LMS/RVT/S17242

2017 Verification Monitoring Report, Riverton, Wyoming, Processing Site

July 2018

U.S. DEPARTMENT OF ENERGY | Legacy Management

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Abbreviations

AWSS	alternate water supply system
bgs	below ground surface
CFR	*Code of Federal Regulations*
cfs	cubic feet per second
COCs	contaminants of concern
CSM	conceptual site model
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ft	feet
GEMS	Geospatial Environmental Mapping System
ICs	institutional controls
LM	Office of Legacy Management
LTMP	*Long-Term Management Plan for the Riverton, Wyoming, Processing Site*
MCLs	maximum concentration limits
mg/L	milligrams per liter
NANRO	Northern Arapaho Natural Resources Office
NAW&SD	Northern Arapaho Water & Sewer Department
NRZs	naturally reduced zones
pCi/L	picocuries per liter
^{226}Ra	radium-226
SLAC	Stanford Linear Accelerator Center
^{230}Th	thorium
USGS	U.S. Geological Survey

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Executive Summary

This verification monitoring report presents data collected during calendar year 2017 and provides updates on the natural flushing compliance strategy and conceptual site model at the Riverton, Wyoming, Processing Site (Riverton site). Activities included monitoring institutional controls (ICs) and routine sampling of groundwater, surface water, and domestic wells.

ICs continue to function as intended at the Riverton site. IC monitoring was conducted to verify that ICs are in place and working in order to ensure that potential exposure to contaminated groundwater is minimized during the natural flushing period. IC monitoring consisted of two components: (1) sampling of domestic wells and (2) land and water use verification. Land and water use inspections within the IC boundary verified that warning signs around the oxbow lake were in place and in good condition. Land and water use inspections also resulted in the discovery that the stilling well installed in the Little Wind River was destroyed by large ice flows on the river during the February flood event. The IC related to new well installation was verified in 2017 when the Wyoming State Engineer's Office notified the U.S. Department of Energy of a new application for a well permit requesting the installation of a domestic well immediately adjacent to the IC boundary.

Flushing and sampling of the alternate water supply system (AWSS) IC was not conducted in 2017 because current issues with the AWSS prevent an effective flush of the system. A condition assessment of the AWSS is in progress to identify required maintenance and to determine the current system configuration in order to obtain an effective flush of the system.

Concentrations of uranium and molybdenum at the site continued to remain above the standards for groundwater in numerous surficial aquifer wells, and uranium and molybdenum concentrations remained elevated (compared to 2015 pre-flood levels) in monitoring wells that were impacted by flooding of the Little Wind River in February and June 2017. Sampling results from semiconfined monitoring wells and domestic wells continued to indicate no impact from site-related contaminants.

Several types of information, including contaminants mobilized by flood events, the current plume size and contaminant concentration levels, groundwater modeling results, historical data, and experience at other Uranium Mill Tailings Radiation Control Act sites, indicate natural flushing of the surficial aquifer is occurring at the Riverton site, but the rate at which it is occurring might not be sufficient to meet the 100-year regulatory time frame. Additional ongoing evaluation of the data will likely produce a better understanding of the site's processes before a final decision regarding the natural flushing compliance strategy is made or before an alternate compliance strategy is chosen.

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1.0 Introduction

This verification monitoring report presents data collected during calendar year 2017 and provides updates on the natural flushing compliance strategy and conceptual site model (CSM) at the Riverton, Wyoming, Processing Site (Riverton site). Data from 2017 were generated from one routine groundwater and surface water sampling event conducted at the Riverton site during August.

The compliance strategy for the Riverton site is natural flushing in conjunction with institutional controls (ICs) (DOE 1998a). Monitoring required during the natural flushing period is referred to as verification monitoring because its purpose is to verify that the natural flushing strategy is progressing as predicted and to verify that ICs are in place and functioning as intended. Data collected during verification monitoring are reported annually in a verification monitoring report. These reports have been issued annually since 2001, and the reports from 2005 to 2016 are available on the U.S. Department of Energy (DOE) Office of Legacy Management (LM) website at https://www.lm.doe.gov/Riverton/Sites.aspx. All water quality data for the Riverton site are archived in the environmental database at the LM office in Grand Junction, Colorado. Water quality data also are available for viewing with dynamic mapping via the Geospatial Environmental Mapping System (GEMS) website at https://gems.lm.doe.gov/#&site=RVT. The monitoring program at the Riverton site is specified in the *Long-Term Management Plan for the Riverton, Wyoming, Processing Site* (LTMP) (DOE 2009), which is in the process of being updated.

2.0 Site Conditions

2.1 Surface Remediation

A uranium and vanadium ore processing mill operated from 1958 to 1963 at the Riverton site. A tailings pile covered about 72 acres of the 140-acre site. The tailings and associated slurry water were the primary, original source of groundwater contamination of the surficial aquifer. In 1988 and 1989, the tailings pile was excavated down to an average depth of 4 feet (ft) below ground surface (bgs) based on a radium (^{226}Ra) soil standard in Title 40 *Code of Federal Regulations* Part 192 (40 CFR 192). Surface remediation activities resulted in removal of about 1.8 million cubic yards of tailings and associated materials from the site, which were encapsulated at the Gas Hills East, Wyoming, Disposal Site (Figure 1) (DOE 1998a). Soils at and below the water table with elevated thorium (^{230}Th) concentrations were left in place (DOE 1991) on portions of the former mill site as permitted by the supplemental standards provision of 40 CFR 192. Additional details about the Riverton site, along with links to site documents and data, can be found at https://www.lm.doe.gov/Riverton/Sites.aspx.

2.2 Hydrogeology

The Riverton site is located on an alluvial terrace between the Wind River and the Little Wind River approximately 2.3 miles southwest of the town of Riverton, Wyoming (Figure 1). Groundwater is in three aquifers beneath the site: (1) a surficial unconfined aquifer (surficial aquifer), (2) a middle semiconfined aquifer, and (3) a deeper confined aquifer (DOE 1998b).

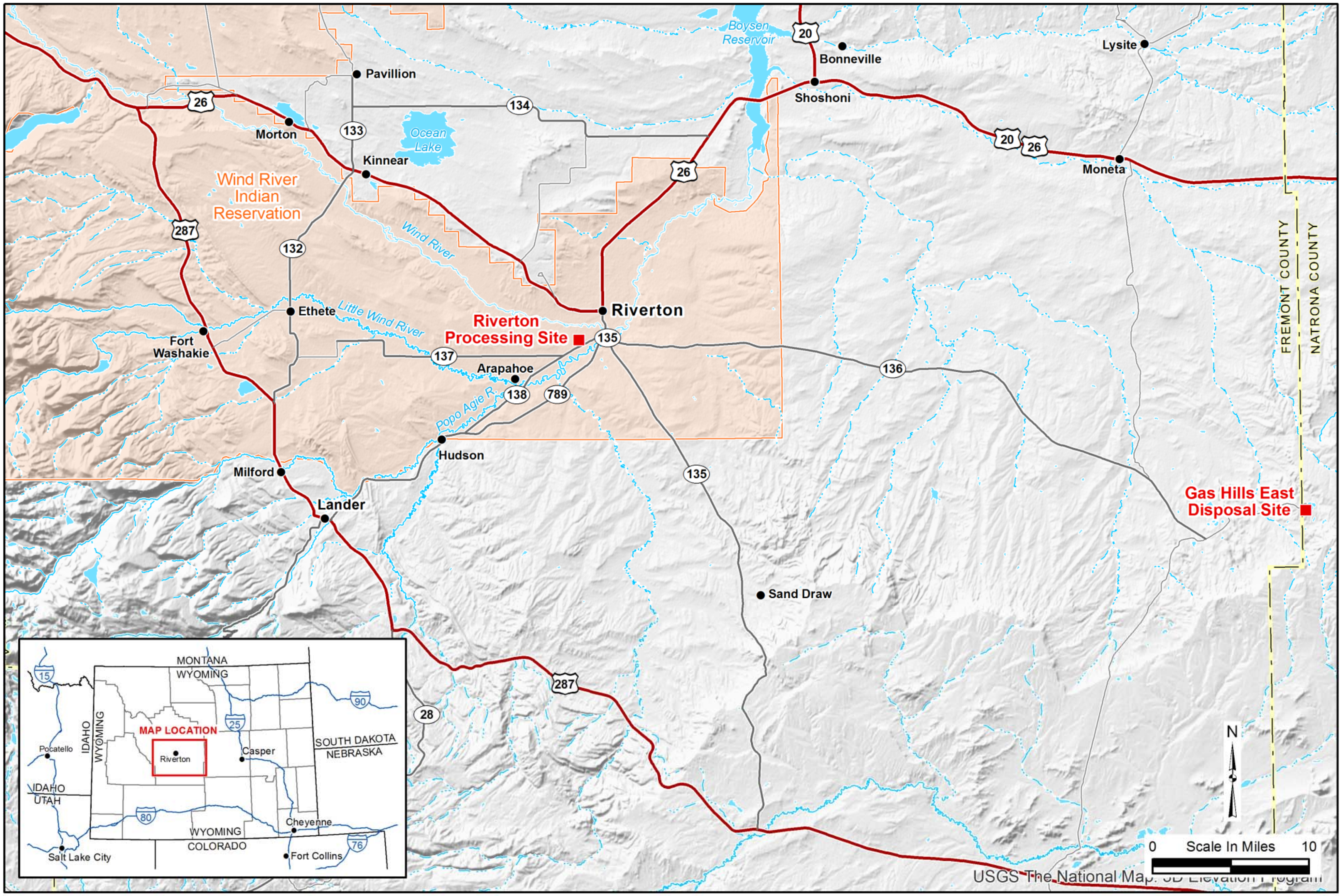

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Figure 1. Riverton Site Location Map

The surficial aquifer consists of approximately 15–20 ft of unconsolidated alluvial material; the semiconfined and confined aquifers are composed of shales and sandstones of the upper units of the Eocene Wind River Formation, which is over 500 ft thick in the vicinity of the site. Depth to groundwater in the surficial aquifer is generally less than 10 ft bgs. For compliance purposes, the uppermost aquifer, which is the aquifer in which compliance with groundwater standards is assessed, comprises the surficial aquifer and semiconfined aquifer. Groundwater in the uppermost aquifer flows to the southeast.

Because the Riverton site is located on an alluvial terrace between the Wind River and the Little Wind River, site conditions have been influenced by periodic flooding of these rivers. Influences of river flooding include the following:

- Formation of the oxbow lake in 1995
- Formation of a scour zone that exposes groundwater in a side channel of the Little Wind River in 2016
- Spikes in groundwater contaminant concentrations in areas inundated by flood waters
- High groundwater elevations that can leave contaminants in the unsaturated zone
- High groundwater elevations that leached contaminants from the former tailings pile (White et al. 1984)
- Destruction of a DOE stilling well and the U.S. Geological Survey (USGS) gaging station on the Little Wind River in 2017

Significant floods of the Little Wind River that likely affected the site occurred in 1963, 1965, 1967, 1983, 1991, 1995, 2010, 2016, and 2017 (2), when peak river discharge was greater than 8000 cubic feet per second (cfs) (USGS 2017a). Significant floods of the Wind River that likely affected the site occurred in 1963, 1967, 1971, 1991, 1997, 1999, 2011, and 2017, when peak stream discharge was greater than 8000 cfs (USGS 2017b). Discharge data and flood data from the Little Wind River are presented in Section 4.2.1.

2.3 Water Quality

Shallow groundwater beneath and downgradient from the site was contaminated as a result of uranium-processing activities from 1958 through 1963 (DOE 1998b). Contaminants of concern (COCs) in the groundwater beneath the Riverton site are manganese, molybdenum, sulfate, and uranium. COCs were selected using a screening process that compared contaminant concentrations with the maximum concentration limits (MCLs) in 40 CFR 192, as appropriate, and evaluated potential human health risks and ecological risks. (Note: The MCLs for groundwater discussed herein are different from the maximum contaminant levels [also abbreviated as MCLs] for the U.S. Environmental Protection Agency [EPA] drinking water standards that are applied to domestic wells.) The COC-selection process is detailed in the *Environmental Assessment of Ground Water Compliance at the Riverton, Wyoming, Uranium Mill Tailings Site* (DOE 1998c). Molybdenum and uranium were selected as indicator contaminants for compliance monitoring in the *Final Ground Water Compliance Action Plan for the Riverton, Wyoming, Title I UMTRA Project Site* (DOE 1998a). These contaminants were selected as indicator contaminants because they are the most widely distributed and because they form significant aqueous plumes in the uppermost aquifer in the vicinity of the site. The MCLs for molybdenum and uranium are 0.10 milligram per liter (mg/L) and 30 picocuries per liter (pCi/L), respectively. In order to provide a consistent comparison with historical data, uranium concentrations continue to be measured in milligrams per liter; therefore, the uranium standard referenced in this report has been converted from 30 pCi/L to 0.044 mg/L (which assumes secular equilibrium of uranium isotopes) to allow direct comparison of uranium data to the standard.

2.4 Institutional Controls

To protect human health and the environment during the natural flushing period, ICs are required to control exposure to contaminated groundwater. An IC boundary has been established at the Riverton site (Figure 2), delineating the area that requires protection. The IC boundary was set to encompass the area of current groundwater contamination and a surrounding buffer zone to account for potential future plume migration.

2.4.1 Site Institutional Controls

Cooperative efforts are ongoing among DOE, the Northern Arapaho Tribe and the Eastern Shoshone Tribe, and the State of Wyoming to implement viable and enforceable ICs at the Riverton site. ICs currently in place include the following:

- An alternate water supply system (AWSS), funded by DOE and currently operated by Northern Arapaho Water & Sewer Department (NAW&SD), supplies potable water to residents within the IC boundary to minimize use of groundwater.
- Warning signs installed around the oxbow lake explain that the contaminated water is not safe for human consumption, with instructions not to drink from, fish in, or swim in the lake.
- A tribal ordinance places restrictions on well installation, prohibits surface-water impoundments, authorizes access to inspect and sample new wells, and provides notification to drilling contractors of the groundwater contamination within the IC boundary. Restrictions on well installation include a minimum depth of 150 ft bgs (approximately 50 ft below the top of the confined aquifer) and a requirement that surface casing be installed through the contaminated upper aquifer.
- DOE notification to area drilling contractors of the existing groundwater contamination.
- A State of Wyoming Department of Environmental Quality notification of existing groundwater contamination to be provided to persons on privately owned land who apply for a gravel pit permit within the IC boundary.
- A U.S. Bureau of Indian Affairs notification of existing groundwater contamination to be provided to persons on tribal land who apply for a surface-water impoundment within or adjacent to the IC boundary.
- Notification to DOE by the Wyoming State Engineer’s Office when permit applications are received for wells or surface impoundments within or adjacent to the IC boundary, providing DOE with a copy of the application (so that DOE may comment on it), and incorporating DOE’s comments on the permit, if approved.
- An easement and covenant to restrict land use and well drilling on the former mill site property, which was finalized on June 29, 2009; the former mill site was purchased by Chemtrade Refinery Services Inc. (Chemtrade).

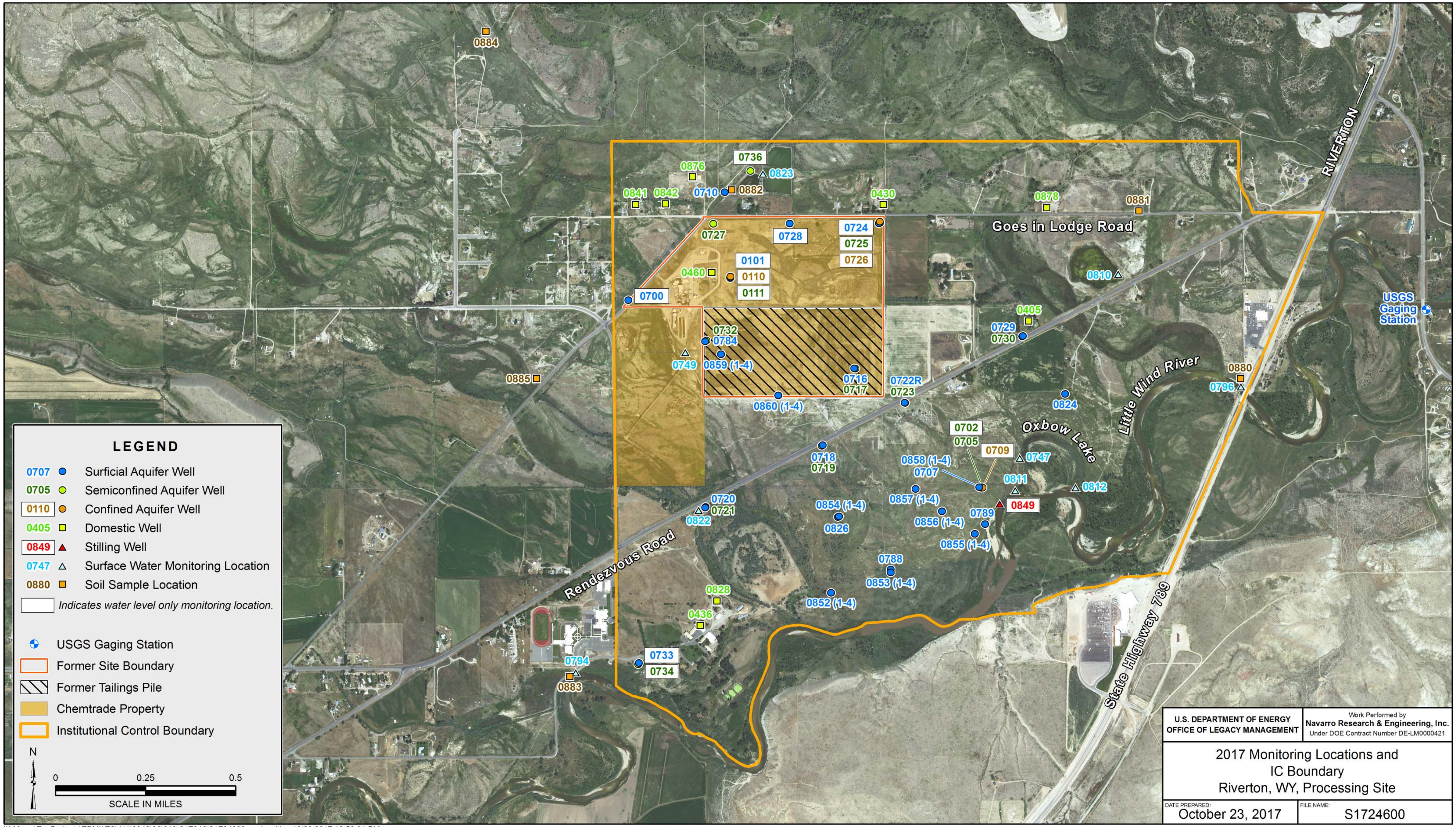

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Figure 2. 2017 Monitoring Locations and IC Boundary at the Riverton Site

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2.4.2 Institutional Control Monitoring

The LTMP specifies ongoing IC monitoring to verify that ICs are in place and working in order to ensure that potential exposure to contaminated groundwater is minimized during the natural flushing period. IC monitoring consists of two components: (1) sampling and (2) land and water use verification. The sampling component consists of sampling domestic wells and the AWSS. The land and water use verification consists of periodic inspection of land within the IC boundary to verify and document that no additional land or water uses expose or involve shallow groundwater, such as new wells, gravel pits, seeps, and recreational ponds.

Eight domestic wells were sampled during the August sampling event. Domestic well location 0430 was not sampled during the August sampling event because the pump was not working. Results for samples collected from domestic wells are presented in Section 4.1.2.2 and Appendix A.

The NAW&SD is responsible for ensuring that the quality, safety, and quantity of the water in the AWSS are adequate. The organization is also required to maintain compliance with EPA standards that regulate community water systems. To assist in this effort and to maintain the AWSS as a viable IC, DOE has worked with the Northern Arapaho Tribe to ensure cooperative efforts and funding for ongoing maintenance, flushing, sampling, and capital improvements of the AWSS.

In 2017, flushing and sampling of the AWSS was not conducted. Historically, the flushing program was effective in controlling the buildup of radionuclides in the system; however, in 2016, flow rates measured during flushing were lower than they were in previous years at some hydrants, which prevented an effective flush of the system and resulted in elevated radium concentrations at two locations. A condition assessment of the AWSS is in progress to identify required maintenance and to determine the current system configuration in order to obtain an effective flush of the system.

Inspection of areas within the IC boundary is a requirement of the LTMP. Land and water use verification within the IC boundary was conducted by Northern Arapaho Natural Resources Office (NANRO) personnel prior to the August sampling event and by the sampling crews during the August sampling event. Results of the water and land use inspections include the following:

- In February, the Little Wind River flooded because of record cold and record snowfall accumulations in December 2016 and January 2017, followed by unusually warm temperatures and high winds in early February 2017. Large sections of ice were broken loose during the warm-up and caused damage to infrastructure adjacent to the river (Figure 3). NANRO personnel subsequently reported damage to the USGS gaging station and complete removal of the DOE stilling well (0849) installed in 2015.
- In August, warning signs around the oxbow lake were verified to be in place and in good condition (Figure 4).

ICs continue to function as intended at the Riverton site. In August, the State Engineer's Office notified DOE of a new application for a well permit requesting the installation of a domestic well immediately adjacent to the IC boundary and within the notification area. A review of the application was conducted, and DOE gave approval for the State to proceed with the permitting process on August 24, 2017.

Figure 3. February 2017 Flood of the Little Wind River (photo courtesy of NANRO)

Figure 4. Warning Signs at the Oxbow Lake

3.0 Monitoring Program

The verification monitoring program consists of 56 monitoring wells, 9 domestic wells, and 9 surface water locations, which are listed in Table 1 and shown in Figure 2. In 2017, the annual sampling event was conducted in August, and water samples were analyzed for COCs (manganese, molybdenum, sulfate, and uranium), major cations (calcium, magnesium, potassium, and sodium), and additional major anions (chloride). Analyses also included field measurements of temperature, pH, specific conductance, oxidation-reduction potential, dissolved oxygen, alkalinity, and turbidity at each sampling location. In addition, ferrous iron was measured in the field at selected wells. Water levels were measured in all wells in the monitoring network during the annual sampling event.

Table 1. 2017 Sampling Network at the Riverton Site

Location ID	Description	Rationale	Comments
DOE Monitoring Wells			
0705	Semiconfined aquifer	Monitor semiconfined aquifer	
0707	Surficial aquifer	Monitor centroid of plume	
0710	Surficial aquifer	Background location	
0716	Surficial aquifer	Monitor upgradient portion of plume	
0717	Semiconfined aquifer	Monitor semiconfined aquifer	
0718	Surficial aquifer	Monitor lateral plume movement	
0719	Semiconfined aquifer	Monitor semiconfined aquifer	
0720	Surficial aquifer	Monitor lateral plume movement	
0721	Semiconfined aquifer	Monitor semiconfined aquifer	
0722R	Surficial aquifer	Monitor centroid of plume	
0723	Semiconfined aquifer	Monitor semiconfined aquifer	
0727	Semiconfined aquifer	Geochemical evidence of connection with surficial aquifer	
0729	Surficial aquifer	Monitor lateral plume movement	
0730	Semiconfined aquifer	Monitor semiconfined aquifer	
0732	Semiconfined aquifer	Geochemical evidence of connection with surficial aquifer	
0784	Surficial aquifer	Monitor lateral plume movement	
0788	Surficial aquifer	Monitor lateral plume movement	
0789	Surficial aquifer	Monitor centroid of plume	
0824	Surficial aquifer	Monitor lateral plume movement	
0826	Surficial aquifer	Monitor lateral plume movement	
852 (1–4)	Surficial aquifer	Monitor vertical variation in the surficial aquifer	Multilevel monitoring well
853 (1–4)	Surficial aquifer	Monitor vertical variation in the surficial aquifer	Multilevel monitoring well
854 (1–4)	Surficial aquifer	Monitor vertical variation in the surficial aquifer	Multilevel monitoring well
855 (1–4)	Surficial aquifer	Monitor vertical variation in the surficial aquifer	Multilevel monitoring well
856 (1–4)	Surficial aquifer	Monitor vertical variation in the surficial aquifer	Multilevel monitoring well
857 (1–4)	Surficial aquifer	Monitor vertical variation in the surficial aquifer	Multilevel monitoring well
858 (1–4)	Surficial aquifer	Monitor vertical variation in the surficial aquifer	Multilevel monitoring well
859 (1–4)	Surficial aquifer	Monitor vertical variation in the surficial aquifer	Multilevel monitoring well
860 (1–4)	Surficial aquifer	Monitor vertical variation in the surficial aquifer	Multilevel monitoring well

Table 1. 2017 Sampling Network at the Riverton Site (continued)

Location ID	Description	Rationale	Comments
Domestic Wells[a]			
0405	Confined aquifer	Point of groundwater use	Private residence
0430	Confined aquifer	Point of groundwater use	Private residence
0436	Confined aquifer	Point of groundwater use	St. Stephens Mission
0460	Confined aquifer	Point of groundwater use	Chemtrade refinery
0828	Confined aquifer	Point of groundwater use	St. Stephens Mission
0841	Semiconfined aquifer	Point of groundwater use	Private residence
0842	Confined aquifer	Point of groundwater use	Private residence
0876	Confined aquifer	Point of groundwater use	Private residence
0878	Confined aquifer	Point of groundwater use	Private residence
Surface Water			
0747	Oxbow lake	Impacted by groundwater discharge	
0749	Chemtrade refinery discharge ditch	Effluent from sulfuric acid plant	
0794	Little Wind River	Upstream of predicted plume discharge	
0796	Little Wind River	Downstream of predicted plume discharge	
0810	Pond—former gravel pit	Potential for impact—within IC boundary	
0811	Little Wind River	Within area of predicted plume discharge	
0812	Little Wind River	Within area of predicted plume discharge	
0822	West side ditch	Potential for impact—within IC boundary	
0823	Pond—former gravel pit	Upgradient of plume—within IC area	

[a] All domestic wells are completed in the confined aquifer, except for well 0841, which might be completed in the semiconfined aquifer.

4.0 Results of 2017 Monitoring

4.1 Groundwater

4.1.1 Groundwater Flow

Water levels were measured at all wells (except domestic wells) in the monitoring network (Figure 2) in August to verify groundwater flow direction and to assess vertical gradients throughout the IC area. Water level data are included in Appendix B.

Assessment of horizontal groundwater flow direction in the surficial aquifer is required to ensure that the monitoring network is adequate for assessing contaminant plume movement and to ensure that the IC boundary provides a sufficient buffer to prevent access to contaminated groundwater. As shown in Figure 5, groundwater elevation contours for the surficial aquifer indicated a general flow direction to the southeast in August, which is consistent with historical flow direction. In addition to water levels measured in August, continuous water level measurements were recorded by pressure transducers installed in wells along the groundwater flow path (Figure 6). Groundwater elevations displayed in Figure 6 demonstrate that the groundwater flow does not generally reverse direction throughout the year except during flood stage of the Little Wind River (February and June in 2017) when groundwater elevations in monitoring wells adjacent to the river (0707 and 0789) increase more than monitoring wells further from the river (like 0857-4 and 0722R).

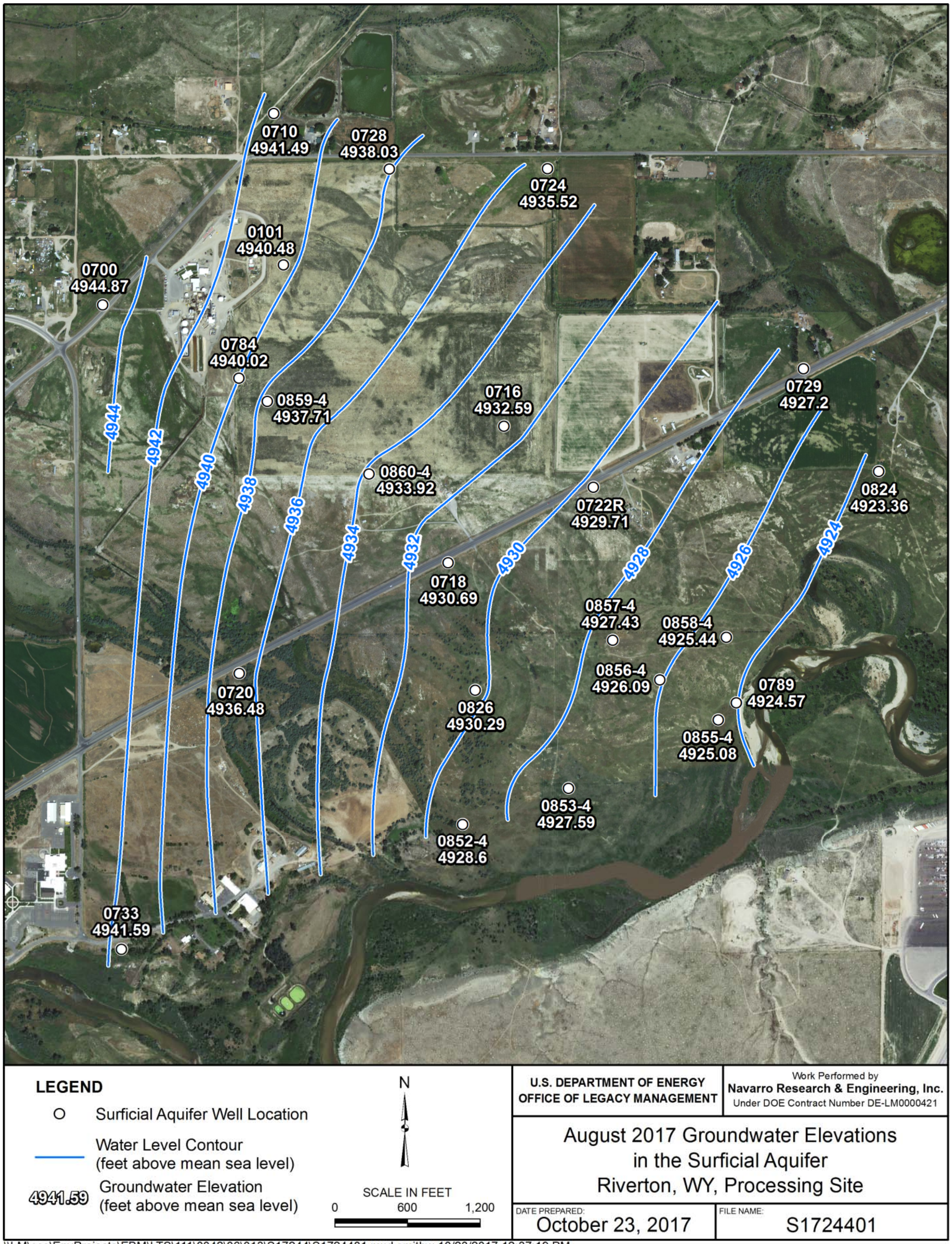

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Figure 5. August 2017 Groundwater Elevations in the Surficial Aquifer at the Riverton Site

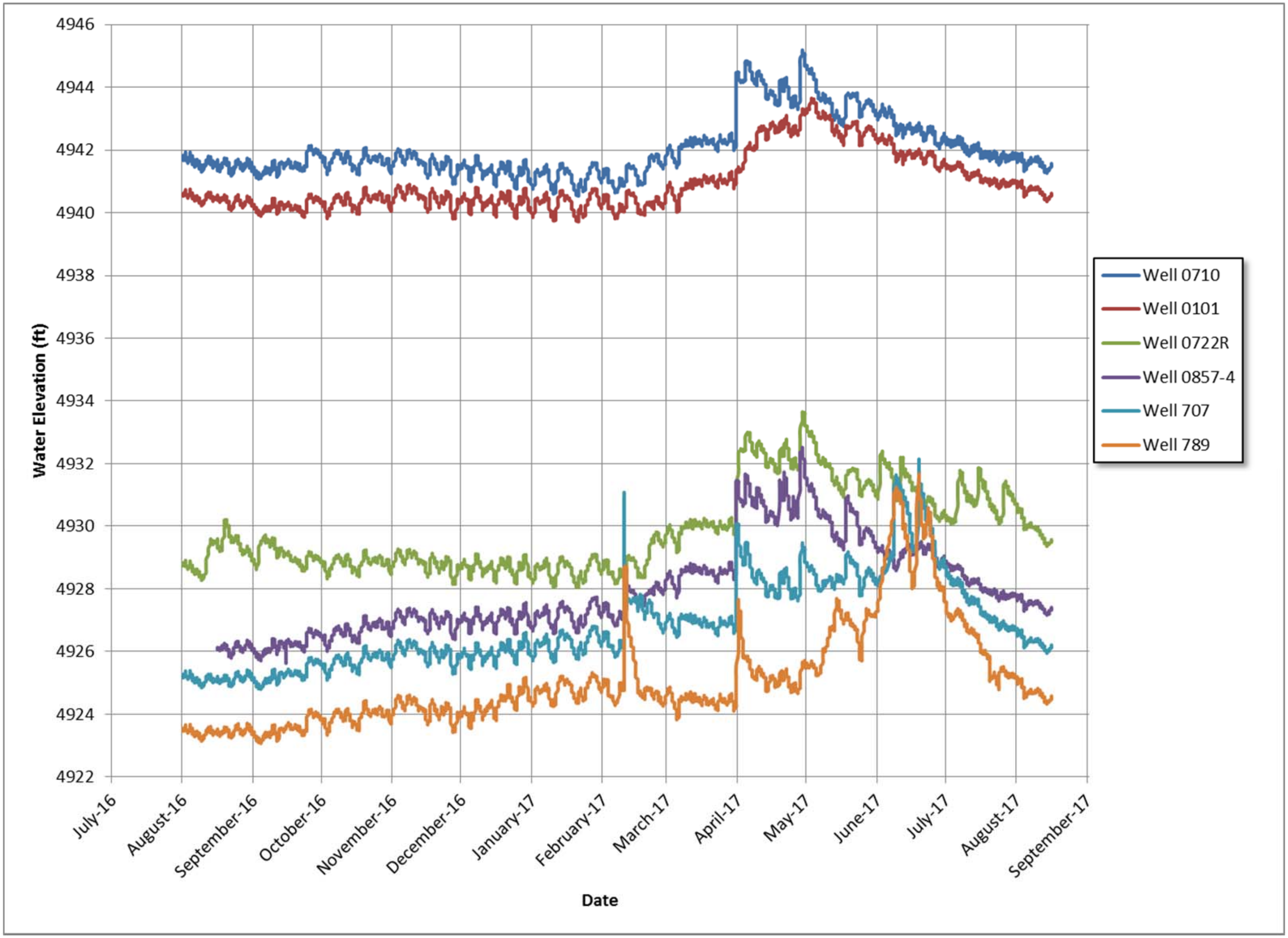


Figure 6. Continuous Water Elevations in Selected Surficial Aquifer Wells

Vertical gradients are used to assess the direction that groundwater will flow vertically. The methods traditionally applied to assess vertical flow use a negative gradient to indicate potential for upward groundwater flow and a positive gradient to indicate potential for downward groundwater flow. Regardless of the direction and magnitude indicated by gradient, vertical migration of groundwater between the Riverton site aquifers is expected to be relatively minor because of the low vertical hydraulic conductivities of the confining layers separating aquifers. Vertical gradients are calculated from monitoring wells in an upper aquifer (aquifer 1) and lower aquifer (aquifer 2) using the following formula:

$$\frac{(\mathrm{GE}_1 - \mathrm{GE}_2)}{(\mathrm{SE}_1 - \mathrm{SE}_2)}$$

where

GE = groundwater elevation
SE = screen elevation at the midpoint of the screen

Table 2 shows vertical gradients calculated (from August data) from grouped monitoring wells. General observations from Table 2 include the following:

- Vertical gradients in the confined aquifer are upward at one location and downward at two locations.
- The well cluster adjacent to the sulfuric acid plant (0101, 0111, and 0110) has a downward vertical gradient between the confined aquifer and surficial aquifer, which is likely a reflection of continuous long-term pumping of the confined aquifer from the acid plant production well (0460).
- Vertical gradients between the surficial and semiconfined aquifer vary but tend to be downward near (within 200 ft) surface water features and upward away from surface water features. Surface water is likely recharging the surficial aquifer, causing localized increases in head in the surficial aquifer and a resulting downward vertical gradient.

Table 2. August 2017 Vertical Gradients at the Riverton Site

Well ID	Aquifer	Water Elevation (ft)	Vertical Gradient[a]
0724	Surficial	4935.52	
0725	Semiconfined	4935.59	−0.004
0726	Confined	4934.67	0.007
0101	Surficial	4940.48	
0111	Semiconfined	4938.97	0.056
0110	Confined	4938.89	0.030
0784	Surficial	4940.02	
0732	Semiconfined	4938.45	0.059
0716	Surficial	4932.59	
0717	Semiconfined	4932.63	−0.001
0707	Surficial	4926.18	
0705	Semiconfined	4925.89	0.010
0709	Confined	4927.68	−0.020
0718	Surficial	4930.69	
0719	Semiconfined	4931.05	−0.018
0722R	Surficial	4929.71	
0723	Semiconfined	4929.79	−0.003

Table 2. August 2017 Vertical Gradients at the Riverton Site (continued)

Well ID	Aquifer	Water Elevation (ft)	Vertical Gradient[a]
0720	Surficial	4936.48	
0721	Semiconfined	4933.22	0.091
0729	Surficial	4927.2	
0730	Semiconfined	4927.76	−0.024
0733	Surficial	4941.59	
0734	Semiconfined	4939.74	0.081

[a] The vertical gradient from the semiconfined aquifer is between the semiconfined aquifer and the surficial aquifer, and the vertical gradient from the confined aquifer is between the confined aquifer and the surficial aquifer. A negative value indicates an upward vertical gradient; a positive value indicates a downward vertical gradient.

4.1.2 Groundwater Quality

Figure 7 through Figure 12 summarize surficial aquifer data from the 2017 sampling events. Time-concentration plots for molybdenum in wells located within contaminant plumes and wells bordering the contaminant plumes in the surficial aquifer are shown in Figure 7 and Figure 8, respectively. The distribution of molybdenum in the surficial aquifer from the August 2017 sampling event is shown in Figure 9. Time-concentration plots for uranium in wells located within contaminant plumes and wells bordering the contaminant plumes in the surficial aquifer are shown in Figure 10 and Figure 11, respectively. The distribution of uranium in the surficial aquifer, based on August 2017 sampling results, is shown in Figure 12. The distributions of molybdenum and uranium plumes (Figure 9 and Figure 12, respectively) include data from conventional and multilevel monitoring wells. The multilevel monitoring-well port with the highest molybdenum and uranium concentrations are plotted on the figures. At monitoring wells 0707, 0788, and 0826, where a conventional monitoring well is co-located with a multiport monitoring well, the highest molybdenum and uranium concentration from either well is plotted.

As shown in the plots and figures, concentrations of molybdenum and uranium in groundwater in the surficial aquifer are still above their respective MCLs. In 2010 and 2016, the molybdenum and uranium concentrations in wells 0707, 0788, 0789, and 0826 increased dramatically following flooding of the Little Wind River. The current CSM suggests that contaminants become “loaded” in the unsaturated zone during non-flood years via seasonally fluctuating groundwater levels. This results in wicking of contaminants into the overlying silt layer via capillary action. Contaminants are subsequently released to the saturated zone during flood events (see Section 6.0, “CSM Update”). The Riverton site was affected by floods again in 2017. The Little Wind River flooded twice in 2017 (February and June) and the Wind River had the fourth largest flood on record (since 1912) on June 10 (11,800 cfs). In confirmation of the current CSM, this resulted in concentrations of molybdenum and uranium generally remaining elevated above 2015 levels.

Concentrations of molybdenum and uranium in groundwater in the semiconfined aquifer are still below corresponding MCLs in areas where the overlying surficial aquifer groundwater is contaminated, which indicate no significant impact from site-related contamination in this unit (Figure 13 and Figure 14, respectively). Appendix C provides groundwater quality data, by parameter, for monitoring wells in the long-term monitoring network which were sampled during 2017.

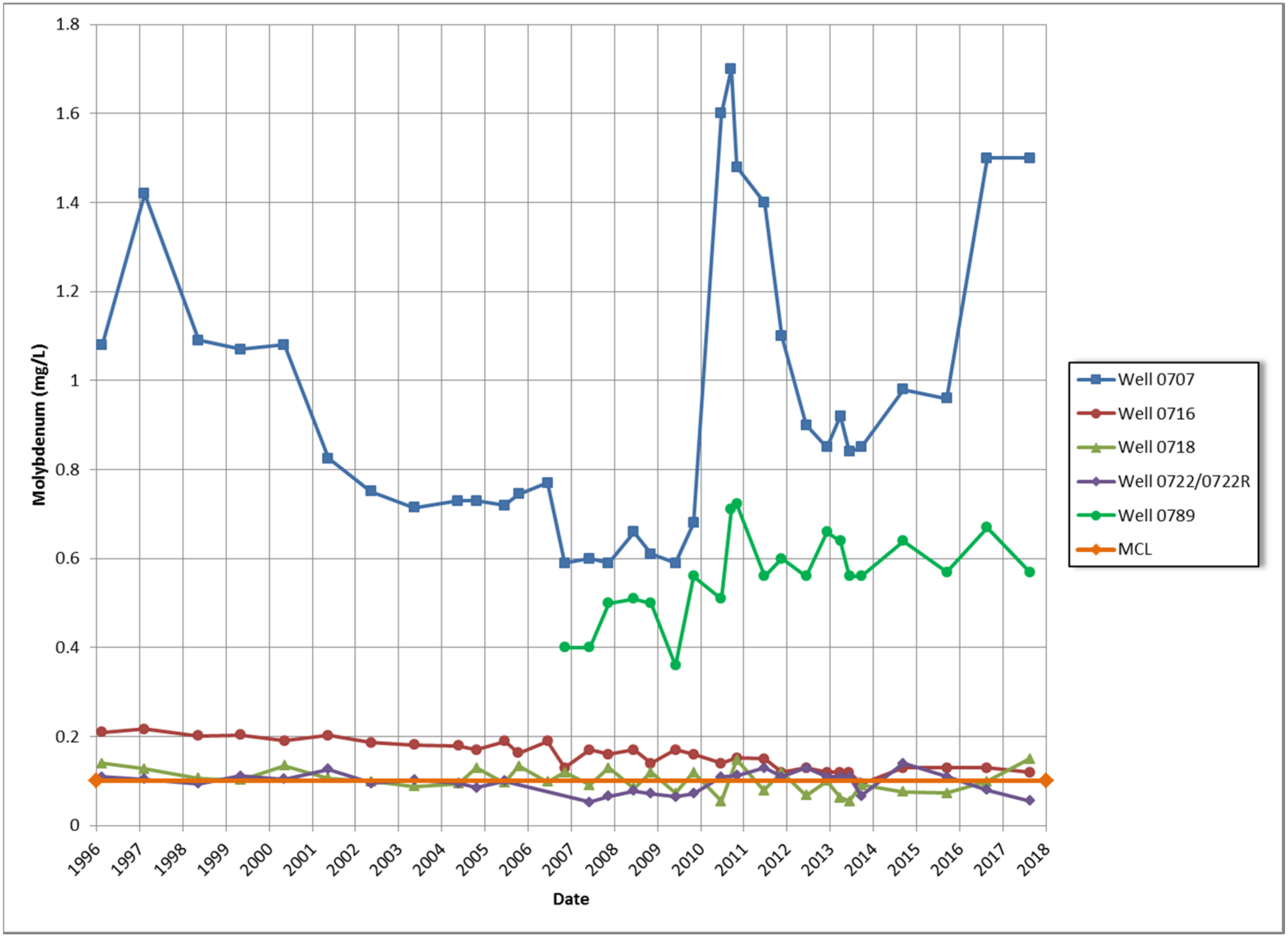


Figure 7. Molybdenum Concentrations in Surficial Aquifer Wells Within the Contaminant Plume

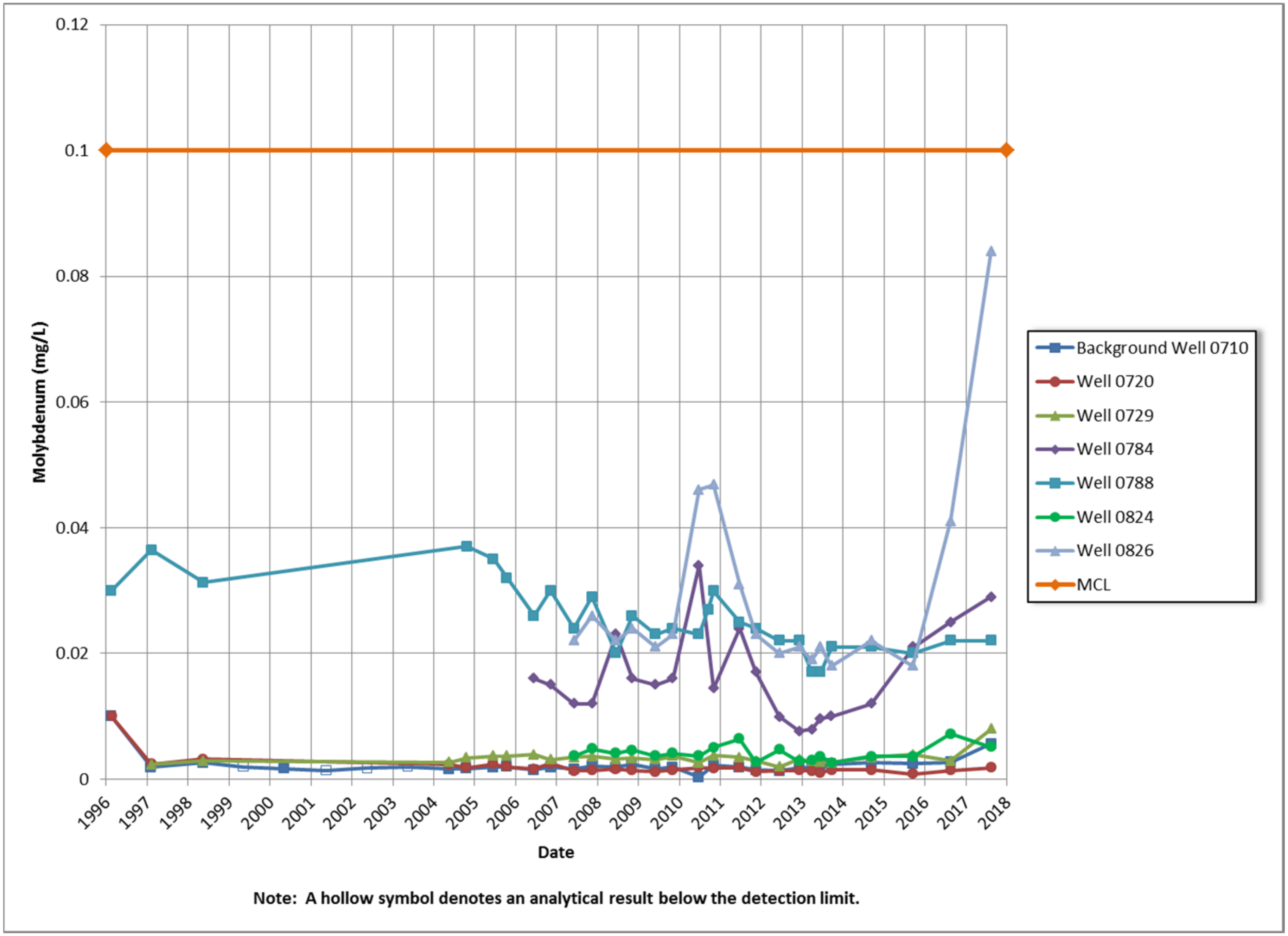


Figure 8. Molybdenum Concentrations in Surficial Aquifer Wells on the Edge and Outside of the Contaminant Plume

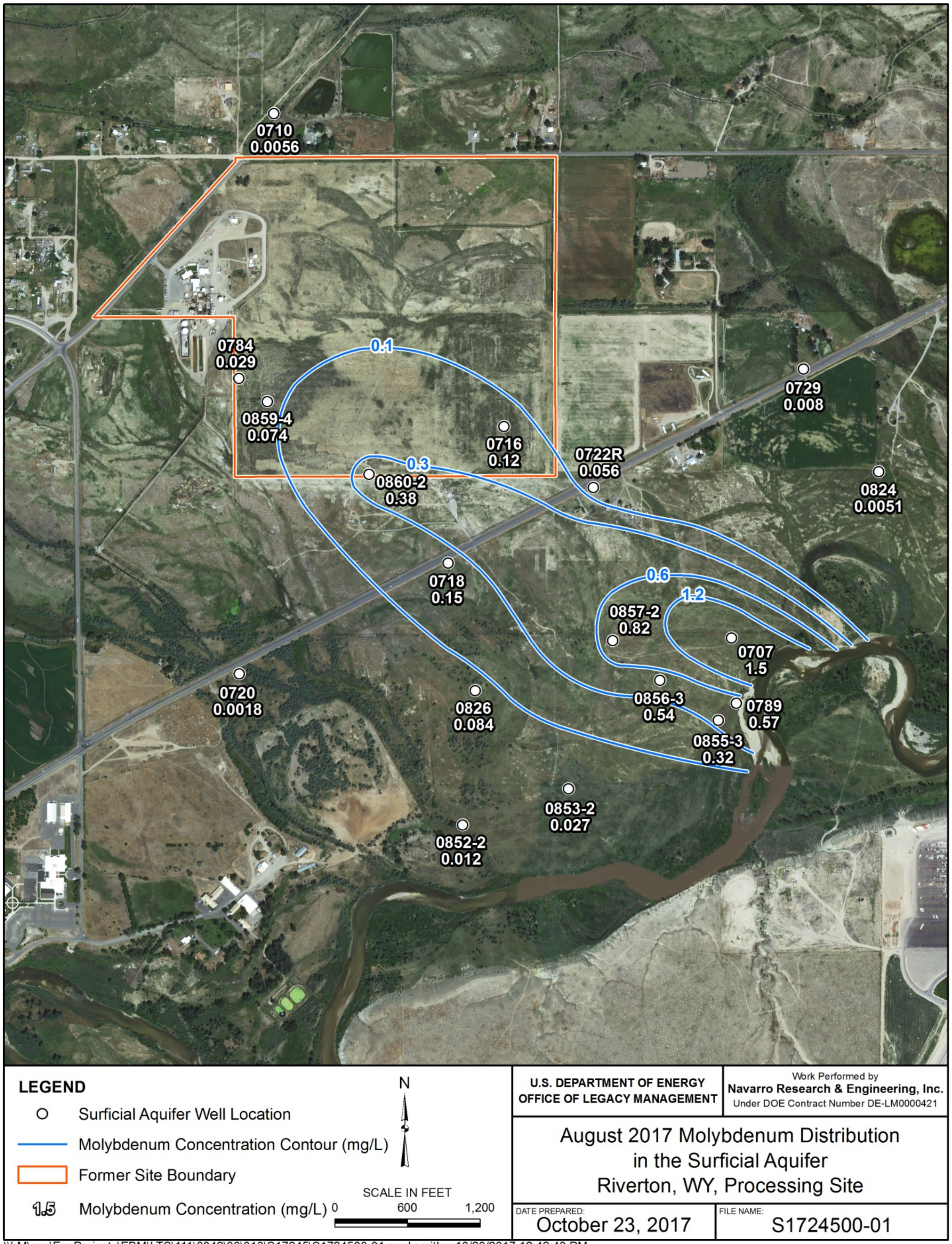


Figure 9. Molybdenum Distribution in the Surficial Aquifer at the Riverton Site in August 2017

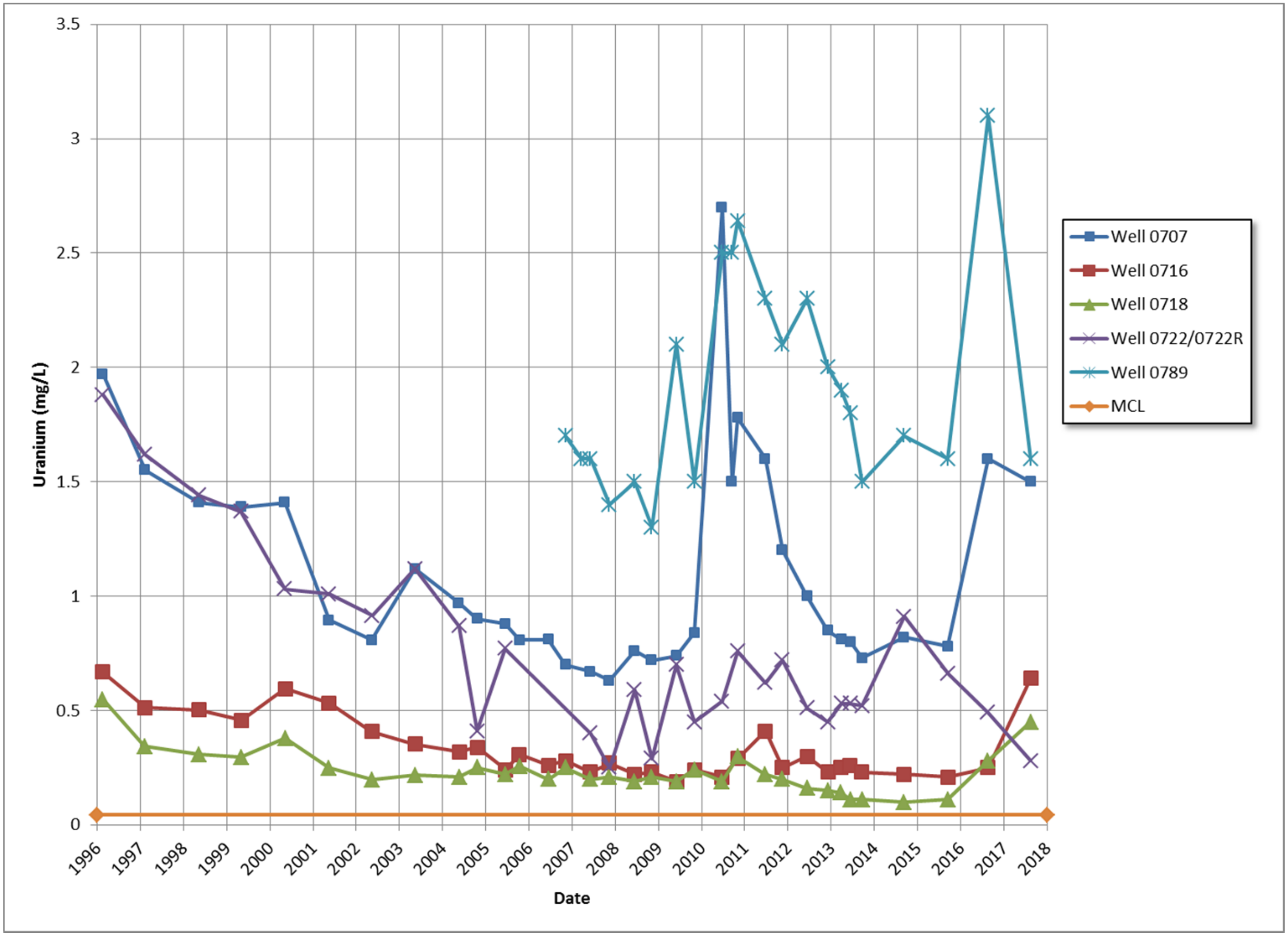


Figure 10. Uranium Concentrations in Surficial Aquifer Wells Within the Contaminant Plume

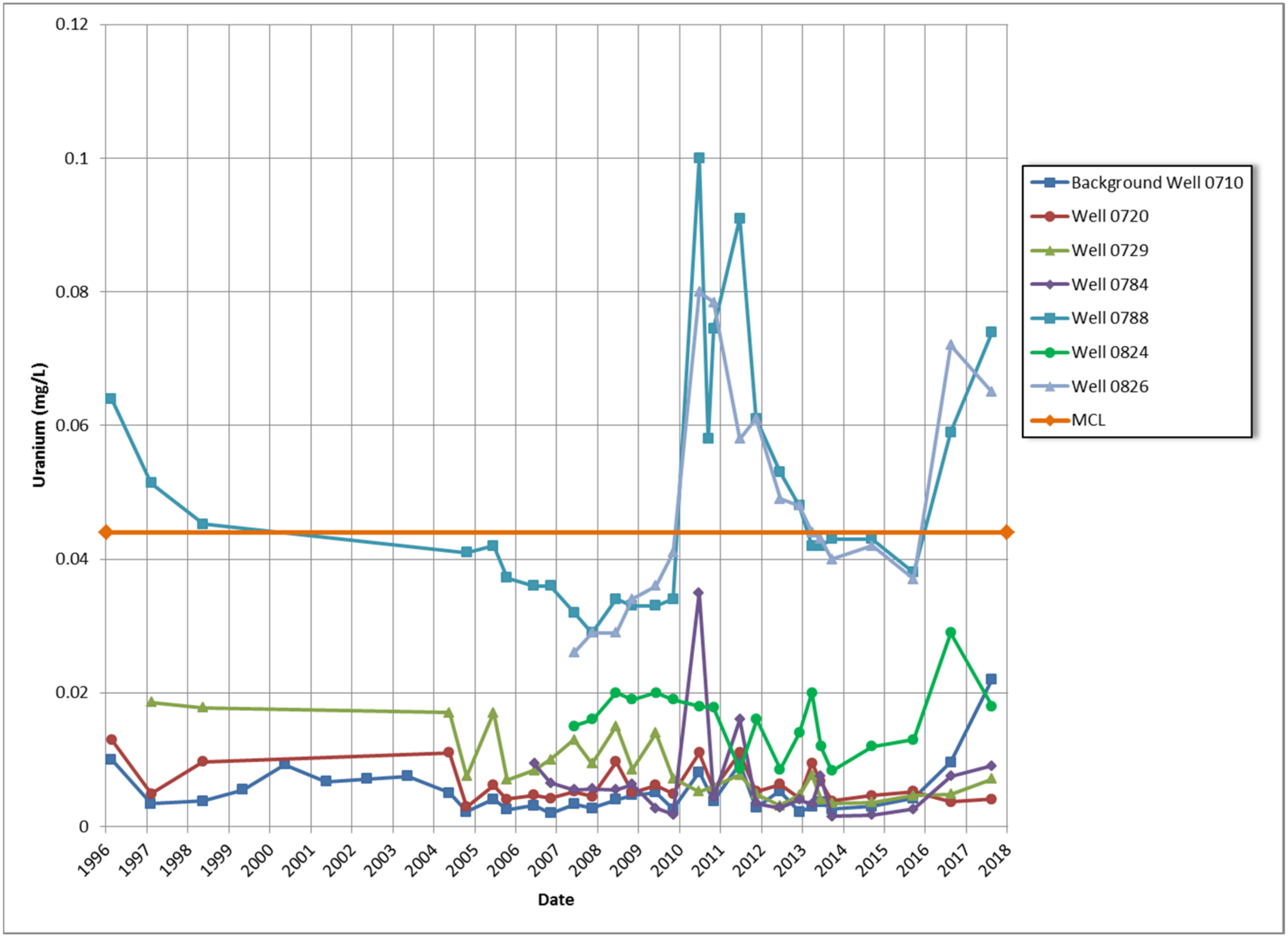


Figure 11. Uranium Concentrations in Surficial Aquifer Wells on the Edge and Outside of the Contaminant Plume

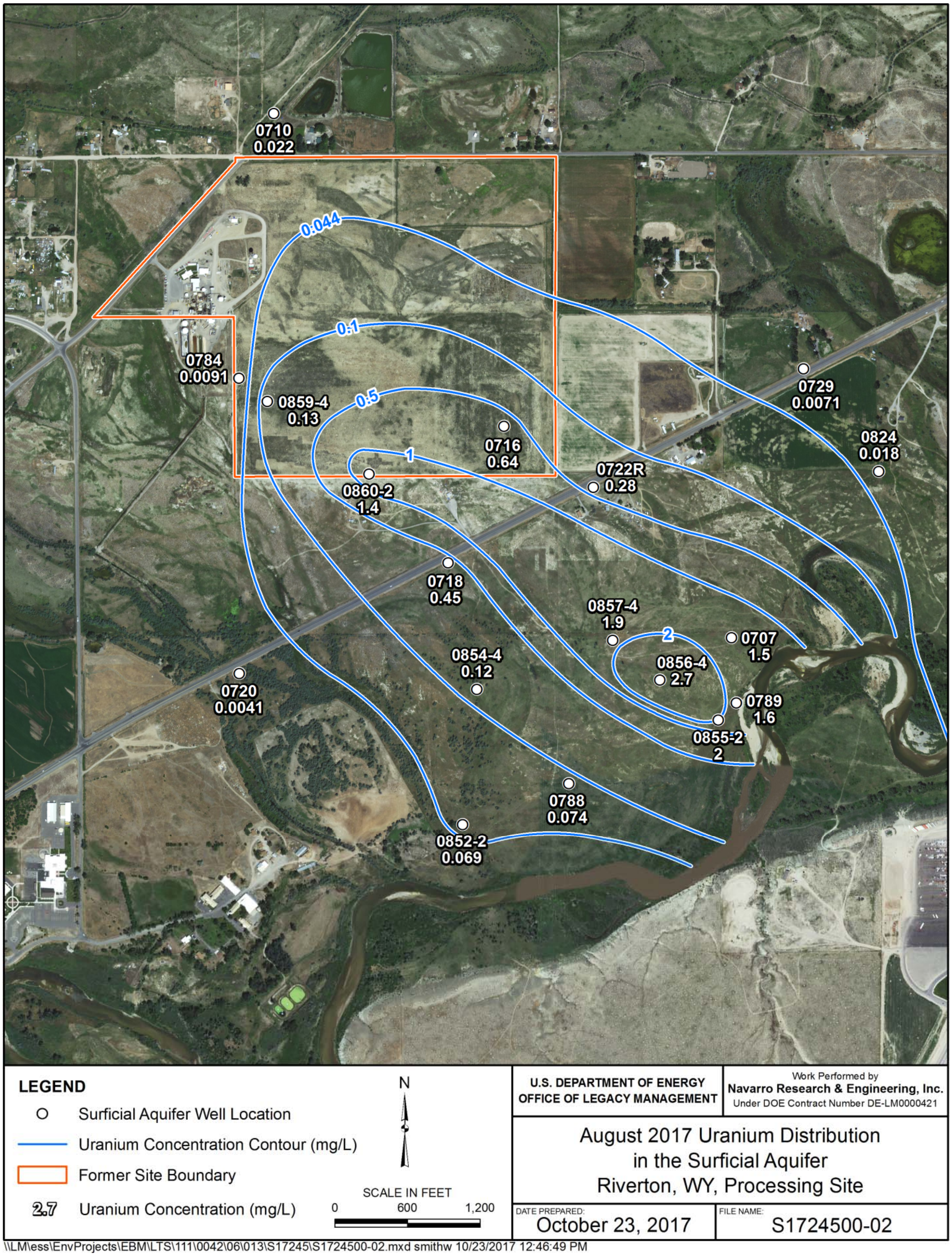


Figure 12. Uranium Distribution in the Surficial Aquifer at the Riverton Site in August 2017

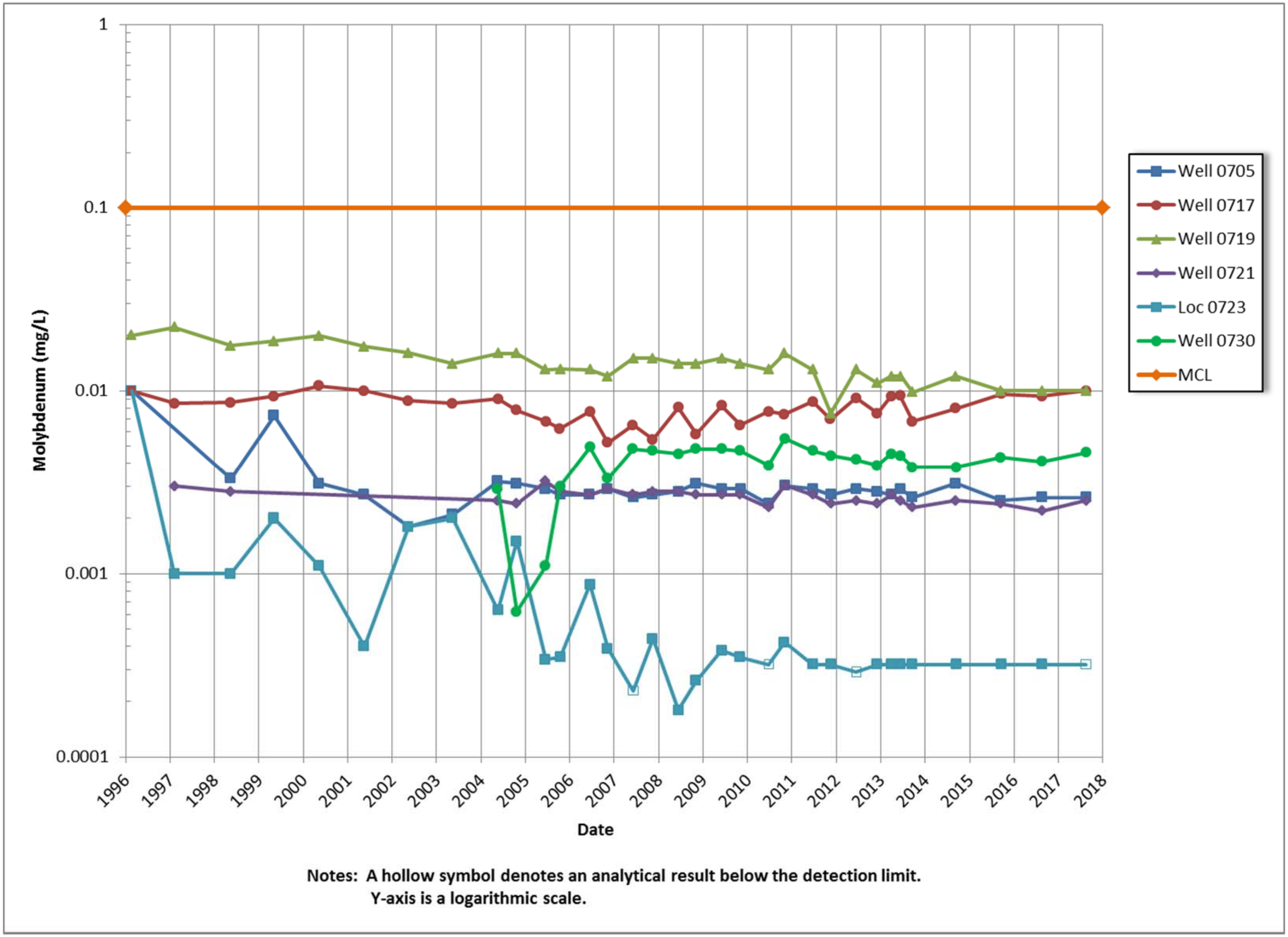


Figure 13. Molybdenum Concentrations in Semiconfined Aquifer Wells

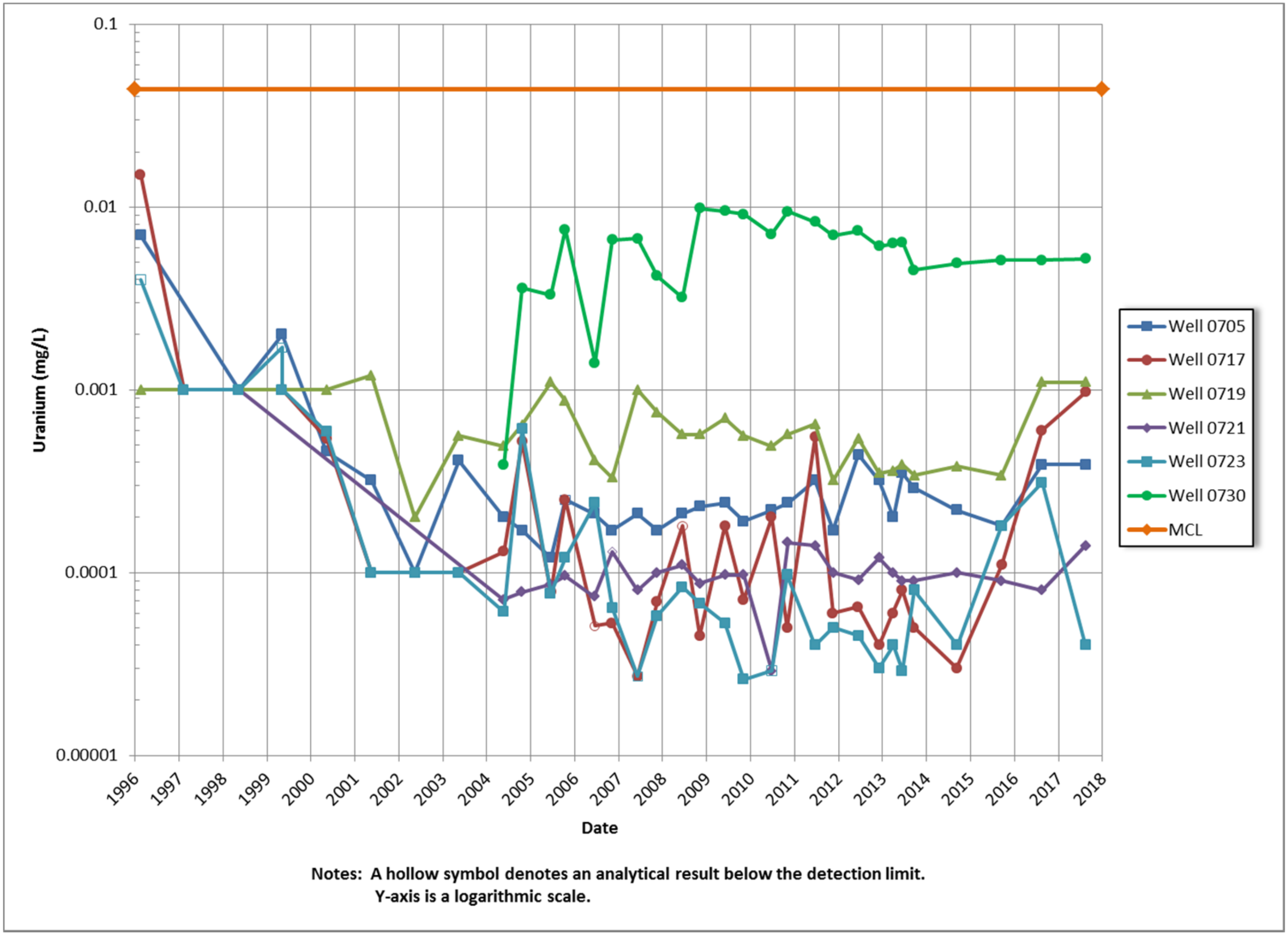


Figure 14. Uranium Concentrations in Semiconfined Aquifer Wells

4.1.2.1 *Multilevel Monitoring Wells*

Nine multilevel groundwater monitoring wells (0852 through 0860) were installed in 2015. Construction details and initial sampling in 2015 are provided in the *2015 Advanced Site Investigation and Monitoring Report, Riverton, Wyoming, Processing Site* (DOE 2016). Because of the low water table elevation at the time of sampling, all top ports in the multilevel wells were dry. The number designation on these wells indicate the order of port depths (i.e., 0856-1 is the shallowest port and 0856-4 is the deepest port).

Figure 15 and Figure 16 show molybdenum and uranium concentrations, respectively, in multilevel monitoring well 0856 from the 2015, 2016, and 2017 sampling events. As shown in these graphs, molybdenum and uranium concentrations are generally higher after the 2016 and 2017 floods than they were in 2015, which confirms the CSM, specifically, that contaminants are stored in the unsaturated zone and released during flood events. In addition, these figures show there is some vertical stratification in the surficial aquifer. Graphs of molybdenum and uranium for all multilevel monitoring wells are displayed in Appendix D.

Additional data collection from the multilevel monitoring wells was conducted by USGS for DOE’s Applied Studies and Technology program in 2016 and 2017. These data will provide additional insights into vertical stratification of the surficial aquifer and distribution and movement of contaminants in the surficial aquifer after flood events. These data will be evaluated and presented in future scientific reports and publications.

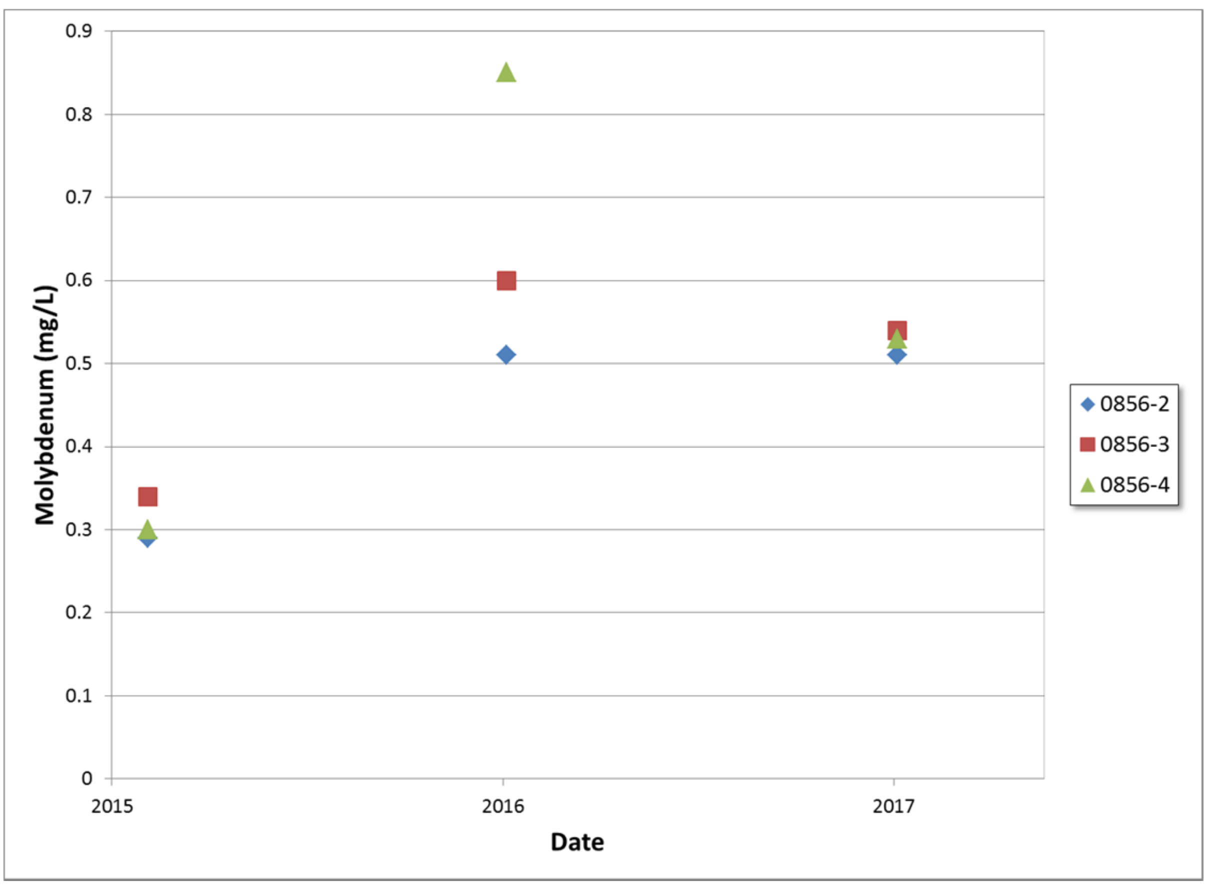


Figure 15. Molybdenum Concentrations in Multilevel Monitoring Well 0856

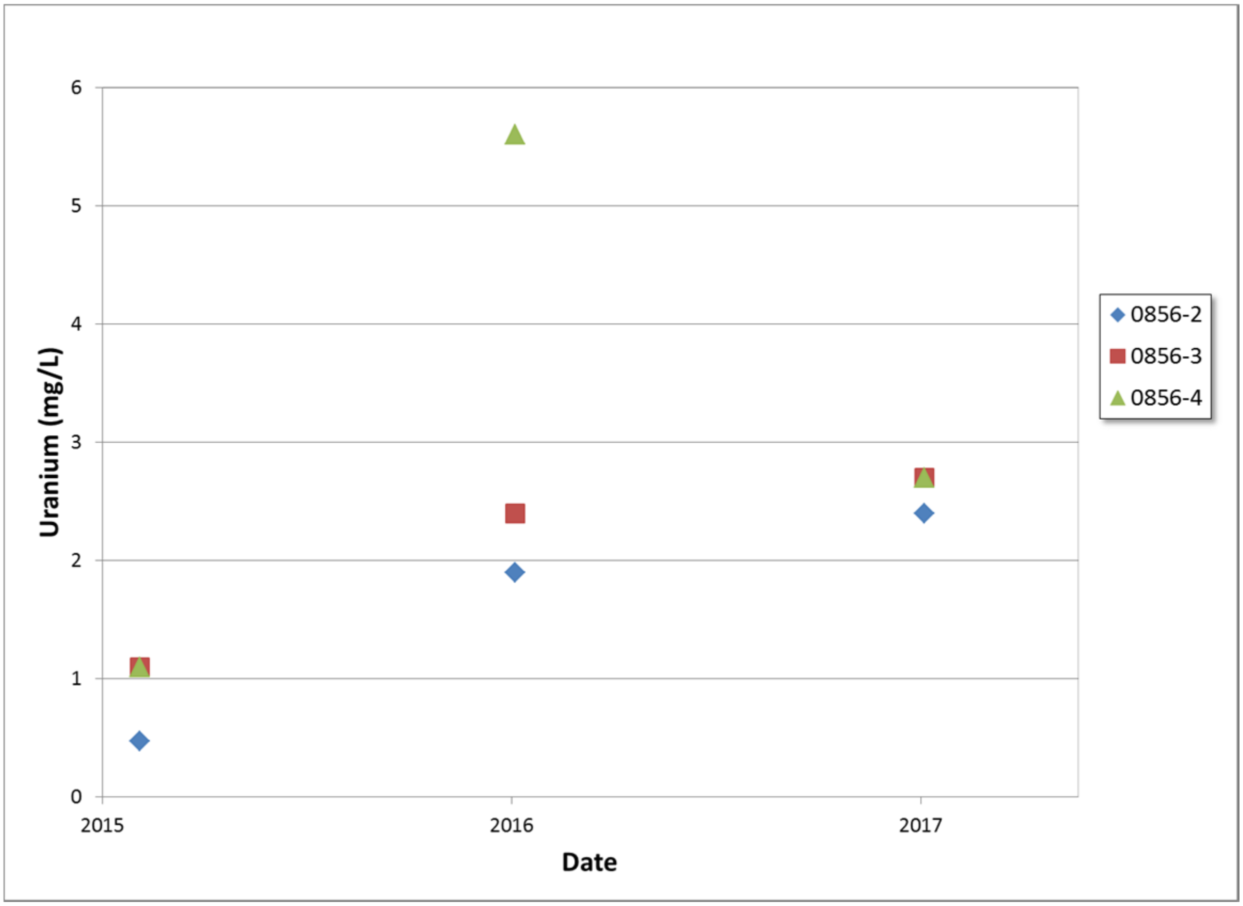


Figure 16. Uranium Concentrations in Multilevel Monitoring Well 0856

4.1.2.2 Domestic Wells

Domestic wells used as potable water sources at residences within the IC boundary were sampled in 2017; most of these wells are completed in the confined aquifer with the exception of well 0841, which is likely completed in the semiconfined aquifer. Domestic well 0430 was not sampled in 2017 because the pump was not working. Results from domestic wells did not indicate any impacts from the Riverton site. Concentrations of molybdenum in samples collected from domestic wells were 2 orders of magnitude below the standard, and concentrations of uranium in samples collected from domestic wells were 1–3 orders of magnitude below the standard. Figure 17 and Figure 18 show time-concentration graphs for molybdenum and uranium, respectively. Appendix A provides data obtained from sampling domestic wells in 2017.

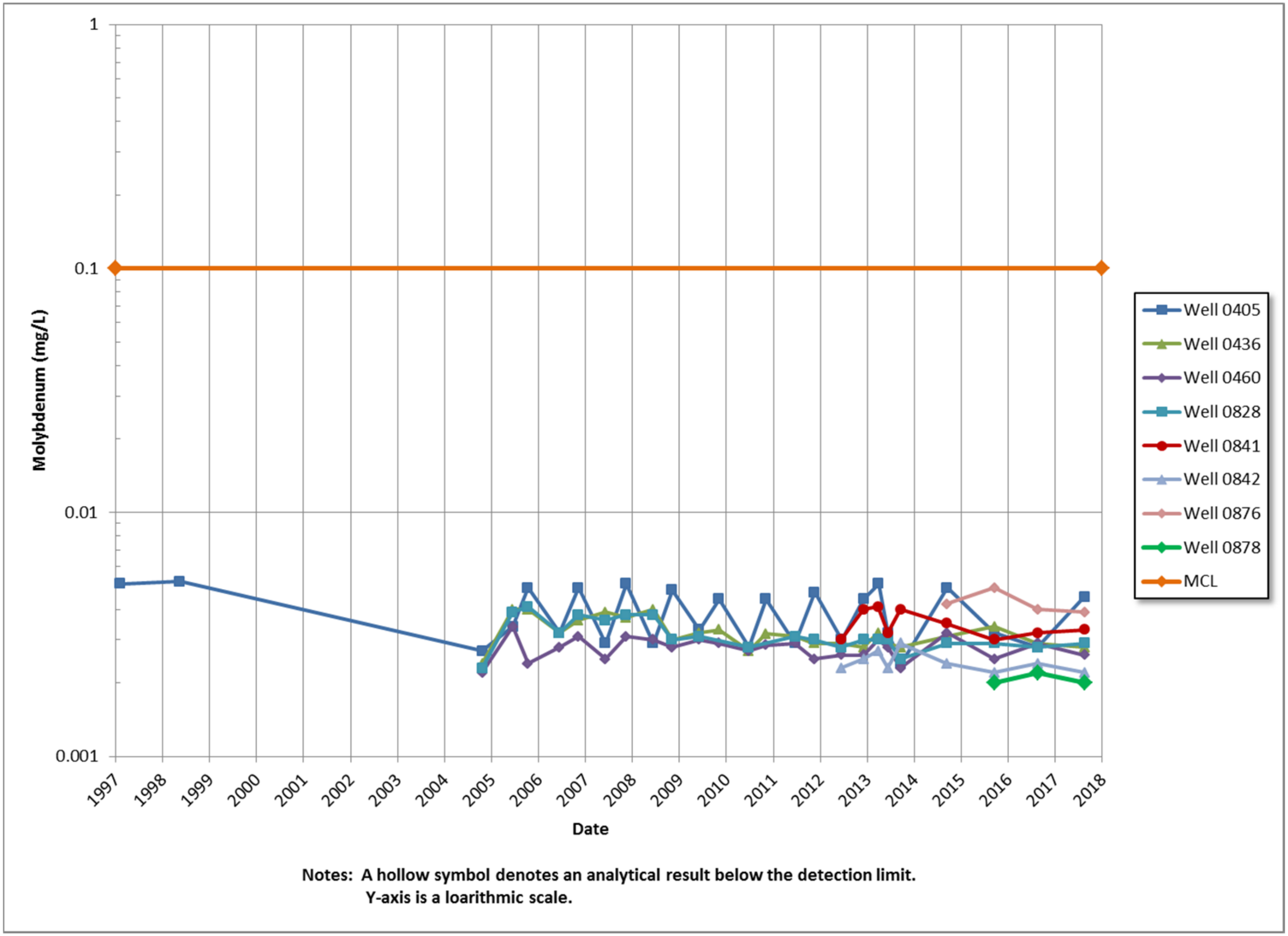


Figure 17. Molybdenum Concentrations in Domestic Wells

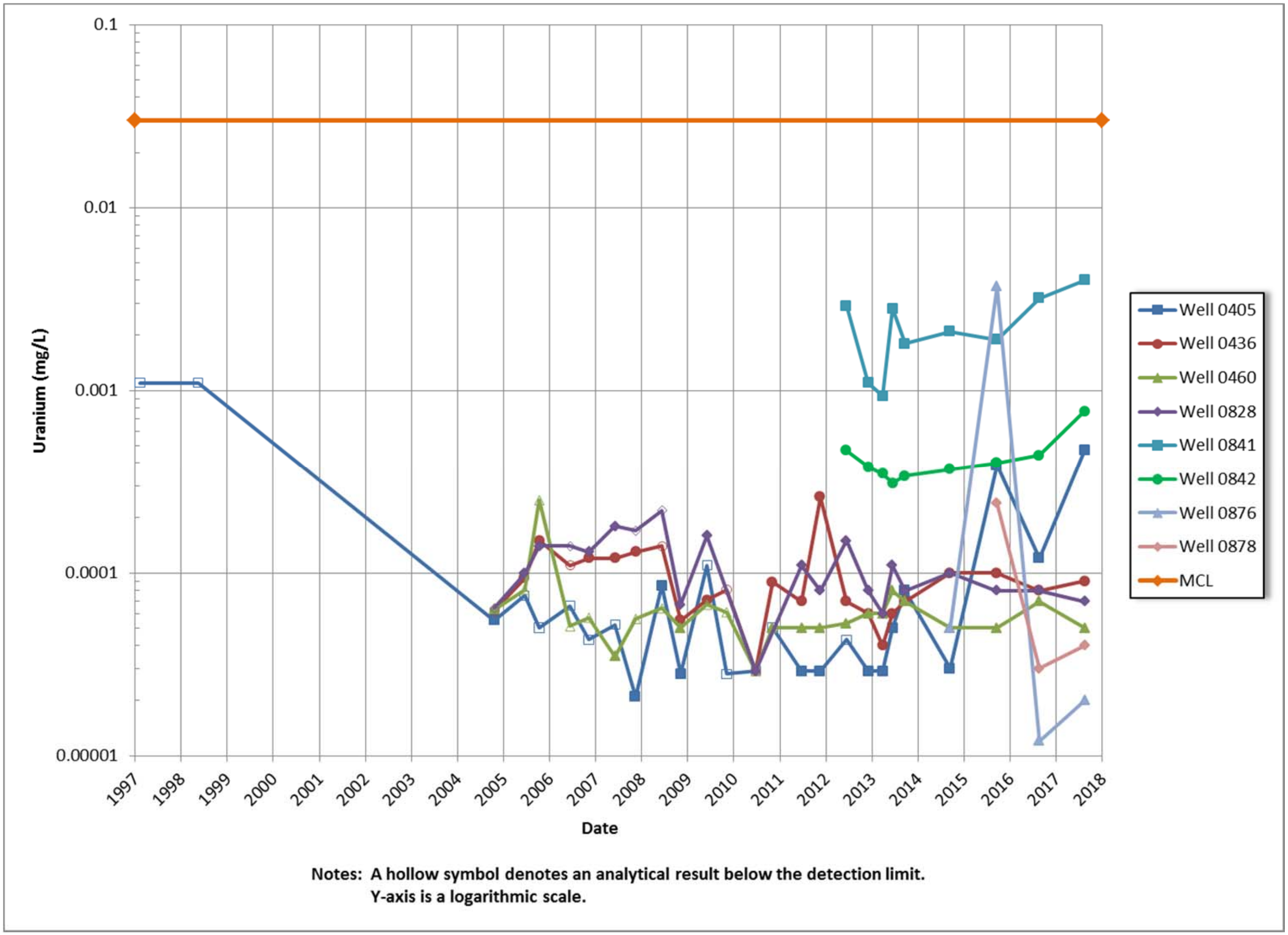


Figure 18. Uranium Concentrations in Domestic Wells

4.2 Surface Water

4.2.1 Surface Water Flow

Surface water flow in the Little Wind River has a direct impact on conditions at the Riverton site. The 2010 flood of the Little Wind River demonstrated a direct correlation between flooding of the Little Wind River and increased contaminant concentrations in the surficial aquifer (DOE 2011). This correlation was confirmed in 2016 and in 2017. In addition, flooding of the Little Wind River has impacted the geomorphology of the Riverton site with the development and evolution of surface water features such as the oxbow lake and a scour within a generally dry channel that exposed the top of the water table.

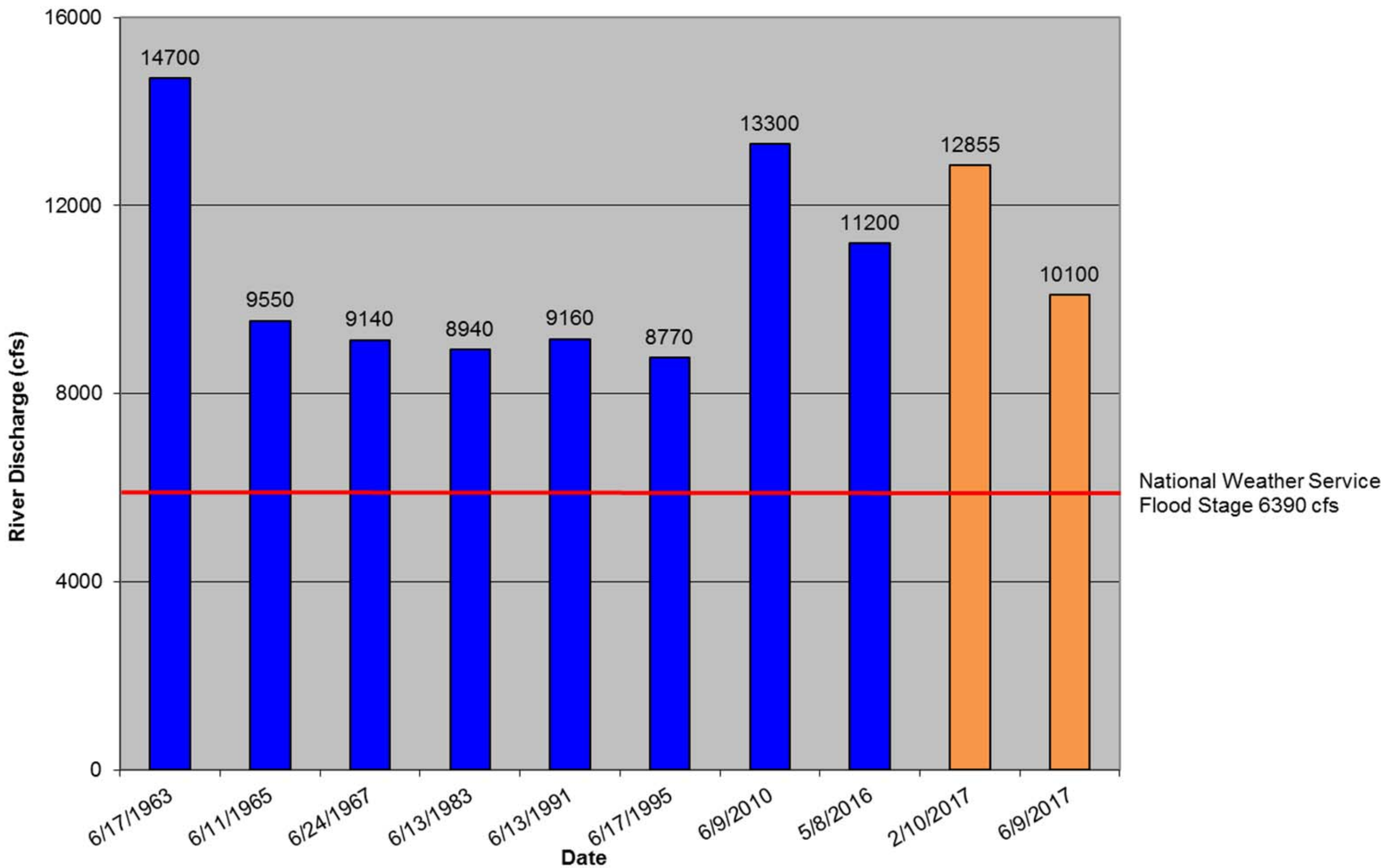
Flooding of the Little Wind River occurred in February and June 2017 (Figure 3 and Figure 19, respectively). The February flood was caused by a rapid winter warm-up and ice flows, and the June event was caused by spring runoff from a heavy winter snowpack in the Wind River Range. The peak discharge on February 10, 2017, of 12,855 cfs was estimated because the USGS gaging station located 1.6 miles east of the former mill site (Figure 2) was destroyed by large blocks of ice flowing down the river during the flood. In June, the peak discharge of 10,100 cfs occurred on June 9, 2017. Figure 20 shows the highest peak discharges recorded since the start of milling operations (1958) (USGS 2017a). Discharge in the Little Wind River is statistically the highest in June, which reflects the spring runoff from the Wind River Range. An assessment of Little Wind River discharge data indicates that spring runoff and flow in the river was above normal from 2015 through 2017 and the mean June 2017 discharge was the highest on record (Table 3) (USGS 2017a).

Table 3. Discharge from the Little Wind River

Year[a]	Mean June Discharge (cfs)	Deviation from Normal[b] June Discharge (cfs)	Maximum Spring Discharge (cfs)
2000	1089	−1211	2720
2001	233.2	−2067	2090
2002	740.6	−1559	1930
2003	861.7	−1438	2490
2004	1591	−709	4120
2005	2272	−28	4520
2006	642.4	−1658	1710
2007	738.9	−1561	1910
2008	2175	−125	3730
2009	3012	712	4190
2010	5829	3529	13,300
2011	2861	561	7210
2012	594	−1706	1610
2013	587	−1713	1640
2014	1333	−967	3140
2015	2538	238	4240
2016	3443	1143	11,200
2017	6397	4097	10,100

[a] These statistics are from the USGS gaging station.
[b] Based on a mean June discharge of 2300 cfs from 1941 to 2016.

Figure 19. Flooding of the Little Wind River in June 2017 (photo courtesy of NANRO)



Note: Provisional data (from 2/10/2017 and 6/9/2017) are displayed in orange.

Figure 20. Historical Maximum Discharges of the Little Wind River

4.2.2 Surface Water Quality

Samples were collected at four locations on the Little Wind River (Figure 2), which flows generally to the northeast. Contaminated groundwater discharges to the Little Wind River, but there is no evidence that it adversely impacts surface water quality in the river. Molybdenum and uranium concentrations measured in samples collected from river locations adjacent to and downstream of the groundwater plume (locations 0811, 0812, and 0796) are comparable to concentrations from river samples collected upstream of the groundwater plume (location 0794), as shown in Figure 21 and Figure 22, respectively. Appendix E provides surface water quality data, by parameter, for all surface water locations sampled during 2017.

Two ponds (locations 0810 and 0823) formed from groundwater discharge into former gravel pits were sampled as part of the long-term monitoring network. These ponds are primarily used for fishing and swimming and are cross-gradient (0810) and upgradient (0823) from contaminant plumes. Samples collected from the ponds had concentrations of molybdenum and uranium that were below their respective groundwater MCLs and comparable to background groundwater concentrations, which indicates no discernible impacts from the site. Figure 23 and Figure 24 show concentrations of molybdenum and uranium, respectively, over time in these ponds.

Concentrations of molybdenum and uranium in the oxbow lake (location 0747) have varied over time (see Figure 23 for molybdenum and Figure 24 for uranium). This variability is partially attributed to the time samples are taken. If inflow from the Little Wind River to the oxbow lake occurred just prior to or during the sampling event, then contaminant concentrations are diluted. Hydraulic and water quality data indicate that the oxbow lake is fed by the discharge of contaminated groundwater; therefore, elevated concentrations are expected. Variability in uranium concentrations in the oxbow lake is also attributed to fluctuations in groundwater chemistry. In 2017, the concentration of uranium (0.36 mg/L) in the sample collected from the oxbow lake reflects uranium concentrations in the surficial groundwater, which remain above the groundwater MCL. Molybdenum concentrations in the oxbow lake have been historically below the groundwater MCL for molybdenum and were again in 2017.

In 2017, the Little Wind River was not flowing into the oxbow lake during the August sampling event when low-flow conditions were observed. Field observations since 2002 indicate the oxbow lake is gradually filling with sediment and vegetation over time, as expected. Numerous abandoned meanders (oxbows) of the Wind and Little Wind Rivers are evident from aerial photographs (Figure 2). Eventually, the oxbow lake will fill in as other abandoned channels have and will not be an expression of surface water at the Riverton site. Figure 25 and Figure 26 show photographs of the oxbow lake in May of 2002 and August of 2016, respectively, which illustrates the progress of the vegetation and sedimentation filling in the ponded water.

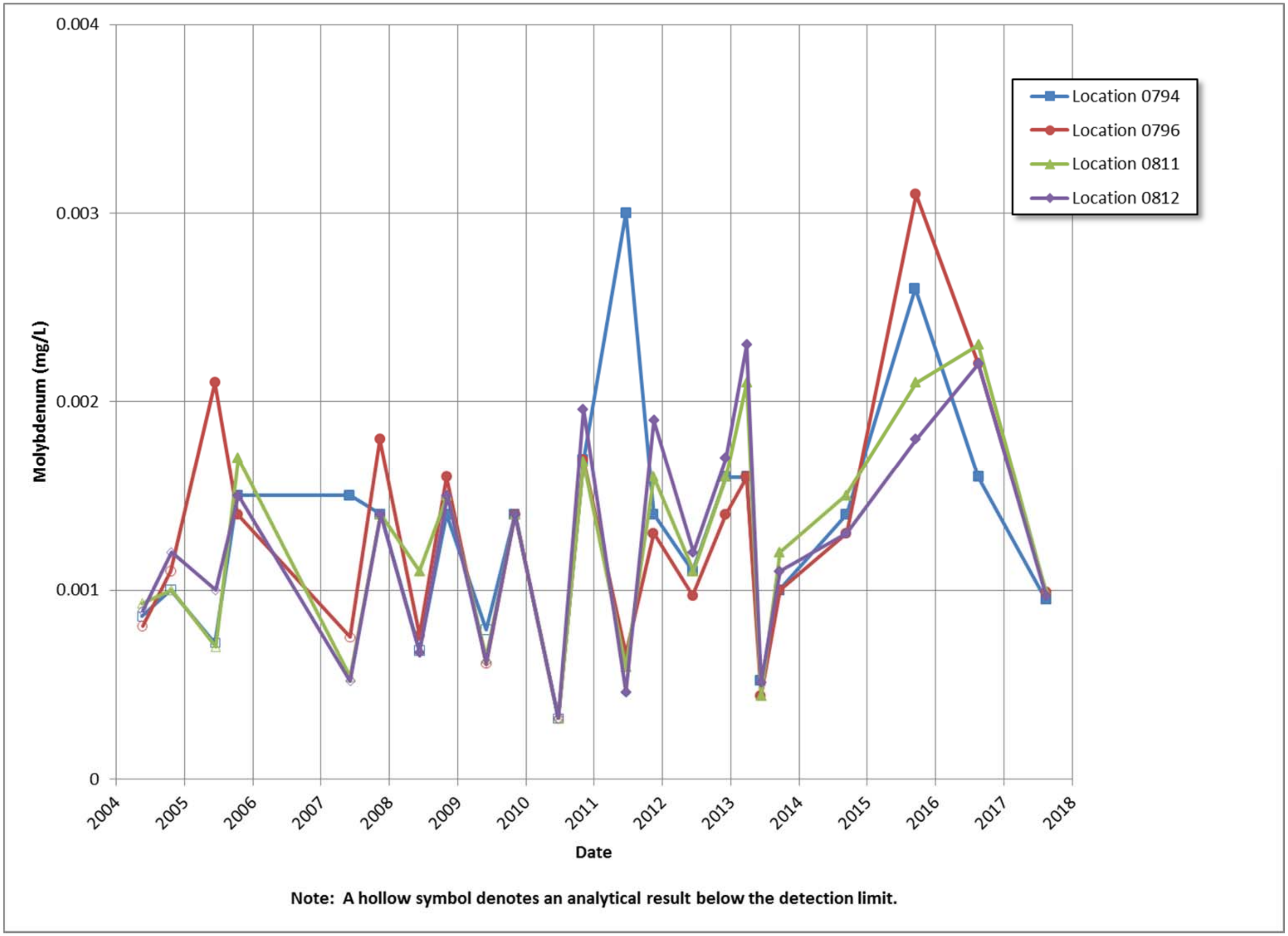


Figure 21. Molybdenum Concentrations in Little Wind River Locations

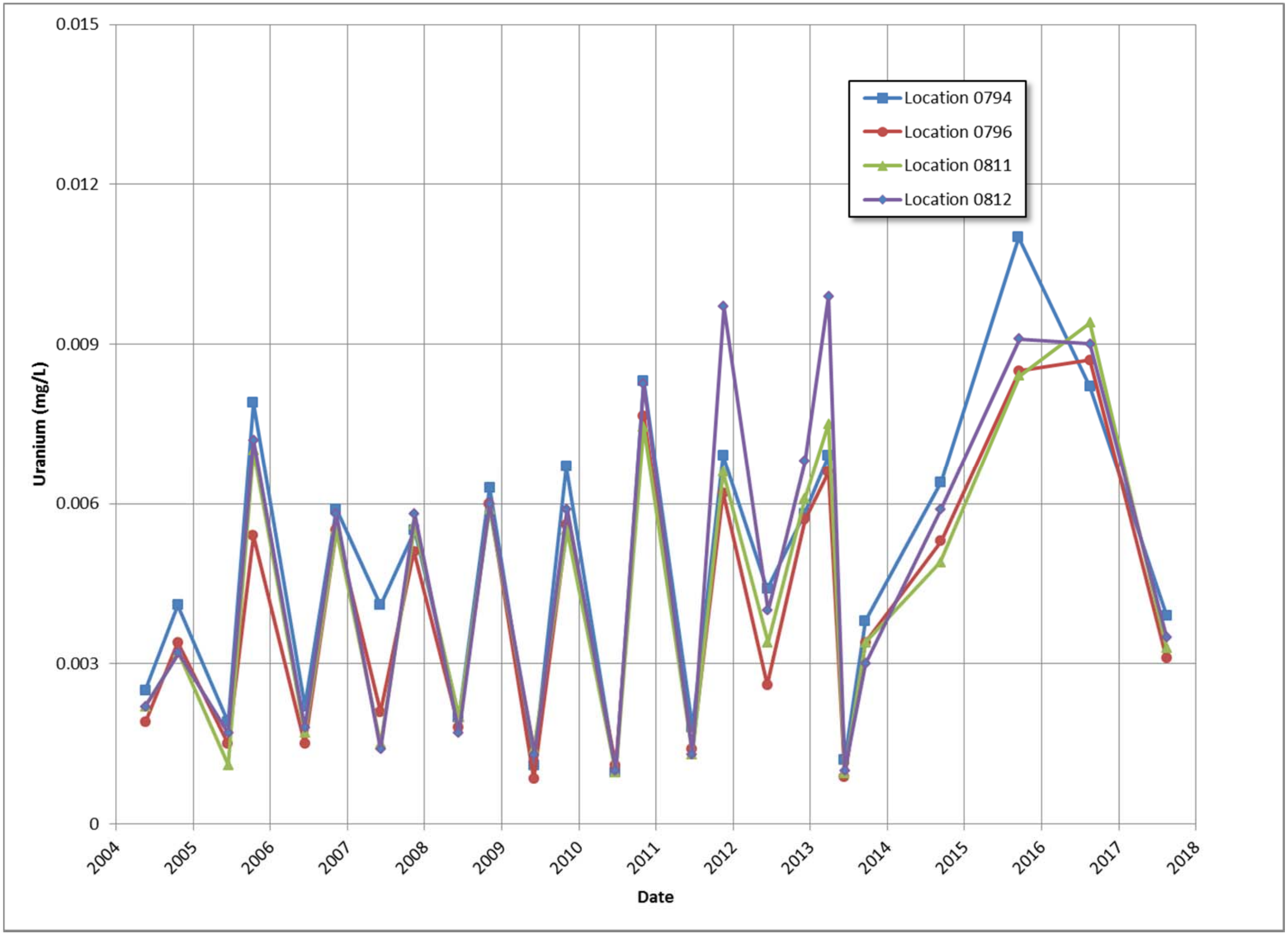


Figure 22. Uranium Concentrations in Little Wind River Locations

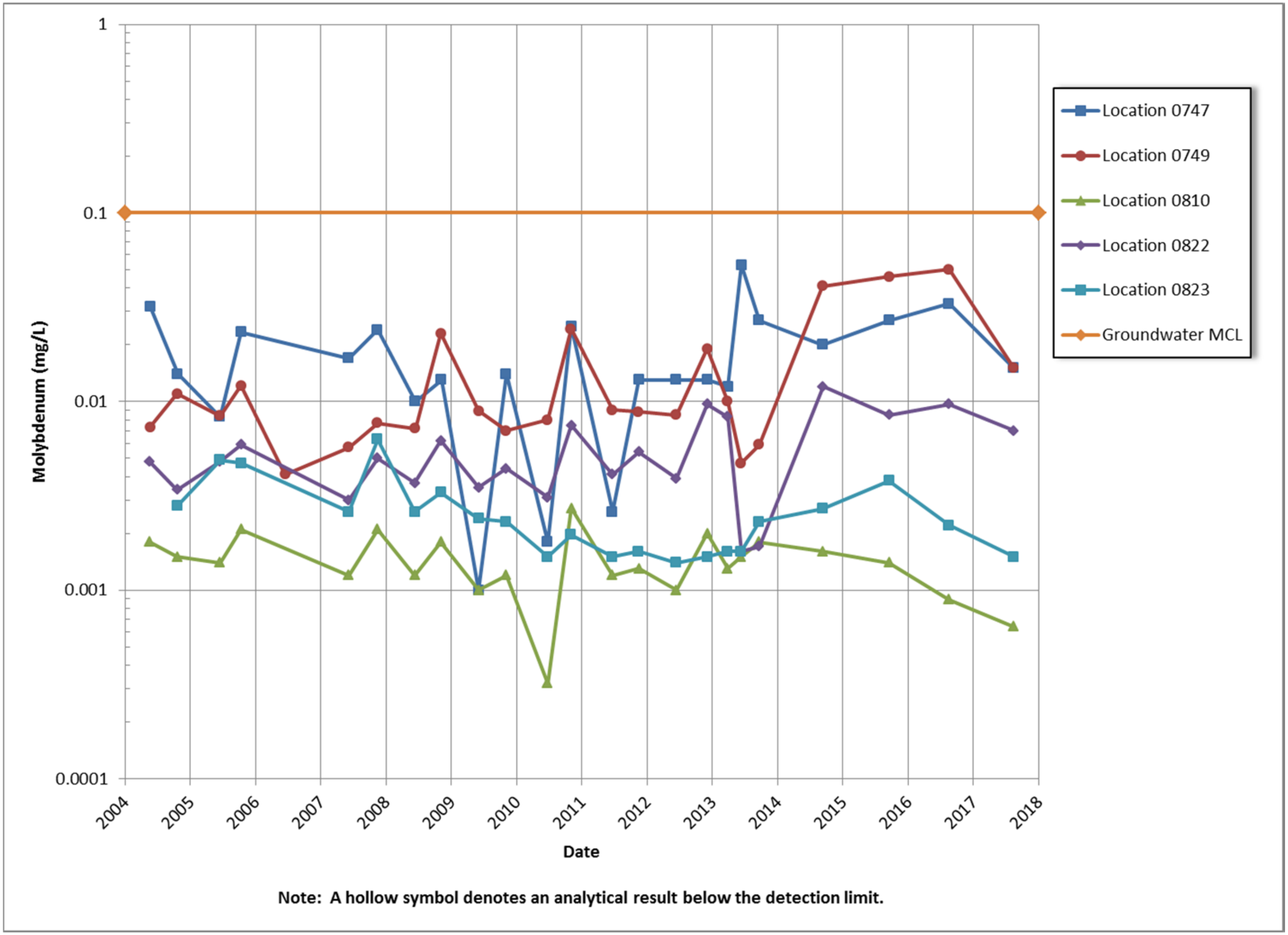


Figure 23. Molybdenum Concentrations in Ponds and Ditches

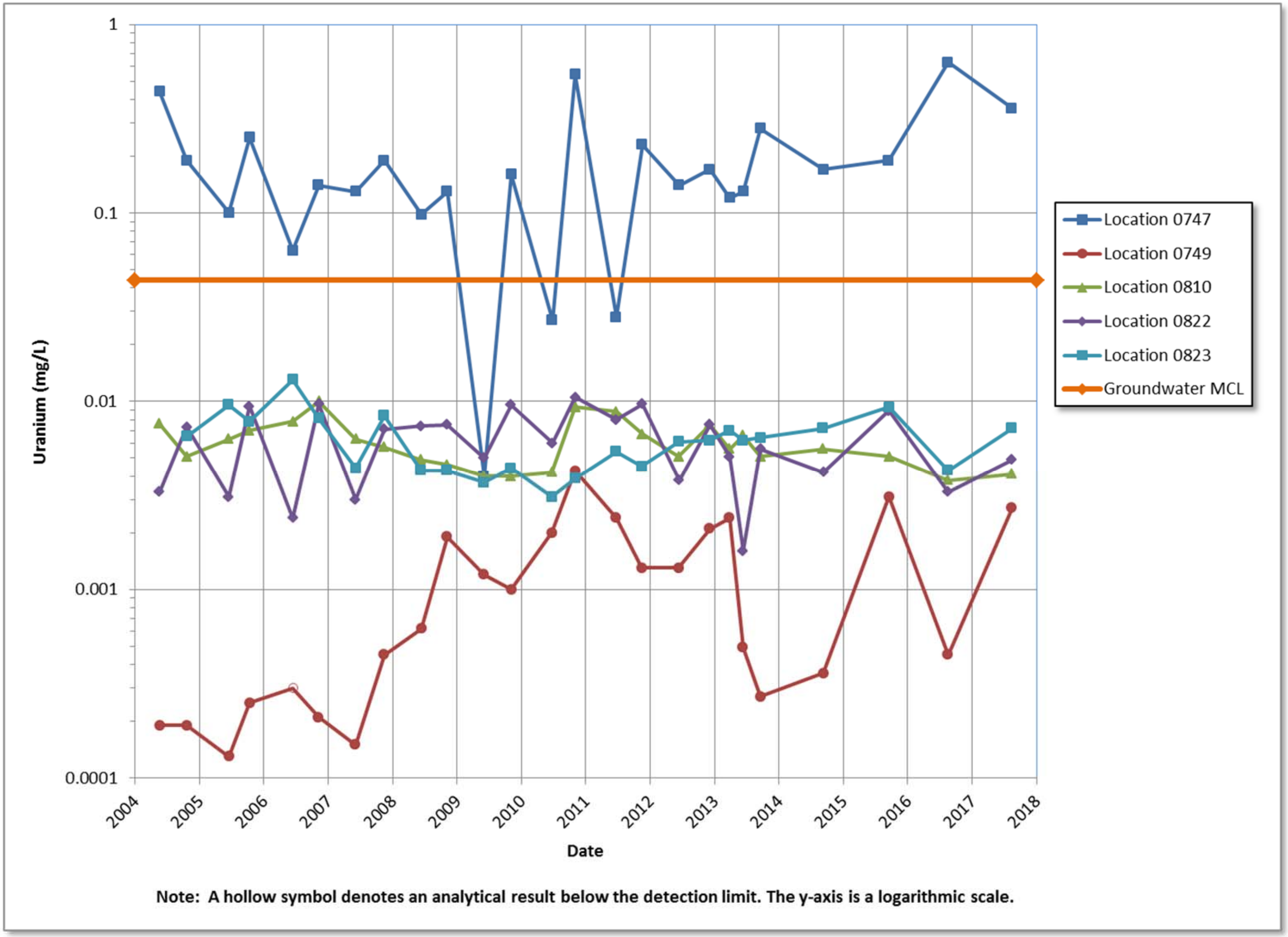


Figure 24. Uranium Concentrations in Ponds and Ditches

Figure 25. Oxbow Lake in May 2002

Figure 26. Oxbow Lake in August 2016

The sample collected at the ditch that carries discharge water from the Chemtrade sulfuric acid refinery (location 0749) had elevated concentrations of sulfate that have been in the 1500–3000 mg/L range from 2004 to March of 2013. In June of 2013, however, concentrations were significantly reduced (550 mg/L at location 0749) because of a change in plant processes that reduced sulfate in the water discharge and in the air emissions. Discharge from the ditch is regulated through a National Pollutant Discharge Elimination System permit issued to Chemtrade and administered by EPA. Since 2013, sulfate concentrations in the ditch have been generally lower but variable (Figure 27) with an increase in concentration to 1800 mg/L measured in August of 2017. The unlined ditch is a continual source of sulfate to the surficial aquifer.

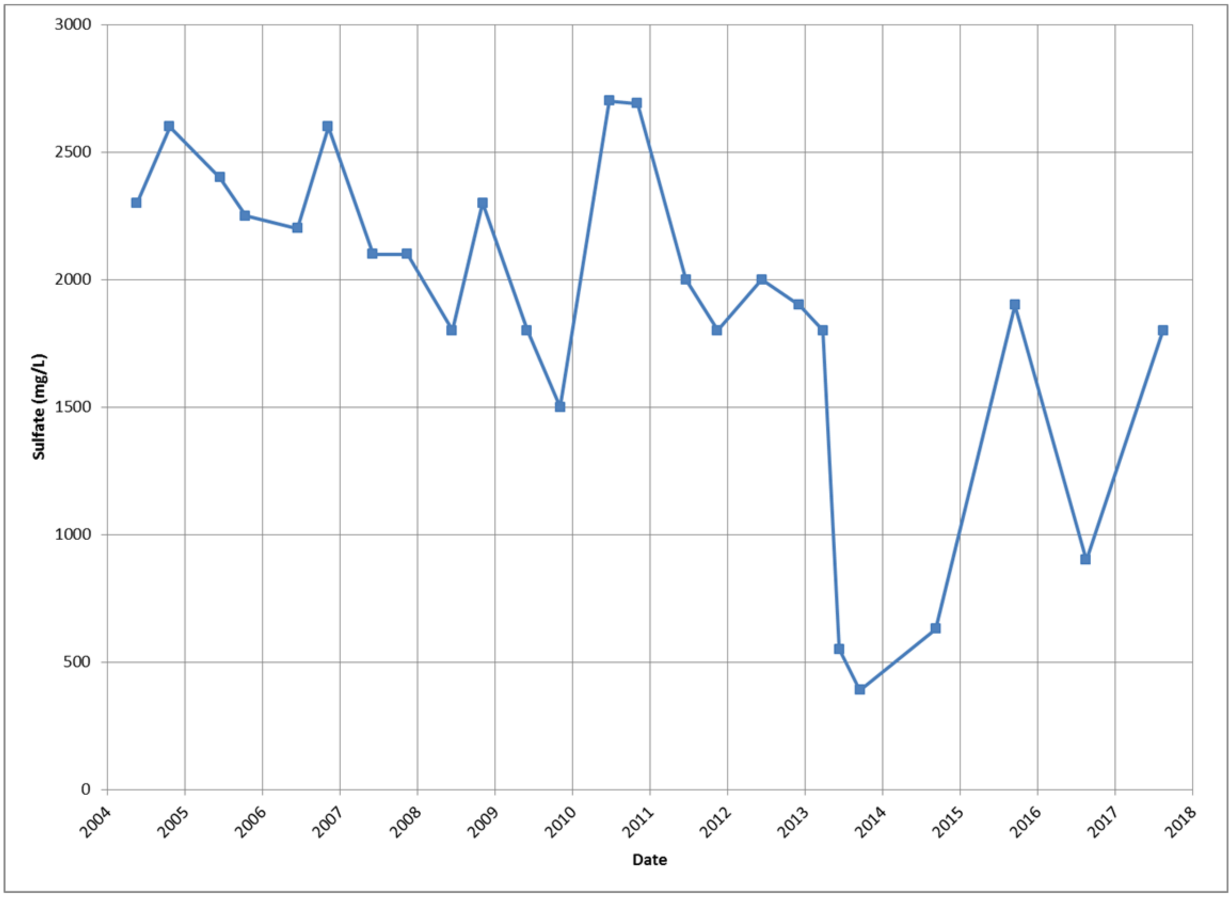


Figure 27. Sulfate Concentrations at Location 0749

Concentrations of molybdenum and uranium in the Chemtrade ditch (0749) are below the groundwater MCLs, but concentrations indicate a small contribution from plant processes. The concentration of molybdenum in the sample collected from the ditch (0.015 mg/L) was elevated compared to the molybdenum concentration in process water used by the sulfuric acid plant that is supplied by well 0460 (0.0026 mg/L), which indicates a minor molybdenum input from plant processes. The concentration of uranium in the sample collected from the ditch was very low (0.0027 mg/L) but slightly elevated compared to concentrations of the process water used at the plant (0.00005 mg/L), which indicates a minor uranium input from plant processes.

Downstream of the Chemtrade ditch, a sample was collected from the west side irrigation ditch (0822). The molybdenum concentrations were slightly lower and uranium concentration slightly higher in the west side irrigation ditch sample compared to the Chemtrade ditch sample (0749), which reflects a mixing with background water upstream of the site along the flow path from 0749 to 0822. The low molybdenum and uranium concentrations (Figure 23 and Figure 24) indicate minimal site impacts to the water quality in the ditch.

5.0 Compliance Strategy Assessment

After surface remediation was completed, groundwater numerical modeling in 1998 predicted that the alluvial aquifer will naturally flush contaminants to levels below applicable standards within the 100-year regulatory time frame. This modeling formed the basis for the natural flushing strategy that was approved in the *Final Ground Water Compliance Action Plan for the Riverton, Wyoming, Title I UMTRA Project Site* (DOE 1998a) in 1998. Prior to 2010, the progress of natural flushing was assessed using three tools: comparison to hydrogeologic modeling predictions, trend analysis, and curve matching and interpolation techniques applied to temporal plots of contaminant concentrations at individual locations. These techniques were based on a CSM of gradually declining contaminant concentrations after surface remediation of source material on the former mill site. Prior to 2010, these techniques indicated that natural flushing of the surficial aquifer was progressing toward applicable standards.

However, based on observations made in 2010 in context with historical data, the CSM and groundwater computer modeling were too simplistic to account for the spikes in contaminant concentrations in the surficial aquifer groundwater. Spikes in contaminant concentrations are attributed to flooding of the Little Wind River in June 2010, which mobilized contaminants into the saturated zone of the surficial aquifer. Cross-correlation of flood events in the Little Wind River with monitoring data reveal that uranium concentrations spiked in monitoring well 0707 in 1991, 1995, 2010, 2016, and 2017, which followed floods of the Little Wind River (Figure 28). Figure 29 shows the average uranium concentration in surficial aquifer wells with a long history that have always been above the MCL (0707, 0716, 0718, and 0722/0722R). As shown in Figure 28, the average uranium concentration in these wells increased significantly after the 2010 flood event and increased again after the 2016 and 2017 flood events, but not as much as it had in 2010.

Although the 2010 flood of the Little Wind River caused significant spikes in contaminant concentrations in the surficial aquifer, uranium concentrations declined to pre-flood concentrations by 2013 (Figure 29). These data indicate that the effects of the 2010 flood are relatively short-lived in context of the 100-year regulatory time frame; however, long-term trends are still unclear. In 2016, significant concentration increases were seen again for molybdenum, uranium, and sulfate, and concentrations generally remained high after the 2017 floods compared to pre-flood levels (Table 4).

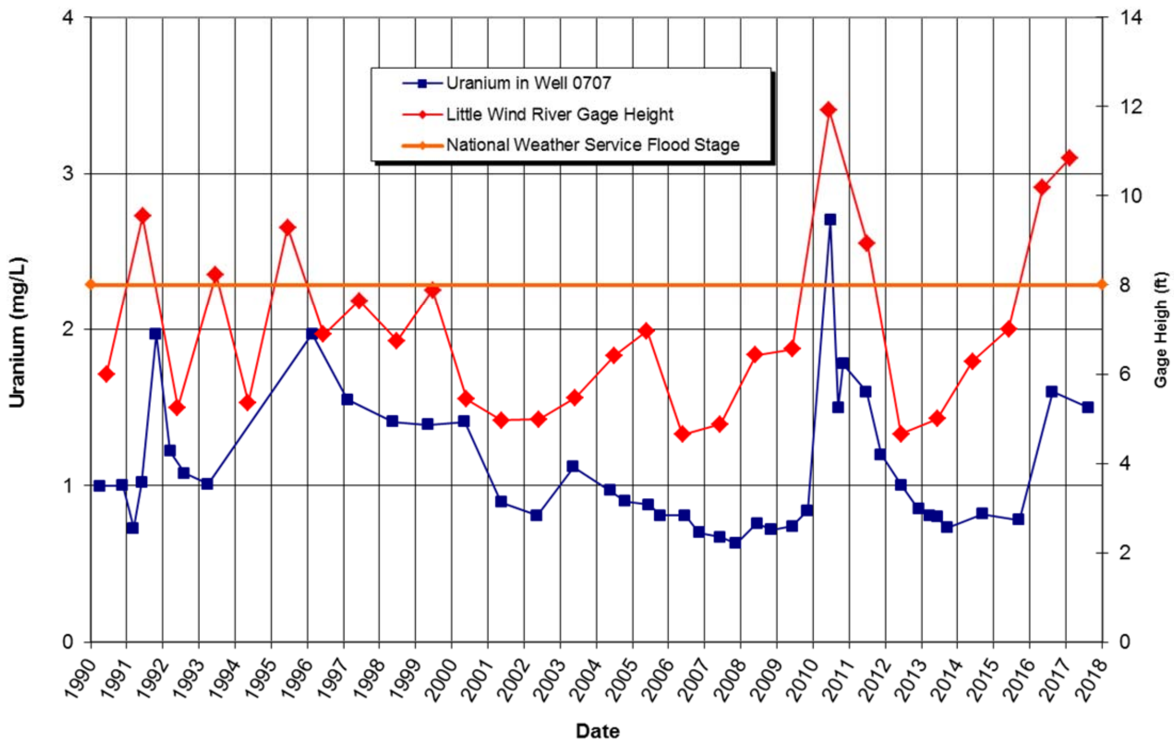


Figure 28. Uranium Concentrations in Monitoring Well 0707 Versus Little Wind River Stage

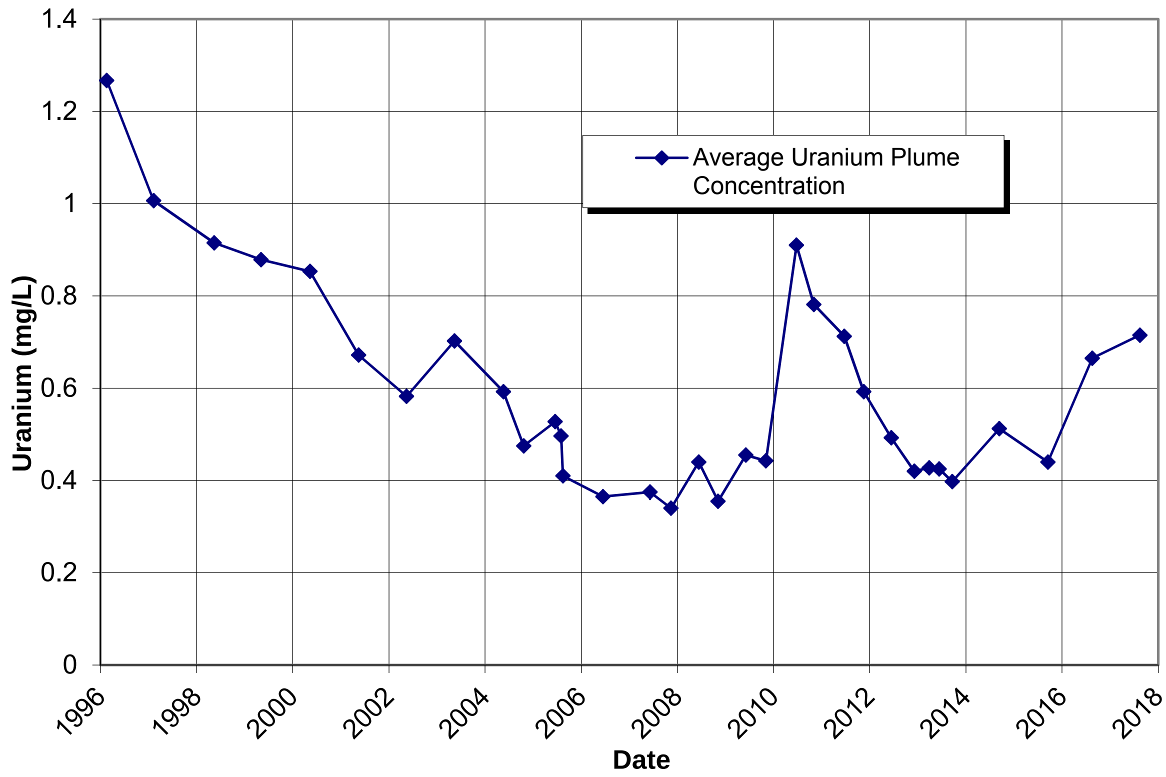


Figure 29. Average Uranium Concentrations in Surficial Aquifer Wells 0707, 0716, 0718, and 0722/0722R

Table 4. Comparison of Pre-Flood (2015) and Post-Flood (2016 and 2017) Results

Well	Molybdenum			Uranium			Sulfate		
	Pre-Flood 2015	**Post-Flood 2016**	**Post-Flood 2017**	**Pre-Flood 2015**	**Post-Flood 2016**	**Post-Flood 2017**	**Pre-Flood 2015**	**Post-Flood 2016**	**Post-Flood 2017**
0707	0.96	1.5	1.5	0.78	1.6	1.5	2700	5800	5600
0788	0.02	0.022	0.022	0.038	0.059	0.074	1400	2800	3200
0789	0.57	0.67	0.57	1.6	3.1	1.6	4700	11,000	9100
0826	0.018	0.041	0.084	0.037	0.072	0.065	1300	3400	2900
0855-4	0.25	0.25	0.27	0.86	1.1	1.2	5100	6600	6700
0856-4	0.3	0.83	0.51	1.1	5.6	2.7	4000	14,000	11,000

Note:
Units are in mg/L.

Overall, natural flushing (contaminant movement and removal via groundwater flow) in the surficial aquifer is occurring; however, the rate of flushing does not currently appear to be enough to restore the aquifer within the 100-year regulatory time requirement. Several lines of evidence indicate that the natural flushing compliance strategy may not meet the 2089 target date. These include:

- Current plume configurations and magnitude.
  - A uranium concentration of 1.4 mg/L was measured on the former mill site in 2017, which indicates that contaminant plume movement is retarded by aquifer properties, influenced by additional sources, or both.
  - Uranium concentrations in the center of the plume adjacent to the Little Wind River were as high as 2.7 mg/L in 2017, which is very high compared to the uranium standard of 0.044 mg/L.
- Groundwater concentrations of molybdenum and uranium are outside the predicted error range generated from the initial groundwater modeling (Figure 30 and Figure 31).
- Recently completed groundwater modeling indicates aquifer restoration will take longer than 100 years from the present (DOE 2013).
- At other Uranium Mill Tailings Radiation Control Act sites with similar geology and contaminants, concentrations of groundwater COCs are not attenuating as quickly as predicted by groundwater modeling (Shafer et al. 2014).
- Graphs of time versus concentration for average concentrations and for individual wells at the Riverton site show that COCs are either declining more slowly than in the past or have leveled out.
- Future flooding of the Little Wind River and extreme precipitation events will likely cause an increase in contaminant concentrations in groundwater, even if the increase is relatively short-lived, which will prolong the time required for natural flushing.
- Secondary contaminant accumulations in the saturated zone, unsaturated zone, or both may be acting as additional sources for elevated concentrations in groundwater.

The completion of natural flushing remains uncertain, but evidence collected prior to and in 2017 indicates that uranium and molybdenum concentrations will not fall below the MCLs for these constituents within the 100-year regulatory time frame. Data collection to date has provided a better understanding of the Riverton site, including aquifer properties, geochemistry, and potential additional contaminant sources. Research has also identified the importance of unsaturated zone processes for accumulating solid-phase contaminants in shallow aquifer sediments during most years, the subsequent mobilization of those contaminants back into groundwater during floods on the Little Wind River, and spikes in the groundwater concentrations of those contaminants in the months following the flooding. The findings from work conducted thus far indicate that existing evidence is sufficient for identifying a new compliance strategy. Further work on secondary sources in the surficial aquifer will help DOE to better understand the mechanisms controlling subsurface uranium migration at Riverton and support a new compliance strategy. This work will also assist in better managing LM sites that have the potential to be impacted by processes similar to those observed at the Riverton site.

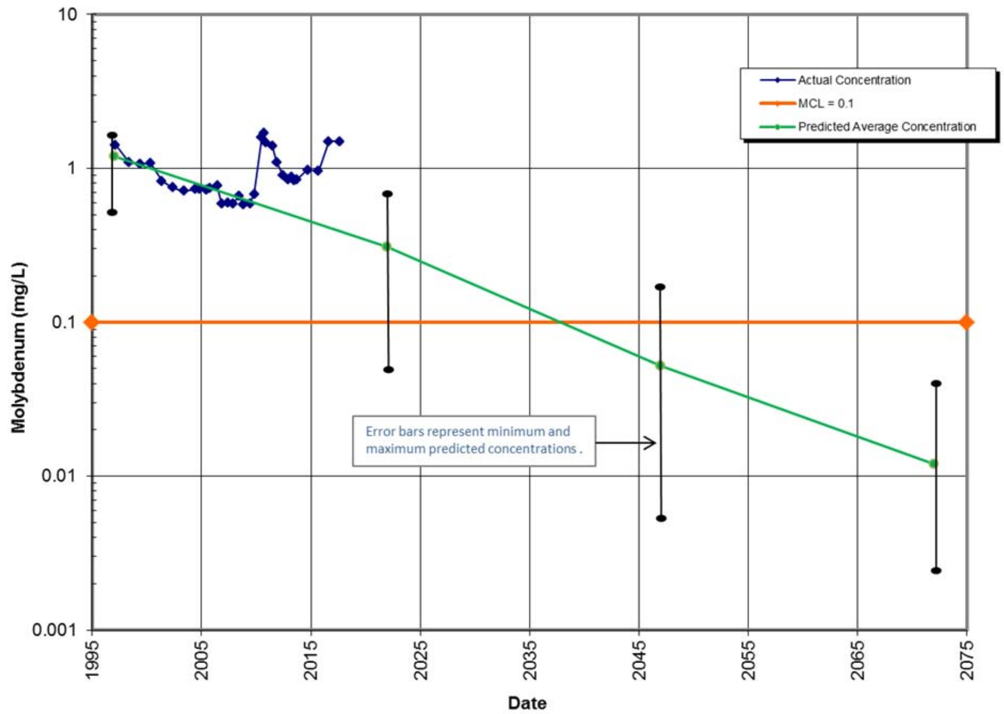


Figure 30. Predicted Versus Measured Molybdenum Concentrations in Well 0707

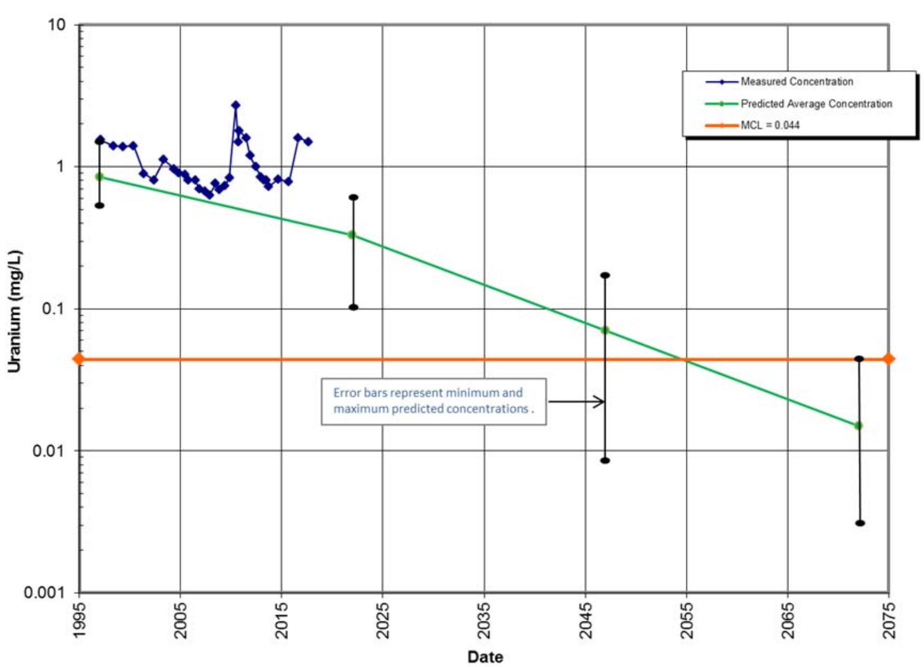


Figure 31. Predicted Versus Measured Uranium Concentrations in Well 0707

6.0 CSM Update

The sampling results and laboratory testing from 2017 confirm the CSM provided in the *2015 Advanced Site Investigation and Monitoring Report, Riverton, Wyoming, Processing Site* (DOE 2016). This conceptual model accounts for an ongoing contaminant source zone underneath the former tailings impoundment in the saturated zone, secondary contaminant sources within the plume footprint in evaporites within the unsaturated zone, and naturally reduced zones (NRZs) in the variably saturated zone. Data from 2017 indicate an ongoing source underneath the former tailings pile persists with a uranium concentration of 1.4 mg/L. Data from 2016 and 2017 also confirm that overland flooding can provide a mechanism to release contaminants, specifically uranium and molybdenum, from the unsaturated zone. Whether or not the NRZs are a source or sink for uranium and molybdenum is still being investigated by Stanford Linear Accelerator Center (SLAC) personnel.

The observation that uranium and molybdenum concentrations remain high after 2017 floods confirms the CSM, which posits a secondary contaminant source in the unsaturated zone. The CSM suggests that the unsaturated zone is “loaded” with contaminants as seasonal high water levels bring contaminants into the typically unsaturated sediments. During these times of high water levels, contaminants are wicked up and stored in the silt layer overlying much of the surficial aquifer, which can be released during river flooding. The potential for release of the contaminants in the silt layer was also confirmed with column tests conducted by the Environmental Sciences Laboratory in Grand Junction, Colorado, in 2017, where concentrations of up to 0.93 mg/L of uranium were leached from samples of the silt. The magnitude of contaminant spikes were not as large after the 2016 and 2017 floods as they were after the 2010 flood, which may indicate some removal of the secondary contaminant source by prior flooding in combination with insufficient time to “reload” the silt between flood events.

7.0 Conclusions and Recommendations

Verification monitoring results from 2017 verify that mill-related groundwater contamination continues to impact the surficial aquifer and oxbow lake, but ICs are in place and functioning as intended to protect human health and the environment from the groundwater contamination. In addition, verification monitoring results continue to verify that mill-related contamination has not impacted: (1) any potable domestic wells within the IC boundary installed in the semiconfined aquifer, or (2) the confined aquifer, or (3) water quality in the Little Wind River, or (4) the gravel pit ponds. A thorough risk assessment is currently being planned with coordination between the DOE, Argonne National Laboratory, and the Northern Arapahoe Tribe to address any human health and environmental risk posed by contaminated groundwater. This risk assessment will include evaluations of groundwater discharge to surface water bodies, contaminant uptake by plants, and any potential impacts to the ecosystem.

Molybdenum and uranium concentrations in the surficial aquifer groundwater remain above their respective MCLs. After the 2010 flood on the Little Wind River, molybdenum and uranium concentrations increased, but then returned to their pre-flood levels by 2013. Two floods on the Little Wind River in February and June 2017 confirmed that contaminant concentrations tend to spike after a flood event in the affected areas. Numerous lines of evidence indicate that the rate of natural flushing may not be rapid enough to meet the 100-year regulatory limit.

DOE has continued to pursue refinement of the CSM, contaminant distributions, and properties of the unsaturated zone of the surficial aquifer at the Riverton site. As a result, additional characterization has been completed over the past several years, and column-leach testing of unconsolidated materials was completed in 2017. Ongoing work involves collaboration with SLAC and USGS on various site investigations. Continuing efforts will include thorough interpretations and evaluations of existing data to further refine the conceptual model and understand geochemical processes that affect contaminant fate and transport. These investigations will be the subject of future scientific publications produced by USGS, SLAC, and DOE.

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Appendix A

Domestic Well Data

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GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

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PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Alkalinity, Total (As CaCO3)													
Alkalinity, Total (As CaCO3)	0405	WL	mg/L	8/15/2017	(N)F	NR	N	32				-	-
Alkalinity, Total (As CaCO3)	0436	WL	mg/L	8/15/2017	(N)F	NR	N	147				-	-
Alkalinity, Total (As CaCO3)	0460	WL	mg/L	8/16/2017	(N)F	NR	N	156				-	-
Alkalinity, Total (As CaCO3)	0828	WL	mg/L	8/15/2017	(N)F		O	138				-	-
Alkalinity, Total (As CaCO3)	0841	WL	mg/L	8/15/2017	(N)F			213				-	-
Alkalinity, Total (As CaCO3)	0842	WL	mg/L	8/16/2017	(N)F			165				-	-
Alkalinity, Total (As CaCO3)	0876	WL	mg/L	8/16/2017	(N)F			38				-	-
Alkalinity, Total (As CaCO3)	0878	WL	mg/L	8/15/2017	(N)F			118				-	-
Calcium													
Calcium	0405	WL	mg/L	8/15/2017	(N)F	NR	N	7.5				0.024	-
Calcium	0405	WL	mg/L	8/15/2017	(N)D	NR	N	8				0.024	-
Calcium	0436	WL	mg/L	8/15/2017	(N)F	NR	N	3.7				0.024	-
Calcium	0460	WL	mg/L	8/16/2017	(N)F	NR	N	3.3				0.024	-
Calcium	0828	WL	mg/L	8/15/2017	(N)F		O	3.8				0.024	-
Calcium	0841	WL	mg/L	8/15/2017	(N)F			120				0.024	-
Calcium	0842	WL	mg/L	8/16/2017	(N)F			76				0.024	-
Calcium	0876	WL	mg/L	8/16/2017	(N)F			4.9				0.024	-
Calcium	0878	WL	mg/L	8/15/2017	(N)F			4.8				0.012	-
Chloride													
Chloride	0405	WL	mg/L	8/15/2017	(N)F	NR	N	26				1.2	-
Chloride	0405	WL	mg/L	8/15/2017	(N)D	NR	N	24				3	-
Chloride	0436	WL	mg/L	8/15/2017	(N)F	NR	N	12				1.2	-
Chloride	0460	WL	mg/L	8/16/2017	(N)F	NR	N	9.2				0.6	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/19/2017 8:04:05 AM

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Chloride	0828	WL	mg/L	8/15/2017	(N)F		O	11				1.2	-
Chloride	0841	WL	mg/L	8/15/2017	(N)F			33				1.2	-
Chloride	0842	WL	mg/L	8/16/2017	(N)F			18				0.6	-
Chloride	0876	WL	mg/L	8/16/2017	(N)F			31				1.2	-
Chloride	0878	WL	mg/L	8/15/2017	(N)F			9.4				0.3	-
Dissolved Oxygen													
Dissolved Oxygen	0405	WL	mg/L	8/15/2017	(N)F	NR	N	7.83				-	-
Dissolved Oxygen	0436	WL	mg/L	8/15/2017	(N)F	NR	N	6.72				-	-
Dissolved Oxygen	0460	WL	mg/L	8/16/2017	(N)F	NR	N	3.33				-	-
Dissolved Oxygen	0828	WL	mg/L	8/15/2017	(N)F		O	8.79				-	-
Dissolved Oxygen	0841	WL	mg/L	8/15/2017	(N)F			6.53				-	-
Dissolved Oxygen	0842	WL	mg/L	8/16/2017	(N)F			3.53				-	-
Dissolved Oxygen	0876	WL	mg/L	8/16/2017	(N)F			1.92				-	-
Dissolved Oxygen	0878	WL	mg/L	8/15/2017	(N)F			5.29				-	-
Magnesium													
Magnesium	0405	WL	mg/L	8/15/2017	(N)F	NR	N	0.1	J			0.03	-
Magnesium	0405	WL	mg/L	8/15/2017	(N)D	NR	N	0.031	J			0.03	-
Magnesium	0436	WL	mg/L	8/15/2017	(N)F	NR	N	0.14	J			0.03	-
Magnesium	0460	WL	mg/L	8/16/2017	(N)F	NR	N	0.057	J			0.03	-
Magnesium	0828	WL	mg/L	8/15/2017	(N)F		O	0.13	J			0.03	-
Magnesium	0841	WL	mg/L	8/15/2017	(N)F			22				0.03	-
Magnesium	0842	WL	mg/L	8/16/2017	(N)F			9.2				0.03	-
Magnesium	0876	WL	mg/L	8/16/2017	(N)F			0.15	J			0.03	-
Magnesium	0878	WL	mg/L	8/15/2017	(N)F			0.052	J			0.013	-
Manganese													
Manganese	0405	WL	mg/L	8/15/2017	(N)F	NR	N	0.004	J			0.00024	-
Manganese	0405	WL	mg/L	8/15/2017	(N)D	NR	N	0.0038	J			0.00024	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Manganese	0436	WL	mg/L	8/15/2017	(N)F	NR	N	0.0034	J			0.00024	-
Manganese	0460	WL	mg/L	8/16/2017	(N)F	NR	N	0.0012	J			0.00024	-
Manganese	0828	WL	mg/L	8/15/2017	(N)F		O	0.0038	J			0.00024	-
Manganese	0841	WL	mg/L	8/15/2017	(N)F			0.15				0.00024	-
Manganese	0842	WL	mg/L	8/16/2017	(N)F			0.09				0.00024	-
Manganese	0876	WL	mg/L	8/16/2017	(N)F			0.00086	J			0.00024	-
Manganese	0878	WL	mg/L	8/15/2017	(N)F			0.0037	J			0.00011	-
Molybdenum													
Molybdenum	0405	WL	mg/L	8/15/2017	(N)F	NR	N	0.0045				0.00032	-
Molybdenum	0405	WL	mg/L	8/15/2017	(N)D	NR	N	0.0045				0.00032	-
Molybdenum	0436	WL	mg/L	8/15/2017	(N)F	NR	N	0.0028				0.00032	-
Molybdenum	0460	WL	mg/L	8/16/2017	(N)F	NR	N	0.0026				0.00032	-
Molybdenum	0828	WL	mg/L	8/15/2017	(N)F		O	0.0029				0.00032	-
Molybdenum	0841	WL	mg/L	8/15/2017	(N)F			0.0033				0.00032	-
Molybdenum	0842	WL	mg/L	8/16/2017	(N)F			0.0022				0.00032	-
Molybdenum	0876	WL	mg/L	8/16/2017	(N)F			0.0039				0.00032	-
Molybdenum	0878	WL	mg/L	8/15/2017	(N)F			0.002	J			0.00032	-
Oxidation Reduction Potential													
Oxidation Reduction Potential	0405	WL	mV	8/15/2017	(N)F	NR	N	79.0				-	-
Oxidation Reduction Potential	0436	WL	mV	8/15/2017	(N)F	NR	N	202.4				-	-
Oxidation Reduction Potential	0460	WL	mV	8/16/2017	(N)F	NR	N	98.9				-	-
Oxidation Reduction Potential	0828	WL	mV	8/15/2017	(N)F		O	211.1				-	-
Oxidation Reduction Potential	0841	WL	mV	8/15/2017	(N)F			224.2				-	-
Oxidation Reduction Potential	0842	WL	mV	8/16/2017	(N)F			239.6				-	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Oxidation Reduction Potential	0876	WL	mV	8/16/2017	(N)F			88.4				-	-
Oxidation Reduction Potential	0878	WL	mV	8/15/2017	(N)F			192.3				-	-
pH													
pH	0405	WL	SU	8/15/2017	(N)F	NR	N	8.78				-	-
pH	0436	WL	SU	8/15/2017	(N)F	NR	N	8.79				-	-
pH	0460	WL	SU	8/16/2017	(N)F	NR	N	8.90				-	-
pH	0828	WL	SU	8/15/2017	(N)F		O	8.41				-	-
pH	0841	WL	SU	8/15/2017	(N)F			7.81				-	-
pH	0842	WL	SU	8/16/2017	(N)F			7.38				-	-
pH	0876	WL	SU	8/16/2017	(N)F			9.41				-	-
pH	0878	WL	SU	8/15/2017	(N)F			8.62				-	-
Potassium													
Potassium	0405	WL	mg/L	8/15/2017	(N)F	NR	N	0.46	J			0.052	-
Potassium	0405	WL	mg/L	8/15/2017	(N)D	NR	N	0.45	J			0.052	-
Potassium	0436	WL	mg/L	8/15/2017	(N)F	NR	N	0.43	J			0.052	-
Potassium	0460	WL	mg/L	8/16/2017	(N)F	NR	N	0.39	J			0.052	-
Potassium	0828	WL	mg/L	8/15/2017	(N)F		O	0.5	J			0.052	-
Potassium	0841	WL	mg/L	8/15/2017	(N)F			4				0.052	-
Potassium	0842	WL	mg/L	8/16/2017	(N)F			0.68	J			0.052	-
Potassium	0876	WL	mg/L	8/16/2017	(N)F			0.22	J			0.052	-
Potassium	0878	WL	mg/L	8/15/2017	(N)F			0.49	J			0.11	-
Sodium													
Sodium	0405	WL	mg/L	8/15/2017	(N)F	NR	N	210				0.047	-
Sodium	0405	WL	mg/L	8/15/2017	(N)D	NR	N	200				0.047	-
Sodium	0436	WL	mg/L	8/15/2017	(N)F	NR	N	180				0.047	-
Sodium	0460	WL	mg/L	8/16/2017	(N)F	NR	N	160				0.047	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/19/2017 8:04:07 AM

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Sodium	0828	WL	mg/L	8/15/2017	(N)F		O	180				0.047	-
Sodium	0841	WL	mg/L	8/15/2017	(N)F			99				0.047	-
Sodium	0842	WL	mg/L	8/16/2017	(N)F			90				0.047	-
Sodium	0876	WL	mg/L	8/16/2017	(N)F			160				0.047	-
Sodium	0878	WL	mg/L	8/15/2017	(N)F			160				0.033	-
Specific Conductance													
Specific Conductance	0405	WL	uS/cm	8/15/2017	(N)F	NR	N	1005				-	-
Specific Conductance	0436	WL	uS/cm	8/15/2017	(N)F	NR	N	843				-	-
Specific Conductance	0460	WL	uS/cm	8/16/2017	(N)F	NR	N	732				-	-
Specific Conductance	0828	WL	uS/cm	8/15/2017	(N)F		O	831				-	-
Specific Conductance	0841	WL	uS/cm	8/15/2017	(N)F			1135				-	-
Specific Conductance	0842	WL	uS/cm	8/16/2017	(N)F			783				-	-
Specific Conductance	0876	WL	uS/cm	8/16/2017	(N)F			818				-	-
Specific Conductance	0878	WL	uS/cm	8/15/2017	(N)F			927				-	-
Sulfate													
Sulfate	0405	WL	mg/L	8/15/2017	(N)F	NR	N	370				3	-
Sulfate	0405	WL	mg/L	8/15/2017	(N)D	NR	N	330				7.5	-
Sulfate	0436	WL	mg/L	8/15/2017	(N)F	NR	N	210				3	-
Sulfate	0460	WL	mg/L	8/16/2017	(N)F	NR	N	170				1.5	-
Sulfate	0828	WL	mg/L	8/15/2017	(N)F		O	210				3	-
Sulfate	0841	WL	mg/L	8/15/2017	(N)F			320				3	-
Sulfate	0842	WL	mg/L	8/16/2017	(N)F			180				1.5	-
Sulfate	0876	WL	mg/L	8/16/2017	(N)F			250				3	-
Sulfate	0878	WL	mg/L	8/15/2017	(N)F			240				3	-
Temperature													
Temperature	0405	WL	C	8/15/2017	(N)F	NR	N	18.11				-	-
Temperature	0436	WL	C	8/15/2017	(N)F	NR	N	23.82				-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/19/2017 8:04:08 AM

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Temperature	0460	WL	C	8/16/2017	(N)F	NR	N	21.16				-	-
Temperature	0828	WL	C	8/15/2017	(N)F		O	18.07				-	-
Temperature	0841	WL	C	8/15/2017	(N)F			19.54				-	-
Temperature	0842	WL	C	8/16/2017	(N)F			14.15				-	-
Temperature	0876	WL	C	8/16/2017	(N)F			17.84				-	-
Temperature	0878	WL	C	8/15/2017	(N)F			13.69				-	-
Turbidity													
Turbidity	0405	WL	NTU	8/15/2017	(N)F	NR	N	2.72				-	-
Turbidity	0436	WL	NTU	8/15/2017	(N)F	NR	N	5.79				-	-
Turbidity	0460	WL	NTU	8/16/2017	(N)F	NR	N	0.52				-	-
Turbidity	0828	WL	NTU	8/15/2017	(N)F		O	6.74				-	-
Turbidity	0841	WL	NTU	8/15/2017	(N)F			0.70				-	-
Turbidity	0842	WL	NTU	8/16/2017	(N)F			2.72				-	-
Turbidity	0876	WL	NTU	8/16/2017	(N)F			6.76				-	-
Turbidity	0878	WL	NTU	8/15/2017	(N)F			1.64				-	-
Uranium													
Uranium	0405	WL	mg/L	8/15/2017	(N)F	NR	N	0.00028				0.000012	-
Uranium	0405	WL	mg/L	8/15/2017	(N)D	NR	N	0.00047				0.000012	-
Uranium	0436	WL	mg/L	8/15/2017	(N)F	NR	N	0.00009	J			0.000012	-
Uranium	0460	WL	mg/L	8/16/2017	(N)F	NR	N	0.00005	J			0.000012	-
Uranium	0828	WL	mg/L	8/15/2017	(N)F		O	0.00007	J			0.000012	-
Uranium	0841	WL	mg/L	8/15/2017	(N)F			0.004				0.000012	-
Uranium	0842	WL	mg/L	8/16/2017	(N)F			0.00077				0.000012	-
Uranium	0876	WL	mg/L	8/16/2017	(N)F			0.00002	J			0.000012	-
Uranium	0878	WL	mg/L	8/15/2017	(N)F			0.00004	J			0.000012	-

ZONES OF COMPLETION:

PARAMETER	LOCATION CODE/TYPE	UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA	QA	DETECTION LIMIT	UNCERTAINTY

NR	NO RECOVERY OF DATA FOR CLASSIFYING

LOCATION TYPE:

WL	WELL

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.
N	Tentatively identified compund (TIC).
Q	Qualitative result due to sampling technique
R	Unusable result.
U	Parameter analyzed for but was not detected.
X	Location is undefined.

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
+	Correlation coefficient for MSA < 0.995.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: 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 Value.
M	GFAA duplicate injection precision not met.
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
S	Result determined by method of standard addition (MSA).
U	Parameter analyzed for but was not detected.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.

PARAMETER	LOCATION CODE/TYPE	UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA	QA	DETECTION LIMIT	UNCERTAINTY

X	Laboratory defined qualifier, see case narrative.
Y	Laboratory defined qualifier, see case narrative.
Z	Laboratory defined qualifier, see case narrative.

SAMPLE TYPES:
(F) Filtered Sample   Type Codes: F-Field Sample   R-Replicate   FR-Field Sample with Replicates
(N) Nonfiltered Sample   D-Duplicate   N-Not Known   S-Split Sample

FLOW CODES:

B	BACKGROUND	C	CROSS GRADIENT	D	DOWN GRADIENT
F	OFF-SITE	N	UNKNOWN	O	ON-SITE
U	UPGRADIENT				

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

Appendix B

Static Water Level Data

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STATIC WATER LEVELS (EQuIS700) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/18/2017 3:56:47 PM

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE/TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
LOCATION: 0101 <On site>						
0101	O	4950.68	8/16/2017 8:40:00 AM	10.2	4940.48	
LOCATION: 0110 <On site>						
0110	O	4950.19	8/16/2017 8:35:00 AM	13.22	4938.89	
LOCATION: 0111 <On site>						
0111	O	4948.85	8/16/2017 9:07:00 AM	9.88	4938.97	
LOCATION: 0700 <>						
0700	U	4951.97	8/16/2017 4:46:00 PM	7.1	4944.87	
LOCATION: 0705 <>						
0705	D	4931.91	8/15/2017 3:15:00 PM	6.02	4925.89	
LOCATION: 0707 <>						
0707	D	4931.3	8/15/2017 3:34:00 PM	5.12	4926.18	
LOCATION: 0709 <>						
0709	D	4931.64	8/15/2017 4:05:00 PM	3.96	4927.68	
LOCATION: 0710 <>						
0710	U	4947.69	8/15/2017 9:52:00 AM	6.2	4941.49	
LOCATION: 0716 <>						
0716	O	4940.69	8/16/2017 1:54:00 PM	8.1	4932.59	
LOCATION: 0717 <>						
0717	O	4940.3	8/16/2017 2:09:00 PM	7.67	4932.63	
LOCATION: 0718 <>						
0718	D	4937.6	8/15/2017 2:31:00 PM	7.43	4930.69	
LOCATION: 0719 <>						
0719	D	4937.55	8/15/2017 2:52:00 PM	7.08	4931.05	
LOCATION: 0720 <>						
0720	C	4941.15	8/15/2017 9:14:00 AM	4.67	4936.48	
LOCATION: 0721 <>						
0721	C	4941.05	8/15/2017 8:47:00 AM	7.83	4933.22	
LOCATION: 0722R <> Replacement well for destroyed well 0722.						
0722R		4937.83	8/15/2017 3:26:00 PM	8.12	4929.71	
LOCATION: 0723 <>						
0723	D	4936.01	8/15/2017 3:12:00 PM	6.87	4929.79	
LOCATION: 0724 <On site>						
0724	U	4941.93	8/16/2017 10:01:00 AM	6.41	4935.52	
LOCATION: 0725 <On site>						
0725	U	4942.21	8/16/2017 10:02:00 AM	6.62	4935.59	

STATIC WATER LEVELS (EQuIS700) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/18/2017 3:56:48 PM

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE/TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
LOCATION: 0726 <On site>						
0726	U	4942.2	8/16/2017 10:03:00 AM	7.53	4934.67	
LOCATION: 0727 <On site>						
0727	U	4952.26	8/16/2017 9:08:00 AM	10.35	4941.91	
LOCATION: 0728 <On site>						
0728	U	4946.63	8/16/2017 9:48:00 AM	8.6	4938.03	
LOCATION: 0729 <>						
0729	D	4932.75	8/15/2017 3:49:00 PM	6.18	4927.2	
LOCATION: 0730 <>						
0730	D	4933.08	8/15/2017 4:04:00 PM	6.12	4927.76	
LOCATION: 0732 <>						
0732	U	4946.58	8/16/2017 9:35:00 AM	8.13	4938.45	
LOCATION: 0733 <>						
0733	U	4947.46	8/15/2017 2:18:00 PM	5.87	4941.59	
LOCATION: 0734 <>						
0734	U	4946.84	8/15/2017 2:20:00 PM	7.1	4939.74	
LOCATION: 0736 <West of gravel pit.>						
0736	U	4946.43	8/15/2017 10:57:00 AM	7.28	4939.15	
LOCATION: 0784 <>						
0784	U	4947	8/16/2017 10:12:00 AM	6.98	4940.02	
LOCATION: 0788 <>						
0788	C	4935.43	8/16/2017 10:05:00 AM	7.89	4927.54	
LOCATION: 0789 <>						
0789	D	4933.08	8/16/2017 4:10:00 PM	8.51	4924.57	
LOCATION: 0824 <>						
0824		4929.38	8/15/2017 4:50:00 PM	6.02	4923.36	
LOCATION: 0826 <>						
0826		4937.36	8/16/2017 12:37:00 PM	7.07	4930.29	
LOCATION: 0852-1 <>						
0852-1		4938	8/16/2017 8:38:00 AM			D
LOCATION: 0852-4 <>						
0852-4		4938.3	8/16/2017 9:25:00 AM	9.7	4928.6	
LOCATION: 0853-1 <>						
0853-1		4935.81	8/15/2017 1:00:00 PM			D
LOCATION: 0853-4 <>						
0853-4		4935.98	8/15/2017 2:38:00 PM	8.39	4927.59	

STATIC WATER LEVELS (EQuIS700) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/18/2017 3:56:48 PM

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE/TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
LOCATION: 0854-1 <>						
0854-1		4937.19	8/16/2017 11:30:00 AM			D
LOCATION: 0854-4 <>						
0854-4		4937.42	8/16/2017 12:17:00 PM	7.13	4930.29	
LOCATION: 0855-1 <>						
0855-1		4931.02	8/16/2017 3:00:00 PM			D
LOCATION: 0855-4 <>						
0855-4		4931.48	8/16/2017 3:36:00 PM	6.4	4925.08	
LOCATION: 0856-1 <>						
0856-1		4933.63	8/16/2017 1:14:00 PM			D
LOCATION: 0856-4 <>						
0856-4		4933.87	8/16/2017 1:51:00 PM	7.78	4926.09	
LOCATION: 0857-1 <>						
0857-1		4935.51	8/15/2017 9:16:00 AM			D
LOCATION: 0857-4 <>						
0857-4		4935.76	8/15/2017 9:35:00 AM	8.33	4927.43	
LOCATION: 0858-1 <>						
0858-1		4932.14	8/15/2017 3:56:00 PM			D
LOCATION: 0858-4 <>						
0858-4		4932.39	8/16/2017 5:00:00 PM	6.95	4925.44	
LOCATION: 0859-1 <>						
0859-1		4945.98	8/16/2017 10:42:00 AM			D
LOCATION: 0859-4 <>						
0859-4		4946.26	8/16/2017 11:12:00 AM	8.55	4937.71	
LOCATION: 0860-1 <>						
0860-1		4944.1	8/16/2017 12:56:00 PM			D
LOCATION: 0860-4 <>						
0860-4		4944.38	8/16/2017 1:30:00 PM	10.46	4933.92	

FLOW CODES:	B	BACKGROUND	C	CROSS GRADIENT	D	DOWN GRADIENT
	F	OFF-SITE	N	UNKNOWN	O	ON-SITE
	U	UPGRADIENT				

WATER LEVEL FLAGS:	B	Water level is below the top of the pump	D	Dry
	E	Water elevation may not be comparable to other water elevations at this site	F	Flowing
	I	Inaccessible		

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Appendix C

Monitoring Well Data

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GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/19/2017 7:56:29 AM

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Alkalinity, Total (As CaCO3)													
Alkalinity, Total (As CaCO3)	0705	WL	mg/L	8/15/2017	(F)F	SE	D	51				-	-
Alkalinity, Total (As CaCO3)	0707	WL	mg/L	8/15/2017	(N)F	SF	D	362				-	-
Alkalinity, Total (As CaCO3)	0710	WL	mg/L	8/15/2017	(N)F	SF	U	262				-	-
Alkalinity, Total (As CaCO3)	0716	WL	mg/L	8/16/2017	(N)F	SF	O	330				-	-
Alkalinity, Total (As CaCO3)	0717	WL	mg/L	8/16/2017	(N)F	SE	O	193				-	-
Alkalinity, Total (As CaCO3)	0718	WL	mg/L	8/15/2017	(N)F	SF	D	378				-	-
Alkalinity, Total (As CaCO3)	0719	WL	mg/L	8/15/2017	(N)F	SE	D	88				-	-
Alkalinity, Total (As CaCO3)	0720	WL	mg/L	8/15/2017	(N)F	SF	C	220				-	-
Alkalinity, Total (As CaCO3)	0721	WL	mg/L	8/15/2017	(N)F	SE	C	91				-	-
Alkalinity, Total (As CaCO3)	0722R	WL	mg/L	8/15/2017	(N)F	SF		360				-	-
Alkalinity, Total (As CaCO3)	0723	WL	mg/L	8/15/2017	(N)F	SE	D	301				-	-
Alkalinity, Total (As CaCO3)	0727	WL	mg/L	8/16/2017	(N)F	SE	U	161				-	-
Alkalinity, Total (As CaCO3)	0729	WL	mg/L	8/15/2017	(N)F	SF	D	294				-	-
Alkalinity, Total (As CaCO3)	0730	WL	mg/L	8/15/2017	(N)F	SE	D	303				-	-
Alkalinity, Total (As CaCO3)	0732	WL	mg/L	8/16/2017	(N)F	SE	U	234				-	-
Alkalinity, Total (As CaCO3)	0784	WL	mg/L	8/16/2017	(N)F	SF	U	228				-	-
Alkalinity, Total (As CaCO3)	0788	WL	mg/L	8/16/2017	(N)F	SF	C	376				-	-
Alkalinity, Total (As CaCO3)	0789	WL	mg/L	8/16/2017	(N)F	SF	D	614				-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/19/2017 7:56:30 AM

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Alkalinity, Total (As CaCO3)	0824	WL	mg/L	8/15/2017	(N)F	SF		344				-	-
Alkalinity, Total (As CaCO3)	0826	WL	mg/L	8/16/2017	(N)F	SF		496				-	-
Alkalinity, Total (As CaCO3)	0852-2	WL	mg/L	8/16/2017	(N)F			708				-	-
Alkalinity, Total (As CaCO3)	0852-3	WL	mg/L	8/16/2017	(N)F			416				-	-
Alkalinity, Total (As CaCO3)	0852-4	WL	mg/L	8/16/2017	(N)F			360				-	-
Alkalinity, Total (As CaCO3)	0853-2	WL	mg/L	8/15/2017	(N)F			458				-	-
Alkalinity, Total (As CaCO3)	0853-3	WL	mg/L	8/15/2017	(N)F			384				-	-
Alkalinity, Total (As CaCO3)	0853-4	WL	mg/L	8/15/2017	(N)F			360				-	-
Alkalinity, Total (As CaCO3)	0854-2	WL	mg/L	8/16/2017	(N)F			442				-	-
Alkalinity, Total (As CaCO3)	0854-3	WL	mg/L	8/16/2017	(N)F			434				-	-
Alkalinity, Total (As CaCO3)	0854-4	WL	mg/L	8/16/2017	(N)F			424				-	-
Alkalinity, Total (As CaCO3)	0855-2	WL	mg/L	8/16/2017	(N)F			636				-	-
Alkalinity, Total (As CaCO3)	0855-3	WL	mg/L	8/16/2017	(N)F			574				-	-
Alkalinity, Total (As CaCO3)	0855-4	WL	mg/L	8/16/2017	(N)F			536				-	-
Alkalinity, Total (As CaCO3)	0856-2	WL	mg/L	8/16/2017	(N)F			596				-	-
Alkalinity, Total (As CaCO3)	0856-3	WL	mg/L	8/16/2017	(N)F			520				-	-
Alkalinity, Total (As CaCO3)	0856-4	WL	mg/L	8/16/2017	(N)F			484				-	-
Alkalinity, Total (As CaCO3)	0857-2	WL	mg/L	8/15/2017	(N)F			731				-	-
Alkalinity, Total (As CaCO3)	0857-3	WL	mg/L	8/15/2017	(N)F			458				-	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Alkalinity, Total (As CaCO3)	0857-4	WL	mg/L	8/15/2017	(N)F			478				-	-
Alkalinity, Total (As CaCO3)	0858-2	WL	mg/L	8/15/2017	(N)F			362				-	-
Alkalinity, Total (As CaCO3)	0858-3	WL	mg/L	8/15/2017	(N)F			366				-	-
Alkalinity, Total (As CaCO3)	0858-4	WL	mg/L	8/15/2017	(N)F			376				-	-
Alkalinity, Total (As CaCO3)	0859-2	WL	mg/L	8/16/2017	(N)F			267				-	-
Alkalinity, Total (As CaCO3)	0859-3	WL	mg/L	8/16/2017	(N)F			256				-	-
Alkalinity, Total (As CaCO3)	0859-4	WL	mg/L	8/16/2017	(N)F			281				-	-
Alkalinity, Total (As CaCO3)	0860-2	WL	mg/L	8/16/2017	(N)F			336				-	-
Alkalinity, Total (As CaCO3)	0860-3	WL	mg/L	8/16/2017	(N)F			327				-	-
Alkalinity, Total (As CaCO3)	0860-4	WL	mg/L	8/16/2017	(N)F			328				-	-
Calcium													
Calcium	0705	WL	mg/L	8/15/2017	(F)F	SE	D	27				0.024	-
Calcium	0707	WL	mg/L	8/15/2017	(N)F	SF	D	630				0.12	-
Calcium	0710	WL	mg/L	8/15/2017	(N)F	SF	U	190				0.024	-
Calcium	0716	WL	mg/L	8/16/2017	(N)F	SF	O	310				0.024	-
Calcium	0717	WL	mg/L	8/16/2017	(N)F	SE	O	90				0.024	-
Calcium	0718	WL	mg/L	8/15/2017	(N)D	SF	D	610				0.12	-
Calcium	0718	WL	mg/L	8/15/2017	(N)F	SF	D	610				0.12	-
Calcium	0719	WL	mg/L	8/15/2017	(N)F	SE	D	85				0.024	-
Calcium	0720	WL	mg/L	8/15/2017	(N)F	SF	C	72				0.024	-
Calcium	0721	WL	mg/L	8/15/2017	(N)F	SE	C	8.6				0.024	-
Calcium	0722R	WL	mg/L	8/15/2017	(N)F	SF		170				0.024	-
Calcium	0723	WL	mg/L	8/15/2017	(N)F	SE	D	290				0.12	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/19/2017 7:56:31 AM

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Calcium	0727	WL	mg/L	8/16/2017	(N)F	SE	U	64				0.024	-
Calcium	0729	WL	mg/L	8/15/2017	(N)F	SF	D	94				0.024	-
Calcium	0730	WL	mg/L	8/15/2017	(N)F	SE	D	77				0.024	-
Calcium	0732	WL	mg/L	8/16/2017	(N)F	SE	U	430				0.024	-
Calcium	0784	WL	mg/L	8/16/2017	(N)F	SF	U	210				0.024	-
Calcium	0788	WL	mg/L	8/16/2017	(N)F	SF	C	520				0.12	-
Calcium	0789	WL	mg/L	8/16/2017	(N)F	SF	D	470				0.24	-
Calcium	0824	WL	mg/L	8/15/2017	(N)F	SF		99				0.024	-
Calcium	0826	WL	mg/L	8/16/2017	(N)F	SF		420				0.12	-
Calcium	0852-2	WL	mg/L	8/16/2017	(N)F			330				0.12	-
Calcium	0852-3	WL	mg/L	8/16/2017	(N)F			410				0.24	-
Calcium	0852-4	WL	mg/L	8/16/2017	(N)D			420				0.12	-
Calcium	0852-4	WL	mg/L	8/16/2017	(N)F			430				0.12	-
Calcium	0853-2	WL	mg/L	8/15/2017	(N)F			550				0.12	-
Calcium	0853-3	WL	mg/L	8/15/2017	(N)F			580				0.12	-
Calcium	0853-4	WL	mg/L	8/15/2017	(N)F			630				0.12	-
Calcium	0854-2	WL	mg/L	8/16/2017	(N)F			410				0.12	-
Calcium	0854-3	WL	mg/L	8/16/2017	(N)F			450				0.12	-
Calcium	0854-4	WL	mg/L	8/16/2017	(N)F			710				0.12	-
Calcium	0855-2	WL	mg/L	8/16/2017	(N)F			540				0.24	-
Calcium	0855-3	WL	mg/L	8/16/2017	(N)F			480				0.24	-
Calcium	0855-4	WL	mg/L	8/16/2017	(N)F			700				0.12	-
Calcium	0856-2	WL	mg/L	8/16/2017	(N)F			550				0.24	-
Calcium	0856-3	WL	mg/L	8/16/2017	(N)F			480				0.24	-
Calcium	0856-4	WL	mg/L	8/16/2017	(N)D			470				0.24	-
Calcium	0856-4	WL	mg/L	8/16/2017	(N)F			470				0.24	-
Calcium	0857-2	WL	mg/L	8/15/2017	(N)F			580				0.12	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Calcium	0857-3	WL	mg/L	8/15/2017	(N)F			680				0.12	-
Calcium	0857-4	WL	mg/L	8/15/2017	(N)F			680				0.12	-
Calcium	0858-2	WL	mg/L	8/15/2017	(N)F			680				0.12	-
Calcium	0858-3	WL	mg/L	8/15/2017	(N)F			680				0.12	-
Calcium	0858-4	WL	mg/L	8/15/2017	(N)F			630				0.12	-
Calcium	0859-2	WL	mg/L	8/16/2017	(N)F			310				0.24	-
Calcium	0859-3	WL	mg/L	8/16/2017	(N)F			440				0.12	-
Calcium	0859-4	WL	mg/L	8/16/2017	(N)F			450				0.12	-
Calcium	0860-2	WL	mg/L	8/16/2017	(N)F			540				0.12	-
Calcium	0860-3	WL	mg/L	8/16/2017	(N)F			500				0.12	-
Calcium	0860-4	WL	mg/L	8/16/2017	(N)F			450				0.12	-
Chloride													
Chloride	0705	WL	mg/L	8/15/2017	(F)F	SE	D	40				1.2	-
Chloride	0707	WL	mg/L	8/15/2017	(N)F	SF	D	200				15	-
Chloride	0710	WL	mg/L	8/15/2017	(N)F	SF	U	57				3	-
Chloride	0716	WL	mg/L	8/16/2017	(N)F	SF	O	110				6	-
Chloride	0717	WL	mg/L	8/16/2017	(N)F	SE	O	39				3	-
Chloride	0718	WL	mg/L	8/15/2017	(N)D	SF	D	250				15	-
Chloride	0718	WL	mg/L	8/15/2017	(N)F	SF	D	250				15	-
Chloride	0719	WL	mg/L	8/15/2017	(N)F	SE	D	32				2.4	-
Chloride	0720	WL	mg/L	8/15/2017	(N)F	SF	C	3.4				0.06	-
Chloride	0721	WL	mg/L	8/15/2017	(N)F	SE	C	20				1.2	-
Chloride	0722R	WL	mg/L	8/15/2017	(N)F	SF		12				1.5	-
Chloride	0723	WL	mg/L	8/15/2017	(N)F	SE	D	44				7.5	-
Chloride	0727	WL	mg/L	8/16/2017	(N)F	SE	U	13				1.2	-
Chloride	0729	WL	mg/L	8/15/2017	(N)F	SF	D	7.2				0.06	-
Chloride	0730	WL	mg/L	8/15/2017	(N)F	SE	D	5.5				1.2	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/19/2017 7:56:33 AM

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Chloride	0732	WL	mg/L	8/16/2017	(N)F	SE	U	37				7.5	-
Chloride	0784	WL	mg/L	8/16/2017	(N)F	SF	U	25				3	-
Chloride	0788	WL	mg/L	8/16/2017	(N)F	SF	C	110				15	-
Chloride	0789	WL	mg/L	8/16/2017	(N)F	SF	D	460				15	-
Chloride	0824	WL	mg/L	8/15/2017	(N)F	SF		6.7				0.3	-
Chloride	0826	WL	mg/L	8/16/2017	(N)F	SF		81				12	-
Chloride	0852-2	WL	mg/L	8/16/2017	(N)F			470				15	-
Chloride	0852-3	WL	mg/L	8/16/2017	(N)F			140				12	-
Chloride	0852-4	WL	mg/L	8/16/2017	(N)D			130				1.2	-
Chloride	0852-4	WL	mg/L	8/16/2017	(N)F			110				1.5	-
Chloride	0853-2	WL	mg/L	8/15/2017	(N)F			150				3	-
Chloride	0853-3	WL	mg/L	8/15/2017	(N)F			140				1.5	-
Chloride	0853-4	WL	mg/L	8/15/2017	(N)F			140				1.5	-
Chloride	0854-2	WL	mg/L	8/16/2017	(N)F			84				1.5	-
Chloride	0854-3	WL	mg/L	8/16/2017	(N)F			100				1.5	-
Chloride	0854-4	WL	mg/L	8/16/2017	(N)F			140				3	-
Chloride	0855-2	WL	mg/L	8/16/2017	(N)F			1000				6	-
Chloride	0855-3	WL	mg/L	8/16/2017	(N)F			1000				6	-
Chloride	0855-4	WL	mg/L	8/16/2017	(N)F			740				3	-
Chloride	0856-2	WL	mg/L	8/16/2017	(N)F			570				6	-
Chloride	0856-3	WL	mg/L	8/16/2017	(N)F			590				6	-
Chloride	0856-4	WL	mg/L	8/16/2017	(N)D			580				6	-
Chloride	0856-4	WL	mg/L	8/16/2017	(N)F			590				6	-
Chloride	0857-2	WL	mg/L	8/15/2017	(N)F			400				3	-
Chloride	0857-3	WL	mg/L	8/15/2017	(N)F			380				6	-
Chloride	0857-4	WL	mg/L	8/15/2017	(N)F			390				6	-
Chloride	0858-2	WL	mg/L	8/15/2017	(N)F			230				3	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/19/2017 7:56:34 AM

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Chloride	0858-3	WL	mg/L	8/15/2017	(N)F			230				3	-
Chloride	0858-4	WL	mg/L	8/15/2017	(N)F			230				3	-
Chloride	0859-2	WL	mg/L	8/16/2017	(N)F			49				1.5	-
Chloride	0859-3	WL	mg/L	8/16/2017	(N)F			48				1.5	-
Chloride	0859-4	WL	mg/L	8/16/2017	(N)F			54				2.4	-
Chloride	0860-2	WL	mg/L	8/16/2017	(N)F			91				1.5	-
Chloride	0860-3	WL	mg/L	8/16/2017	(N)F			130				1.5	-
Chloride	0860-4	WL	mg/L	8/16/2017	(N)F			120				1.5	-
Dissolved Oxygen													
Dissolved Oxygen	0705	WL	mg/L	8/15/2017	(F)F	SE	D	0.96				-	-
Dissolved Oxygen	0707	WL	mg/L	8/15/2017	(N)F	SF	D	0.37				-	-
Dissolved Oxygen	0710	WL	mg/L	8/15/2017	(N)F	SF	U	0.75				-	-
Dissolved Oxygen	0716	WL	mg/L	8/16/2017	(N)F	SF	O	0.46				-	-
Dissolved Oxygen	0717	WL	mg/L	8/16/2017	(N)F	SE	O	0.44				-	-
Dissolved Oxygen	0718	WL	mg/L	8/15/2017	(N)F	SF	D	0.90				-	-
Dissolved Oxygen	0719	WL	mg/L	8/15/2017	(N)F	SE	D	1.70				-	-
Dissolved Oxygen	0720	WL	mg/L	8/15/2017	(N)F	SF	C	1.34				-	-
Dissolved Oxygen	0721	WL	mg/L	8/15/2017	(N)F	SE	C	0.26				-	-
Dissolved Oxygen	0722R	WL	mg/L	8/15/2017	(N)F	SF		0.81				-	-
Dissolved Oxygen	0723	WL	mg/L	8/15/2017	(N)F	SE	D	0.54				-	-
Dissolved Oxygen	0727	WL	mg/L	8/16/2017	(N)F	SE	U	1.98				-	-
Dissolved Oxygen	0729	WL	mg/L	8/15/2017	(N)F	SF	D	0.57				-	-
Dissolved Oxygen	0730	WL	mg/L	8/15/2017	(N)F	SE	D	1.30				-	-
Dissolved Oxygen	0732	WL	mg/L	8/16/2017	(N)F	SE	U	2.76				-	-
Dissolved Oxygen	0784	WL	mg/L	8/16/2017	(N)F	SF	U	0.65				-	-
Dissolved Oxygen	0788	WL	mg/L	8/16/2017	(N)F	SF	C	0.43				-	-
Dissolved Oxygen	0789	WL	mg/L	8/16/2017	(N)F	SF	D	0.37				-	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Dissolved Oxygen	0824	WL	mg/L	8/15/2017	(N)F	SF		0.73				-	-
Dissolved Oxygen	0826	WL	mg/L	8/16/2017	(N)F	SF		0.32				-	-
Dissolved Oxygen	0852-2	WL	mg/L	8/16/2017	(N)F			0.43				-	-
Dissolved Oxygen	0852-3	WL	mg/L	8/16/2017	(N)F			0.46				-	-
Dissolved Oxygen	0852-4	WL	mg/L	8/16/2017	(N)F			0.40				-	-
Dissolved Oxygen	0853-2	WL	mg/L	8/15/2017	(N)F			1.22				-	-
Dissolved Oxygen	0853-3	WL	mg/L	8/15/2017	(N)F			0.55				-	-
Dissolved Oxygen	0853-4	WL	mg/L	8/15/2017	(N)F			0.37				-	-
Dissolved Oxygen	0854-2	WL	mg/L	8/16/2017	(N)F			0.40				-	-
Dissolved Oxygen	0854-3	WL	mg/L	8/16/2017	(N)F			0.77				-	-
Dissolved Oxygen	0854-4	WL	mg/L	8/16/2017	(N)F			0.65				-	-
Dissolved Oxygen	0855-2	WL	mg/L	8/16/2017	(N)F			0.47				-	-
Dissolved Oxygen	0855-3	WL	mg/L	8/16/2017	(N)F			2.90				-	-
Dissolved Oxygen	0855-4	WL	mg/L	8/16/2017	(N)F			0.35				-	-
Dissolved Oxygen	0856-2	WL	mg/L	8/16/2017	(N)F			0.42				-	-
Dissolved Oxygen	0856-3	WL	mg/L	8/16/2017	(N)F			0.70				-	-
Dissolved Oxygen	0856-4	WL	mg/L	8/16/2017	(N)F			0.26				-	-
Dissolved Oxygen	0857-3	WL	mg/L	8/15/2017	(N)F			0.41				-	-
Dissolved Oxygen	0857-4	WL	mg/L	8/15/2017	(N)F			0.57				-	-
Dissolved Oxygen	0858-2	WL	mg/L	8/15/2017	(N)F			0.41				-	-
Dissolved Oxygen	0858-3	WL	mg/L	8/15/2017	(N)F			1.18				-	-
Dissolved Oxygen	0858-4	WL	mg/L	8/15/2017	(N)F			0.35				-	-
Dissolved Oxygen	0859-2	WL	mg/L	8/16/2017	(N)F			0.67				-	-
Dissolved Oxygen	0859-3	WL	mg/L	8/16/2017	(N)F			0.51				-	-
Dissolved Oxygen	0859-4	WL	mg/L	8/16/2017	(N)F			0.52				-	-
Dissolved Oxygen	0860-2	WL	mg/L	8/16/2017	(N)F			0.46				-	-
Dissolved Oxygen	0860-3	WL	mg/L	8/16/2017	(N)F			0.43				-	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Dissolved Oxygen	0860-4	WL	mg/L	8/16/2017	(N)F			0.34				-	-
Field Ferrous Iron													
Field Ferrous Iron	0852-2	WL	mg/L	8/16/2017	(N)F			0.32				-	-
Field Ferrous Iron	0852-3	WL	mg/L	8/16/2017	(N)F			0.00				-	-
Field Ferrous Iron	0852-4	WL	mg/L	8/16/2017	(N)F			0.00				-	-
Field Ferrous Iron	0853-2	WL	mg/L	8/15/2017	(N)F			0.49				-	-
Field Ferrous Iron	0853-3	WL	mg/L	8/15/2017	(N)F			0.50				-	-
Field Ferrous Iron	0853-4	WL	mg/L	8/15/2017	(N)F			1.41				-	-
Field Ferrous Iron	0854-2	WL	mg/L	8/16/2017	(N)F			1.35				-	-
Field Ferrous Iron	0854-3	WL	mg/L	8/16/2017	(N)F			0.49				-	-
Field Ferrous Iron	0854-4	WL	mg/L	8/16/2017	(N)F			2.12				-	-
Field Ferrous Iron	0855-2	WL	mg/L	8/16/2017	(N)F			3.30				-	-
Field Ferrous Iron	0855-3	WL	mg/L	8/16/2017	(N)F			0.97				-	-
Field Ferrous Iron	0855-4	WL	mg/L	8/16/2017	(N)F			2.12				-	-
Field Ferrous Iron	0856-2	WL	mg/L	8/16/2017	(N)F			1.77				-	-
Field Ferrous Iron	0856-3	WL	mg/L	8/16/2017	(N)F			0.04				-	-
Field Ferrous Iron	0856-4	WL	mg/L	8/16/2017	(N)F			0.66				-	-
Field Ferrous Iron	0857-2	WL	mg/L	8/15/2017	(N)F			3.22				-	-
Field Ferrous Iron	0857-3	WL	mg/L	8/15/2017	(N)F			0.47				-	-
Field Ferrous Iron	0857-4	WL	mg/L	8/15/2017	(N)F			1.2				-	-
Field Ferrous Iron	0858-2	WL	mg/L	8/15/2017	(N)F			0.86				-	-
Field Ferrous Iron	0858-3	WL	mg/L	8/15/2017	(N)F			0.31				-	-
Field Ferrous Iron	0858-4	WL	mg/L	8/15/2017	(N)F			0.38				-	-
Magnesium													
Magnesium	0705	WL	mg/L	8/15/2017	(F)F	SE	D	1.7				0.03	-
Magnesium	0707	WL	mg/L	8/15/2017	(N)F	SF	D	270				0.15	-
Magnesium	0710	WL	mg/L	8/15/2017	(N)F	SF	U	43				0.03	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

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PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Magnesium	0716	WL	mg/L	8/16/2017	(N)F	SF	O	99				0.03	-
Magnesium	0717	WL	mg/L	8/16/2017	(N)F	SE	O	5.9				0.03	-
Magnesium	0718	WL	mg/L	8/15/2017	(N)D	SF	D	180				0.15	-
Magnesium	0718	WL	mg/L	8/15/2017	(N)F	SF	D	180				0.15	-
Magnesium	0719	WL	mg/L	8/15/2017	(N)F	SE	D	3.7				0.03	-
Magnesium	0720	WL	mg/L	8/15/2017	(N)F	SF	C	18				0.03	-
Magnesium	0721	WL	mg/L	8/15/2017	(N)F	SE	C	0.15	J			0.03	-
Magnesium	0722R	WL	mg/L	8/15/2017	(N)F	SF		20				0.03	-
Magnesium	0723	WL	mg/L	8/15/2017	(N)F	SE	D	12				0.15	-
Magnesium	0727	WL	mg/L	8/16/2017	(N)F	SE	U	7.6				0.03	-
Magnesium	0729	WL	mg/L	8/15/2017	(N)F	SF	D	24				0.03	-
Magnesium	0730	WL	mg/L	8/15/2017	(N)F	SE	D	14				0.03	-
Magnesium	0732	WL	mg/L	8/16/2017	(N)F	SE	U	26				0.03	-
Magnesium	0784	WL	mg/L	8/16/2017	(N)F	SF	U	42				0.03	-
Magnesium	0788	WL	mg/L	8/16/2017	(N)F	SF	C	160				0.15	-
Magnesium	0789	WL	mg/L	8/16/2017	(N)F	SF	D	480				0.3	-
Magnesium	0824	WL	mg/L	8/15/2017	(N)F	SF		27				0.03	-
Magnesium	0826	WL	mg/L	8/16/2017	(N)F	SF		130				0.15	-
Magnesium	0852-2	WL	mg/L	8/16/2017	(N)F			210				0.15	-
Magnesium	0852-3	WL	mg/L	8/16/2017	(N)F			140				0.3	-
Magnesium	0852-4	WL	mg/L	8/16/2017	(N)D			110				0.15	-
Magnesium	0852-4	WL	mg/L	8/16/2017	(N)F			110				0.15	-
Magnesium	0853-2	WL	mg/L	8/15/2017	(N)F			210				0.15	-
Magnesium	0853-3	WL	mg/L	8/15/2017	(N)F			160				0.15	-
Magnesium	0853-4	WL	mg/L	8/15/2017	(N)F			160				0.15	-
Magnesium	0854-2	WL	mg/L	8/16/2017	(N)F			140				0.15	-
Magnesium	0854-3	WL	mg/L	8/16/2017	(N)F			150				0.15	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Magnesium	0854-4	WL	mg/L	8/16/2017	(N)F			210				0.15	-
Magnesium	0855-2	WL	mg/L	8/16/2017	(N)F			630				0.3	-
Magnesium	0855-3	WL	mg/L	8/16/2017	(N)F			610				0.3	-
Magnesium	0855-4	WL	mg/L	8/16/2017	(N)F			390				0.15	-
Magnesium	0856-2	WL	mg/L	8/16/2017	(N)F			520				0.3	-
Magnesium	0856-3	WL	mg/L	8/16/2017	(N)F			560				0.3	-
Magnesium	0856-4	WL	mg/L	8/16/2017	(N)D			600				0.3	-
Magnesium	0856-4	WL	mg/L	8/16/2017	(N)F			610				0.3	-
Magnesium	0857-2	WL	mg/L	8/15/2017	(N)F			340				0.15	-
Magnesium	0857-3	WL	mg/L	8/15/2017	(N)F			320				0.15	-
Magnesium	0857-4	WL	mg/L	8/15/2017	(N)F			310				0.15	-
Magnesium	0858-2	WL	mg/L	8/15/2017	(N)F			250				0.15	-
Magnesium	0858-3	WL	mg/L	8/15/2017	(N)F			250				0.15	-
Magnesium	0858-4	WL	mg/L	8/15/2017	(N)F			240				0.15	-
Magnesium	0859-2	WL	mg/L	8/16/2017	(N)F			69				0.3	-
Magnesium	0859-3	WL	mg/L	8/16/2017	(N)F			82				0.15	-
Magnesium	0859-4	WL	mg/L	8/16/2017	(N)F			130				0.15	-
Magnesium	0860-2	WL	mg/L	8/16/2017	(N)F			79				0.15	-
Magnesium	0860-3	WL	mg/L	8/16/2017	(N)F			68				0.15	-
Magnesium	0860-4	WL	mg/L	8/16/2017	(N)F			65				0.15	-
Manganese													
Manganese	0705	WL	mg/L	8/15/2017	(F)F	SE	D	0.039				0.00024	-
Manganese	0707	WL	mg/L	8/15/2017	(N)F	SF	D	1.9				0.0012	-
Manganese	0710	WL	mg/L	8/15/2017	(N)F	SF	U	0.066				0.00024	-
Manganese	0716	WL	mg/L	8/16/2017	(N)F	SF	O	0.56				0.00024	-
Manganese	0717	WL	mg/L	8/16/2017	(N)F	SE	O	0.17				0.00024	-
Manganese	0718	WL	mg/L	8/15/2017	(N)D	SF	D	0.62				0.0012	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Manganese	0718	WL	mg/L	8/15/2017	(N)F	SF	D	0.92				0.0012	-
Manganese	0719	WL	mg/L	8/15/2017	(N)F	SE	D	0.17				0.00024	-
Manganese	0720	WL	mg/L	8/15/2017	(N)F	SF	C	0.0014	J			0.00024	-
Manganese	0721	WL	mg/L	8/15/2017	(N)F	SE	C	0.0036	J			0.00024	-
Manganese	0722R	WL	mg/L	8/15/2017	(N)F	SF		0.0022	J			0.00024	-
Manganese	0723	WL	mg/L	8/15/2017	(N)F	SE	D	0.41				0.0012	-
Manganese	0727	WL	mg/L	8/16/2017	(N)F	SE	U	0.22				0.00024	-
Manganese	0729	WL	mg/L	8/15/2017	(N)F	SF	D	0.72				0.00024	-
Manganese	0730	WL	mg/L	8/15/2017	(N)F	SE	D	0.049				0.00024	-
Manganese	0732	WL	mg/L	8/16/2017	(N)F	SE	U	0.16				0.00024	-
Manganese	0784	WL	mg/L	8/16/2017	(N)F	SF	U	1.1				0.00024	-
Manganese	0788	WL	mg/L	8/16/2017	(N)F	SF	C	0.96				0.0012	-
Manganese	0789	WL	mg/L	8/16/2017	(N)F	SF	D	0.31				0.0024	-
Manganese	0824	WL	mg/L	8/15/2017	(N)F	SF		0.0089				0.00024	-
Manganese	0826	WL	mg/L	8/16/2017	(N)F	SF		3.4				0.0012	-
Manganese	0852-2	WL	mg/L	8/16/2017	(N)F			2.1				0.0012	-
Manganese	0852-3	WL	mg/L	8/16/2017	(N)F			2.2				0.0024	-
Manganese	0852-4	WL	mg/L	8/16/2017	(N)D			2.4				0.0012	-
Manganese	0852-4	WL	mg/L	8/16/2017	(N)F			2.5				0.0012	-
Manganese	0853-2	WL	mg/L	8/15/2017	(N)F			2.7				0.0012	-
Manganese	0853-3	WL	mg/L	8/15/2017	(N)F			2.8				0.0012	-
Manganese	0853-4	WL	mg/L	8/15/2017	(N)F			2.9				0.0012	-
Manganese	0854-2	WL	mg/L	8/16/2017	(N)F			2.6				0.0012	-
Manganese	0854-3	WL	mg/L	8/16/2017	(N)F			2.9				0.0012	-
Manganese	0854-4	WL	mg/L	8/16/2017	(N)F			5.7				0.0012	-
Manganese	0855-2	WL	mg/L	8/16/2017	(N)F			0.77				0.0024	-
Manganese	0855-3	WL	mg/L	8/16/2017	(N)F			1.7				0.0024	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

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PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Manganese	0855-4	WL	mg/L	8/16/2017	(N)F			2.7				0.0012	-
Manganese	0856-2	WL	mg/L	8/16/2017	(N)F			0.85				0.0024	-
Manganese	0856-3	WL	mg/L	8/16/2017	(N)F			1.2				0.0024	-
Manganese	0856-4	WL	mg/L	8/16/2017	(N)D			2				0.0024	-
Manganese	0856-4	WL	mg/L	8/16/2017	(N)F			2				0.0024	-
Manganese	0857-2	WL	mg/L	8/15/2017	(N)F			6.3				0.0012	-
Manganese	0857-3	WL	mg/L	8/15/2017	(N)F			2.6				0.0012	-
Manganese	0857-4	WL	mg/L	8/15/2017	(N)F			2.8				0.0012	-
Manganese	0858-2	WL	mg/L	8/15/2017	(N)F			1.3				0.0012	-
Manganese	0858-3	WL	mg/L	8/15/2017	(N)F			1.7				0.0012	-
Manganese	0858-4	WL	mg/L	8/15/2017	(N)F			1.8				0.0012	-
Manganese	0859-2	WL	mg/L	8/16/2017	(N)F			1.3				0.0024	-
Manganese	0859-3	WL	mg/L	8/16/2017	(N)F			1.8				0.0012	-
Manganese	0859-4	WL	mg/L	8/16/2017	(N)F			1.5				0.0012	-
Manganese	0860-2	WL	mg/L	8/16/2017	(N)F			5.9				0.0012	-
Manganese	0860-3	WL	mg/L	8/16/2017	(N)F			1.8				0.0012	-
Manganese	0860-4	WL	mg/L	8/16/2017	(N)F			1.9				0.0012	-
Molybdenum													
Molybdenum	0705	WL	mg/L	8/15/2017	(F)F	SE	D	0.0026				0.00032	-
Molybdenum	0707	WL	mg/L	8/15/2017	(N)F	SF	D	1.5				0.00032	-
Molybdenum	0710	WL	mg/L	8/15/2017	(N)F	SF	U	0.0056				0.00032	-
Molybdenum	0716	WL	mg/L	8/16/2017	(N)F	SF	O	0.12				0.00032	-
Molybdenum	0717	WL	mg/L	8/16/2017	(N)F	SE	O	0.01				0.00032	-
Molybdenum	0718	WL	mg/L	8/15/2017	(N)D	SF	D	0.15				0.00032	-
Molybdenum	0718	WL	mg/L	8/15/2017	(N)F	SF	D	0.14				0.00032	-
Molybdenum	0719	WL	mg/L	8/15/2017	(N)F	SE	D	0.01				0.00032	-
Molybdenum	0720	WL	mg/L	8/15/2017	(N)F	SF	C	0.0018	J			0.00032	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/19/2017 7:56:40 AM

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Molybdenum	0721	WL	mg/L	8/15/2017	(N)F	SE	C	0.0025				0.00032	-
Molybdenum	0722R	WL	mg/L	8/15/2017	(N)F	SF		0.056				0.00032	-
Molybdenum	0723	WL	mg/L	8/15/2017	(N)F	SE	D	0.00032	U			0.00032	-
Molybdenum	0727	WL	mg/L	8/16/2017	(N)F	SE	U	0.0035				0.00032	-
Molybdenum	0729	WL	mg/L	8/15/2017	(N)F	SF	D	0.008				0.00032	-
Molybdenum	0730	WL	mg/L	8/15/2017	(N)F	SE	D	0.0046				0.00032	-
Molybdenum	0732	WL	mg/L	8/16/2017	(N)F	SE	U	0.022				0.00032	-
Molybdenum	0784	WL	mg/L	8/16/2017	(N)F	SF	U	0.029				0.00032	-
Molybdenum	0788	WL	mg/L	8/16/2017	(N)F	SF	C	0.022				0.00032	-
Molybdenum	0789	WL	mg/L	8/16/2017	(N)F	SF	D	0.57				0.00032	-
Molybdenum	0824	WL	mg/L	8/15/2017	(N)F	SF		0.0051				0.00032	-
Molybdenum	0826	WL	mg/L	8/16/2017	(N)F	SF		0.084				0.00032	-
Molybdenum	0852-2	WL	mg/L	8/16/2017	(N)F			0.012				0.00032	-
Molybdenum	0852-3	WL	mg/L	8/16/2017	(N)F			0.01				0.00032	-
Molybdenum	0852-4	WL	mg/L	8/16/2017	(N)D			0.01				0.00032	-
Molybdenum	0852-4	WL	mg/L	8/16/2017	(N)F			0.0093				0.00032	-
Molybdenum	0853-2	WL	mg/L	8/15/2017	(N)F			0.027				0.00032	-
Molybdenum	0853-3	WL	mg/L	8/15/2017	(N)F			0.014				0.00032	-
Molybdenum	0853-4	WL	mg/L	8/15/2017	(N)F			0.013				0.00032	-
Molybdenum	0854-2	WL	mg/L	8/16/2017	(N)F			0.074				0.00032	-
Molybdenum	0854-3	WL	mg/L	8/16/2017	(N)F			0.071				0.00032	-
Molybdenum	0854-4	WL	mg/L	8/16/2017	(N)F			0.074				0.00032	-
Molybdenum	0855-2	WL	mg/L	8/16/2017	(N)F			0.28				0.00032	-
Molybdenum	0855-3	WL	mg/L	8/16/2017	(N)F			0.32				0.00032	-
Molybdenum	0855-4	WL	mg/L	8/16/2017	(N)F			0.27				0.00032	-
Molybdenum	0856-2	WL	mg/L	8/16/2017	(N)F			0.51				0.00032	-
Molybdenum	0856-3	WL	mg/L	8/16/2017	(N)F			0.54				0.00032	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

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PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Molybdenum	0856-4	WL	mg/L	8/16/2017	(N)D			0.51				0.00032	-
Molybdenum	0856-4	WL	mg/L	8/16/2017	(N)F			0.53				0.00032	-
Molybdenum	0857-2	WL	mg/L	8/15/2017	(N)F			0.82				0.00032	-
Molybdenum	0857-3	WL	mg/L	8/15/2017	(N)F			0.68				0.00032	-
Molybdenum	0857-4	WL	mg/L	8/15/2017	(N)F			0.65				0.00032	-
Molybdenum	0858-2	WL	mg/L	8/15/2017	(N)F			1.4				0.00032	-
Molybdenum	0858-3	WL	mg/L	8/15/2017	(N)F			1.4				0.00032	-
Molybdenum	0858-4	WL	mg/L	8/15/2017	(N)F			1.4				0.00032	-
Molybdenum	0859-2	WL	mg/L	8/16/2017	(N)F			0.057				0.00032	-
Molybdenum	0859-3	WL	mg/L	8/16/2017	(N)F			0.057				0.00032	-
Molybdenum	0859-4	WL	mg/L	8/16/2017	(N)F			0.074				0.00032	-
Molybdenum	0860-2	WL	mg/L	8/16/2017	(N)F			0.38				0.00032	-
Molybdenum	0860-3	WL	mg/L	8/16/2017	(N)F			0.32				0.00032	-
Molybdenum	0860-4	WL	mg/L	8/16/2017	(N)F			0.31				0.00032	-
Oxidation Reduction Potential													
Oxidation Reduction Potential	0705	WL	mV	8/15/2017	(F)F	SE	D	-42.7				-	-
Oxidation Reduction Potential	0707	WL	mV	8/15/2017	(N)F	SF	D	6.4				-	-
Oxidation Reduction Potential	0710	WL	mV	8/15/2017	(N)F	SF	U	185.3				-	-
Oxidation Reduction Potential	0716	WL	mV	8/16/2017	(N)F	SF	O	-11.0				-	-
Oxidation Reduction Potential	0717	WL	mV	8/16/2017	(N)F	SE	O	-66.8				-	-
Oxidation Reduction Potential	0718	WL	mV	8/15/2017	(N)F	SF	D	224.8				-	-
Oxidation Reduction Potential	0719	WL	mV	8/15/2017	(N)F	SE	D	81.3				-	-
Oxidation Reduction Potential	0720	WL	mV	8/15/2017	(N)F	SF	C	166.4				-	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Oxidation Reduction Potential	0721	WL	mV	8/15/2017	(N)F	SE	C	154.7				-	-
Oxidation Reduction Potential	0722R	WL	mV	8/15/2017	(N)F	SF		91.8				-	-
Oxidation Reduction Potential	0723	WL	mV	8/15/2017	(N)F	SE	D	54.7				-	-
Oxidation Reduction Potential	0727	WL	mV	8/16/2017	(N)F	SE	U	223.1				-	-
Oxidation Reduction Potential	0729	WL	mV	8/15/2017	(N)F	SF	D	75.5				-	-
Oxidation Reduction Potential	0730	WL	mV	8/15/2017	(N)F	SE	D	37.9				-	-
Oxidation Reduction Potential	0732	WL	mV	8/16/2017	(N)F	SE	U	233.0				-	-
Oxidation Reduction Potential	0784	WL	mV	8/16/2017	(N)F	SF	U	156.8				-	-
Oxidation Reduction Potential	0788	WL	mV	8/16/2017	(N)F	SF	C	102.5				-	-
Oxidation Reduction Potential	0789	WL	mV	8/16/2017	(N)F	SF	D	31.2				-	-
Oxidation Reduction Potential	0824	WL	mV	8/15/2017	(N)F	SF		101.5				-	-
Oxidation Reduction Potential	0826	WL	mV	8/16/2017	(N)F	SF		17.2				-	-
Oxidation Reduction Potential	0852-2	WL	mV	8/16/2017	(N)F			48.4				-	-
Oxidation Reduction Potential	0852-3	WL	mV	8/16/2017	(N)F			51.8				-	-
Oxidation Reduction Potential	0852-4	WL	mV	8/16/2017	(N)F			68.8				-	-
Oxidation Reduction Potential	0853-2	WL	mV	8/15/2017	(N)F			-13.1				-	-
Oxidation Reduction Potential	0853-3	WL	mV	8/15/2017	(N)F			-9.7				-	-
Oxidation Reduction Potential	0853-4	WL	mV	8/15/2017	(N)F			-66.9				-	-
Oxidation Reduction Potential	0854-2	WL	mV	8/16/2017	(N)F			-52.7				-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/19/2017 7:56:42 AM

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Oxidation Reduction Potential	0854-3	WL	mV	8/16/2017	(N)F			-17.9				-	-
Oxidation Reduction Potential	0854-4	WL	mV	8/16/2017	(N)F			-72.5				-	-
Oxidation Reduction Potential	0855-2	WL	mV	8/16/2017	(N)F			-55.2				-	-
Oxidation Reduction Potential	0855-3	WL	mV	8/16/2017	(N)F			-25.9				-	-
Oxidation Reduction Potential	0855-4	WL	mV	8/16/2017	(N)F			-44.7				-	-
Oxidation Reduction Potential	0856-2	WL	mV	8/16/2017	(N)F			-33.4				-	-
Oxidation Reduction Potential	0856-3	WL	mV	8/16/2017	(N)F			27.3				-	-
Oxidation Reduction Potential	0856-4	WL	mV	8/16/2017	(N)F			-11.4				-	-
Oxidation Reduction Potential	0857-2	WL	mV	8/15/2017	(N)F			-71.2				-	-
Oxidation Reduction Potential	0857-3	WL	mV	8/15/2017	(N)F			-10.9				-	-
Oxidation Reduction Potential	0857-4	WL	mV	8/15/2017	(N)F			-57.1				-	-
Oxidation Reduction Potential	0858-2	WL	mV	8/15/2017	(N)F			-5.8				-	-
Oxidation Reduction Potential	0858-3	WL	mV	8/15/2017	(N)F			20.0				-	-
Oxidation Reduction Potential	0858-4	WL	mV	8/15/2017	(N)F			-1.3				-	-
Oxidation Reduction Potential	0859-2	WL	mV	8/16/2017	(N)F			22.1				-	-
Oxidation Reduction Potential	0859-3	WL	mV	8/16/2017	(N)F			-0.8				-	-
Oxidation Reduction Potential	0859-4	WL	mV	8/16/2017	(N)F			-32.9				-	-
Oxidation Reduction Potential	0860-2	WL	mV	8/16/2017	(N)F			90.3				-	-
Oxidation Reduction Potential	0860-3	WL	mV	8/16/2017	(N)F			-34.1				-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/19/2017 7:56:42 AM

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Oxidation Reduction Potential	0860-4	WL	mV	8/16/2017	(N)F			-23.7				-	-
pH													
pH	0705	WL	SU	8/15/2017	(F)F	SE	D	8.09				-	-
pH	0707	WL	SU	8/15/2017	(N)F	SF	D	6.76				-	-
pH	0710	WL	SU	8/15/2017	(N)F	SF	U	7.31				-	-
pH	0716	WL	SU	8/16/2017	(N)F	SF	O	6.97				-	-
pH	0717	WL	SU	8/16/2017	(N)F	SE	O	7.73				-	-
pH	0718	WL	SU	8/15/2017	(N)F	SF	D	6.96				-	-
pH	0719	WL	SU	8/15/2017	(N)F	SE	D	7.71				-	-
pH	0720	WL	SU	8/15/2017	(N)F	SF	C	7.20				-	-
pH	0721	WL	SU	8/15/2017	(N)F	SE	C	8.65				-	-
pH	0722R	WL	SU	8/15/2017	(N)F	SF		6.85				-	-
pH	0723	WL	SU	8/15/2017	(N)F	SE	D	7.12				-	-
pH	0727	WL	SU	8/16/2017	(N)F	SE	U	7.67				-	-
pH	0729	WL	SU	8/15/2017	(N)F	SF	D	7.15				-	-
pH	0730	WL	SU	8/15/2017	(N)F	SE	D	7.42				-	-
pH	0732	WL	SU	8/16/2017	(N)F	SE	U	7.14				-	-
pH	0784	WL	SU	8/16/2017	(N)F	SF	U	7.28				-	-
pH	0788	WL	SU	8/16/2017	(N)F	SF	C	6.87				-	-
pH	0789	WL	SU	8/16/2017	(N)F	SF	D	6.82				-	-
pH	0824	WL	SU	8/15/2017	(N)F	SF		7.06				-	-
pH	0826	WL	SU	8/16/2017	(N)F	SF		6.87				-	-
pH	0852-2	WL	SU	8/16/2017	(N)F			6.82				-	-
pH	0852-3	WL	SU	8/16/2017	(N)F			7.03				-	-
pH	0852-4	WL	SU	8/16/2017	(N)F			7.12				-	-
pH	0853-2	WL	SU	8/15/2017	(N)F			6.79				-	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
pH	0853-3	WL	SU	8/15/2017	(N)F			6.90				-	-
pH	0853-4	WL	SU	8/15/2017	(N)F			6.92				-	-
pH	0854-2	WL	SU	8/16/2017	(N)F			6.88				-	-
pH	0854-3	WL	SU	8/16/2017	(N)F			6.84				-	-
pH	0854-4	WL	SU	8/16/2017	(N)F			6.85				-	-
pH	0855-2	WL	SU	8/16/2017	(N)F			6.79				-	-
pH	0855-3	WL	SU	8/16/2017	(N)F			6.84				-	-
pH	0855-4	WL	SU	8/16/2017	(N)F			6.78				-	-
pH	0856-2	WL	SU	8/16/2017	(N)F			6.86				-	-
pH	0856-3	WL	SU	8/16/2017	(N)F			6.83				-	-
pH	0856-4	WL	SU	8/16/2017	(N)F			6.83				-	-
pH	0857-2	WL	s.u.	8/15/2017	(N)F			6.86				-	-
pH	0857-3	WL	SU	8/15/2017	(N)F			6.79				-	-
pH	0857-4	WL	SU	8/15/2017	(N)F			6.80				-	-
pH	0858-2	WL	SU	8/15/2017	(N)F			6.77				-	-
pH	0858-3	WL	SU	8/15/2017	(N)F			6.76				-	-
pH	0858-4	WL	SU	8/15/2017	(N)F			6.76				-	-
pH	0859-2	WL	SU	8/16/2017	(N)F			6.94				-	-
pH	0859-3	WL	SU	8/16/2017	(N)F			6.82				-	-
pH	0859-4	WL	SU	8/16/2017	(N)F			6.82				-	-
pH	0860-2	WL	SU	8/16/2017	(N)F			6.90				-	-
pH	0860-3	WL	SU	8/16/2017	(N)F			6.92				-	-
pH	0860-4	WL	SU	8/16/2017	(N)F			6.92				-	-
Potassium													
Potassium	0705	WL	mg/L	8/15/2017	(F)F	SE	D	1.4				0.052	-
Potassium	0707	WL	mg/L	8/15/2017	(N)F	SF	D	21				0.26	-
Potassium	0710	WL	mg/L	8/15/2017	(N)F	SF	U	4.3				0.052	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Potassium	0716	WL	mg/L	8/16/2017	(N)F	SF	O	7.8				0.052	-
Potassium	0717	WL	mg/L	8/16/2017	(N)F	SE	O	1				0.052	-
Potassium	0718	WL	mg/L	8/15/2017	(N)D	SF	D	17				0.26	-
Potassium	0718	WL	mg/L	8/15/2017	(N)F	SF	D	30				0.26	-
Potassium	0719	WL	mg/L	8/15/2017	(N)F	SE	D	1.2				0.052	-
Potassium	0720	WL	mg/L	8/15/2017	(N)F	SF	C	2.7				0.052	-
Potassium	0721	WL	mg/L	8/15/2017	(N)F	SE	C	0.29	J			0.052	-
Potassium	0722R	WL	mg/L	8/15/2017	(N)F	SF		6.7				0.052	-
Potassium	0723	WL	mg/L	8/15/2017	(N)F	SE	D	1.6	J			0.26	-
Potassium	0727	WL	mg/L	8/16/2017	(N)F	SE	U	1.1				0.052	-
Potassium	0729	WL	mg/L	8/15/2017	(N)F	SF	D	7.9				0.052	-
Potassium	0730	WL	mg/L	8/15/2017	(N)F	SE	D	2.1				0.052	-
Potassium	0732	WL	mg/L	8/16/2017	(N)F	SE	U	1.9				0.052	-
Potassium	0784	WL	mg/L	8/16/2017	(N)F	SF	U	6.2				0.052	-
Potassium	0788	WL	mg/L	8/16/2017	(N)F	SF	C	11				0.26	-
Potassium	0789	WL	mg/L	8/16/2017	(N)F	SF	D	23				0.52	-
Potassium	0824	WL	mg/L	8/15/2017	(N)F	SF		6.4				0.052	-
Potassium	0826	WL	mg/L	8/16/2017	(N)F	SF		11				0.26	-
Potassium	0852-2	WL	mg/L	8/16/2017	(N)F			12				0.26	-
Potassium	0852-3	WL	mg/L	8/16/2017	(N)F			9	J			0.52	-
Potassium	0852-4	WL	mg/L	8/16/2017	(N)D			8.6				0.26	-
Potassium	0852-4	WL	mg/L	8/16/2017	(N)F			7.8				0.26	-
Potassium	0853-2	WL	mg/L	8/15/2017	(N)F			9.2				0.26	-
Potassium	0853-3	WL	mg/L	8/15/2017	(N)F			10				0.26	-
Potassium	0853-4	WL	mg/L	8/15/2017	(N)F			10				0.26	-
Potassium	0854-2	WL	mg/L	8/16/2017	(N)F			13				0.26	-
Potassium	0854-3	WL	mg/L	8/16/2017	(N)F			12				0.26	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Potassium	0854-4	WL	mg/L	8/16/2017	(N)F			15				0.26	-
Potassium	0855-2	WL	mg/L	8/16/2017	(N)F			27				0.52	-
Potassium	0855-3	WL	mg/L	8/16/2017	(N)F			26				0.52	-
Potassium	0855-4	WL	mg/L	8/16/2017	(N)F			17				0.26	-
Potassium	0856-2	WL	mg/L	8/16/2017	(N)F			34				0.52	-
Potassium	0856-3	WL	mg/L	8/16/2017	(N)F			31				0.52	-
Potassium	0856-4	WL	mg/L	8/16/2017	(N)D			29				0.52	-
Potassium	0856-4	WL	mg/L	8/16/2017	(N)F			29				0.52	-
Potassium	0857-2	WL	mg/L	8/15/2017	(N)F			30				0.26	-
Potassium	0857-3	WL	mg/L	8/15/2017	(N)F			29				0.26	-
Potassium	0857-4	WL	mg/L	8/15/2017	(N)F			27				0.26	-
Potassium	0858-2	WL	mg/L	8/15/2017	(N)F			21				0.26	-
Potassium	0858-3	WL	mg/L	8/15/2017	(N)F			19				0.26	-
Potassium	0858-4	WL	mg/L	8/15/2017	(N)F			21				0.26	-
Potassium	0859-2	WL	mg/L	8/16/2017	(N)F			9.6	J			0.52	-
Potassium	0859-3	WL	mg/L	8/16/2017	(N)F			9.9				0.26	-
Potassium	0859-4	WL	mg/L	8/16/2017	(N)F			11				0.26	-
Potassium	0860-2	WL	mg/L	8/16/2017	(N)F			21				0.26	-
Potassium	0860-3	WL	mg/L	8/16/2017	(N)F			13				0.26	-
Potassium	0860-4	WL	mg/L	8/16/2017	(N)F			12				0.26	-
Sodium													
Sodium	0705	WL	mg/L	8/15/2017	(F)F	SE	D	210				0.047	-
Sodium	0707	WL	mg/L	8/15/2017	(N)F	SF	D	1600				0.23	-
Sodium	0710	WL	mg/L	8/15/2017	(N)F	SF	U	140				0.047	-
Sodium	0716	WL	mg/L	8/16/2017	(N)F	SF	O	250				0.047	-
Sodium	0717	WL	mg/L	8/16/2017	(N)F	SE	O	330				0.047	-
Sodium	0718	WL	mg/L	8/15/2017	(N)D	SF	D	1200				0.23	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Sodium	0718	WL	mg/L	8/15/2017	(N)F	SF	D	1300				0.23	-
Sodium	0719	WL	mg/L	8/15/2017	(N)F	SE	D	190				0.047	-
Sodium	0720	WL	mg/L	8/15/2017	(N)F	SF	C	33				0.047	-
Sodium	0721	WL	mg/L	8/15/2017	(N)F	SE	C	180				0.047	-
Sodium	0722R	WL	mg/L	8/15/2017	(N)F	SF		95				0.047	-
Sodium	0723	WL	mg/L	8/15/2017	(N)F	SE	D	680				0.23	-
Sodium	0727	WL	mg/L	8/16/2017	(N)F	SE	U	77				0.047	-
Sodium	0729	WL	mg/L	8/15/2017	(N)F	SF	D	34				0.047	-
Sodium	0730	WL	mg/L	8/15/2017	(N)F	SE	D	98				0.047	-
Sodium	0732	WL	mg/L	8/16/2017	(N)F	SE	U	260				0.047	-
Sodium	0784	WL	mg/L	8/16/2017	(N)F	SF	U	440				0.047	-
Sodium	0788	WL	mg/L	8/16/2017	(N)F	SF	C	900				0.23	-
Sodium	0789	WL	mg/L	8/16/2017	(N)F	SF	D	3000				0.47	-
Sodium	0824	WL	mg/L	8/15/2017	(N)F	SF		72				0.047	-
Sodium	0826	WL	mg/L	8/16/2017	(N)F	SF		890				0.23	-
Sodium	0852-2	WL	mg/L	8/16/2017	(N)F			1600				0.23	-
Sodium	0852-3	WL	mg/L	8/16/2017	(N)F			860				0.47	-
Sodium	0852-4	WL	mg/L	8/16/2017	(N)D			610				0.23	-
Sodium	0852-4	WL	mg/L	8/16/2017	(N)F			560				0.23	-
Sodium	0853-2	WL	mg/L	8/15/2017	(N)F			1100				0.23	-
Sodium	0853-3	WL	mg/L	8/15/2017	(N)F			830				0.23	-
Sodium	0853-4	WL	mg/L	8/15/2017	(N)F			800				0.23	-
Sodium	0854-2	WL	mg/L	8/16/2017	(N)F			1000				0.23	-
Sodium	0854-3	WL	mg/L	8/16/2017	(N)F			1000				0.23	-
Sodium	0854-4	WL	mg/L	8/16/2017	(N)F			1200				0.23	-
Sodium	0855-2	WL	mg/L	8/16/2017	(N)F			3400				0.47	-
Sodium	0855-3	WL	mg/L	8/16/2017	(N)F			3200				0.47	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Sodium	0855-4	WL	mg/L	8/16/2017	(N)F			2000				0.23	-
Sodium	0856-2	WL	mg/L	8/16/2017	(N)F			3400				0.47	-
Sodium	0856-3	WL	mg/L	8/16/2017	(N)F			3300				0.47	-
Sodium	0856-4	WL	mg/L	8/16/2017	(N)D			3300				0.47	-
Sodium	0856-4	WL	mg/L	8/16/2017	(N)F			3300				0.47	-
Sodium	0857-2	WL	mg/L	8/15/2017	(N)F			2300				0.23	-
Sodium	0857-3	WL	mg/L	8/15/2017	(N)F			2400				0.23	-
Sodium	0857-4	WL	mg/L	8/15/2017	(N)F			2300				0.23	-
Sodium	0858-2	WL	mg/L	8/15/2017	(N)F			1500				0.23	-
Sodium	0858-3	WL	mg/L	8/15/2017	(N)F			1500				0.23	-
Sodium	0858-4	WL	mg/L	8/15/2017	(N)F			1700				0.23	-
Sodium	0859-2	WL	mg/L	8/16/2017	(N)F			960				0.47	-
Sodium	0859-3	WL	mg/L	8/16/2017	(N)F			890				0.23	-
Sodium	0859-4	WL	mg/L	8/16/2017	(N)F			1100				0.23	-
Sodium	0860-2	WL	mg/L	8/16/2017	(N)F			810				0.23	-
Sodium	0860-3	WL	mg/L	8/16/2017	(N)F			880				0.23	-
Sodium	0860-4	WL	mg/L	8/16/2017	(N)F			870				0.23	-
Specific Conductance													
Specific Conductance	0705	WL	uS/cm	8/15/2017	(F)F	SE	D	1127				-	-
Specific Conductance	0707	WL	uS/cm	8/15/2017	(N)F	SF	D	9177				-	-
Specific Conductance	0710	WL	uS/cm	8/15/2017	(N)F	SF	U	1729				-	-
Specific Conductance	0716	WL	uS/cm	8/16/2017	(N)F	SF	O	2927				-	-
Specific Conductance	0717	WL	uS/cm	8/16/2017	(N)F	SE	O	1902				-	-
Specific Conductance	0718	WL	uS/cm	8/15/2017	(N)F	SF	D	8326				-	-
Specific Conductance	0719	WL	uS/cm	8/15/2017	(N)F	SE	D	1292				-	-
Specific Conductance	0720	WL	uS/cm	8/15/2017	(N)F	SF	C	604				-	-
Specific Conductance	0721	WL	uS/cm	8/15/2017	(N)F	SE	C	879				-	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Specific Conductance	0722R	WL	uS/cm	8/15/2017	(N)F	SF		1269				-	-
Specific Conductance	0723	WL	uS/cm	8/15/2017	(N)F	SE	D	3760				-	-
Specific Conductance	0727	WL	uS/cm	8/16/2017	(N)F	SE	U	683				-	-
Specific Conductance	0729	WL	uS/cm	8/15/2017	(N)F	SF	D	747				-	-
Specific Conductance	0730	WL	uS/cm	8/15/2017	(N)F	SE	D	839				-	-
Specific Conductance	0732	WL	uS/cm	8/16/2017	(N)F	SE	U	2925				-	-
Specific Conductance	0784	WL	uS/cm	8/16/2017	(N)F	SF	U	3059				-	-
Specific Conductance	0788	WL	uS/cm	8/16/2017	(N)F	SF	C	6038				-	-
Specific Conductance	0789	WL	uS/cm	8/16/2017	(N)F	SF	D	14047				-	-
Specific Conductance	0824	WL	uS/cm	8/15/2017	(N)F	SF		938				-	-
Specific Conductance	0826	WL	uS/cm	8/16/2017	(N)F	SF		5539				-	-
Specific Conductance	0852-2	WL	uS/cm	8/16/2017	(N)F			9497				-	-
Specific Conductance	0852-3	WL	uS/cm	8/16/2017	(N)F			5532				-	-
Specific Conductance	0852-4	WL	uS/cm	8/16/2017	(N)F			4212				-	-
Specific Conductance	0853-2	WL	uS/cm	8/15/2017	(N)F			6565				-	-
Specific Conductance	0853-3	WL	uS/cm	8/15/2017	(N)F			5725				-	-
Specific Conductance	0853-4	WL	uS/cm	8/15/2017	(N)F			5648				-	-
Specific Conductance	0854-2	WL	uS/cm	8/16/2017	(N)F			5575				-	-
Specific Conductance	0854-3	WL	uS/cm	8/16/2017	(N)F			6160				-	-
Specific Conductance	0854-4	WL	uS/cm	8/16/2017	(N)F			7393				-	-
Specific Conductance	0855-2	WL	uS/cm	8/16/2017	(N)F			16081				-	-
Specific Conductance	0855-3	WL	uS/cm	8/16/2017	(N)F			15224				-	-
Specific Conductance	0855-4	WL	uS/cm	8/16/2017	(N)F			11240				-	-
Specific Conductance	0856-2	WL	uS/cm	8/16/2017	(N)F			14669				-	-
Specific Conductance	0856-3	WL	uS/cm	8/16/2017	(N)F			14653				-	-
Specific Conductance	0856-4	WL	uS/cm	8/16/2017	(N)F			14937				-	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Specific Conductance	0857-2	WL	umhos/cm	8/15/2017	(N)F			11648				-	-
Specific Conductance	0857-3	WL	uS/cm	8/15/2017	(N)F			11991				-	-
Specific Conductance	0857-4	WL	uS/cm	8/15/2017	(N)F			11728				-	-
Specific Conductance	0858-2	WL	uS/cm	8/15/2017	(N)F			8745				-	-
Specific Conductance	0858-3	WL	uS/cm	8/15/2017	(N)F			8836				-	-
Specific Conductance	0858-4	WL	uS/cm	8/15/2017	(N)F			8919				-	-
Specific Conductance	0859-2	WL	uS/cm	8/16/2017	(N)F			4819				-	-
Specific Conductance	0859-3	WL	uS/cm	8/16/2017	(N)F			4973				-	-
Specific Conductance	0859-4	WL	uS/cm	8/16/2017	(N)F			5934				-	-
Specific Conductance	0860-2	WL	uS/cm	8/16/2017	(N)F			4996				-	-
Specific Conductance	0860-3	WL	uS/cm	8/16/2017	(N)F			5198				-	-
Specific Conductance	0860-4	WL	uS/cm	8/16/2017	(N)F			5075				-	-
Sulfate													
Sulfate	0705	WL	mg/L	8/15/2017	(F)F	SE	D	370				3	-
Sulfate	0707	WL	mg/L	8/15/2017	(N)F	SF	D	5600				38	-
Sulfate	0710	WL	mg/L	8/15/2017	(N)F	SF	U	540				7.5	-
Sulfate	0716	WL	mg/L	8/16/2017	(N)F	SF	O	1200				15	-
Sulfate	0717	WL	mg/L	8/16/2017	(N)F	SE	O	680				7.5	-
Sulfate	0718	WL	mg/L	8/15/2017	(N)D	SF	D	4100				38	-
Sulfate	0718	WL	mg/L	8/15/2017	(N)F	SF	D	4000				38	-
Sulfate	0719	WL	mg/L	8/15/2017	(N)F	SE	D	460				6	-
Sulfate	0720	WL	mg/L	8/15/2017	(N)F	SF	C	75				0.15	-
Sulfate	0721	WL	mg/L	8/15/2017	(N)F	SE	C	270				3	-
Sulfate	0722R	WL	mg/L	8/15/2017	(N)F	SF		310				3.8	-
Sulfate	0723	WL	mg/L	8/15/2017	(N)F	SE	D	1800				19	-
Sulfate	0727	WL	mg/L	8/16/2017	(N)F	SE	U	140				3	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

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PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Sulfate	0729	WL	mg/L	8/15/2017	(N)F	SF	D	74				0.15	-
Sulfate	0730	WL	mg/L	8/15/2017	(N)F	SE	D	120				3	-
Sulfate	0732	WL	mg/L	8/16/2017	(N)F	SE	U	1500				19	-
Sulfate	0784	WL	mg/L	8/16/2017	(N)F	SF	U	1700				7.5	-
Sulfate	0788	WL	mg/L	8/16/2017	(N)F	SF	C	3200				38	-
Sulfate	0789	WL	mg/L	8/16/2017	(N)F	SF	D	9100				38	-
Sulfate	0824	WL	mg/L	8/15/2017	(N)F	SF		150				0.75	-
Sulfate	0826	WL	mg/L	8/16/2017	(N)F	SF		2900				30	-
Sulfate	0852-2	WL	mg/L	8/16/2017	(N)F			4200				38	-
Sulfate	0852-3	WL	mg/L	8/16/2017	(N)F			1600				30	-
Sulfate	0852-4	WL	mg/L	8/16/2017	(N)D			2200				7.5	-
Sulfate	0852-4	WL	mg/L	8/16/2017	(N)F			2000				3.8	-
Sulfate	0853-2	WL	mg/L	8/15/2017	(N)F			3600				7.5	-
Sulfate	0853-3	WL	mg/L	8/15/2017	(N)F			3200				7.5	-
Sulfate	0853-4	WL	mg/L	8/15/2017	(N)F			3200				7.5	-
Sulfate	0854-2	WL	mg/L	8/16/2017	(N)F			3000				7.5	-
Sulfate	0854-3	WL	mg/L	8/16/2017	(N)F			3400				7.5	-
Sulfate	0854-4	WL	mg/L	8/16/2017	(N)F			4400				7.5	-
Sulfate	0855-2	WL	mg/L	8/16/2017	(N)F			11000				30	-
Sulfate	0855-3	WL	mg/L	8/16/2017	(N)F			9900				15	-
Sulfate	0855-4	WL	mg/L	8/16/2017	(N)F			6700				15	-
Sulfate	0856-2	WL	mg/L	8/16/2017	(N)F			9800				15	-
Sulfate	0856-3	WL	mg/L	8/16/2017	(N)F			9900				15	-
Sulfate	0856-4	WL	mg/L	8/16/2017	(N)D			11000				30	-
Sulfate	0856-4	WL	mg/L	8/16/2017	(N)F			11000				30	-
Sulfate	0857-2	WL	mg/L	8/15/2017	(N)F			7200				15	-
Sulfate	0857-3	WL	mg/L	8/15/2017	(N)F			7800				15	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Sulfate	0857-4	WL	mg/L	8/15/2017	(N)F			7800				15	-
Sulfate	0858-2	WL	mg/L	8/15/2017	(N)F			5600				15	-
Sulfate	0858-3	WL	mg/L	8/15/2017	(N)F			5900				15	-
Sulfate	0858-4	WL	mg/L	8/15/2017	(N)F			5800				15	-
Sulfate	0859-2	WL	mg/L	8/16/2017	(N)F			2900				7.5	-
Sulfate	0859-3	WL	mg/L	8/16/2017	(N)F			3300				7.5	-
Sulfate	0859-4	WL	mg/L	8/16/2017	(N)F			3700				6	-
Sulfate	0860-2	WL	mg/L	8/16/2017	(N)F			3200				7.5	-
Sulfate	0860-3	WL	mg/L	8/16/2017	(N)F			3100				7.5	-
Sulfate	0860-4	WL	mg/L	8/16/2017	(N)F			2900				7.5	-
Temperature													
Temperature	0705	WL	C	8/15/2017	(F)F	SE	D	11.31				-	-
Temperature	0707	WL	C	8/15/2017	(N)F	SF	D	13.06				-	-
Temperature	0710	WL	C	8/15/2017	(N)F	SF	U	11.09				-	-
Temperature	0716	WL	C	8/16/2017	(N)F	SF	O	14.67				-	-
Temperature	0717	WL	C	8/16/2017	(N)F	SE	O	12.53				-	-
Temperature	0718	WL	C	8/15/2017	(N)F	SF	D	14.56				-	-
Temperature	0719	WL	C	8/15/2017	(N)F	SE	D	14.91				-	-
Temperature	0720	WL	C	8/15/2017	(N)F	SF	C	13.10				-	-
Temperature	0721	WL	C	8/15/2017	(N)F	SE	C	11.00				-	-
Temperature	0722R	WL	C	8/15/2017	(N)F	SF		15.53				-	-
Temperature	0723	WL	C	8/15/2017	(N)F	SE	D	13.12				-	-
Temperature	0727	WL	C	8/16/2017	(N)F	SE	U	13.17				-	-
Temperature	0729	WL	C	8/15/2017	(N)F	SF	D	15.29				-	-
Temperature	0730	WL	C	8/15/2017	(N)F	SE	D	13.65				-	-
Temperature	0732	WL	C	8/16/2017	(N)F	SE	U	12.45				-	-
Temperature	0784	WL	C	8/16/2017	(N)F	SF	U	18.28				-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

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PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Temperature	0788	WL	C	8/16/2017	(N)F	SF	C	12.54				-	-
Temperature	0789	WL	C	8/16/2017	(N)F	SF	D	13.19				-	-
Temperature	0824	WL	C	8/15/2017	(N)F	SF		15.26				-	-
Temperature	0826	WL	C	8/16/2017	(N)F	SF		12.62				-	-
Temperature	0852-2	WL	C	8/16/2017	(N)F			12.00				-	-
Temperature	0852-3	WL	C	8/16/2017	(N)F			12.34				-	-
Temperature	0852-4	WL	C	8/16/2017	(N)F			10.67				-	-
Temperature	0853-2	WL	C	8/15/2017	(N)F			14.09				-	-
Temperature	0853-3	WL	C	8/15/2017	(N)F			13.28				-	-
Temperature	0853-4	WL	C	8/15/2017	(N)F			11.80				-	-
Temperature	0854-2	WL	C	8/16/2017	(N)F			13.81				-	-
Temperature	0854-3	WL	C	8/16/2017	(N)F			13.16				-	-
Temperature	0854-4	WL	C	8/16/2017	(N)F			12.78				-	-
Temperature	0855-2	WL	C	8/16/2017	(N)F			15.60				-	-
Temperature	0855-3	WL	C	8/16/2017	(N)F			15.14				-	-
Temperature	0855-4	WL	C	8/16/2017	(N)F			12.13				-	-
Temperature	0856-2	WL	C	8/16/2017	(N)F			16.59				-	-
Temperature	0856-3	WL	C	8/16/2017	(N)F			15.47				-	-
Temperature	0856-4	WL	C	8/16/2017	(N)F			14.39				-	-
Temperature	0857-2	WL	C	8/15/2017	(N)F			17.99				-	-
Temperature	0857-3	WL	C	8/15/2017	(N)F			18.08				-	-
Temperature	0857-4	WL	C	8/15/2017	(N)F			17.31				-	-
Temperature	0858-2	WL	C	8/15/2017	(N)F			14.46				-	-
Temperature	0858-3	WL	C	8/15/2017	(N)F			12.97				-	-
Temperature	0858-4	WL	C	8/15/2017	(N)F			11.45				-	-
Temperature	0859-2	WL	C	8/16/2017	(N)F			17.34				-	-
Temperature	0859-3	WL	C	8/16/2017	(N)F			16.22				-	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Temperature	0859-4	WL	C	8/16/2017	(N)F			15.16				-	-
Temperature	0860-2	WL	C	8/16/2017	(N)F			17.08				-	-
Temperature	0860-3	WL	C	8/16/2017	(N)F			16.47				-	-
Temperature	0860-4	WL	C	8/16/2017	(N)F			14.74				-	-
Turbidity													
Turbidity	0705	WL	NTU	8/15/2017	(F)F	SE	D	17.0				-	-
Turbidity	0707	WL	NTU	8/15/2017	(N)F	SF	D	3.44				-	-
Turbidity	0710	WL	NTU	8/15/2017	(N)F	SF	U	0.64				-	-
Turbidity	0716	WL	NTU	8/16/2017	(N)F	SF	O	1.18				-	-
Turbidity	0717	WL	NTU	8/16/2017	(N)F	SE	O	0.48				-	-
Turbidity	0718	WL	NTU	8/15/2017	(N)F	SF	D	1.49				-	-
Turbidity	0719	WL	NTU	8/15/2017	(N)F	SE	D	2.99				-	-
Turbidity	0720	WL	NTU	8/15/2017	(N)F	SF	C	0.90				-	-
Turbidity	0721	WL	NTU	8/15/2017	(N)F	SE	C	0.65				-	-
Turbidity	0722R	WL	NTU	8/15/2017	(N)F	SF		0.51				-	-
Turbidity	0723	WL	NTU	8/15/2017	(N)F	SE	D	0.56				-	-
Turbidity	0727	WL	NTU	8/16/2017	(N)F	SE	U	1.98				-	-
Turbidity	0729	WL	NTU	8/15/2017	(N)F	SF	D	1.86				-	-
Turbidity	0730	WL	NTU	8/15/2017	(N)F	SE	D	4.96				-	-
Turbidity	0732	WL	NTU	8/16/2017	(N)F	SE	U	0.37				-	-
Turbidity	0784	WL	NTU	8/16/2017	(N)F	SF	U	5.85				-	-
Turbidity	0788	WL	NTU	8/16/2017	(N)F	SF	C	3.44				-	-
Turbidity	0789	WL	NTU	8/16/2017	(N)F	SF	D	1.38				-	-
Turbidity	0824	WL	NTU	8/15/2017	(N)F	SF		2.27				-	-
Turbidity	0826	WL	NTU	8/16/2017	(N)F	SF		1.81				-	-
Turbidity	0852-2	WL	NTU	8/16/2017	(N)F			1.16				-	-
Turbidity	0852-3	WL	NTU	8/16/2017	(N)F			1.91				-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH ZONE (EQuIS201) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/19/2017 7:56:52 AM

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Turbidity	0852-4	WL	NTU	8/16/2017	(N)F			1.03				-	-
Turbidity	0853-2	WL	NTU	8/15/2017	(N)F			0.6				-	-
Turbidity	0853-3	WL	NTU	8/15/2017	(N)F			1.85				-	-
Turbidity	0853-4	WL	NTU	8/15/2017	(N)F			1.98				-	-
Turbidity	0854-2	WL	NTU	8/16/2017	(N)F			0.88				-	-
Turbidity	0854-3	WL	NTU	8/16/2017	(N)F			1.25				-	-
Turbidity	0854-4	WL	NTU	8/16/2017	(N)F			2.02				-	-
Turbidity	0855-2	WL	NTU	8/16/2017	(N)F			3.23				-	-
Turbidity	0855-3	WL	NTU	8/16/2017	(N)F			1.32				-	-
Turbidity	0855-4	WL	NTU	8/16/2017	(N)F			1.39				-	-
Turbidity	0856-2	WL	NTU	8/16/2017	(N)F			0.89				-	-
Turbidity	0856-3	WL	NTU	8/16/2017	(N)F			0.80				-	-
Turbidity	0856-4	WL	NTU	8/16/2017	(N)F			1.49				-	-
Turbidity	0857-2	WL	NTU	8/15/2017	(N)F			2.76				-	-
Turbidity	0857-3	WL	NTU	8/15/2017	(N)F			1.37				-	-
Turbidity	0857-4	WL	NTU	8/15/2017	(N)F			3.02				-	-
Turbidity	0858-2	WL	NTU	8/15/2017	(N)F			0.71				-	-
Turbidity	0858-3	WL	NTU	8/15/2017	(N)F			0.83				-	-
Turbidity	0858-4	WL	NTU	8/15/2017	(N)F			0.9				-	-
Turbidity	0859-2	WL	NTU	8/16/2017	(N)F			0.95				-	-
Turbidity	0859-3	WL	NTU	8/16/2017	(N)F			1.01				-	-
Turbidity	0859-4	WL	NTU	8/16/2017	(N)F			2.52				-	-
Turbidity	0860-2	WL	NTU	8/16/2017	(N)F			1.20				-	-
Turbidity	0860-3	WL	NTU	8/16/2017	(N)F			1.30				-	-
Turbidity	0860-4	WL	NTU	8/16/2017	(N)F			7.13				-	-
Uranium													
Uranium	0705	WL	mg/L	8/15/2017	(F)F	SE	D	0.00039				0.000012	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Uranium	0707	WL	mg/L	8/15/2017	(N)F	SF	D	1.5				0.00012	-
Uranium	0710	WL	mg/L	8/15/2017	(N)F	SF	U	0.022				0.000012	-
Uranium	0716	WL	mg/L	8/16/2017	(N)F	SF	O	0.64				0.000012	-
Uranium	0717	WL	mg/L	8/16/2017	(N)F	SE	O	0.00097				0.000012	-
Uranium	0718	WL	mg/L	8/15/2017	(N)D	SF	D	0.45				0.000012	-
Uranium	0718	WL	mg/L	8/15/2017	(N)F	SF	D	0.44				0.000012	-
Uranium	0719	WL	mg/L	8/15/2017	(N)F	SE	D	0.0011				0.000012	-
Uranium	0720	WL	mg/L	8/15/2017	(N)F	SF	C	0.0041				0.000012	-
Uranium	0721	WL	mg/L	8/15/2017	(N)F	SE	C	0.00014				0.000012	-
Uranium	0722R	WL	mg/L	8/15/2017	(N)F	SF		0.28				0.000012	-
Uranium	0723	WL	mg/L	8/15/2017	(N)F	SE	D	0.00004	J			0.000012	-
Uranium	0727	WL	mg/L	8/16/2017	(N)F	SE	U	0.0026				0.000012	-
Uranium	0729	WL	mg/L	8/15/2017	(N)F	SF	D	0.0071				0.000012	-
Uranium	0730	WL	mg/L	8/15/2017	(N)F	SE	D	0.0052				0.000012	-
Uranium	0732	WL	mg/L	8/16/2017	(N)F	SE	U	0.0042				0.000012	-
Uranium	0784	WL	mg/L	8/16/2017	(N)F	SF	U	0.0091				0.000012	-
Uranium	0788	WL	mg/L	8/16/2017	(N)F	SF	C	0.074				0.000012	-
Uranium	0789	WL	mg/L	8/16/2017	(N)F	SF	D	1.6				0.00012	-
Uranium	0824	WL	mg/L	8/15/2017	(N)F	SF		0.018				0.000012	-
Uranium	0826	WL	mg/L	8/16/2017	(N)F	SF		0.065				0.000012	-
Uranium	0852-2	WL	mg/L	8/16/2017	(N)F			0.069				0.000012	-
Uranium	0852-3	WL	mg/L	8/16/2017	(N)F			0.057				0.000012	-
Uranium	0852-4	WL	mg/L	8/16/2017	(N)D			0.054				0.000012	-
Uranium	0852-4	WL	mg/L	8/16/2017	(N)F			0.052				0.000012	-
Uranium	0853-2	WL	mg/L	8/15/2017	(N)F			0.051				0.000012	-
Uranium	0853-3	WL	mg/L	8/15/2017	(N)F			0.056				0.000012	-
Uranium	0853-4	WL	mg/L	8/15/2017	(N)F			0.055				0.000012	-

PARAMETER	LOCATION CODE/TYPE		UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Uranium	0854-2	WL	mg/L	8/16/2017	(N)F			0.097				0.000012	-
Uranium	0854-3	WL	mg/L	8/16/2017	(N)F			0.1				0.000012	-
Uranium	0854-4	WL	mg/L	8/16/2017	(N)F			0.12				0.000012	-
Uranium	0855-2	WL	mg/L	8/16/2017	(N)F			2				0.00012	-
Uranium	0855-3	WL	mg/L	8/16/2017	(N)F			1.9				0.00012	-
Uranium	0855-4	WL	mg/L	8/16/2017	(N)F			1.2				0.00012	-
Uranium	0856-2	WL	mg/L	8/16/2017	(N)F			2.4				0.00012	-
Uranium	0856-3	WL	mg/L	8/16/2017	(N)F			2.7				0.00012	-
Uranium	0856-4	WL	mg/L	8/16/2017	(N)D			2.6				0.00012	-
Uranium	0856-4	WL	mg/L	8/16/2017	(N)F			2.7				0.00012	-
Uranium	0857-2	WL	mg/L	8/15/2017	(N)F			1.2				0.00012	-
Uranium	0857-3	WL	mg/L	8/15/2017	(N)F			1.9				0.00012	-
Uranium	0857-4	WL	mg/L	8/15/2017	(N)F			1.9				0.00012	-
Uranium	0858-2	WL	mg/L	8/15/2017	(N)F			1.4				0.00012	-
Uranium	0858-3	WL	mg/L	8/15/2017	(N)F			1.3				0.00012	-
Uranium	0858-4	WL	mg/L	8/15/2017	(N)F			1.4				0.00012	-
Uranium	0859-2	WL	mg/L	8/16/2017	(N)F			0.05				0.000012	-
Uranium	0859-3	WL	mg/L	8/16/2017	(N)F			0.069				0.000012	-
Uranium	0859-4	WL	mg/L	8/16/2017	(N)F			0.13				0.000012	-
Uranium	0860-2	WL	mg/L	8/16/2017	(N)F			1.4				0.00012	-
Uranium	0860-3	WL	mg/L	8/16/2017	(N)F			1				0.00012	-
Uranium	0860-4	WL	mg/L	8/16/2017	(N)F			0.95				0.000012	-

ZONES OF COMPLETION:

SE SEMICONFINED SANDSTONE

SF SURFICIAL

LOCATION TYPE:

PARAMETER	LOCATION CODE/TYPE	UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA	QA	DETECTION LIMIT	UNCERTAINTY
WL	WELL										

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.
N	Tentatively identified compund (TIC).
Q	Qualitative result due to sampling technique
R	Unusable result.
U	Parameter analyzed for but was not detected.
X	Location is undefined.

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
+	Correlation coefficient for MSA < 0.995.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: 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 Value.
M	GFAA duplicate injection precision not met.
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).
P	> 25% difference in detected pesticide or Aroclor concentrations between 2 columns.
S	Result determined by method of standard addition (MSA).
U	Parameter analyzed for but was not detected.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X	Laboratory defined qualifier, see case narrative.
Y	Laboratory defined qualifier, see case narrative.
Z	Laboratory defined qualifier, see case narrative.

PARAMETER	LOCATION CODE/TYPE	UNITS	SAMPLE DATE	SAMPLE TYPE	ZONE COMPLETION	FLOW REL.	RESULT	QUALIFIERS LAB/DATA	QA	DETECTION LIMIT	UNCERTAINTY

SAMPLE TYPES:

(F) Filtered Sample   Type Codes: F-Field Sample   R-Replicate   FR-Field Sample with Replicates
(N) Nonfiltered Sample   D-Duplicate   N-Not Known   S-Split Sample

FLOW CODES:

B	BACKGROUND	C	CROSS GRADIENT	D	DOWN GRADIENT
F	OFF-SITE	N	UNKNOWN	O	ON-SITE
U	UPGRADIENT				

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

Appendix D

Graphs of Multilevel Well Data 2015–2017

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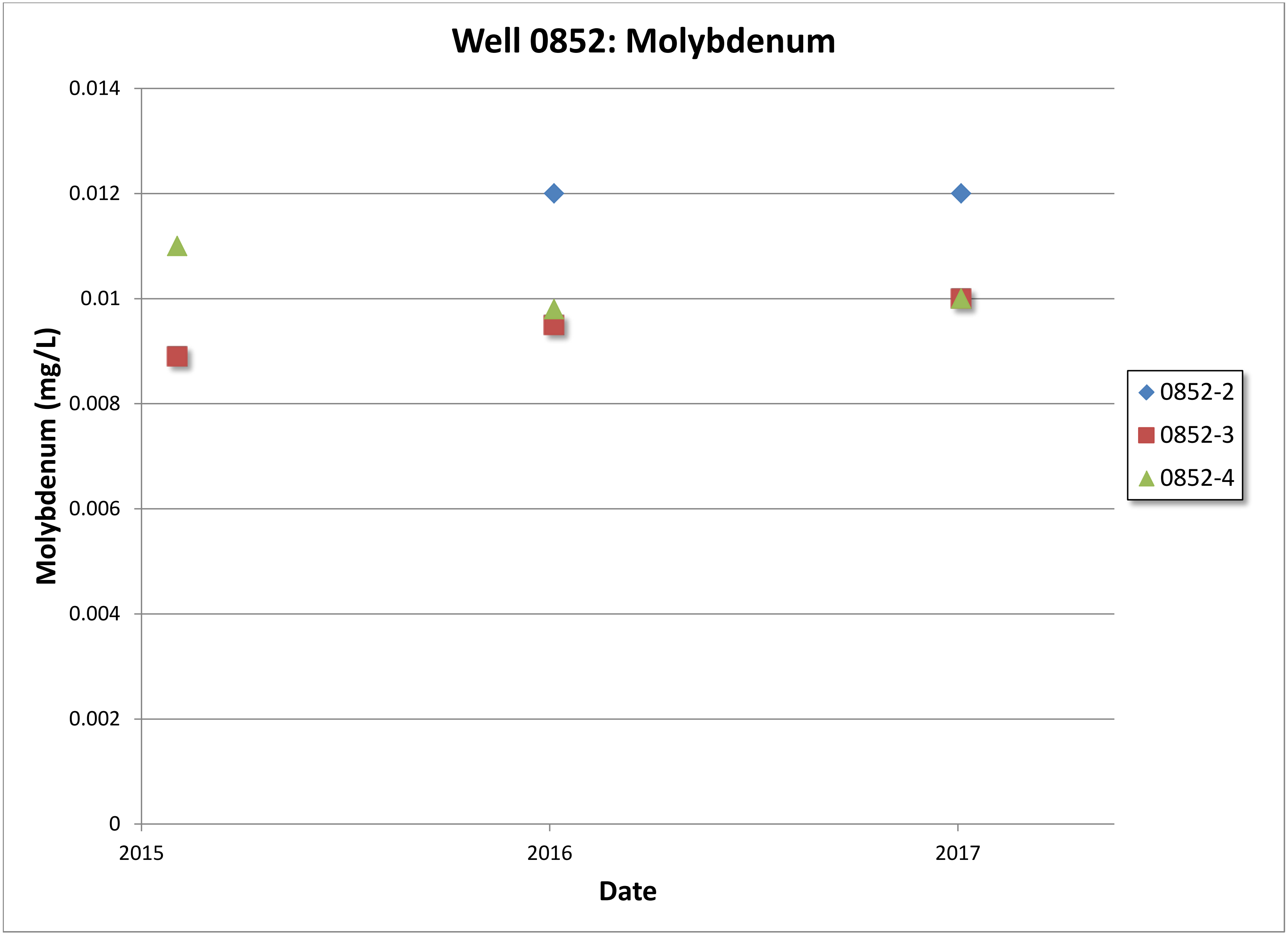
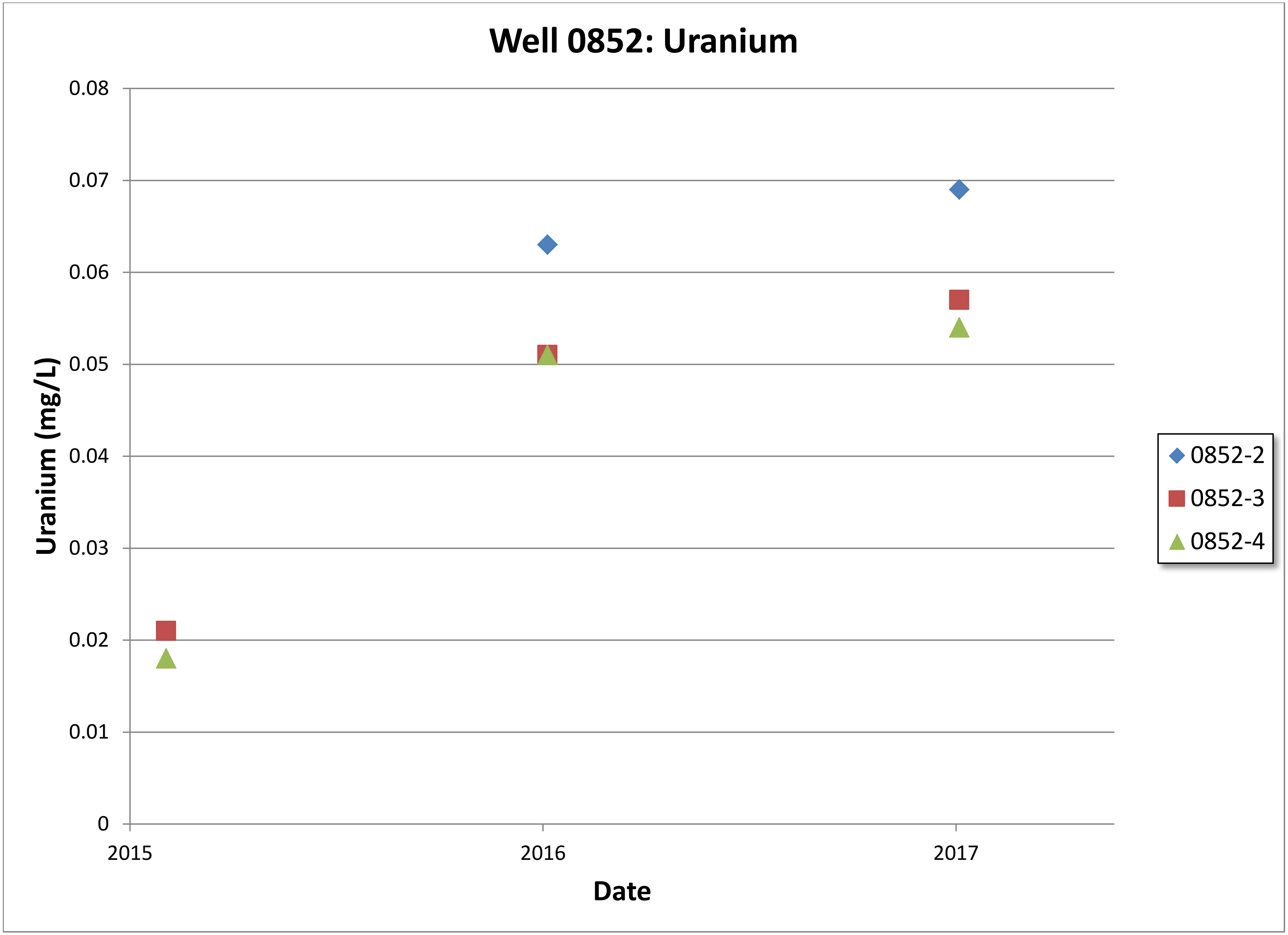
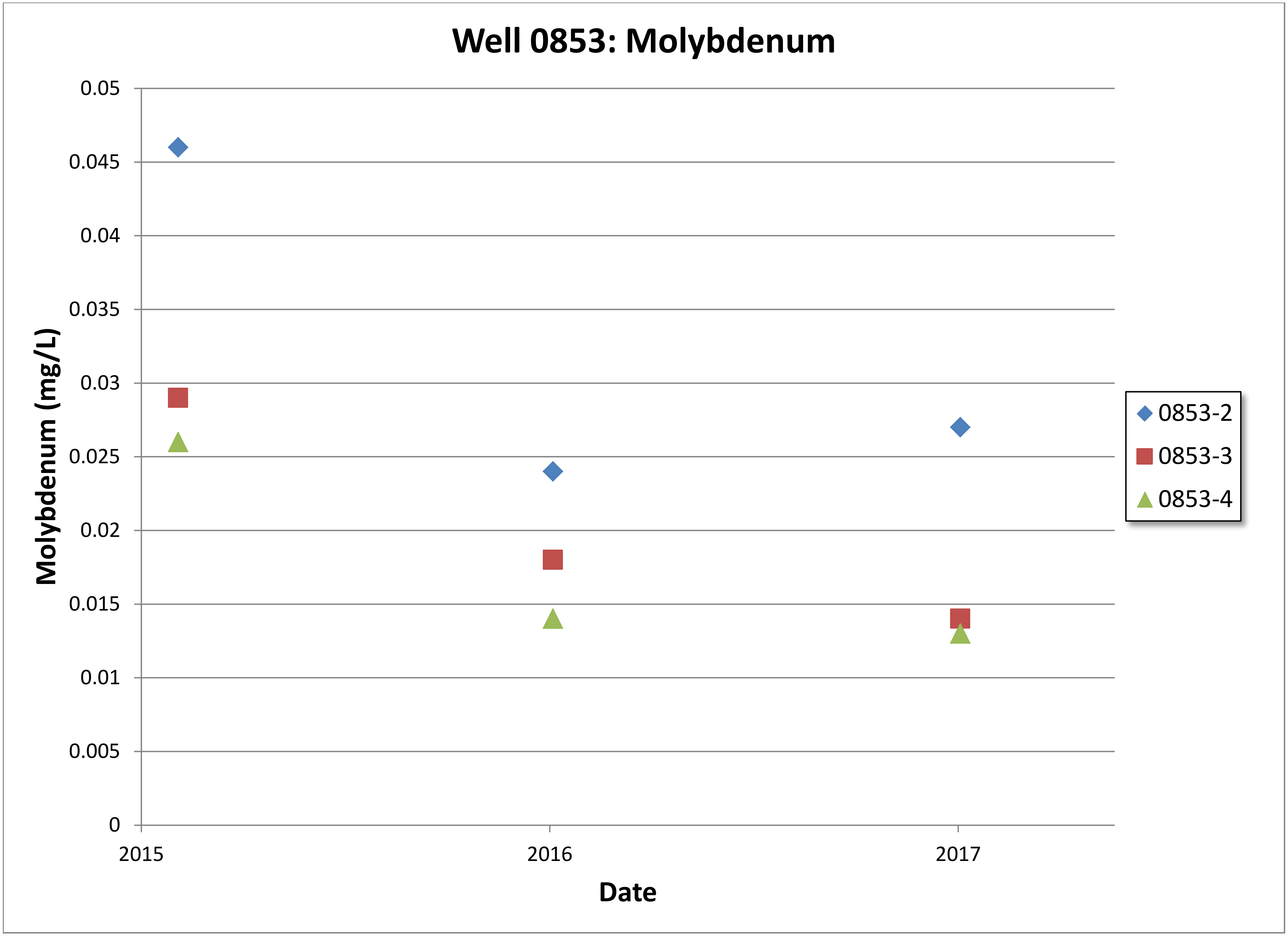
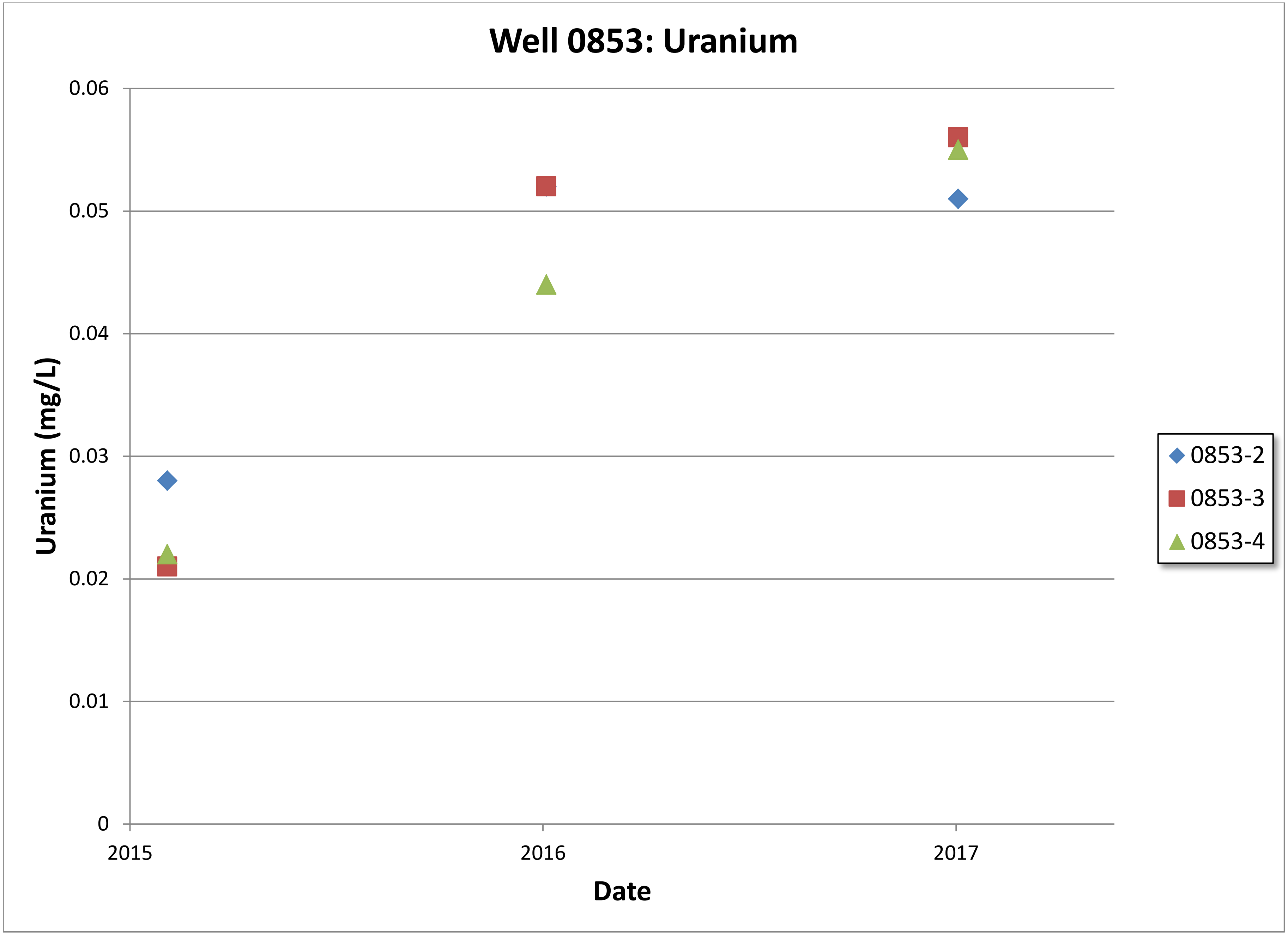


Well 0852: Molybdenum
0.014
0.012
0.01
0.008
0.006
0.004
0.002
0
Molybdenum (mg/L)
2015
2016
2017
Date
0852-2
0852-3
0852-4

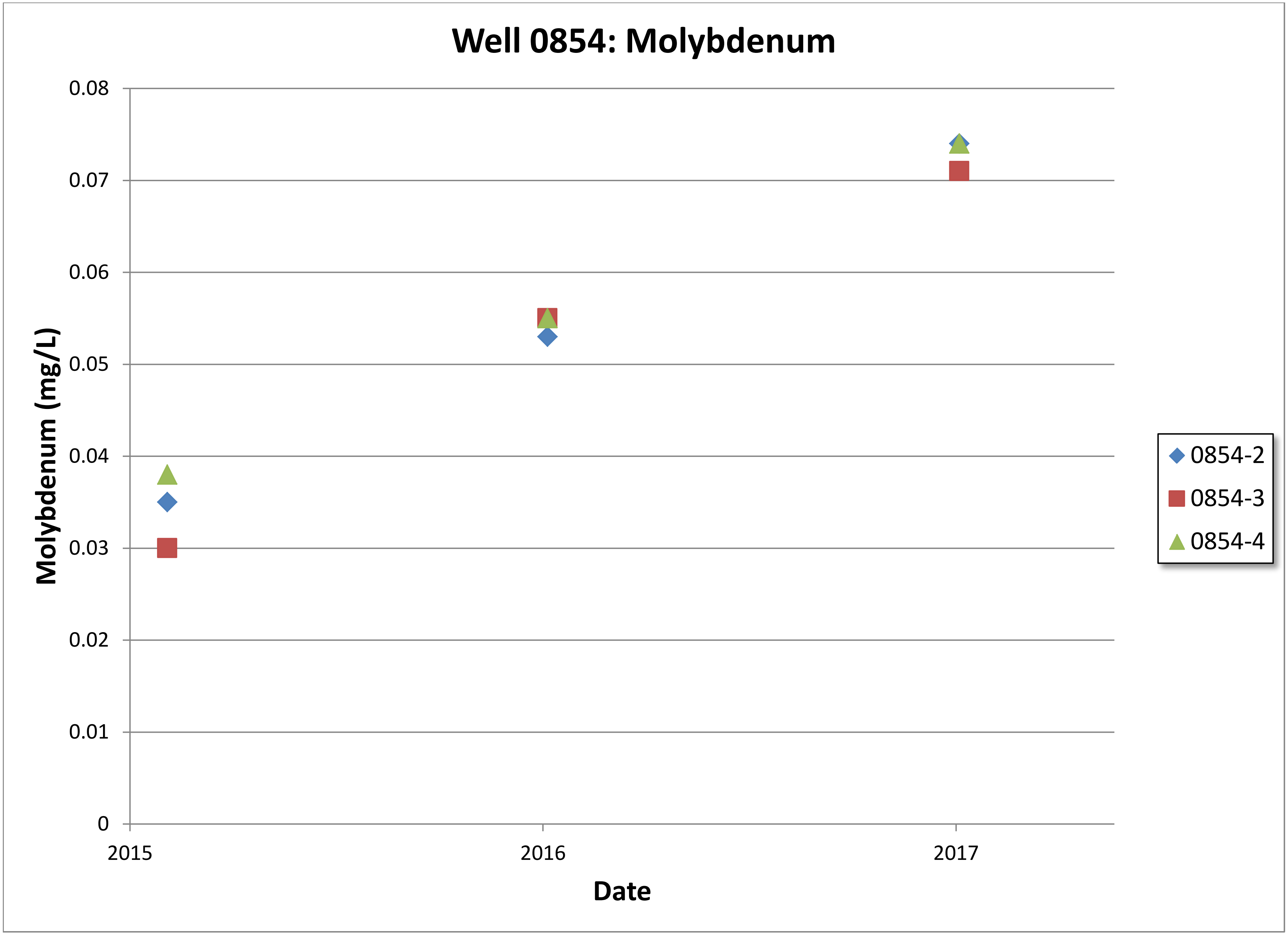


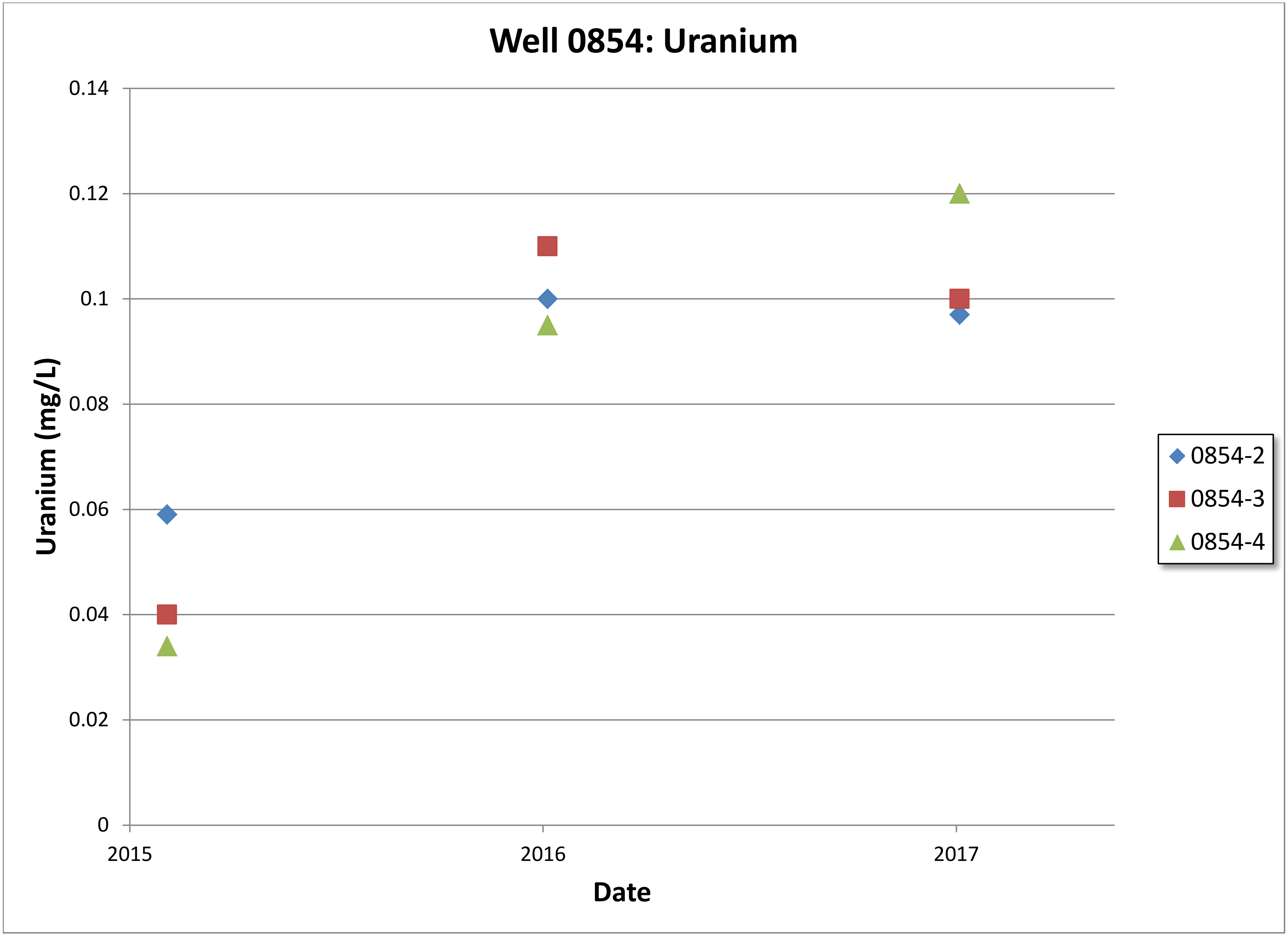
Well 0852: Uranium
Uranium (mg/L)
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
2015
2016
2017
Date
0852-2
0852-3
0852-4


Well 0853: Molybdenum
0.05
0.045
0.04
0.035
0.03
0.025
0.02
0.015
0.01
0.005
0
Molybdenum (mg/L)
2015
2016
2017
Date
0853-2
0853-3
0853-4

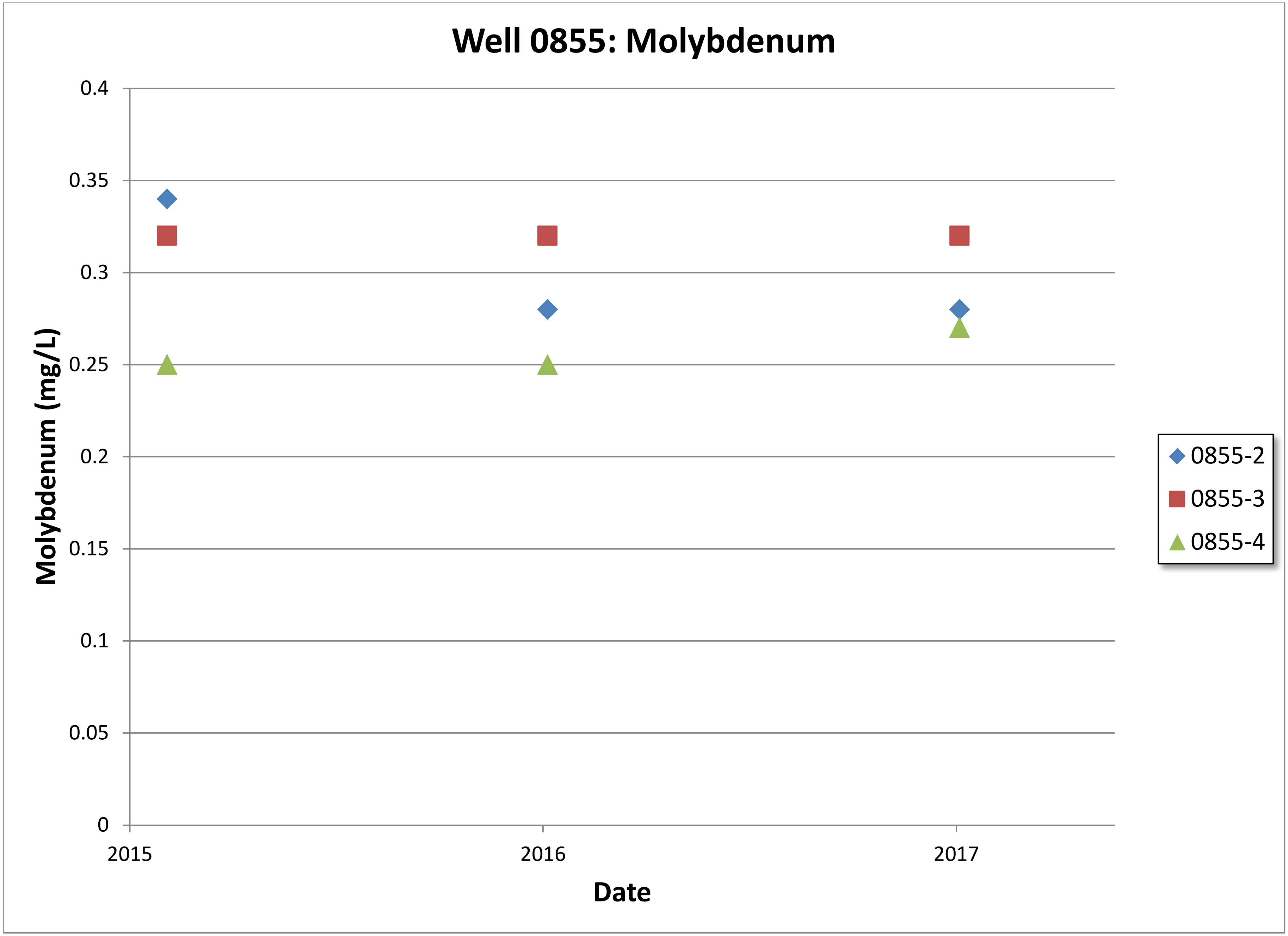


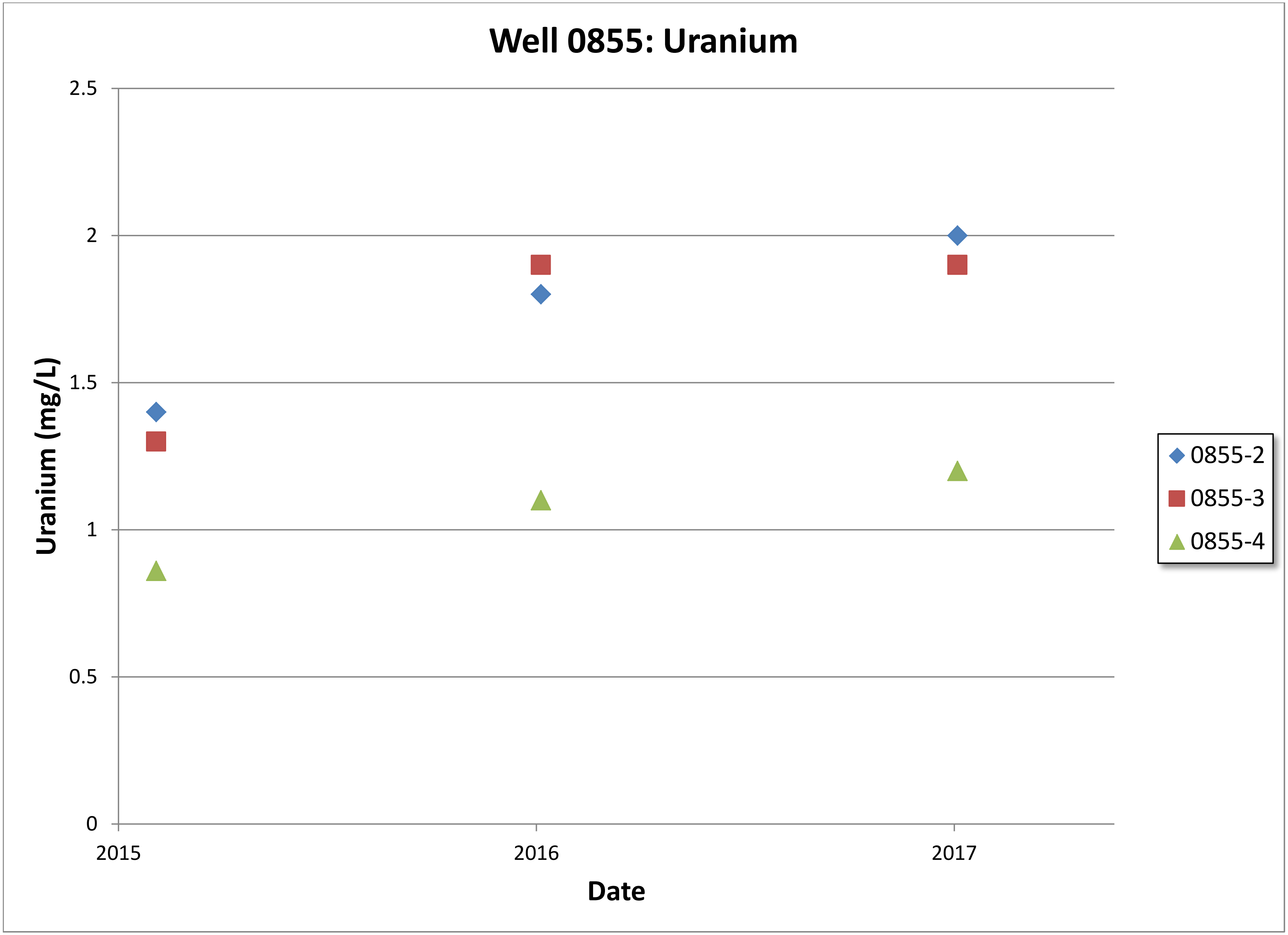
Well 0853: Uranium
0.06
0.05
0.04
0.03
0.02
0.01
0
Uranium (mg/L)
2015
2016
2017
Date
0853-2
0853-3
0853-4

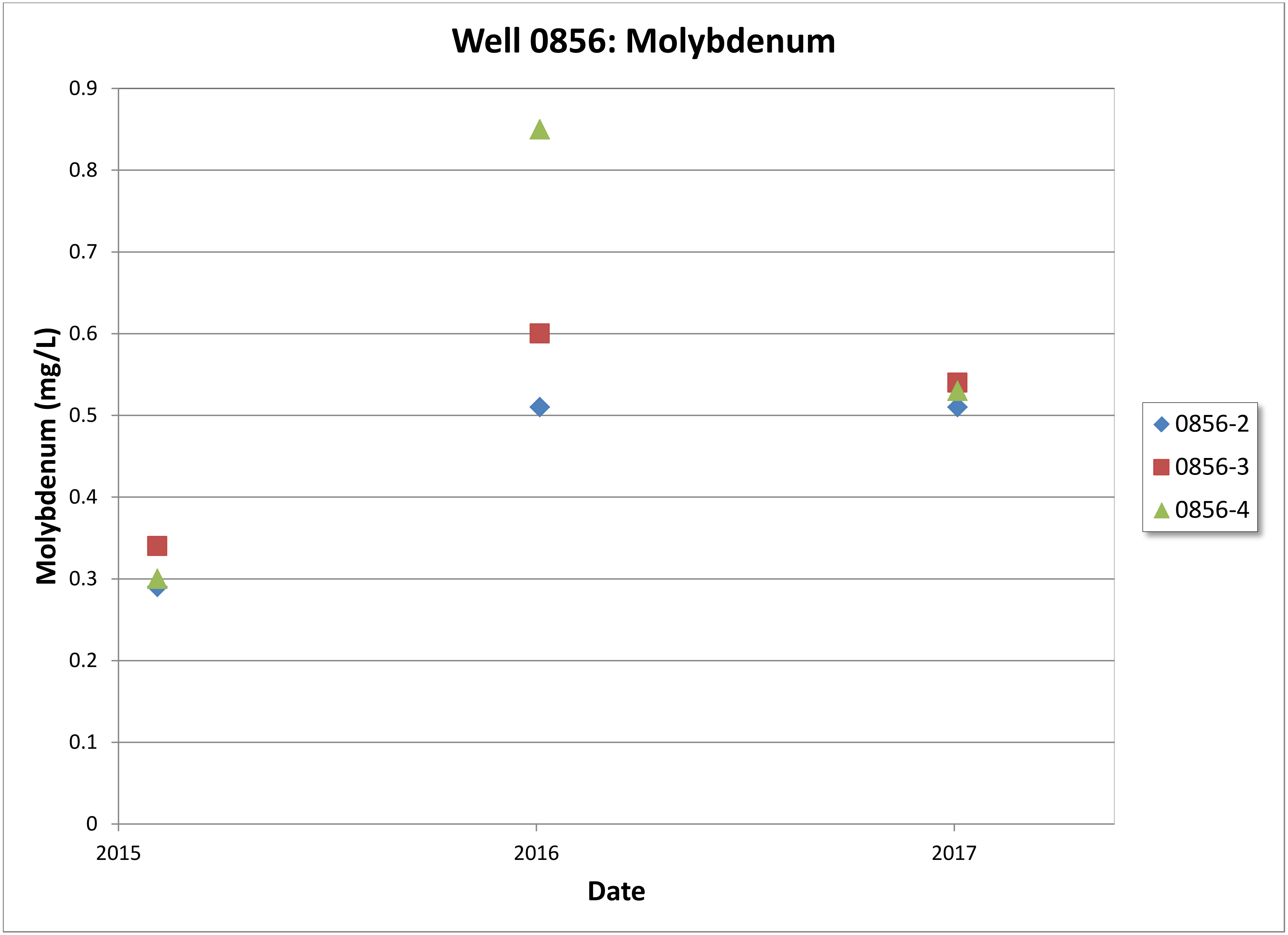

Well 0854: Molybdenum
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
Molybdenum (mg/L)
2015
2016
2017
Date
0854-2
0854-3
0854-4

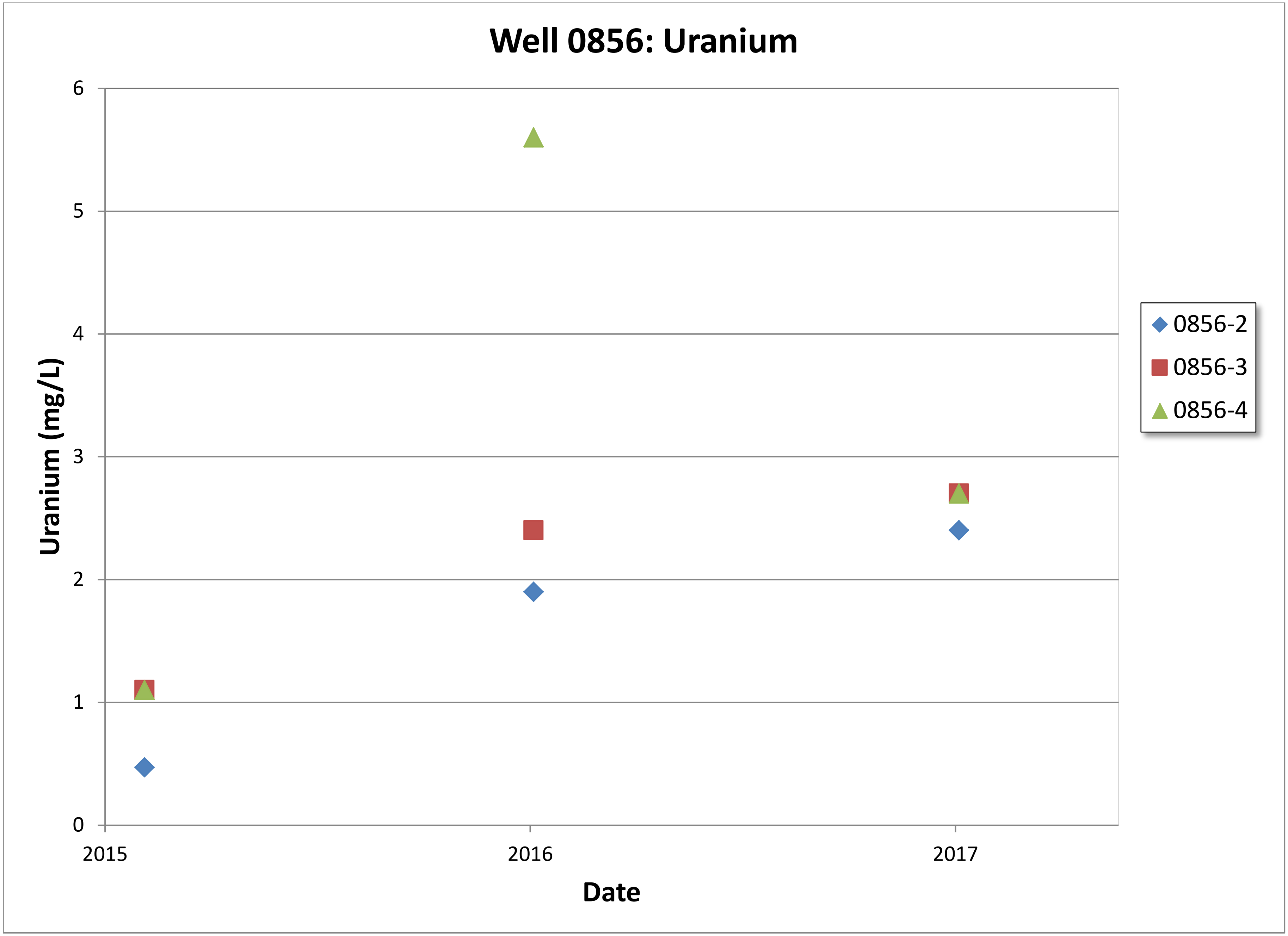


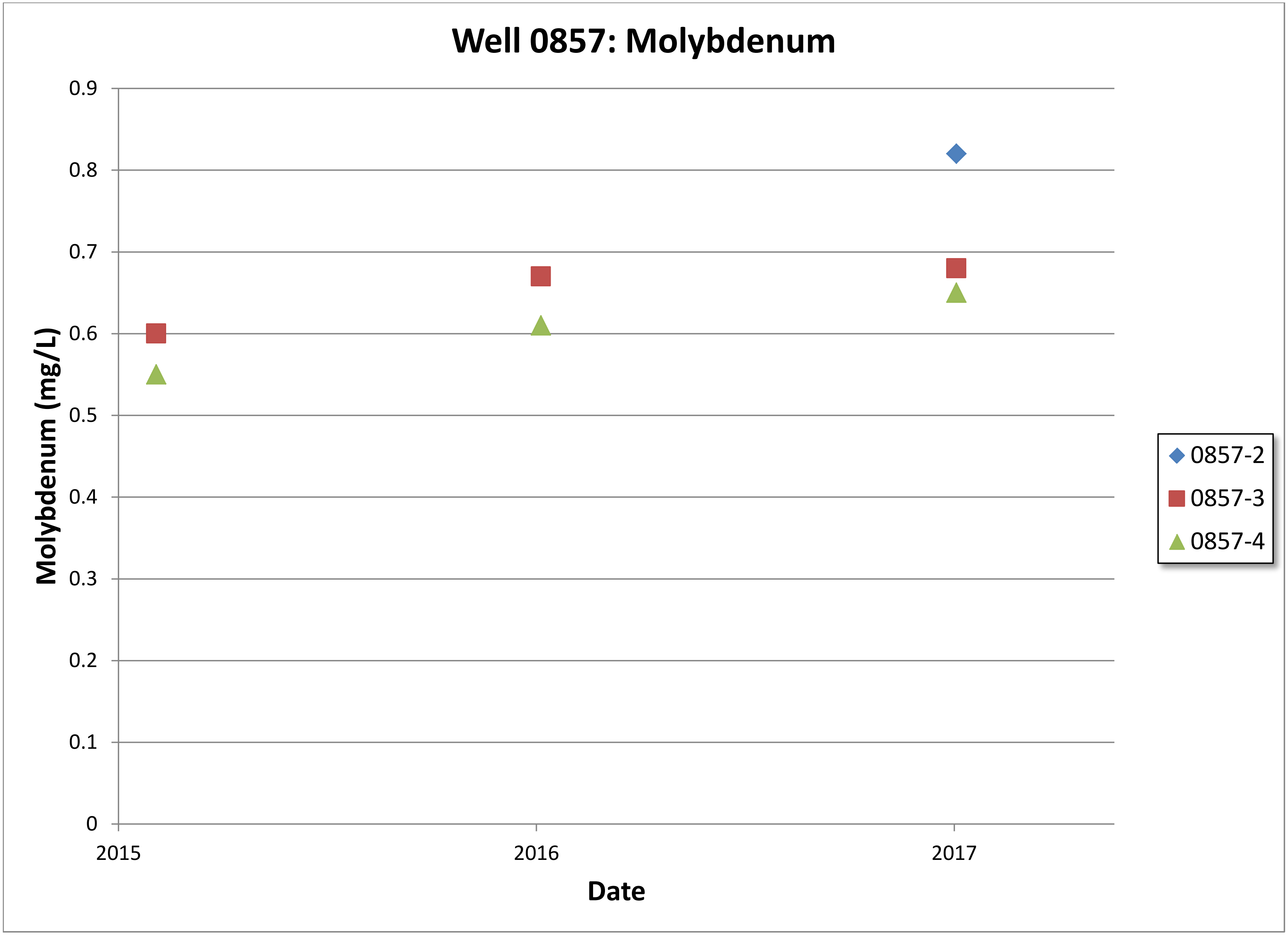
Well 0854: Uranium
Uranium (mg/L)
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2015
2016
2017
Date
0854-2
0854-3
0854-4


Well 0855: Molybdenum
Molybdenum (mg/L)
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
2015
2016
2017
Date
0855-2
0855-3
0855-4

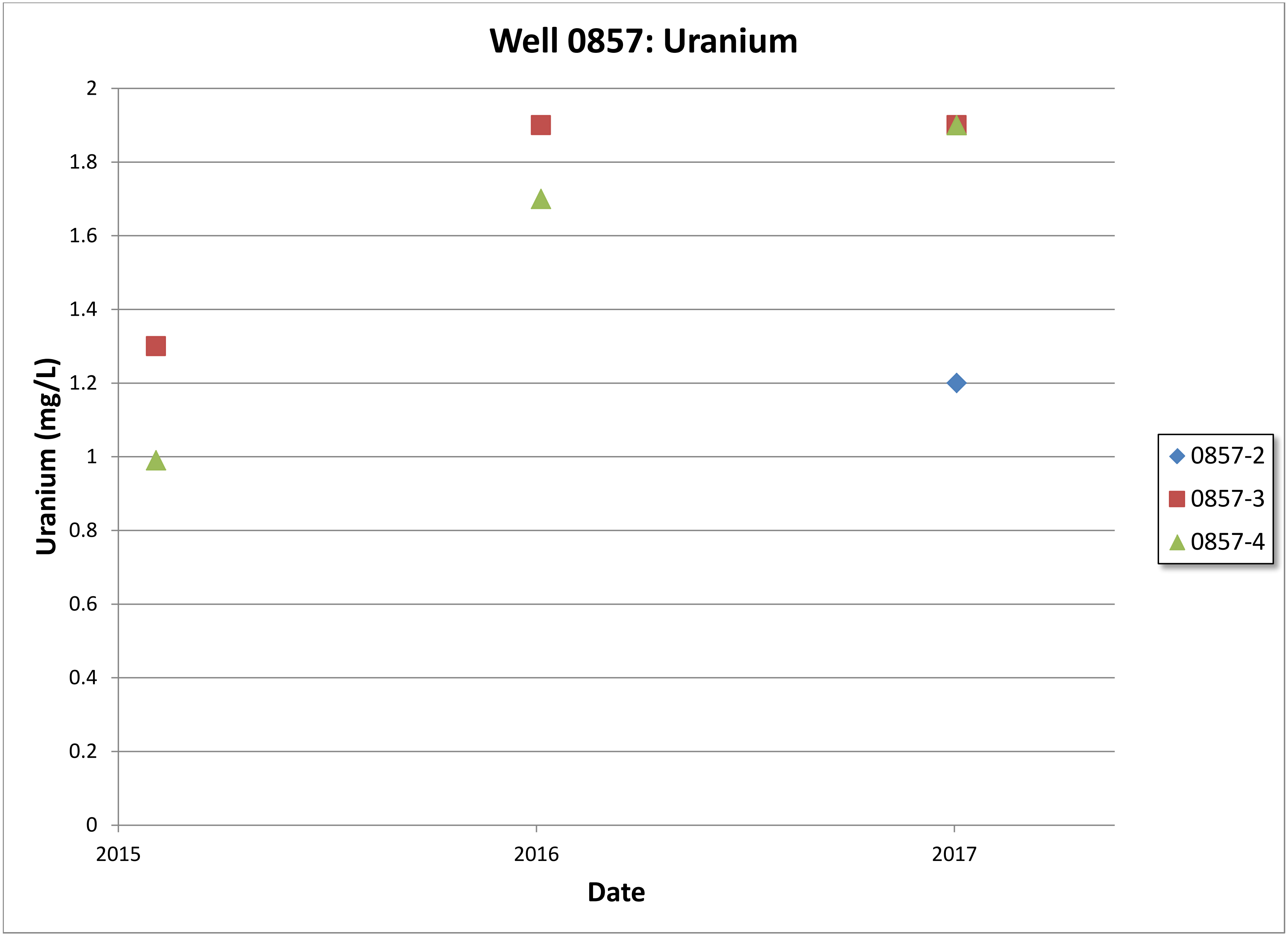

Well 0855: Uranium
Uranium (mg/L)
2.5
2
1.5
1
0.5
0
2015
2016
2017
Date
0855-2
0855-3
0855-4


Well 0856: Molybdenum
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
Molybdenum (mg/L)
2015
2016
2017
Date
0856-2
0856-3
0856-4

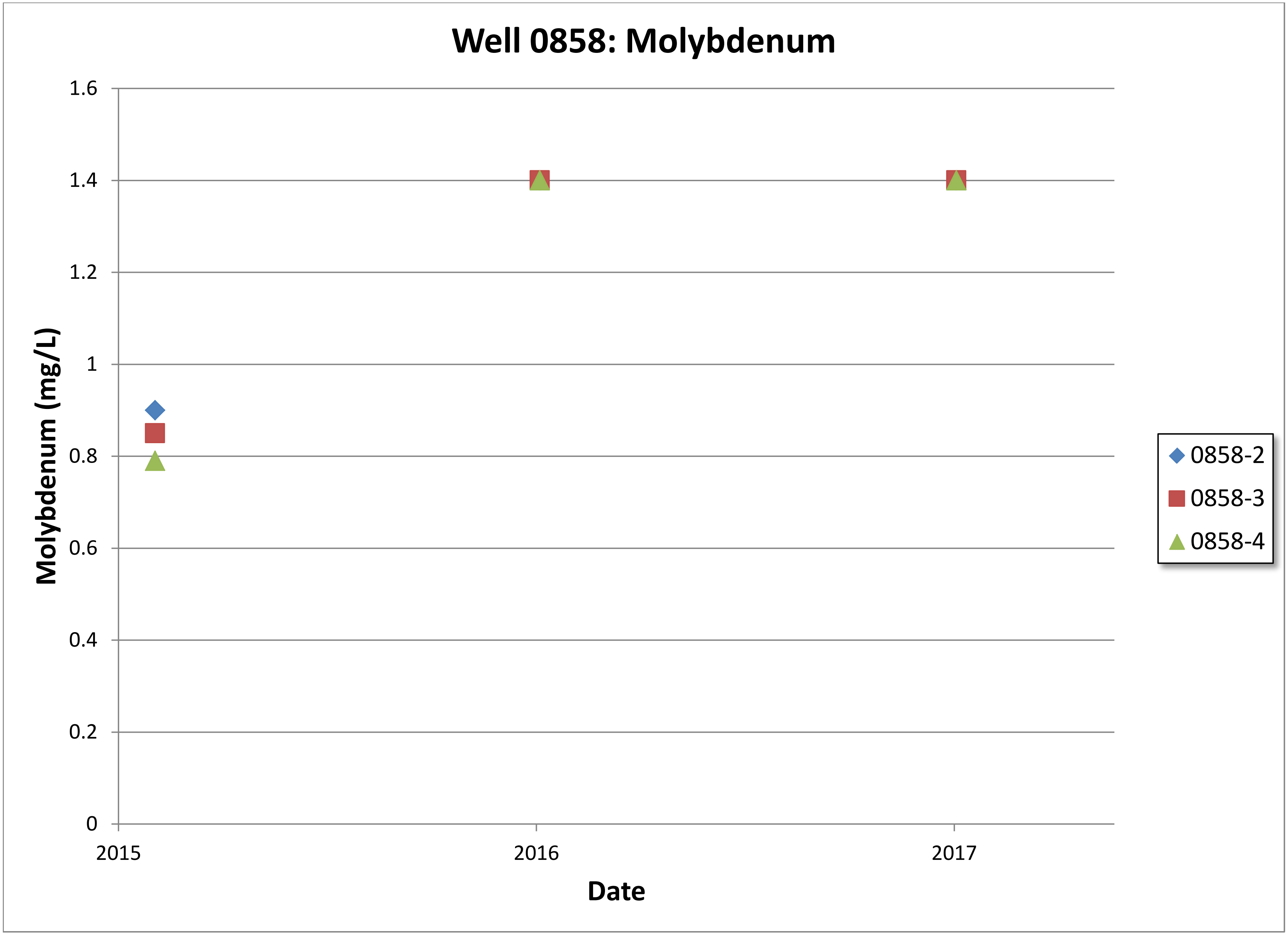

Well 0856: Uranium
Uranium (mg/L)
0
1
2
3
4
5
6
2015
2016
2017
Date
0856-2
0856-3
0856-4



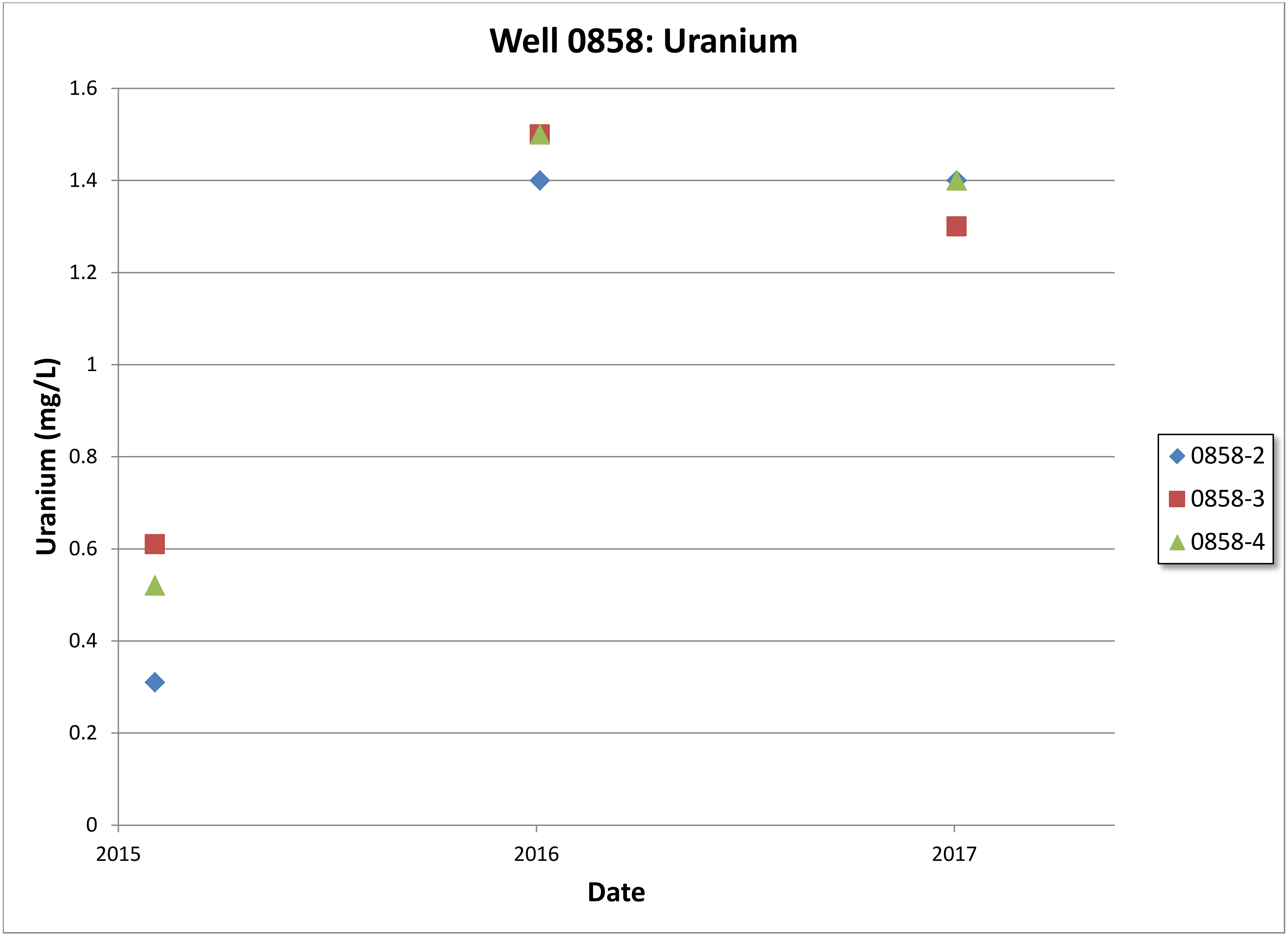
Well 0857: Molybdenum
Molybdenum (mg/L)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
2015
2016
2017
Date
0857-2
0857-3
0857-4

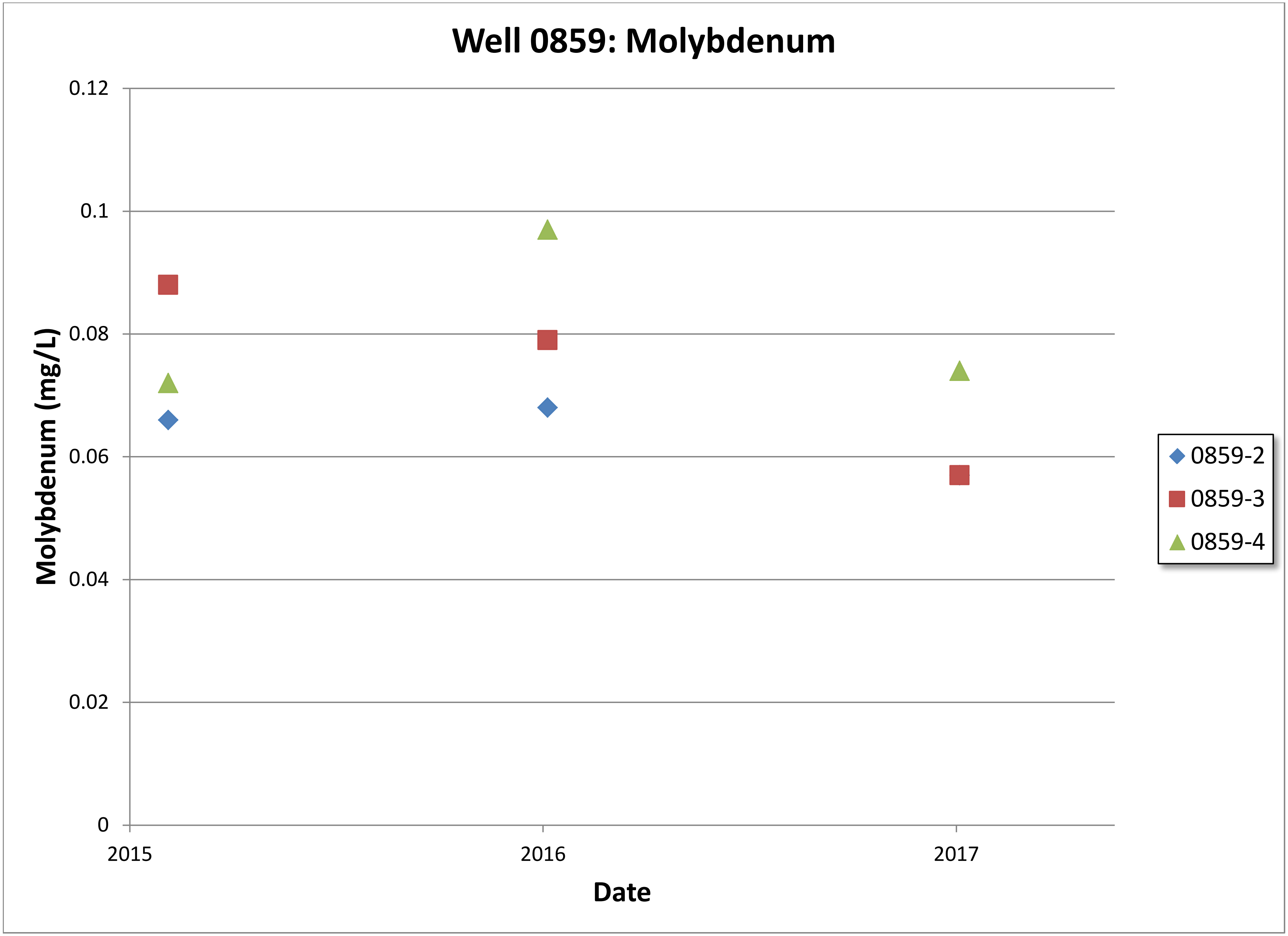


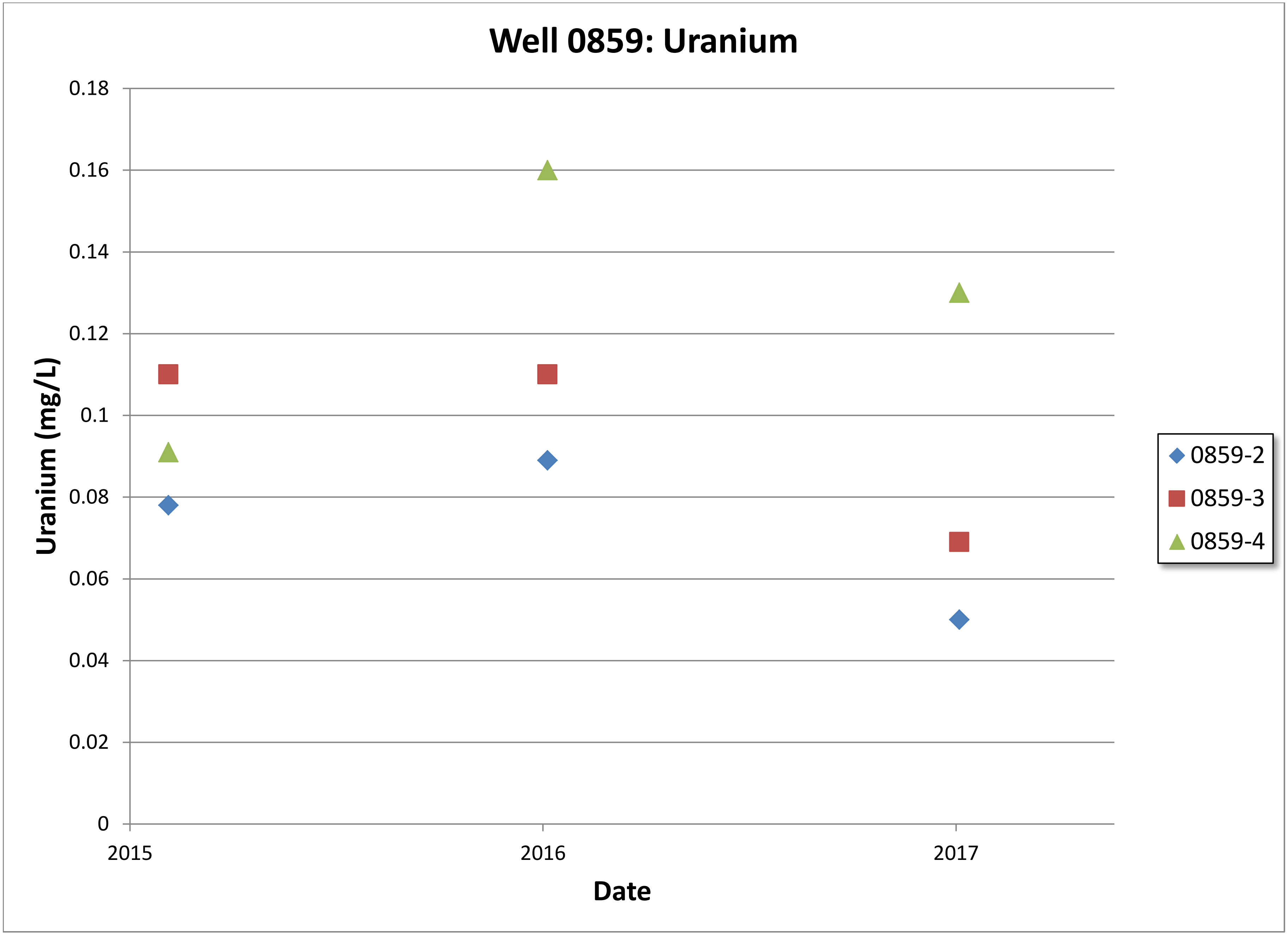
Well 0857: Uranium
Uranium (mg/L)
2
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2015
2016
2017
Date
0857-2
0857-3
0857-4

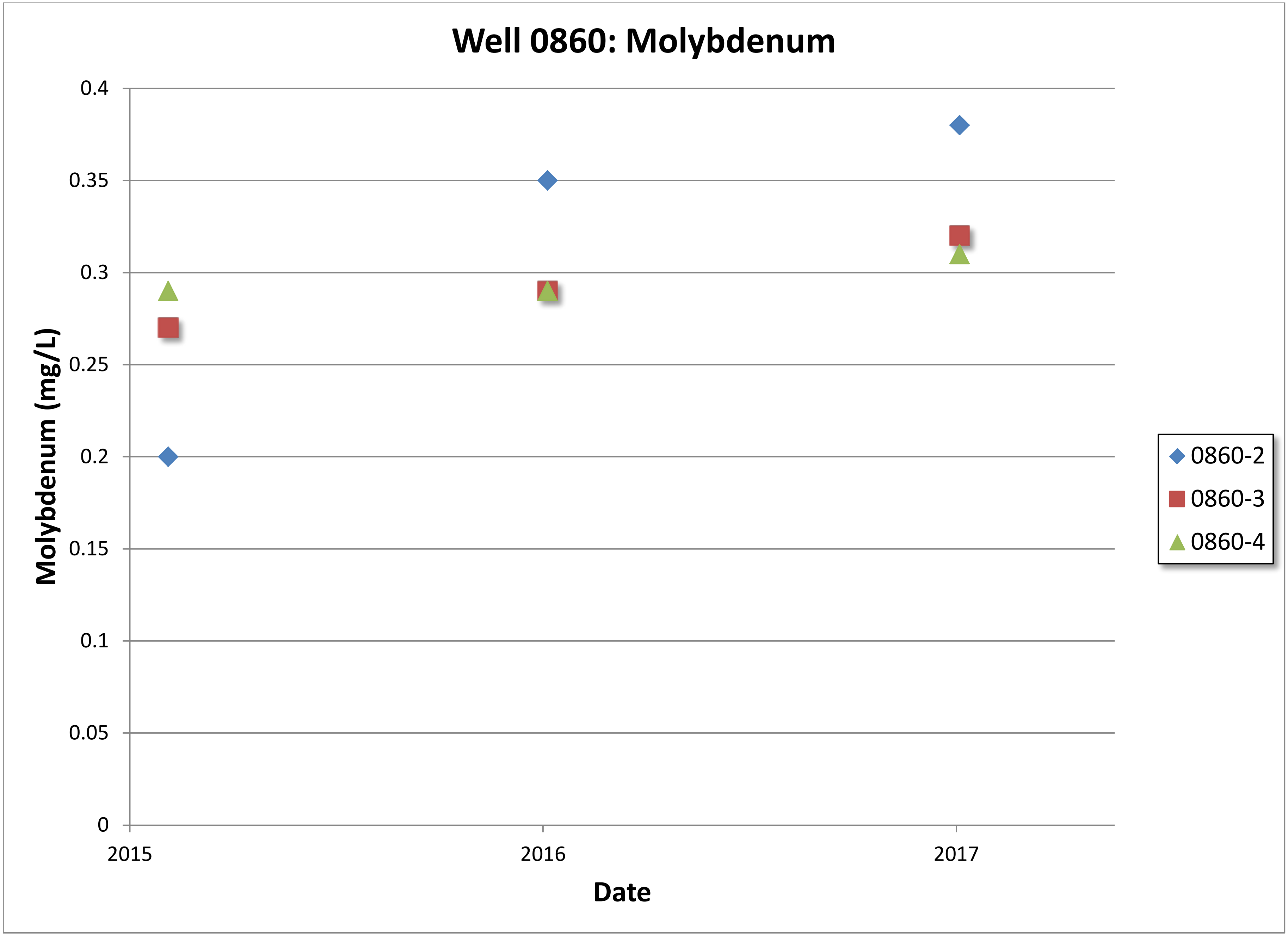


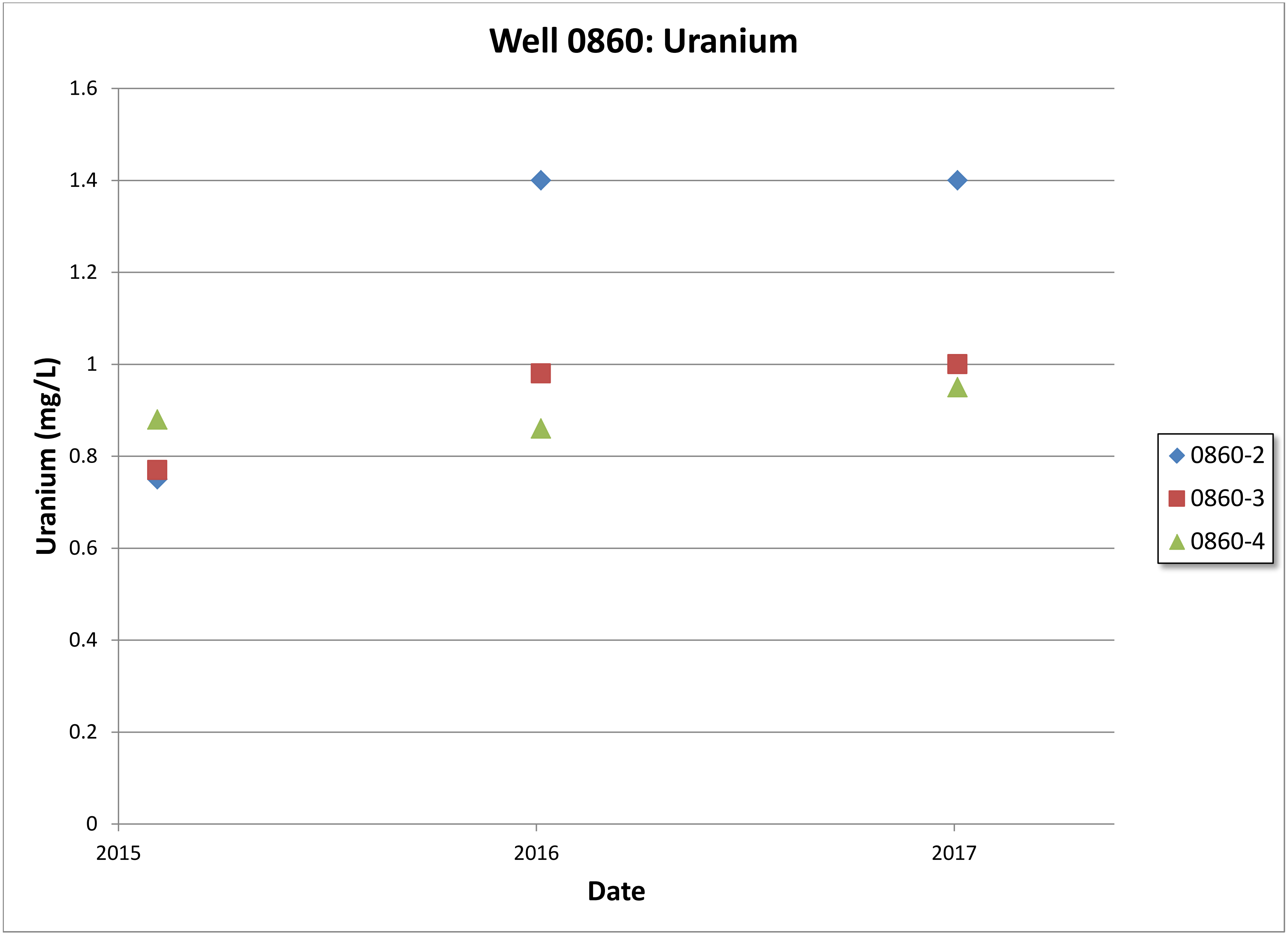
Well 0858: Molybdenum
Molybdenum (mg/L)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2015
2016
2017
Date
0858-2
0858-3
0858-4


Well 0858: Uranium
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
Uranium (mg/L)
2015
2016
2017
Date
0858-2
0858-3
0858-4


Well 0859: Molybdenum
0.12
0.1
0.08
0.06
0.04
0.02
0
Molybdenum (mg/L)
2015
2016
2017
Date
0859-2
0859-3
0859-4


Well 0859: Uranium
Uranium (mg/L)
0.18
0.16
0.14
0.12
0.1
0.08
0.06
0.04
0.02
0
2015
2016
2017
Date
0859-2
0859-3
0859-4


Well 0860: Molybdenum
0.4
0.35
0.3
0.25
0.2
0.15
0.1
0.05
0
Molybdenum (mg/L)
2015
2016
2017
Date
0860-2
0860-3
0860-4


Well 0860: Uranium
Uranium (mg/L)
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
2015
2016
2017
Date
0860-2
0860-3
0860-4

Appendix E

Surface Water Data

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SURFACE WATER QUALITY DATA BY PARAMETER (EQuIS800) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/18/2017 4:00:12 PM

PARAMETER	UNITS	LOCATION CODE	SAMPLE DATE	SAMPLE TYPE	RESULT	QUALIFIERS LAB/DATA		QA	DETECT. LIMIT	UNCERTAINTY
Alkalinity, Total (As CaCO3)										
Alkalinity, Total (As CaCO3)	mg/L	0747	8/16/2017	(F)F	318				-	-
Alkalinity, Total (As CaCO3)	mg/L	0749	8/16/2017	(N)F	92				-	-
Alkalinity, Total (As CaCO3)	mg/L	0794	8/15/2017	(F)F	138				-	-
Alkalinity, Total (As CaCO3)	mg/L	0796	8/16/2017	(F)F	125				-	-
Alkalinity, Total (As CaCO3)	mg/L	0810	8/15/2017	(N)F	308				-	-
Alkalinity, Total (As CaCO3)	mg/L	0811	8/16/2017	(F)F	134				-	-
Alkalinity, Total (As CaCO3)	mg/L	0812	8/15/2017	(N)F	119				-	-
Alkalinity, Total (As CaCO3)	mg/L	0822	8/15/2017	(N)F	222				-	-
Alkalinity, Total (As CaCO3)	mg/L	0823	8/15/2017	(N)F	62				-	-
Calcium										
Calcium	mg/L	0747	8/16/2017	(F)F	460				0.24	-
Calcium	mg/L	0749	8/16/2017	(N)F	610				0.12	-
Calcium	mg/L	0794	8/15/2017	(F)F	61				0.024	-
Calcium	mg/L	0796	8/16/2017	(F)F	61				0.024	-
Calcium	mg/L	0810	8/15/2017	(N)F	27				0.024	-
Calcium	mg/L	0811	8/16/2017	(F)F	60				0.024	-
Calcium	mg/L	0812	8/15/2017	(N)F	58				0.024	-
Calcium	mg/L	0822	8/15/2017	(N)F	220				0.024	-
Calcium	mg/L	0823	8/15/2017	(N)F	220				0.024	-
Chloride										
Chloride	mg/L	0747	8/16/2017	(F)F	77				12	-
Chloride	mg/L	0749	8/16/2017	(N)F	12				3	-
Chloride	mg/L	0794	8/15/2017	(F)F	8.4				0.06	-
Chloride	mg/L	0796	8/16/2017	(F)F	7.2				0.06	-
Chloride	mg/L	0810	8/15/2017	(N)F	39				3	-
Chloride	mg/L	0811	8/16/2017	(F)F	7.3				0.06	-
Chloride	mg/L	0812	8/15/2017	(N)F	7.8				0.06	-
Chloride	mg/L	0822	8/15/2017	(N)F	14				0.06	-
Chloride	mg/L	0823	8/15/2017	(N)F	290				7.5	-
Dissolved Oxygen										
Dissolved Oxygen	mg/L	0747	8/16/2017	(F)F	6.43				-	-
Dissolved Oxygen	mg/L	0749	8/16/2017	(N)F	6.89				-	-
Dissolved Oxygen	mg/L	0794	8/15/2017	(F)F	8.18				-	-

SURFACE WATER QUALITY DATA BY PARAMETER (EQuIS800) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/18/2017 4:00:13 PM

PARAMETER	UNITS	LOCATION CODE	SAMPLE DATE	SAMPLE TYPE	RESULT	QUALIFIERS LAB	QUALIFIERS DATA	QA	DETECT. LIMIT	UNCERTAINTY
Dissolved Oxygen	mg/L	0796	8/16/2017	(F)F	7.60				-	-
Dissolved Oxygen	mg/L	0810	8/15/2017	(N)F	9.99				-	-
Dissolved Oxygen	mg/L	0811	8/16/2017	(F)F	8.32				-	-
Dissolved Oxygen	mg/L	0812	8/15/2017	(N)F	8.72				-	-
Dissolved Oxygen	mg/L	0822	8/15/2017	(N)F	7.73				-	-
Dissolved Oxygen	mg/L	0823	8/15/2017	(N)F	7.30				-	-
Magnesium										
Magnesium	mg/L	0747	8/16/2017	(F)F	150				0.3	-
Magnesium	mg/L	0749	8/16/2017	(N)F	3.3	J			0.15	-
Magnesium	mg/L	0794	8/15/2017	(F)F	21				0.03	-
Magnesium	mg/L	0796	8/16/2017	(F)F	21				0.03	-
Magnesium	mg/L	0810	8/15/2017	(N)F	97				0.03	-
Magnesium	mg/L	0811	8/16/2017	(F)F	21				0.03	-
Magnesium	mg/L	0812	8/15/2017	(N)F	21				0.03	-
Magnesium	mg/L	0822	8/15/2017	(N)F	20				0.03	-
Magnesium	mg/L	0823	8/15/2017	(N)F	110				0.03	-
Manganese										
Manganese	mg/L	0747	8/16/2017	(F)F	2.1				0.0024	-
Manganese	mg/L	0749	8/16/2017	(N)F	0.085				0.0012	-
Manganese	mg/L	0794	8/15/2017	(F)F	0.013				0.00024	-
Manganese	mg/L	0796	8/16/2017	(F)F	0.011				0.00024	-
Manganese	mg/L	0810	8/15/2017	(N)F	0.026				0.00024	-
Manganese	mg/L	0811	8/16/2017	(F)F	0.0096				0.00024	-
Manganese	mg/L	0812	8/15/2017	(N)F	0.029				0.00024	-
Manganese	mg/L	0822	8/15/2017	(N)F	0.13				0.00024	-
Manganese	mg/L	0823	8/15/2017	(N)F	0.25				0.00024	-
Molybdenum										
Molybdenum	mg/L	0747	8/16/2017	(F)F	0.015				0.00032	-
Molybdenum	mg/L	0749	8/16/2017	(N)F	0.015				0.00032	-
Molybdenum	mg/L	0794	8/15/2017	(F)F	0.00095	J			0.00032	-
Molybdenum	mg/L	0796	8/16/2017	(F)F	0.00099	J			0.00032	-
Molybdenum	mg/L	0810	8/15/2017	(N)F	0.00064	J			0.00032	-
Molybdenum	mg/L	0811	8/16/2017	(F)F	0.00099	J			0.00032	-
Molybdenum	mg/L	0812	8/15/2017	(N)F	0.00097	J			0.00032	-
Molybdenum	mg/L	0822	8/15/2017	(N)F	0.007				0.00032	-
Molybdenum	mg/L	0823	8/15/2017	(N)F	0.0015	J			0.00032	-

SURFACE WATER QUALITY DATA BY PARAMETER (EQuIS800) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/18/2017 4:00:14 PM

PARAMETER	UNITS	LOCATION CODE	SAMPLE DATE	SAMPLE TYPE	RESULT	QUALIFIERS LAB/DATA		QA	DETECT. LIMIT	UNCERTAINTY
Oxidation Reduction Potential										
Oxidation Reduction Potential	mV	0747	8/16/2017	(F)F	159.7				-	-
Oxidation Reduction Potential	mV	0749	8/16/2017	(N)F	231.7				-	-
Oxidation Reduction Potential	mV	0794	8/15/2017	(F)F	209.8				-	-
Oxidation Reduction Potential	mV	0796	8/16/2017	(F)F	30.6				-	-
Oxidation Reduction Potential	mV	0810	8/15/2017	(N)F	145.7				-	-
Oxidation Reduction Potential	mV	0811	8/16/2017	(F)F	128.4				-	-
Oxidation Reduction Potential	mV	0812	8/15/2017	(N)F	120.9				-	-
Oxidation Reduction Potential	mV	0822	8/15/2017	(N)F	169.1				-	-
Oxidation Reduction Potential	mV	0823	8/15/2017	(N)F	205.3				-	-
pH										
pH	SU	0747	8/16/2017	(F)F	7.73				-	-
pH	SU	0749	8/16/2017	(N)F	7.92				-	-
pH	SU	0794	8/15/2017	(F)F	8.19				-	-
pH	SU	0796	8/16/2017	(F)F	8.20				-	-
pH	SU	0810	8/15/2017	(N)F	8.74				-	-
pH	SU	0811	8/16/2017	(F)F	8.28				-	-
pH	SU	0812	8/15/2017	(N)F	8.11				-	-
pH	SU	0822	8/15/2017	(N)F	7.59				-	-
pH	SU	0823	8/15/2017	(N)F	8.12				-	-
Potassium										
Potassium	mg/L	0747	8/16/2017	(F)F	15				0.52	-
Potassium	mg/L	0749	8/16/2017	(N)F	1.4	J			0.26	-
Potassium	mg/L	0794	8/15/2017	(F)F	2.5				0.052	-
Potassium	mg/L	0796	8/16/2017	(F)F	2.4				0.052	-
Potassium	mg/L	0810	8/15/2017	(N)F	15				0.052	-
Potassium	mg/L	0811	8/16/2017	(F)F	2.4				0.052	-
Potassium	mg/L	0812	8/15/2017	(N)F	2.4				0.052	-
Potassium	mg/L	0822	8/15/2017	(N)F	4.4				0.052	-
Potassium	mg/L	0823	8/15/2017	(N)F	11				0.052	-
Sodium										
Sodium	mg/L	0747	8/16/2017	(F)F	570				0.47	-
Sodium	mg/L	0749	8/16/2017	(N)F	190				0.23	-
Sodium	mg/L	0794	8/15/2017	(F)F	40				0.047	-

SURFACE WATER QUALITY DATA BY PARAMETER (EQuIS800) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/18/2017 4:00:15 PM

PARAMETER	UNITS	LOCATION CODE	SAMPLE DATE	SAMPLE TYPE	RESULT	QUALIFIERS LAB/DATA		QA	DETECT. LIMIT	UNCERTAINTY
Sodium	mg/L	0796	8/16/2017	(F)F	37				0.047	-
Sodium	mg/L	0810	8/15/2017	(N)F	230				0.047	-
Sodium	mg/L	0811	8/16/2017	(F)F	37				0.047	-
Sodium	mg/L	0812	8/15/2017	(N)F	37				0.047	-
Sodium	mg/L	0822	8/15/2017	(N)F	120				0.047	-
Sodium	mg/L	0823	8/15/2017	(N)F	400				0.047	-
Specific Conductance										
Specific Conductance	uS/cm	0747	8/16/2017	(F)F	4440				-	-
Specific Conductance	uS/cm	0749	8/16/2017	(N)F	3004				-	-
Specific Conductance	uS/cm	0794	8/15/2017	(F)F	634				-	-
Specific Conductance	uS/cm	0796	8/16/2017	(F)F	604				-	-
Specific Conductance	uS/cm	0810	8/15/2017	(N)F	1624				-	-
Specific Conductance	uS/cm	0811	8/16/2017	(F)F	618				-	-
Specific Conductance	uS/cm	0812	8/15/2017	(N)F	601				-	-
Specific Conductance	uS/cm	0822	8/15/2017	(N)F	1477				-	-
Specific Conductance	uS/cm	0823	8/15/2017	(N)F	3427				-	-
Sulfate										
Sulfate	mg/L	0747	8/16/2017	(F)F	2300				30	-
Sulfate	mg/L	0749	8/16/2017	(N)F	1800				19	-
Sulfate	mg/L	0794	8/15/2017	(F)F	150				3	-
Sulfate	mg/L	0796	8/16/2017	(F)F	150				3	-
Sulfate	mg/L	0810	8/15/2017	(N)F	510				7.5	-
Sulfate	mg/L	0811	8/16/2017	(F)F	160				3	-
Sulfate	mg/L	0812	8/15/2017	(N)F	140				3	-
Sulfate	mg/L	0822	8/15/2017	(N)F	570				7.5	-
Sulfate	mg/L	0823	8/15/2017	(N)F	1400				19	-
Temperature										
Temperature	C	0747	8/16/2017	(F)F	25.13				-	-
Temperature	C	0749	8/16/2017	(N)F	21.16				-	-
Temperature	C	0794	8/15/2017	(F)F	19.79				-	-
Temperature	C	0796	8/16/2017	(F)F	20.60				-	-
Temperature	C	0810	8/15/2017	(N)F	22.62				-	-
Temperature	C	0811	8/16/2017	(F)F	21.25				-	-
Temperature	C	0812	8/15/2017	(N)F	20.46				-	-

SURFACE WATER QUALITY DATA BY PARAMETER (EQuIS800) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 10/18/2017 4:00:15 PM

PARAMETER	UNITS	LOCATION CODE	SAMPLE DATE	SAMPLE TYPE	RESULT	QUALIFIERS LAB/DATA		QA	DETECT. LIMIT	UNCERTAINTY
Temperature	C	0822	8/15/2017	(N)F	16.76				-	-
Temperature	C	0823	8/15/2017	(N)F	20.80				-	-
Turbidity										
Turbidity	NTU	0747	8/16/2017	(F)F	11.9				-	-
Turbidity	NTU	0749	8/16/2017	(N)F	6.76				-	-
Turbidity	NTU	0794	8/15/2017	(F)F	11.4				-	-
Turbidity	NTU	0796	8/16/2017	(F)F	13.3				-	-
Turbidity	NTU	0810	8/15/2017	(N)F	3.32				-	-
Turbidity	NTU	0811	8/16/2017	(F)F	12.2				-	-
Turbidity	NTU	0812	8/15/2017	(N)F	9.78				-	-
Turbidity	NTU	0822	8/15/2017	(N)F	5.14				-	-
Turbidity	NTU	0823	8/15/2017	(N)F	2.27				-	-
Uranium										
Uranium	mg/L	0747	8/16/2017	(F)F	0.36				0.000012	-
Uranium	mg/L	0749	8/16/2017	(N)F	0.0027				0.000012	-
Uranium	mg/L	0794	8/15/2017	(F)F	0.0039				0.000012	-
Uranium	mg/L	0796	8/16/2017	(F)F	0.0031				0.000012	-
Uranium	mg/L	0810	8/15/2017	(N)F	0.0041				0.000012	-
Uranium	mg/L	0811	8/16/2017	(F)F	0.0033				0.000012	-
Uranium	mg/L	0812	8/15/2017	(N)F	0.0035				0.000012	-
Uranium	mg/L	0822	8/15/2017	(N)F	0.0049				0.000012	-
Uranium	mg/L	0823	8/15/2017	(N)F	0.0072				0.000012	-

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.
N Tentatively identified compund (TIC).
Q Qualitative result due to sampling technique
R Unusable result.
U Parameter analyzed for but was not detected.
X Location is undefined.

LAB QUALIFIERS:

* Replicate analysis not within control limits.
\+ Correlation coefficient for MSA < 0.995.
> Result above upper detection limit.
A TIC is a suspected aldol-condensation product.
B Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: Analyte also found in method blank.
C Pesticide result confirmed by GC-MS.
D Analyte determined in diluted sample.

PARAMETER	UNITS	LOCATION CODE	SAMPLE DATE	SAMPLE TYPE	RESULT	QUALIFIERS LAB/DATA	QA	DETECT. LIMIT	UNCERTAINTY

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 Value.

M GFAA duplicate injection precision not met.

N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).

P > 25% difference in detected pesticide or Aroclor concentrations between 2 columns.

S Result determined by method of standard addition (MSA).

U Parameter analyzed for but was not detected.

W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.

X Laboratory defined qualifier, see case narrative.

Y Laboratory defined qualifier, see case narrative.

Z Laboratory defined qualifier, see case narrative.

SAMPLE TYPES:
(F) Filtered Sample Type Codes: F-Field Sample R-Replicate FR-Field Sample with Replicates
(N) Nonfiltered Sample D-Duplicate N-Not Known S-Split Sample

QA QUALIFIER: # = validated according to Quality Assurance guidelines.