidation Reduction Potential	mV	0309	11/13/2012	N001	16.93 - 21.93	-14	F	#	
Oxidation Reduction Potential	mV	0655	06/13/2012	N001	13.6 - 23.6	205	F	#	
Oxidation Reduction Potential	mV	0655	11/13/2012	N001	13.6 - 23.6	31.7	F	#	
Oxidation Reduction Potential	mV	0656	06/13/2012	N001	6.35 - 21.35	224	F	#	
Oxidation Reduction Potential	mV	0656	11/12/2012	N001	6.35 - 21.35	168.6	F	#	

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFO01, Rifle Old Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample Date	Sample ID	Depth Range (Ft BLS)	Result	Lab	Qualifiers Data	QA	Detection Limit
Oxidation Reduction Potential	mV	0658	06/12/2012	N001	2.3 - 17.3	36		F	#	
Oxidation Reduction Potential	mV	0658	11/12/2012	N001	2.3 - 17.3	35		F	#	
pH	s.u.	0292A	06/12/2012	N001	10.5 - 20.5	7.01		F	#	
pH	s.u.	0292A	11/12/2012	N001	10.5 - 20.5	7.04		F	#	
pH	s.u.	0304	06/13/2012	N001	13.2 - 18.2	7.07		F	#	
pH	s.u.	0304	11/13/2012	N001	13.2 - 18.2	7.13		F	#	
pH	s.u.	0305	06/13/2012	N001	13.76 - 18.76	7.14		F	#	
pH	s.u.	0305	11/13/2012	N001	13.76 - 18.76	7.23		F	#	
pH	s.u.	0309	06/13/2012	N001	16.93 - 21.93	7.01		F	#	
pH	s.u.	0309	11/13/2012	N001	16.93 - 21.93	7.04		F	#	
pH	s.u.	0310	06/13/2012	N001	17.93 - 22.93	7.04		F	#	
pH	s.u.	0655	06/13/2012	N001	13.6 - 23.6	6.96		F	#	
pH	s.u.	0655	11/13/2012	N001	13.6 - 23.6	7.01		F	#	
pH	s.u.	0656	06/13/2012	N001	6.35 - 21.35	6.92		F	#	
pH	s.u.	0656	11/12/2012	N001	6.35 - 21.35	7.02		F	#	
pH	s.u.	0658	06/12/2012	N001	2.3 - 17.3	7.05		F	#	
pH	s.u.	0658	11/12/2012	N001	2.3 - 17.3	7.03		F	#	
Selenium	mg/L	0292A	06/12/2012	N001	10.5 - 20.5	0.0015	U	F	#	0.0015
Selenium	mg/L	0292A	06/12/2012	N002	10.5 - 20.5	0.00153	B	UF	#	0.0015
Selenium	mg/L	0292A	11/12/2012	N001	10.5 - 20.5	0.00016		F	#	0.000032
Selenium	mg/L	0304	06/13/2012	N001	13.2 - 18.2	0.00376	B	F	#	0.0015
Selenium	mg/L	0304	11/13/2012	N001	13.2 - 18.2	0.0028		F	#	0.000032
Selenium	mg/L	0305	06/13/2012	N001	13.76 - 18.76	0.0235		F	#	0.0015
Selenium	mg/L	0305	11/13/2012	N001	13.76 - 18.76	0.021		F	#	0.00016
Selenium	mg/L	0309	06/13/2012	N001	16.93 - 21.93	0.0015	U	F	#	0.0015
Selenium	mg/L	0309	11/13/2012	N001	16.93 - 21.93	0.00017		F	#	0.000032
Selenium	mg/L	0310	06/13/2012	N001	17.93 - 22.93	0.0015	U	F	#	0.0015

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFO01, Rifle Old Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
			Date	ID			Lab	Data QA	
Selenium	mg/L	0655	06/13/2012	N001	13.6 - 23.6	0.0297	F	#	0.0015
Selenium	mg/L	0655	11/13/2012	N001	13.6 - 23.6	0.0096	F	#	0.00016
Selenium	mg/L	0656	06/13/2012	N001	6.35 - 21.35	0.0176	F	#	0.0015
Selenium	mg/L	0656	11/12/2012	N001	6.35 - 21.35	0.0052	F	#	0.00016
Selenium	mg/L	0658	06/12/2012	N001	2.3 - 17.3	0.0144	F	#	0.0015
Selenium	mg/L	0658	11/12/2012	N001	2.3 - 17.3	0.0047	F	#	0.000032
Specific Conductance	umhos/cm	0292A	06/12/2012	N001	10.5 - 20.5	1936	F	#	
Specific Conductance	umhos/cm	0292A	11/12/2012	N001	10.5 - 20.5	1816	F	#	
Specific Conductance	umhos/cm	0304	06/13/2012	N001	13.2 - 18.2	1575	F	#	
Specific Conductance	umhos/cm	0304	11/13/2012	N001	13.2 - 18.2	1643	F	#	
Specific Conductance	umhos/cm	0305	06/13/2012	N001	13.76 - 18.76	2030	F	#	
Specific Conductance	umhos/cm	0305	11/13/2012	N001	13.76 - 18.76	1821	F	#	
Specific Conductance	umhos/cm	0309	06/13/2012	N001	16.93 - 21.93	2430	F	#	
Specific Conductance	umhos/cm	0309	11/13/2012	N001	16.93 - 21.93	2383	F	#	
Specific Conductance	umhos/cm	0310	06/13/2012	N001	17.93 - 22.93	2500	F	#	
Specific Conductance	umhos/cm	0655	06/13/2012	N001	13.6 - 23.6	2235	F	#	
Specific Conductance	umhos/cm	0655	11/13/2012	N001	13.6 - 23.6	2124	F	#	
Specific Conductance	umhos/cm	0656	06/13/2012	N001	6.35 - 21.35	2020	F	#	
Specific Conductance	umhos/cm	0656	11/12/2012	N001	6.35 - 21.35	2119	F	#	
Specific Conductance	umhos/cm	0658	06/12/2012	N001	2.3 - 17.3	1449	F	#	
Specific Conductance	umhos/cm	0658	11/12/2012	N001	2.3 - 17.3	1364	F	#	
Temperature	C	0292A	06/12/2012	N001	10.5 - 20.5	13.86	F	#	
Temperature	C	0292A	11/12/2012	N001	10.5 - 20.5	13.21	F	#	
Temperature	C	0304	06/13/2012	N001	13.2 - 18.2	12.9	F	#	
Temperature	C	0304	11/13/2012	N001	13.2 - 18.2	14.85	F	#	
Temperature	C	0305	06/13/2012	N001	13.76 - 18.76	12.3	F	#	
Temperature	C	0305	11/13/2012	N001	13.76 - 18.76	16.02	F	#	

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFO01, Rifle Old Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Depth Range (Ft BLS)	Result	Qualifiers		Detection Limit
			Date	ID			Lab	Data QA	
Temperature	C	0309	06/13/2012	N001	16.93 - 21.93	15.6	F	#	
Temperature	C	0309	11/13/2012	N001	16.93 - 21.93	14.25	F	#	
Temperature	C	0310	06/13/2012	N001	17.93 - 22.93	14.4	F	#	
Temperature	C	0655	06/13/2012	N001	13.6 - 23.6	13.3	F	#	
Temperature	C	0655	11/13/2012	N001	13.6 - 23.6	14.85	F	#	
Temperature	C	0656	06/13/2012	N001	6.35 - 21.35	15.9	F	#	
Temperature	C	0656	11/12/2012	N001	6.35 - 21.35	17.36	F	#	
Temperature	C	0658	06/12/2012	N001	2.3 - 17.3	10.26	F	#	
Temperature	C	0658	11/12/2012	N001	2.3 - 17.3	12.06	F	#	
Turbidity	NTU	0292A	06/12/2012	N001	10.5 - 20.5	5.91	F	#	
Turbidity	NTU	0292A	11/12/2012	N001	10.5 - 20.5	2.07	F	#	
Turbidity	NTU	0304	06/13/2012	N001	13.2 - 18.2	9.66	F	#	
Turbidity	NTU	0304	11/13/2012	N001	13.2 - 18.2	2.06	F	#	
Turbidity	NTU	0305	06/13/2012	N001	13.76 - 18.76	6.91	F	#	
Turbidity	NTU	0305	11/13/2012	N001	13.76 - 18.76	1.13	F	#	
Turbidity	NTU	0309	06/13/2012	N001	16.93 - 21.93	9.67	F	#	
Turbidity	NTU	0309	11/13/2012	N001	16.93 - 21.93	2.66	F	#	
Turbidity	NTU	0310	06/13/2012	N001	17.93 - 22.93	2.45	F	#	
Turbidity	NTU	0655	06/13/2012	N001	13.6 - 23.6	1.55	F	#	
Turbidity	NTU	0655	11/13/2012	N001	13.6 - 23.6	1.61	F	#	
Turbidity	NTU	0656	06/13/2012	N001	6.35 - 21.35	4.86	F	#	
Turbidity	NTU	0656	11/12/2012	N001	6.35 - 21.35	3.22	F	#	
Turbidity	NTU	0658	06/12/2012	N001	2.3 - 17.3	5.92	F	#	
Turbidity	NTU	0658	11/12/2012	N001	2.3 - 17.3	2.31	F	#	
Uranium	mg/L	0292A	06/12/2012	N001	10.5 - 20.5	0.0273	F	#	0.000067
Uranium	mg/L	0292A	06/12/2012	N002	10.5 - 20.5	0.0265	F	#	0.000067
Uranium	mg/L	0292A	11/12/2012	N001	10.5 - 20.5	0.022	F	#	0.000029

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFO01, Rifle Old Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit
			Date	ID			Lab	Data	QA	
Uranium	mg/L	0304	06/13/2012	N001	13.2 - 18.2	0.0368		F	#	0.000067
Uranium	mg/L	0304	11/13/2012	N001	13.2 - 18.2	0.034		F	#	0.0000029
Uranium	mg/L	0305	06/13/2012	N001	13.76 - 18.76	0.0861		F	#	0.000067
Uranium	mg/L	0305	11/13/2012	N001	13.76 - 18.76	0.057		F	#	0.000015
Uranium	mg/L	0309	06/13/2012	N001	16.93 - 21.93	0.0308		F	#	0.000067
Uranium	mg/L	0309	11/13/2012	N001	16.93 - 21.93	0.023		F	#	0.0000029
Uranium	mg/L	0310	06/13/2012	N001	17.93 - 22.93	0.207		F	#	0.000335
Uranium	mg/L	0655	06/13/2012	N001	13.6 - 23.6	0.115		F	#	0.000335
Uranium	mg/L	0655	11/13/2012	N001	13.6 - 23.6	0.076		F	#	0.000015
Uranium	mg/L	0656	06/13/2012	N001	6.35 - 21.35	0.225		F	#	0.000335
Uranium	mg/L	0656	11/12/2012	N001	6.35 - 21.35	0.19		F	#	0.000015
Uranium	mg/L	0658	06/12/2012	N001	2.3 - 17.3	0.0124		F	#	0.000067
Uranium	mg/L	0658	11/12/2012	N001	2.3 - 17.3	0.0096		F	#	0.0000029
Vanadium	mg/L	0292A	06/12/2012	N001	10.5 - 20.5	0.001	U	F	#	0.001
Vanadium	mg/L	0292A	06/12/2012	N002	10.5 - 20.5	0.001	U	F	#	0.001
Vanadium	mg/L	0292A	11/12/2012	N001	10.5 - 20.5	0.00026	B	F	#	0.000015
Vanadium	mg/L	0304	06/13/2012	N001	13.2 - 18.2	0.0461		F	#	0.001
Vanadium	mg/L	0304	11/13/2012	N001	13.2 - 18.2	0.057		F	#	0.000015
Vanadium	mg/L	0305	06/13/2012	N001	13.76 - 18.76	0.234		F	#	0.001
Vanadium	mg/L	0305	11/13/2012	N001	13.76 - 18.76	0.43		F	#	0.000076
Vanadium	mg/L	0309	06/13/2012	N001	16.93 - 21.93	0.001	U	F	#	0.001
Vanadium	mg/L	0309	11/13/2012	N001	16.93 - 21.93	0.00021	B	F	#	0.000015
Vanadium	mg/L	0310	06/13/2012	N001	17.93 - 22.93	0.00904		F	#	0.001
Vanadium	mg/L	0655	06/13/2012	N001	13.6 - 23.6	0.307		F	#	0.001
Vanadium	mg/L	0655	11/13/2012	N001	13.6 - 23.6	0.3		F	#	0.000076
Vanadium	mg/L	0656	06/13/2012	N001	6.35 - 21.35	0.0189		F	#	0.001
Vanadium	mg/L	0656	11/12/2012	N001	6.35 - 21.35	0.022		F	#	0.000076

**Groundwater Quality Data by Parameter (USEE205) FOR SITE RFO01, Rifle Old Processing Site**  
**REPORT DATE: 12/10/2013**

Parameter	Units	Location ID	Sample		Depth Range (Ft BLS)	Result	Qualifiers			Detection Limit
			Date	ID			Lab	Data	QA	
Vanadium	mg/L	0658	06/12/2012	N001	2.3 - 17.3	0.001	U	F	#	0.001
Vanadium	mg/L	0658	11/12/2012	N001	2.3 - 17.3	0.00065		F	#	0.000015

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

**LAB QUALIFIERS:**

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

**DATA QUALIFIERS:**

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

**QA QUALIFIER:**

- # Validated according to quality assurance guidelines.