LMS/RVT/43298

2022 Verification Monitoring Report, Riverton, Wyoming, Processing Site

March 2023

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
COC	contaminant of concern
CSM	conceptual site model
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ft	feet
IC	institutional control
LM	Office of Legacy Management
LOESS	locally estimated scatterplot smoothing
LTMP	Long-Term Management Plan
MCL	maximum concentration limit
mg/L	milligrams per liter
NAW&SD	Northern Arapaho Water & Sewer Department
NRZ	naturally reduced zone
pCi/L	picocuries per liter
UMTRCA	Uranium Mill Tailings Radiation Control Act
USGS	U.S. Geological Survey

Executive Summary

This verification monitoring report presents data collected during calendar year 2022 and provides updates on the natural flushing compliance strategy and conceptual site model at the Riverton, Wyoming, Processing Site. Routine 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 to ensure that potential exposure to contaminated groundwater is minimized during the natural flushing period. Land and water use inspections within the IC boundary verified that warning signs around the oxbow lake were in place and in good condition. No additional anthropogenic land or water uses were identified that exposed or involved shallow groundwater. Sampling results from domestic wells indicated no impacts from site-related contaminants. An engineering assessment and design of upgrades to the alternate water supply system are in progress so that the system will remain a viable IC for the Riverton site into the future.

Concentrations of uranium and molybdenum at the site continue to remain above the standards for groundwater in numerous surficial aquifer wells. Sampling results from semiconfined monitoring wells continue to indicate no impact from site-related molybdenum and uranium contamination. Sampling results from surface water indicate that groundwater discharge continues to affect the water quality in the oxbow lake, but there are no significant impacts to surface water in the Little Wind River or other ponds near the site.

Several types of information (e.g., contaminants mobilized by flood events, the current plume size and contaminant concentration levels, comparison of results to groundwater modeling predictions, historical data, and experience at other Uranium Mill Tailings Radiation Control Act sites) indicate that natural flushing of the surficial aquifer is occurring at the Riverton site but not at a rate that will meet the 100-year regulatory time frame. Based on this information, the U.S. Department of Energy Office of Legacy Management is working to fill data gaps and conduct additional modeling to evaluate groundwater remedy alternatives and determine an appropriate alternate compliance strategy for the site. The new compliance strategy will be presented to the U.S. Nuclear Regulatory Commission for concurrence in a new Groundwater Compliance Action Plan.

1.0 Introduction

This Verification Monitoring Report presents routine data collected during calendar year 2022 and provides updates on the natural flushing compliance strategy and conceptual site model (CSM) at the Riverton, Wyoming, Processing Site. Data were generated from one routine groundwater and surface water sampling event conducted at the Riverton site during August 2022.

The Riverton site is regulated under Title I of the Uranium Mill Tailings Radiation Control Act (UMTRCA). The compliance strategy for the Riverton site is natural flushing in conjunction with institutional controls (ICs) (DOE 1998b), as allowed by UMTRCA. Monitoring required during the natural flushing period is called verification monitoring because its purpose is to verify that the natural flushing strategy is progressing as predicted (or not) 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 since 2001, and the reports from 2005 to 2021 are available on the U.S. Department of Energy (DOE) Office of Legacy Management (LM) website at https://lmpublicsearch.lm.doe.gov/SitePages/default.aspx?sitename=Riverton. All water quality data for the Riverton site are archived in the environmental database at the LM Field Support Center at Grand Junction, Colorado. Water quality data are also 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 *Draft Long-Term Management Plan for the Riverton, Wyoming, Processing Site* (DOE 2022b), also called the Long-Term Management Plan (LTMP). The LTMP is being updated to reflect current conditions, monitoring locations, and ICs at the site.

2.0 Conceptual Site Model

The CSM provided in the *2015 Advanced Site Investigation and Monitoring Report, Riverton, Wyoming, Processing Site* (DOE 2016) does not require any updates based on the 2022 sampling results. Among other components, this CSM includes 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 2022 confirmed the presence of an ongoing source underneath the former tailings pile that results in a persistent uranium plume with onsite concentrations up to 1.4 milligrams per liter (mg/L). The CSM (DOE 2016) also suggests that the unsaturated zone above the plume footprint has elevated solid-phase contaminants as seasonal high-water levels bring and store contaminants into the typically unsaturated sediments from the underlying groundwater. During these high-water levels, contaminants are wicked up and stored in the silt layer overlying much of the surficial aquifer and can be released during river flooding or other high recharge events (direct rain or snowmelt infiltration). This release of contaminants from the unsaturated zone into the groundwater was confirmed after flooding in 2010, 2016, and 2017 (Dam et al. 2015; DOE 2019). Data from 2022 continued to confirm the CSM. In a year without flooding and no flood-induced input of secondary source from the unsaturated zone, contaminant concentrations in the surficial aquifer groundwater decreased through natural flushing processes. Whether or not the NRZs are a source or sink for uranium and molybdenum will be investigated in upcoming solid-phase sampling and laboratory testing that are detailed in the *2022 Work Plan for Continued Site Investigation of the Riverton, Wyoming, Processing Site* (DOE 2022a).

3.0 Site Conditions

3.1 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 soil standard in Title 40 *Code of Federal Regulations* Section 192 (40 CFR 192). Surface remediation activities resulted in removal of about 1.8 million cubic yards of tailings and associated materials, which were encapsulated at the Gas Hills East, Wyoming, Disposal Site (Figure 1) (DOE 1998b). Soils at and below the water table with elevated thorium-230 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.

3.2 Hydrogeology

The Riverton site is 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 1998c).

The surficial aquifer consists of approximately 15 to 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 more than 500 ft thick near the site. Depth to groundwater in the surficial aquifer is generally less than 10 ft bgs. For compliance purposes, the uppermost aquifer, where 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 on an alluvial terrace between the Wind River and the Little Wind River, site groundwater conditions have been influenced by periodic flooding of these rivers. Artifacts of river flooding include the following:

- Formation of an oxbow lake in 1995
- Formation of a groundwater seep in a normally dry side channel of the Little Wind River in 2016
- Spikes in groundwater contaminant concentrations in areas inundated by flood waters
- High groundwater elevations depositing contaminants in the unsaturated zone
- High groundwater elevations leaching contaminants from the former tailings pile (White et al. 1984)
- Destruction of an LM stilling well and two LM monitoring wells on the south side of the Little Wind River in 2010
- Destruction of an LM stilling well (north side of the river) and the U.S. Geological Survey (USGS) gaging station on the Little Wind River in 2017

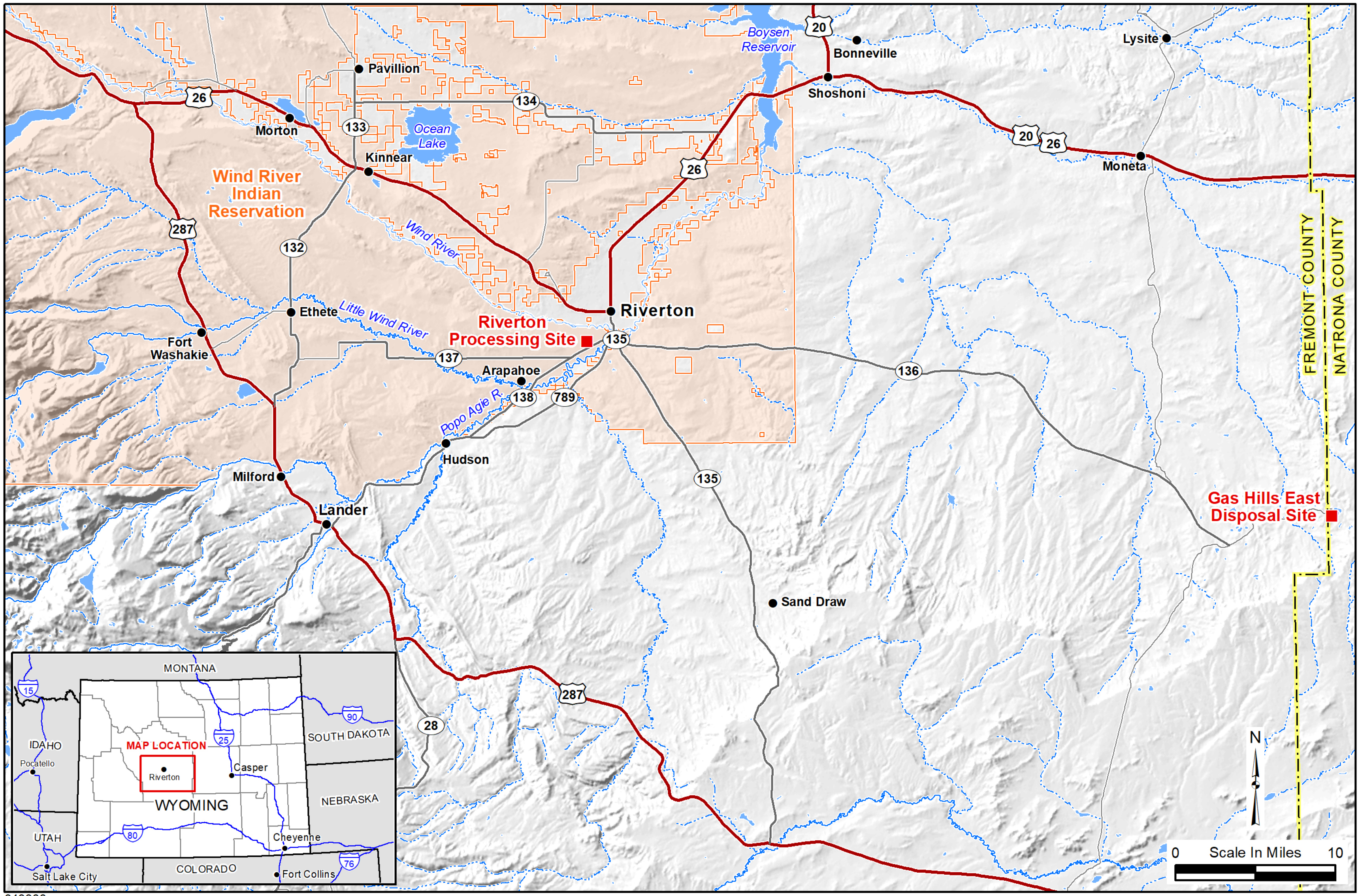


Figure 1. Riverton Site Location Map

Significant flooding of the Little Wind River flooded portions of the site in 1963, 1965, 1967, 1983, 1991, 1995, 2010, 2016, and 2017, when peak river discharge was greater than 8000 cubic feet per second (cfs) (USGS 2023). Discharge data and flood data from the Little Wind River are presented in Section 5.2.1.

3.3 Water Quality

Shallow groundwater beneath and downgradient from the site was contaminated as a result of uranium-processing activities that occurred between 1958 and 1963 (DOE 1998c). 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 and evaluated potential human health risks and ecological risks. The COC selection process is detailed in the *Environmental Assessment of Ground Water Compliance at the Riverton, Wyoming, Uranium Mill Tailings Site* (DOE 1998a). 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 1998b). These contaminants were selected as indicator contaminants because they are the most widely distributed and they form significant aqueous plumes in the uppermost aquifer near the site. The MCLs for molybdenum and uranium are 0.10 mg/L and 30 picocuries per liter (pCi/L), respectively. Manganese and sulfate are not regulated under Title I of UMTRCA.

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. The MCLs for uranium discussed here are different than the "MCLs" (i.e., maximum contaminant levels) for the U.S. Environmental Protection Agency (EPA) drinking water standards that are maximum concentrations allowed in drinking water (0.030 mg/L).

3.4 ICs

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 that delineates the area that requires protection at the Riverton site (Figure 2). 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 based on groundwater modeling for the site.

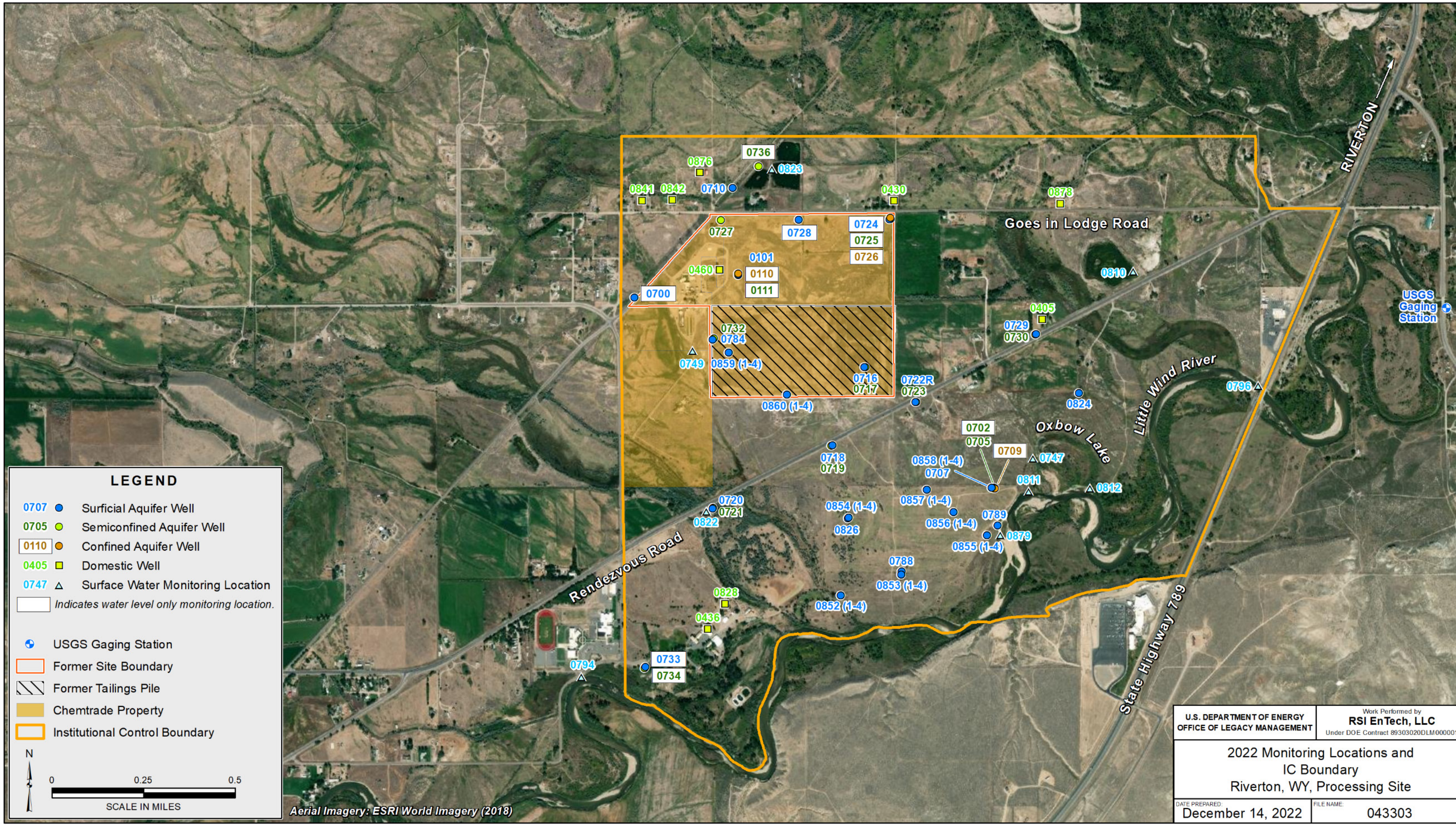


Figure 2. 2022 Monitoring Locations and IC Boundary at the Riverton Site

3.4.1 Site ICs

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

- An alternate water supply system (AWSS), cofunded by DOE and the Indian Health Service and operated by Northern Arapaho Water & Sewer Department (NAW&SD), that supplies potable water to residents within the IC boundary to minimize use of groundwater.
- Warning signs installed around the oxbow lake that 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 that restricts well installation, prohibits surface impoundments, authorizes access to inspect and sample new wells, and notifies 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.
- An LM 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 private landowners who apply for a gravel pit permit within the IC boundary.
- Notification to LM by the Wyoming State Engineer's Office when it receives permit applications for wells or surface impoundments within or adjacent to the IC boundary. This includes providing LM with a copy of the application (so LM may comment on it) and incorporating LM'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).

3.4.2 IC Monitoring

The LTMP specifies ongoing IC monitoring to verify that ICs are in place and working 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. The land and water use verification consists of periodic inspection of land within the IC boundary to verify and document that no additional anthropogenic land or water uses expose or involve shallow groundwater, such as new wells, gravel pits, seeps, and recreational ponds.

Nine domestic wells were sampled during the August 2022 sampling event. Results for samples collected from domestic wells are presented in Section 5.1.2.2 and Appendix A.

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 maintain the AWSS as a viable IC, LM has worked with the Northern Arapaho Tribe to ensure cooperative efforts and funding for ongoing maintenance, flushing, sampling, and capital improvements of the AWSS. Currently, LM has subcontracted an engineering firm to assess the current condition of the AWSS and update the condition assessment report that was issued in 2018 (WWC 2018). The engineering firm will provide engineering design drawings for the upgrades identified in the updated report.

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 personnel before the August 2022 sampling event and by the sampling crews during the August 2022 sampling event. Results of the water and land use inspections include the following:

- Warning signs around the oxbow lake were verified to be in place and in good condition (Figure 3)
- No additional land or water uses were identified that exposed or involved shallow groundwater

4.0 Monitoring Program

The verification monitoring program consists of 21 conventional monitoring wells, 9 multilevel monitoring wells, 9 domestic wells, and 10 surface water locations, all of which are listed in Table 1 and shown in Figure 2. The annual water sampling event at the Riverton site is conducted in late summer when water levels in surface water and the surficial aquifer are typically low. During the 2022 sampling event, the top ports (e.g., 0852-1) of all the multilevel monitoring wells were dry. In addition, surface water sampling location 0879 was not sampled during the 2022 sampling event because it was dry. At each sampling location, water samples were analyzed for COCs (i.e., manganese, molybdenum, sulfate, and uranium), and field measurements were taken of temperature, pH, specific conductance, total alkalinity, and turbidity. Water levels were measured in all wells in the monitoring network during the annual sampling event.

Figure 3. Warning Signs at the Oxbow Lake

Table 1. 2022 Sampling Network at the Riverton Site

Location ID	Description	Rationale	Comments
LM Monitoring Wells			
0101	Surficial aquifer	Monitor upgradient portion of the plume	
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
Domestic Wells			
0405	Confined aquifer	Potential POE	Private residence
0430	Confined aquifer	Potential POE	Private residence
0436	Confined aquifer	Potential POE	St. Stephens Indian Mission
0460	Confined aquifer	Potential POE	Chemtrade refinery
0828	Confined aquifer	Potential POE	St. Stephens Indian Mission
0841	Semiconfined aquifer	Potential POE	Private residence
0842	Confined aquifer	Potential POE	Private residence

Table 1. 2022 Sampling Network at the Riverton Site (continued)

Location ID	Description	Rationale	Comments
0876	Confined aquifer	Potential POE	Private residence
0878	Confined aquifer	Potential POE	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	
0879	Seep	Impacted by groundwater discharge	Side channel of the Little Wind River

Abbreviation:
POE = point of exposure

5.0 Results of 2022 Monitoring

5.1 Groundwater

5.1.1 Groundwater Flow

Water levels were measured at all monitoring wells in the monitoring network (Figure 2) in August to verify groundwater flow direction and 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 4, groundwater elevation contours for the surficial aquifer indicate a general flow direction to the southeast in August 2022, which is consistent with the 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 5). Continuous groundwater elevations in Figure 5 demonstrate that the general groundwater flow direction was consistent throughout the year. In 2022 and in past years, June was an exception when groundwater and river levels were high because the groundwater flow direction reversed temporarily near the river (see Figure 5, well 0789).

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 the potential for upward groundwater flow and a positive gradient to indicate the potential for downward groundwater flow. Regardless of the direction and magnitude indicated by the gradient, vertical migration of groundwater between the Riverton site aquifers is expected to be limited because of the aquitards separating aquifers (DOE 1998c). Vertical gradients are calculated from monitoring wells in an upper aquifer (aquifer 1) and lower aquifer (aquifer 2) using the following formula: $(GE_1 - GE_2)/(SE_1 - SE_2)$, where GE = groundwater elevation and SE = screen elevation at the midpoint of the screen. Table 2 shows vertical gradients calculated from grouped monitoring wells (from August 2022 data). No vertical gradient was greater than an absolute magnitude of 0.1.

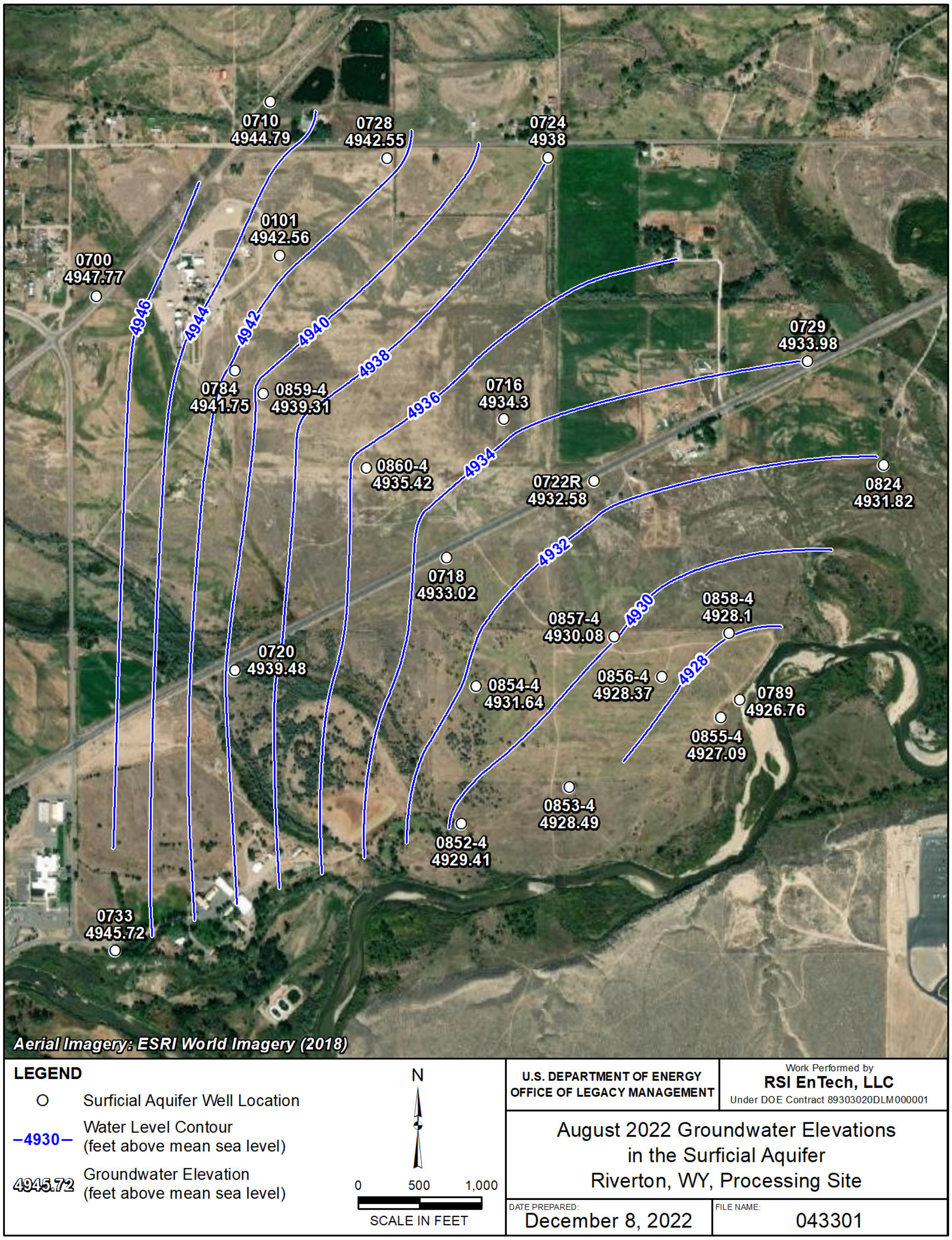


Figure 4. August 2022 Groundwater Elevations in the Surficial Aquifer at the Riverton Site

Figure 5. Continuous Water Elevations in Selected Surficial Aquifer Wells

Table 2. August 2022 Vertical Gradients at the Riverton Site

Well ID	Aquifer	Water Elevation	Vertical Gradient[a]
0724	Surficial	4938.00	
0725	Semiconfined	4938.18	−0.010
0726	Confined	4937.88	0.001
0101	Surficial	4942.56	
0111	Semiconfined	4941.52	0.039
0110	Confined	4941.54	0.020
0784	Surficial	4941.75	
0732	Semiconfined	4940.00	0.066
0716	Surficial	4934.30	
0717	Semiconfined	4934.54	−0.009
0707	Surficial	4927.85	
0705	Semiconfined	4927.61	0.008
0709	Confined	4930.55	−0.035
0718	Surficial	4933.02	
0719	Semiconfined	4933.49	−0.024
0722R	Surficial	4932.58	
0723	Semiconfined	4932.62	-0.0013
0720	Surficial	4939.48	
0721	Semiconfined	4935.87	0.100
0729	Surficial	4933.98	
0730	Semiconfined	4933.60	0.016
0733	Surficial	4945.72	
0734	Semiconfined	4943.63	0.092

Note:

[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.

5.1.2 Groundwater Quality

Figure 6 through Figure 10 summarize surficial aquifer data from the 2022 sampling event. On these figures, the blue line is the locally estimated scatterplot smoothing (LOESS) line, which is an estimate of the average molybdenum or uranium concentration as it changes through time. The distribution of molybdenum in the surficial aquifer from the August 2022 sampling event is shown in Figure 6. Time-concentration plots for molybdenum in wells within contaminant plumes and wells on the edge and outside the contaminant plumes in the surficial aquifer are shown in Figure 7 and Figure 8, respectively. The distribution of uranium in the surficial aquifer, based on August 2022 sampling results, is shown in Figure 9. Time-concentration plots for uranium in wells within contaminant plumes and wells on the edge and outside the contaminant plumes in the surficial aquifer are shown in Figure 10 and Figure 11, respectively. The distribution of molybdenum and uranium plumes (shown in Figure 6 for molybdenum and Figure 9 for uranium) included data from conventional and multilevel monitoring wells. The multilevel monitoring well port with the highest molybdenum and uranium concentrations was plotted on the figures; in areas where a conventional monitoring well was colocated with a multiport monitoring well (0707 and 0858, 0788 and 0853, 0826 and 0854; each pair is a conventional well and multiport well, respectively) the highest molybdenum and uranium concentration from either well was 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. Flooding of the Little Wind River in 2010, 2016, and 2017 caused the molybdenum and uranium concentrations in wells within the area of inundation (wells 0707, 0788, 0789, and 0826) to increase dramatically (2010 and 2016) and remain elevated (2017). No flooding or minor flooding (above flood stage but no floodplain inundation) of the Little Wind River occurred from 2018 to 2022. This resulted in a general decline in molybdenum and uranium concentrations in 2022 as the natural flushing progressed in the surficial aquifer without input of secondary source from the unsaturated zone. Based on overall trends, concentrations are generally near or less than preflood concentrations before 2010 for molybdenum (Figure 7 and Figure 8) and uranium (Figure 10 and Figure 11).

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. This indicates no significant impact from site-related molybdenum or uranium contamination in this unit (Figure 12 for molybdenum and Figure 13 for uranium). Appendix C provides groundwater quality data by parameter for monitoring wells in the long-term monitoring network sampled in 2022.

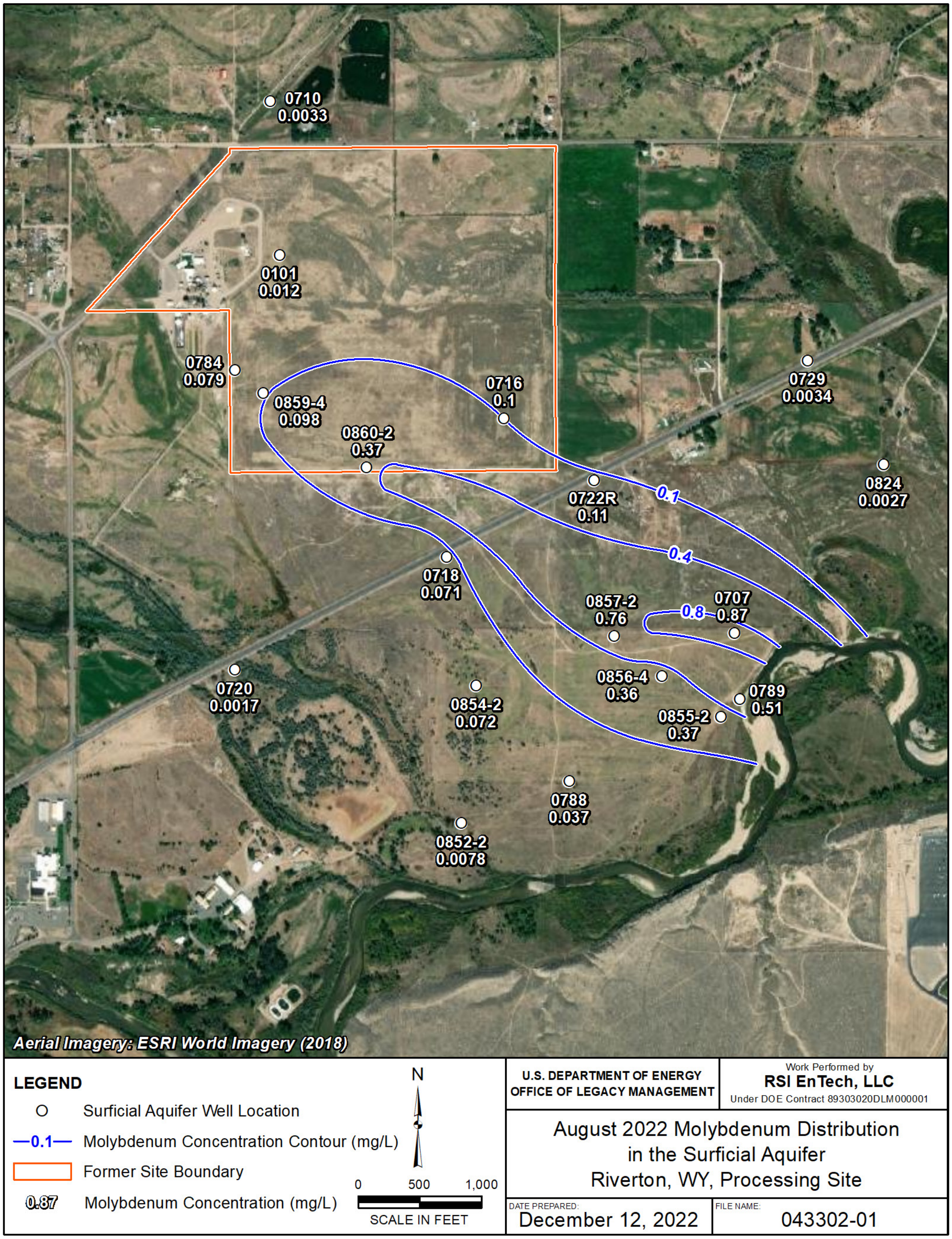
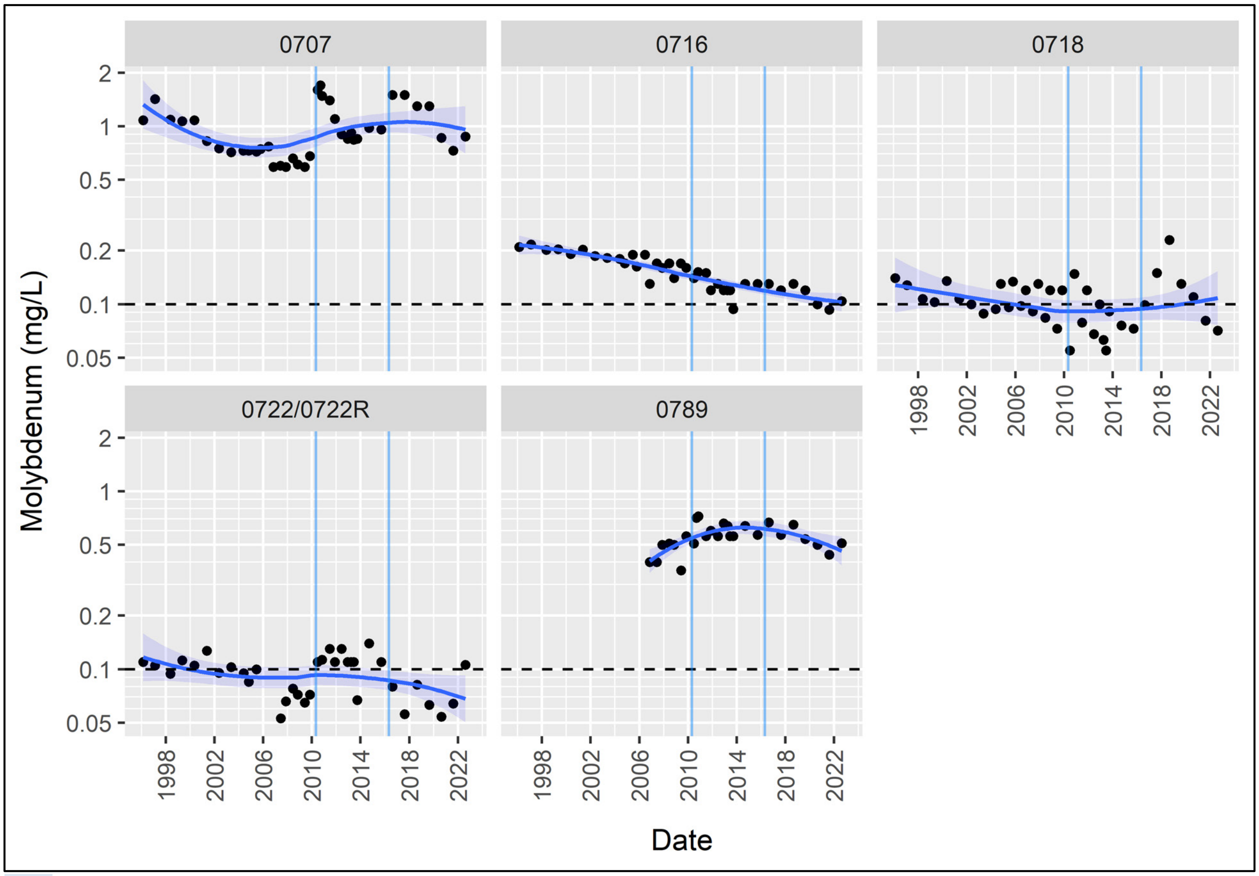


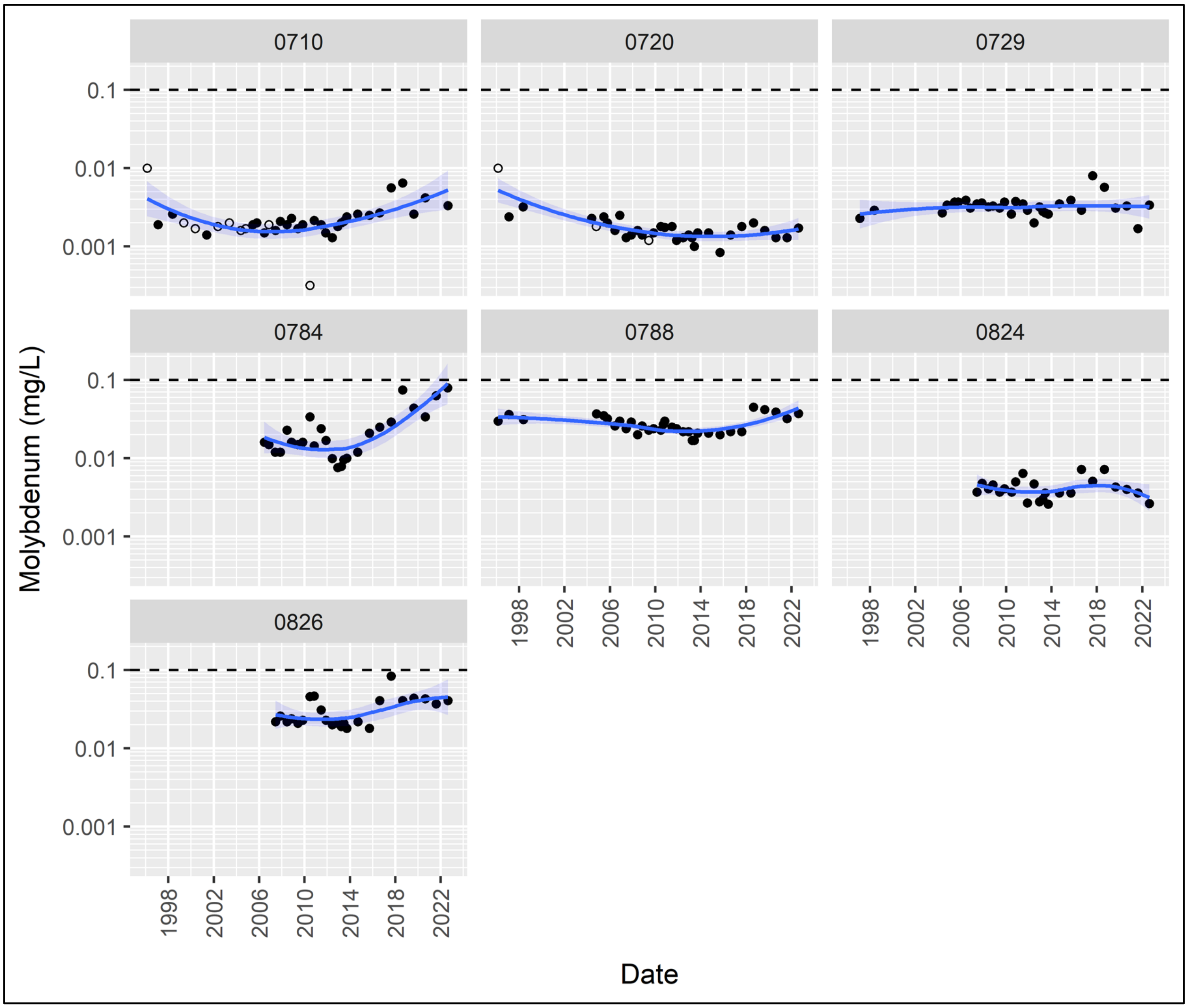
Figure 6. Molybdenum Distribution in the Surficial Aquifer at the Riverton Site in August 2022



LOESS local regression line and 95% confidence interval
0.1 mg/L MCL
2010 and 2016 Little Wind River flood events

Note: Former well 0722 (monitored 1993–2005) was replaced with well 0722R in 2007.

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



● Detect ○ Nondetect
LOESS local regression line and 95% confidence interval
- - - 0.1 mg/L MCL

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

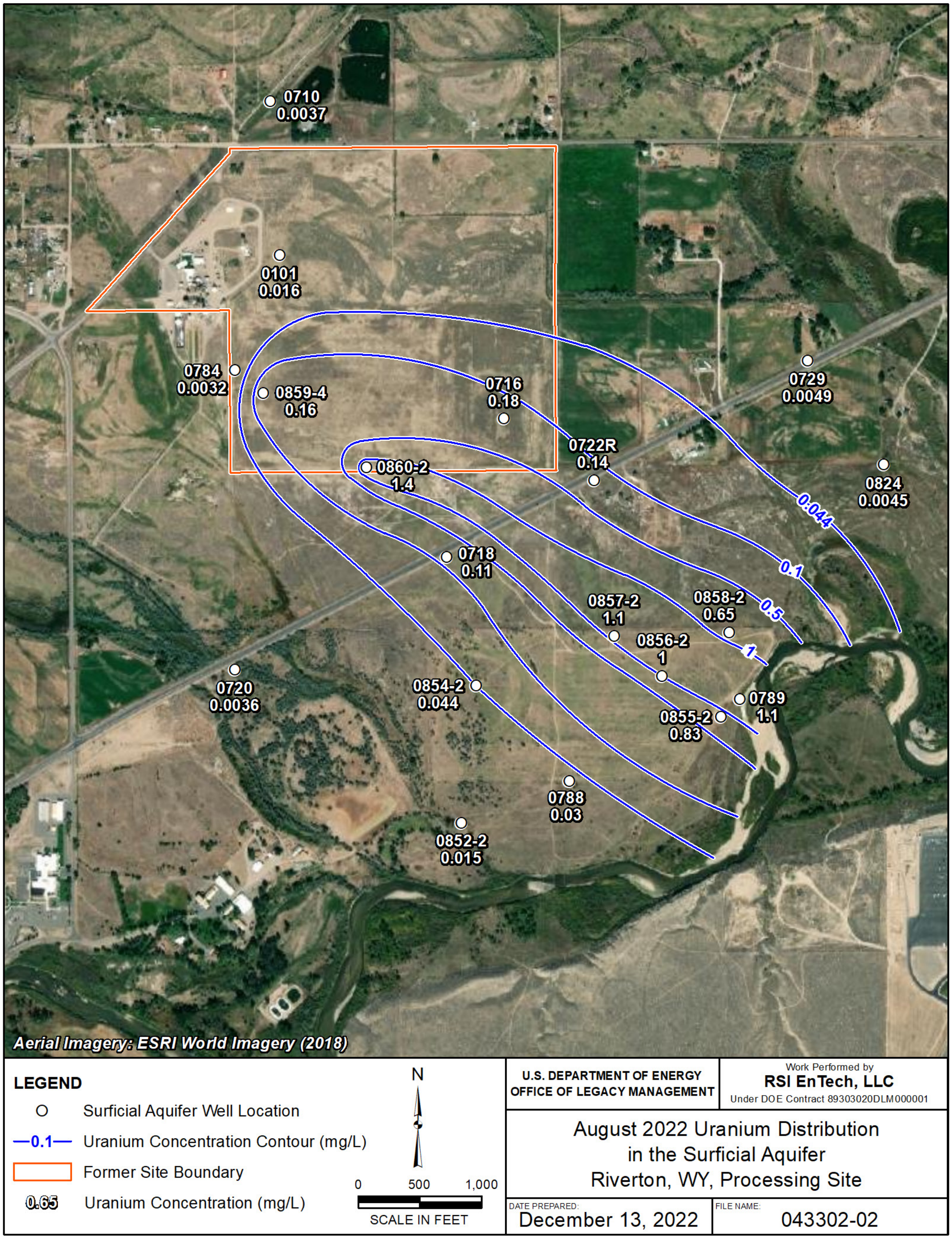
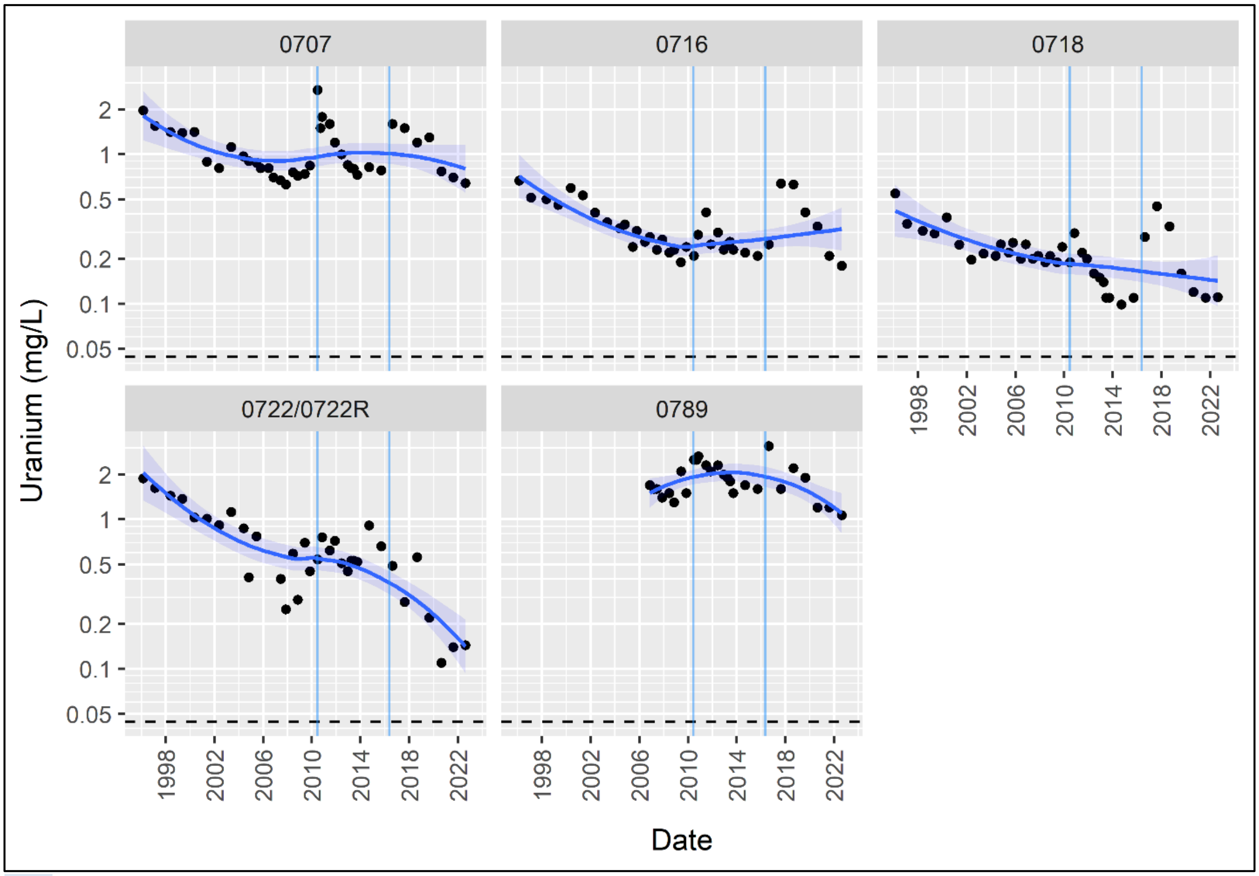


Figure 9. Uranium Distribution in the Surficial Aquifer at the Riverton Site in August 2022



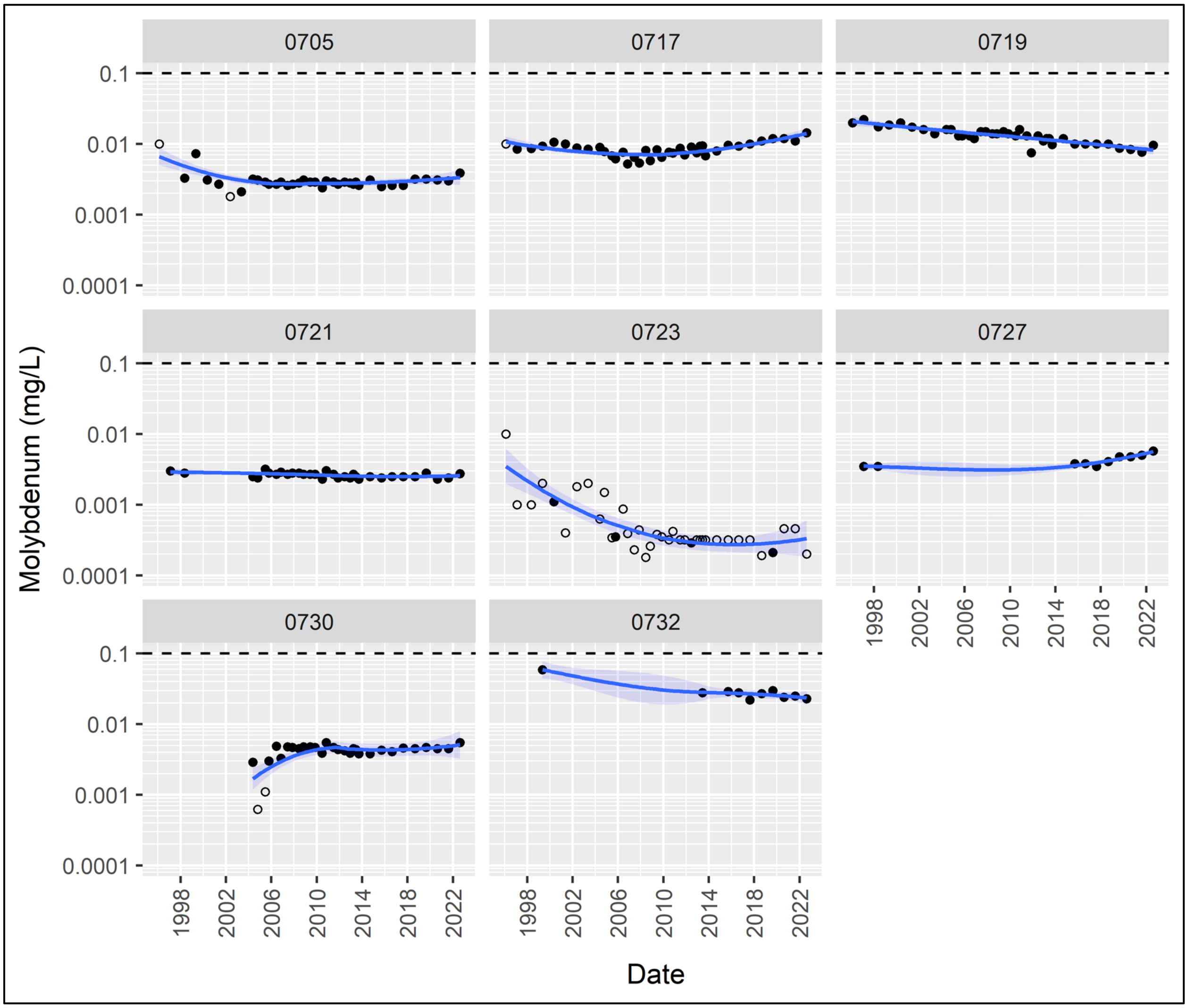
LOESS local regression line and 95% confidence interval

- - - 0.044 mg/L MCL

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

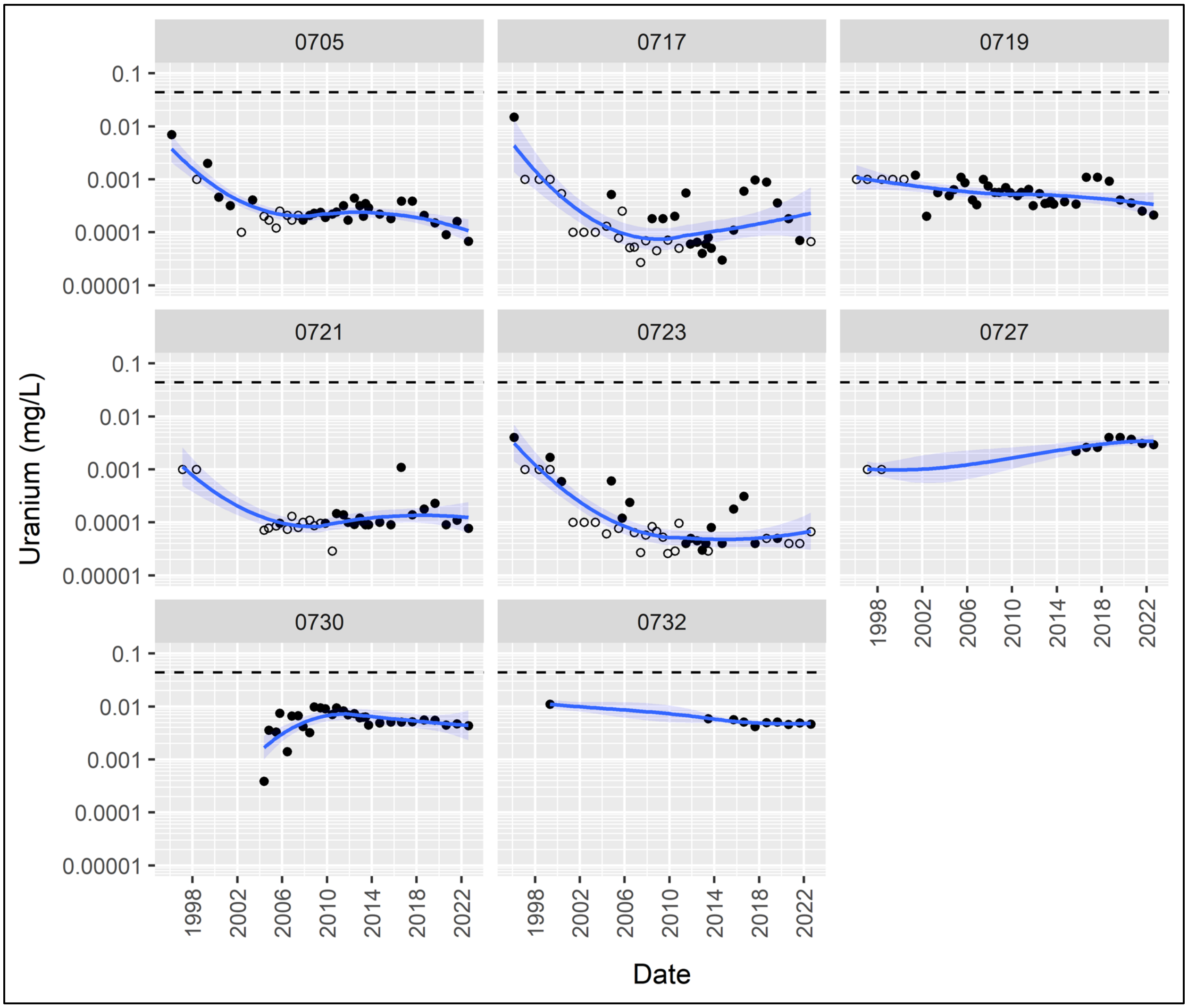
LOESS local regression line and 95% confidence interval
0.044 mg/L MCL

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



● Detect ○ Nondetect
LOESS local regression line and 95% confidence interval
- - - 0.1 mg/L MCL

Figure 12. Molybdenum Concentrations in Semiconfined Aquifer Wells



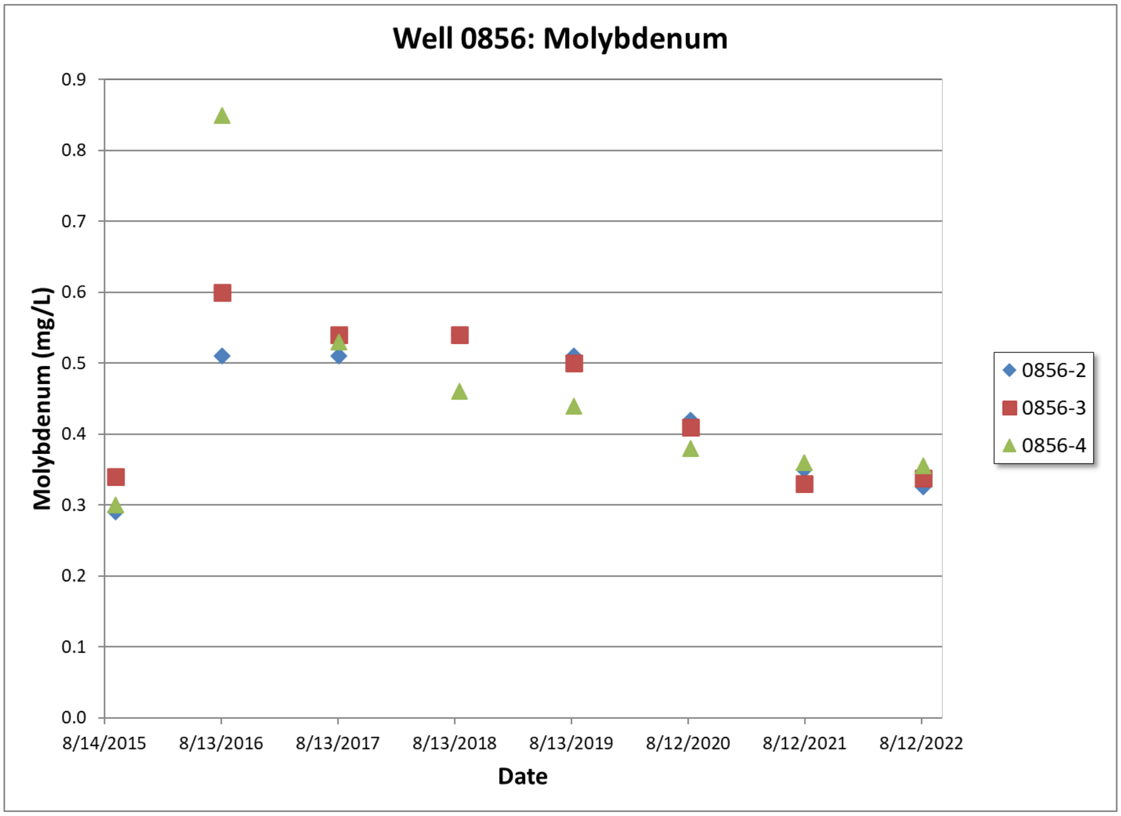
● Detect ○ Nondetect
LOESS local regression line and 95% confidence interval
- - - 0.044 mg/L MCL

Figure 13. Uranium Concentrations in Semiconfined Aquifer Wells

5.1.2.1 Multilevel Monitoring Wells

Nine multilevel groundwater monitoring wells (0852 through 0860) were installed in 2015. Each multilevel monitoring well has four ports designated as -1, -2, -3, and -4 (e.g., 0860-1), with -1 being the top port and -4 being the bottom port. Construction details for the multilevel monitoring wells 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 during the sampling event in August.

Figure 14 shows molybdenum and uranium concentrations, respectively, in multilevel monitoring well 0856, which is downgradient of the former tailings in an area affected by periodic flooding of the Little Wind River. This well had the highest uranium concentration ever measured at the Riverton site in 2016. As shown in these graphs, molybdenum and uranium concentrations were higher after the 2016 and 2017 floods than they were in 2015, which confirms the CSM of contaminants being stored in the unsaturated zone and released during flood events. Molybdenum and uranium concentrations in 2022 continued to remain at the 2021 levels as the surficial aquifer continues to respond to a nonflood year. These figures also show some vertical stratification in the surficial aquifer, particularly after the 2016 flood when contaminants in the unsaturated zone were released into the groundwater. Vertical stratification is shown in numerous multiport wells near the Little Wind River after the 2016 flood (DOE 2019) along with continued stratification in wells 0855, 0859 and 0860 in 2022 (Appendix D). Graphs showing molybdenum and uranium concentrations in all multilevel monitoring wells are provided in Appendix D.



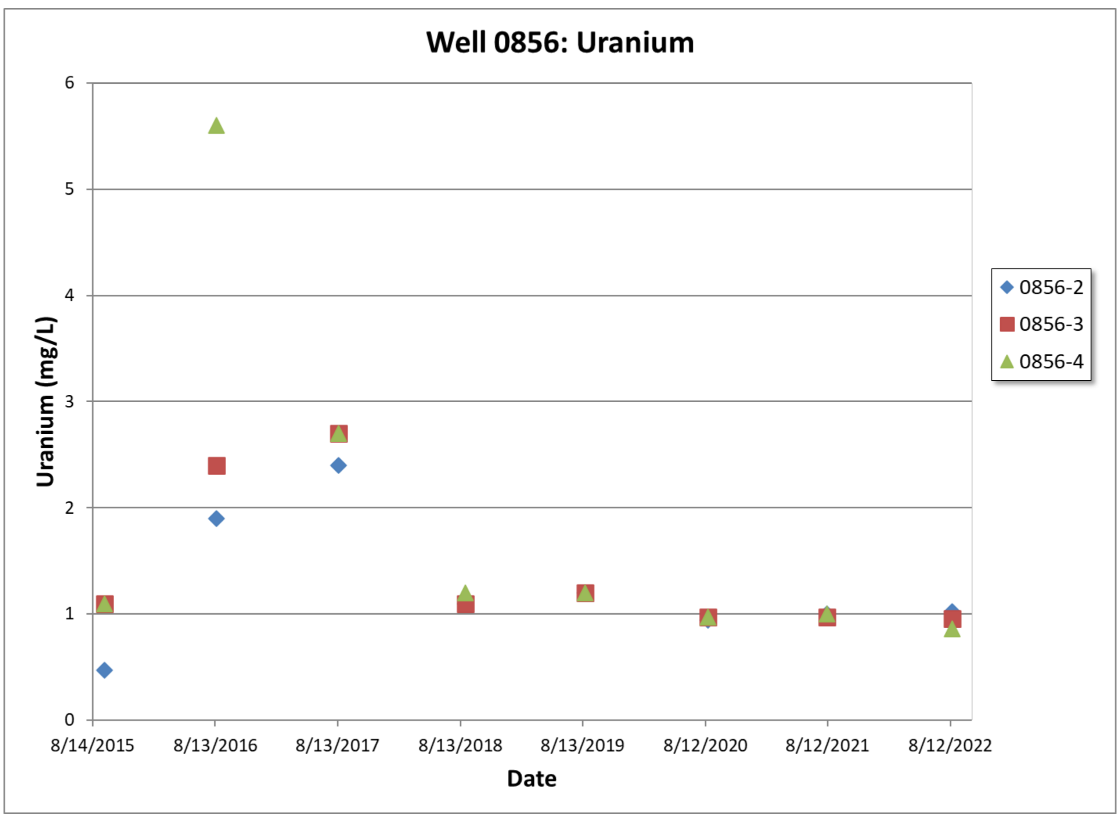


Figure 14. Molybdenum and Uranium Concentrations in Multilevel Monitoring Well 0856

5.1.2.2 Domestic Wells

Domestic wells used as potable water sources at residences within the IC boundary were sampled in 2022. Domestic wells sampled in 2022, with the exception of domestic well 0841, are completed in the confined aquifer; domestic well 0841 is completed in the semiconfined aquifer. 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 (well 0841) to 3 (all other domestic wells) orders of magnitude below the standard. Figure 15 and Figure 16 show time-concentration graphs for molybdenum and uranium, respectively. Appendix A provides data obtained from sampling domestic wells in 2022.

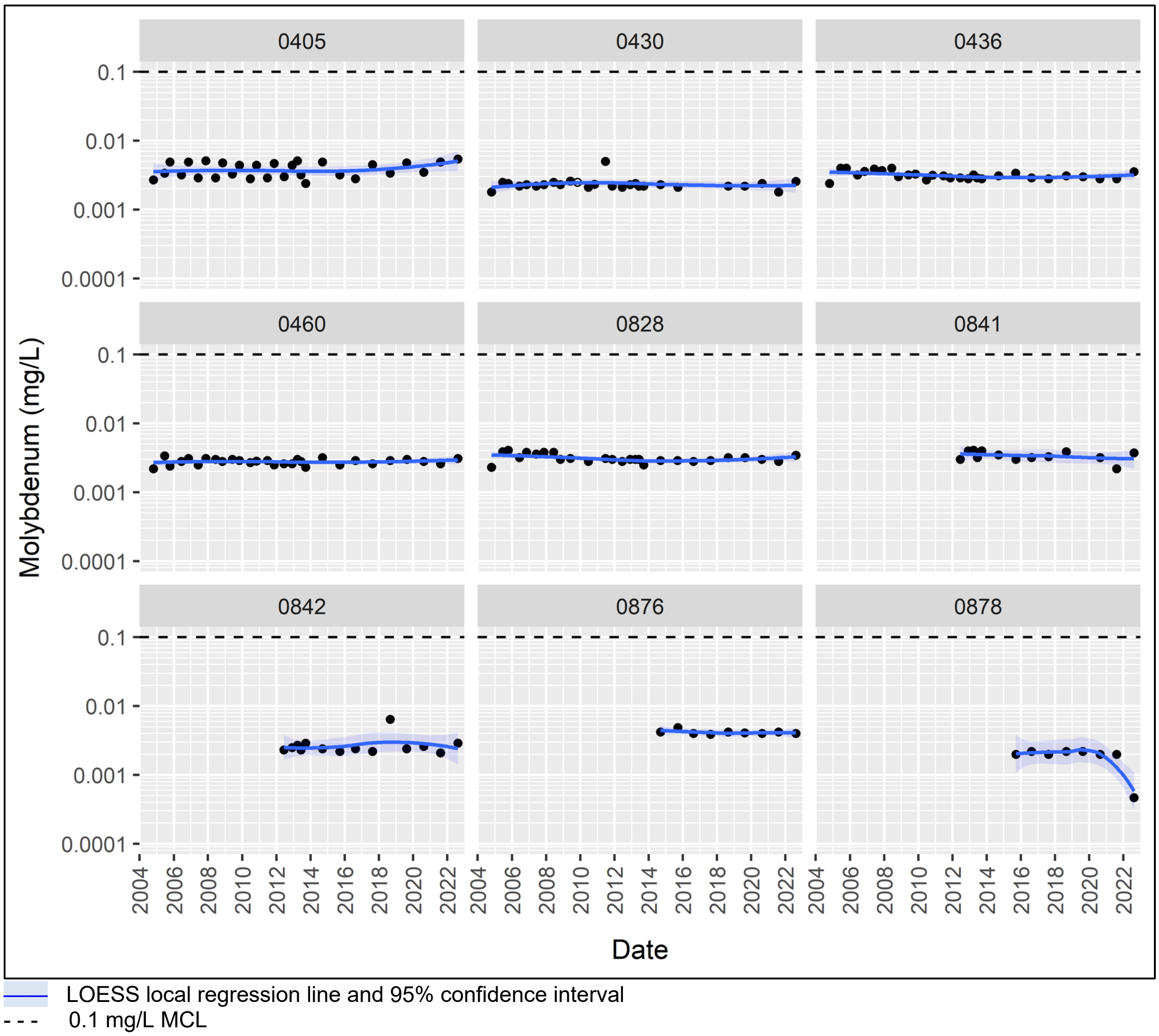
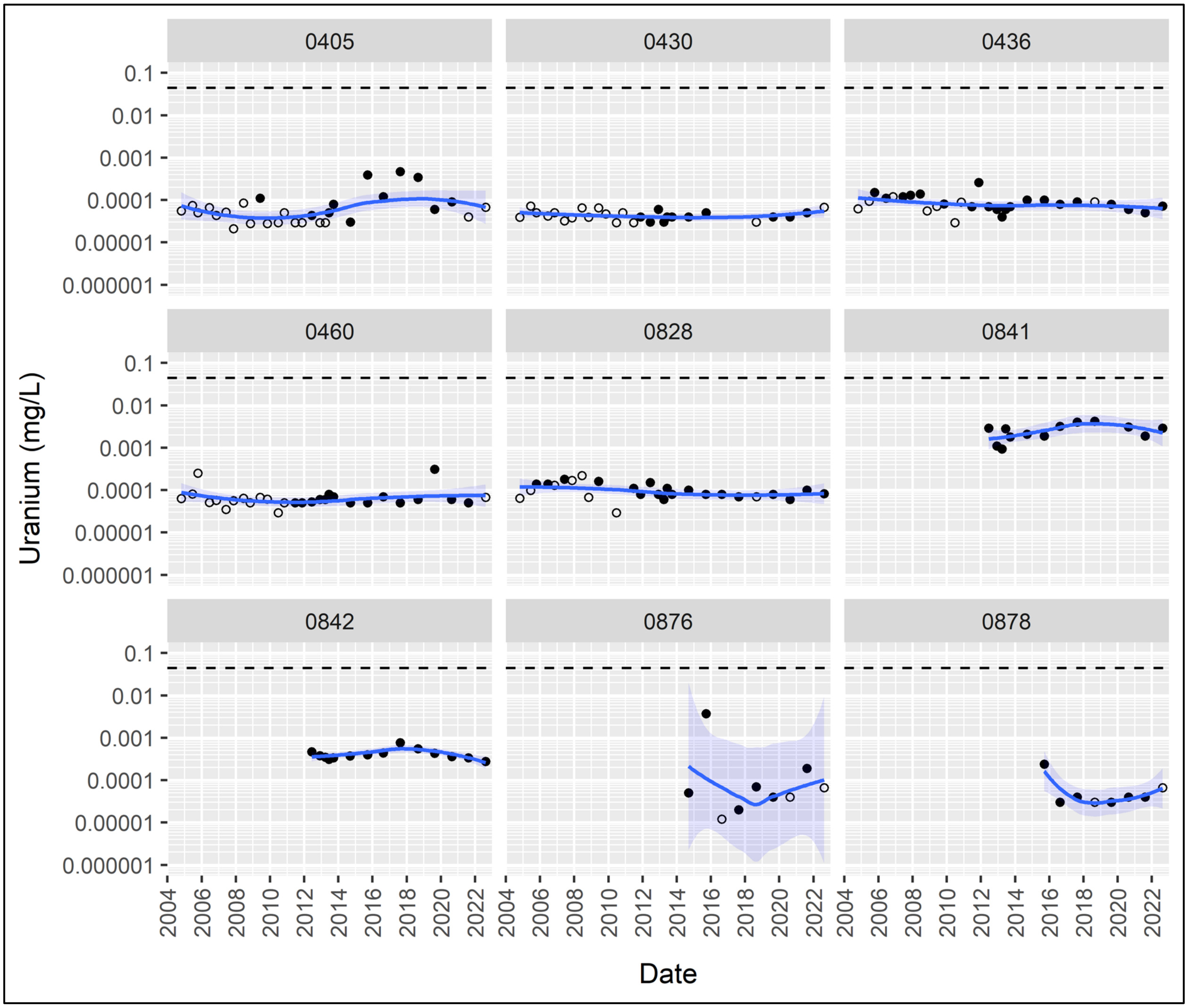


Figure 15. Molybdenum Concentrations in Domestic Wells



● Detect ○ Nondetect
LOESS local regression line and 95% confidence interval
- - - 0.044 mg/L MCL

Figure 16. Uranium Concentrations in Domestic Wells

5.2 Surface Water

5.2.1 Surface Water Flow

Surface water flow in the Little Wind River has a direct impact on groundwater 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 2017. In addition, flooding of the Little Wind River has impacted the geomorphology of the Riverton site next to the Little Wind River with development and evolution of surface water features, such as the oxbow lake and a scour feature in the side channel of the Little Wind River that developed into a seep (Figure 17, location 0879).

Discharge in the Little Wind River is statistically the highest in June, which reflects spring runoff from the Wind River Range. An assessment of Little Wind River discharge data from June indicates that spring runoff and flow in the river were near normal in 2022 (Table 3) (USGS 2023). The peak 2022 discharge of 6260 cfs occurred on June 13, 2022. Figure 18 shows the highest peak discharges recorded since the start of milling operations in 1958 (USGS 2023).

Figure 17. Surface Water Location 0879 in August 2022

Table 3. Discharge from the Little Wind River

Year[a]	Mean June Discharge (cfs)	Deviation from Mean[b] June Discharge (cfs)	Maximum June Discharge (cfs)
2001	233.2	−2107	2090
2002	740.6	−1599	1930
2003	861.7	−1478	2490
2004	1591	−749	4120
2005	2272	−68	4520
2006	642.4	−1698	1710
2007	738.9	−1601	1910
2008	2175	−165	3730
2009	3012	672	4190
2010	5829	3489	13,300
2011	2861	521	7210
2012	594	−1746	1610
2013	587	−1753	1640
2014	1333	−1007	3140
2015	2538	198	4240
2016	3443	1103	11,200
2017	6397	4057	12,855
2018	2375	35	4600
2019	3325	985	7920
2020	500	−1840	3740
2021	1484	−856	4220
2022	2183	-157	6260

Notes:
[a] USGS gaging station statistics.
[b] Based on a mean June discharge of 2340 cfs from 1941 to 2022.

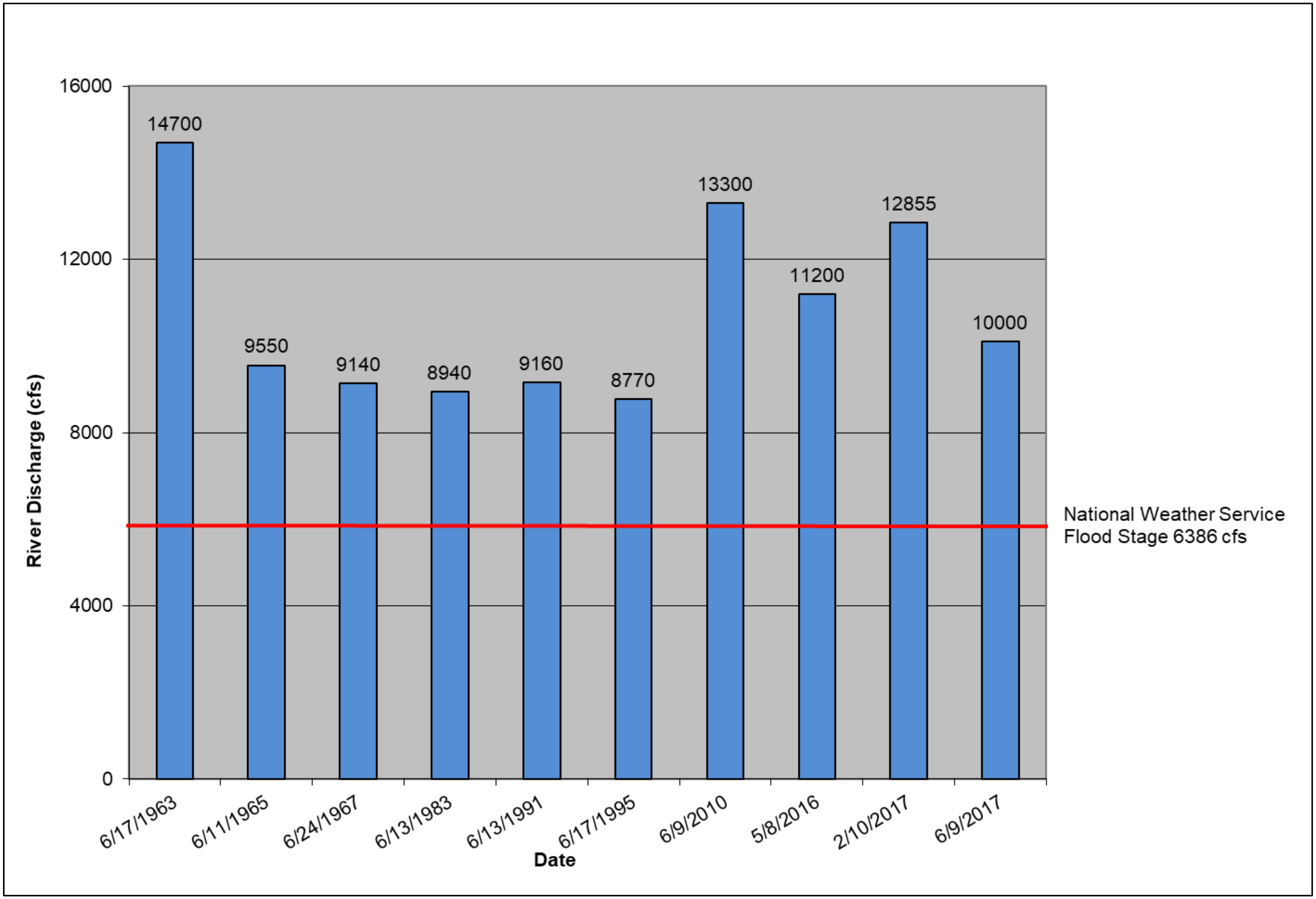


Figure 18. Historical Maximum Discharges of the Little Wind River

5.2.2 Surface Water Quality

Samples were collected at four locations on the Little Wind River (Figure 2), which flows generally to the northeast. Samples were collected from one location upstream of the groundwater plume (location 0794) and from three river locations adjacent to and downstream of the groundwater plume (locations 0811, 0812, and 0796). In 2022, molybdenum and uranium concentrations measured at adjacent and downstream locations were slightly lower than the upstream location 0794, as shown for molybdenum in Figure 19 and for uranium in Figure 20. Groundwater discharge to the river was not evident in 2022 because of dilution from flow in the Little Wind River (225 cfs) on the day the samples were collected from locations 0811 and 0812. Appendix E provides surface water quality data by parameter for all surface water locations sampled during 2022.

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 21 and Figure 22 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 21 for molybdenum and Figure 22 for uranium). This variability is partially attributed to the time these samples are taken. If inflow from the Little Wind River to the oxbow lake occurred just before or during the sampling event, then contaminant concentrations are diluted. In 2022, the Little Wind River was not flowing into the oxbow lake during the August sampling event when low-flow conditions were observed. 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 2022, the concentration of uranium (0.079 mg/L) in the sample collected from the oxbow lake reflected uranium concentrations in the surficial groundwater (Figure 9), which remained above the groundwater MCL but declined without input of secondary source from the unsaturated zone from recent flooding. Molybdenum concentrations in the oxbow lake have been historically below the groundwater MCL and were again in 2022 (Figure 21).

Field observations since 2002 indicate that 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 satellite imagery (Figure 2). Eventually, the oxbow lake will fill in as other abandoned channels have and not be an expression of surface water at the Riverton site. Figure 23 and Figure 24 show an aerial photograph and satellite imagery of the oxbow lake in 2003 and 2022, respectively, which illustrates the progress of the vegetation and sedimentation filling in the ponded water.

Surface water location 0879 is a scour feature in the side channel of the Little Wind River that developed into a seep (Figure 2). This location receives discharge of contaminated groundwater when water levels are high enough in the surficial aquifer; however, this location was dry in 2022 (Figure 17).

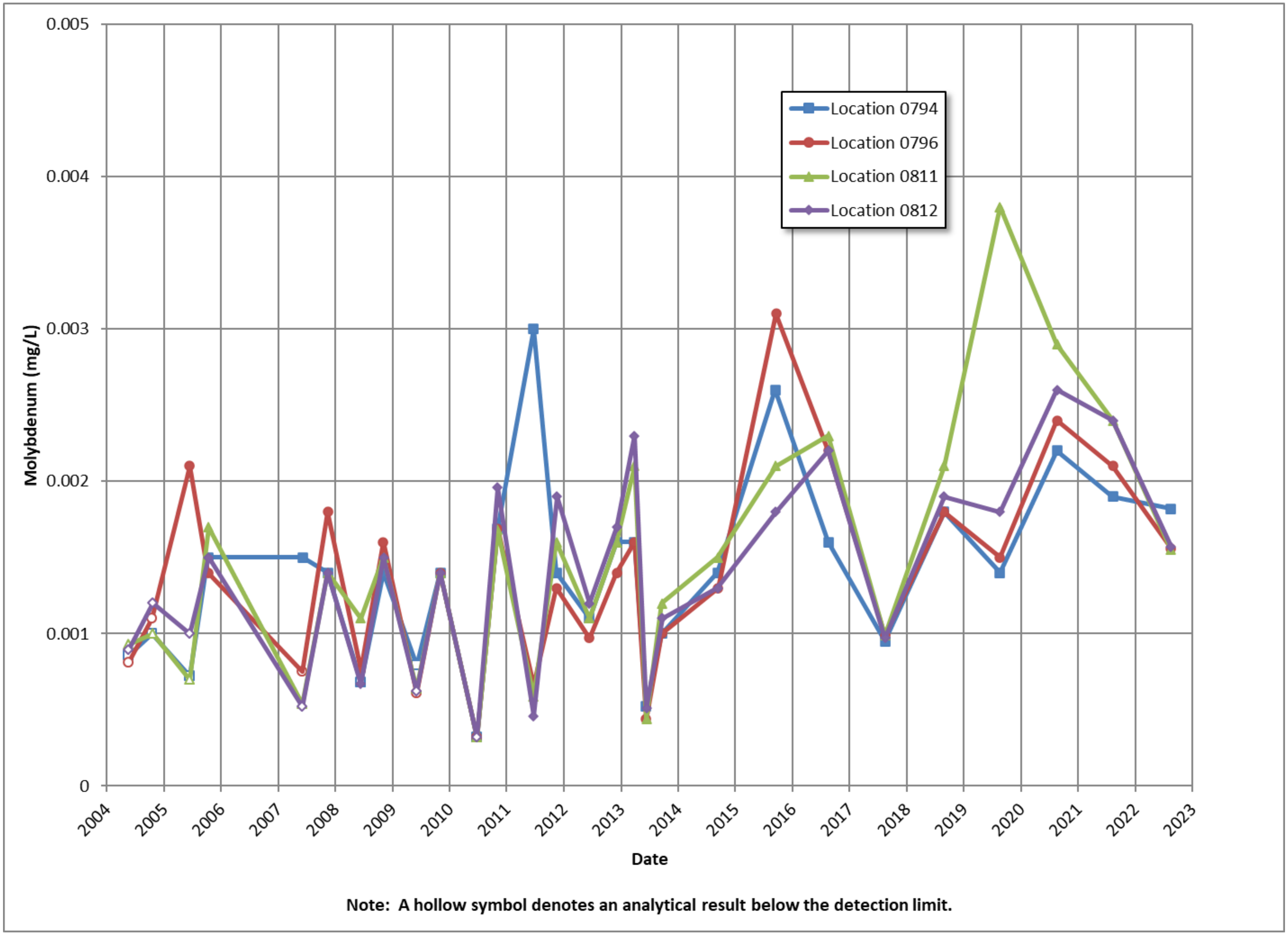


Figure 19. Molybdenum Concentrations in Little Wind River Locations

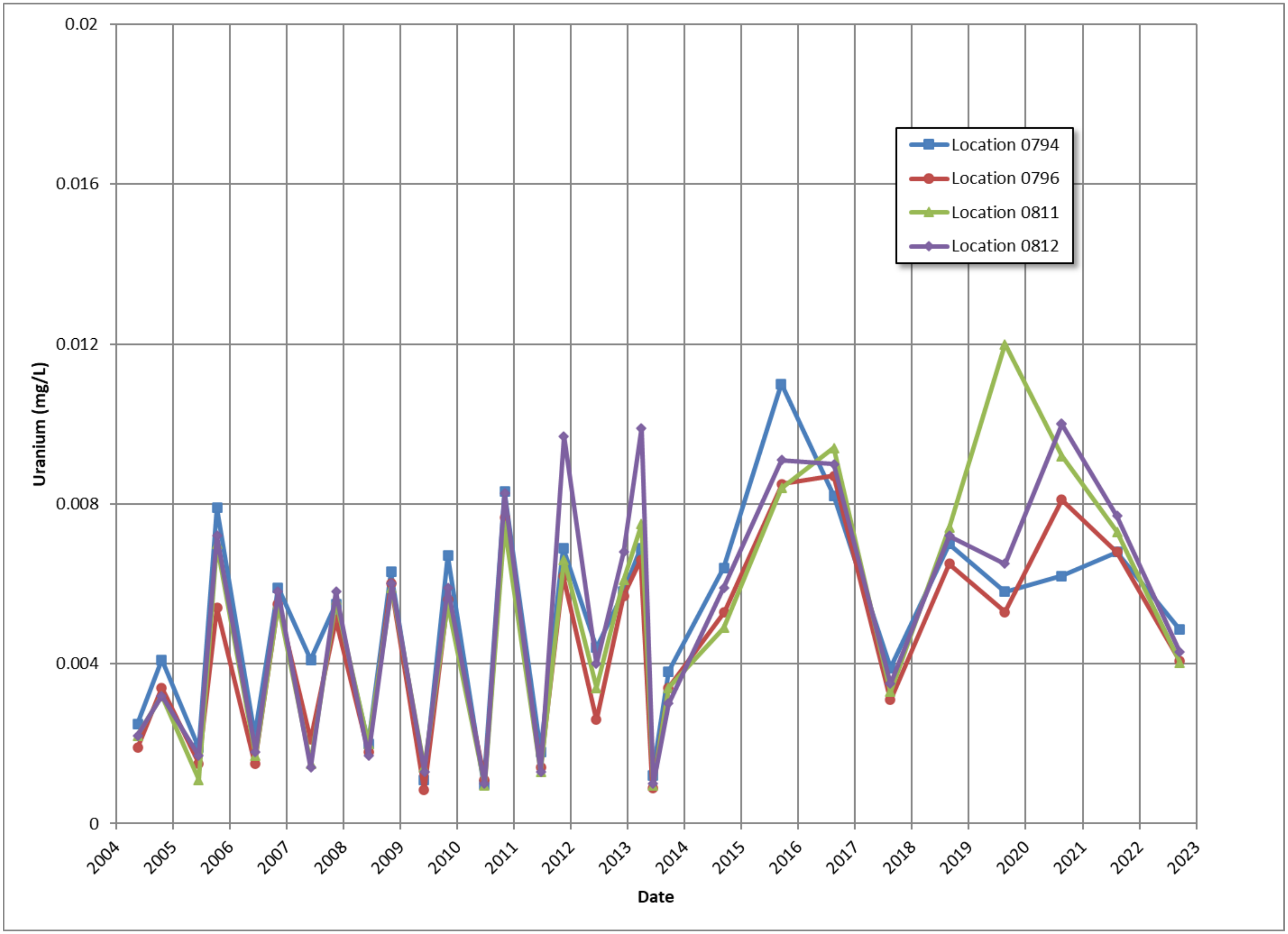


Figure 20. Uranium Concentrations in Little Wind River Locations

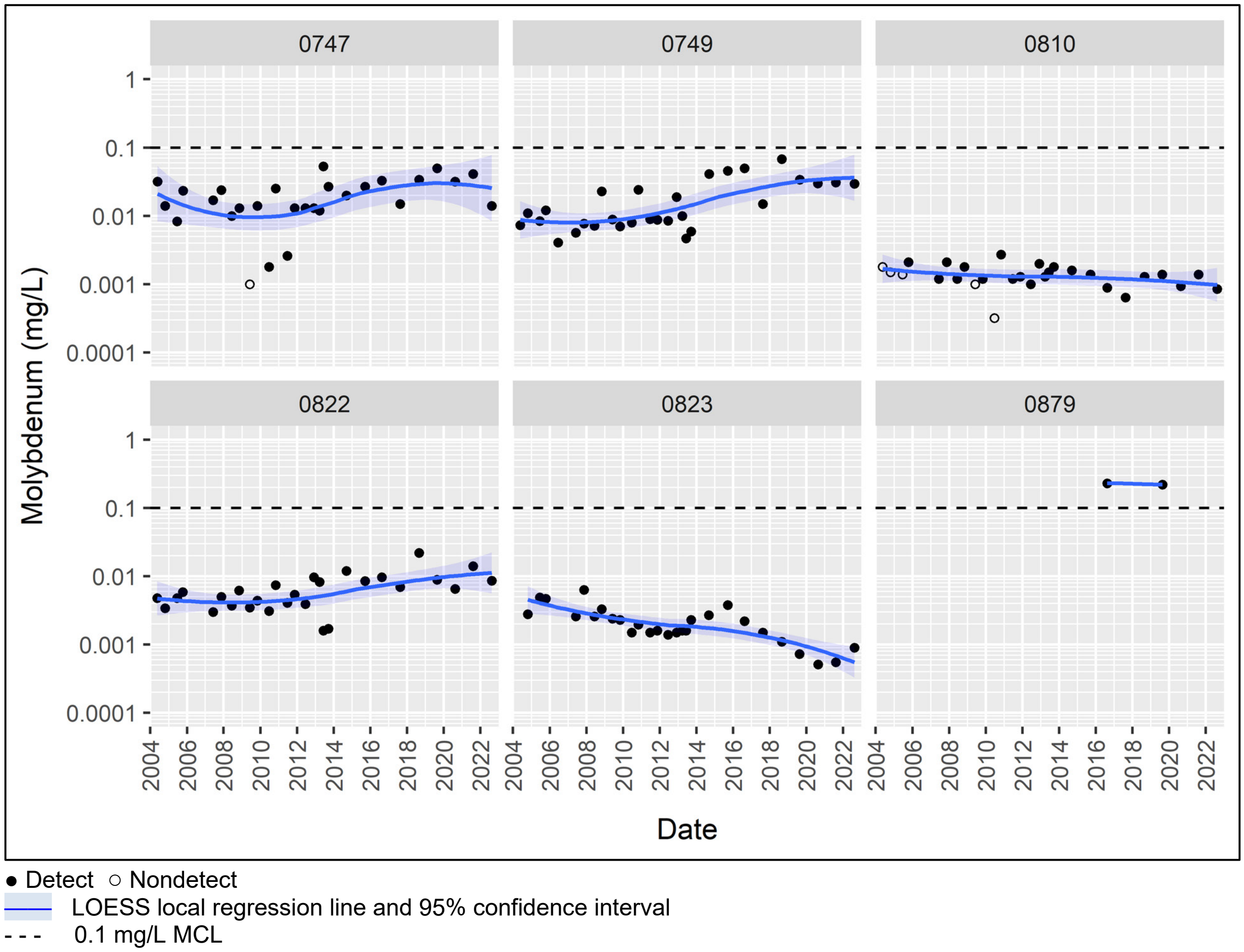
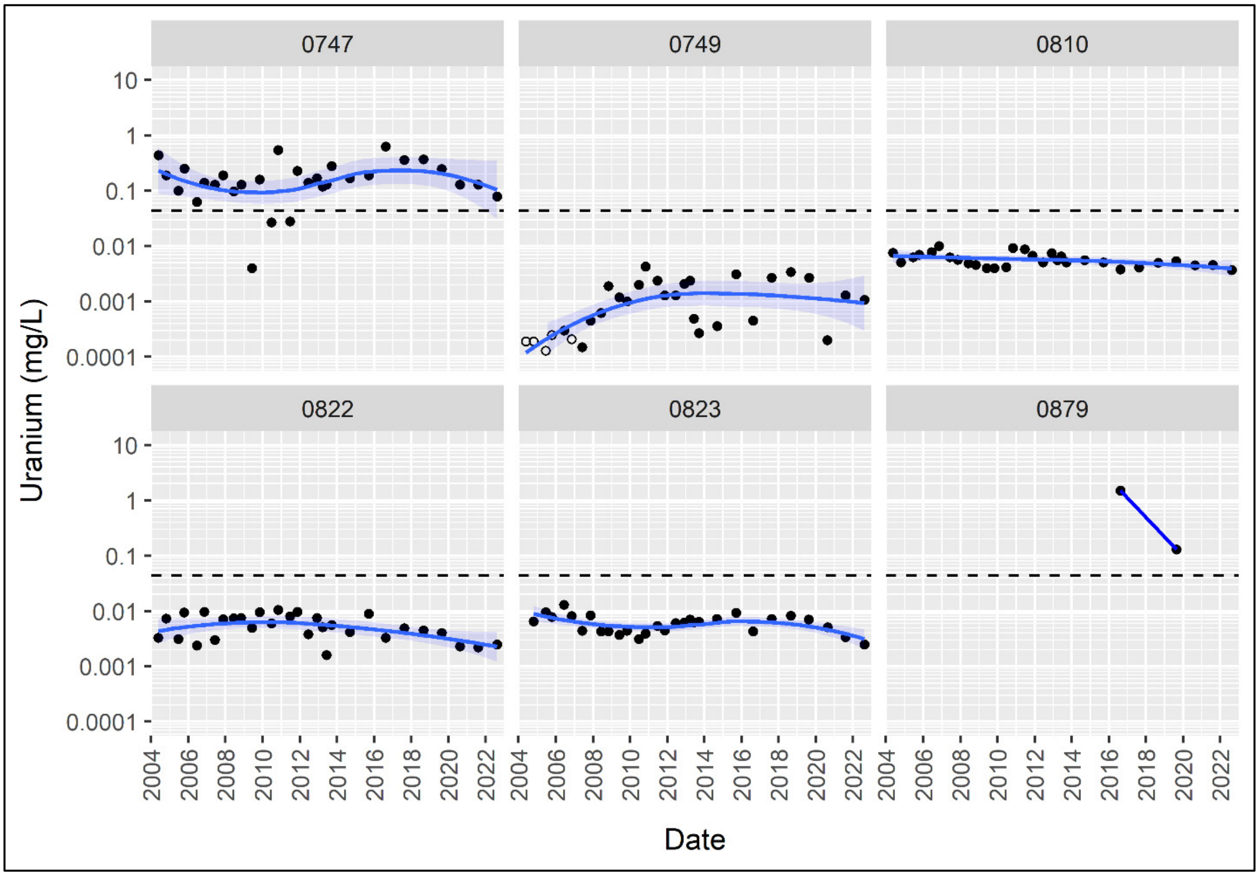


Figure 21. Molybdenum Concentrations in Ponds, Ditches, and Seeps



● Detect ○ Nondetect
LOESS local regression line and 95% confidence interval
- - - 0.044 mg/L MCL

Figure 22. Uranium Concentrations in Ponds and Ditches

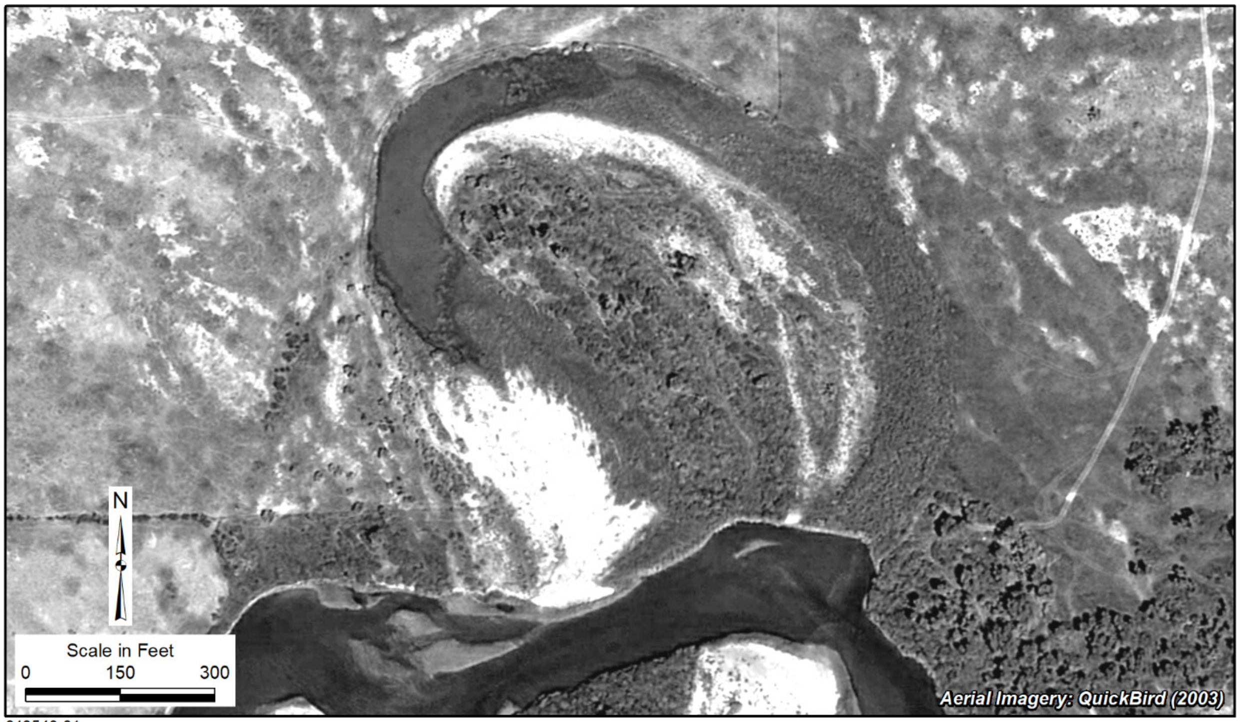


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Figure 23. Satellite Imagery of the Oxbow Lake in 2003

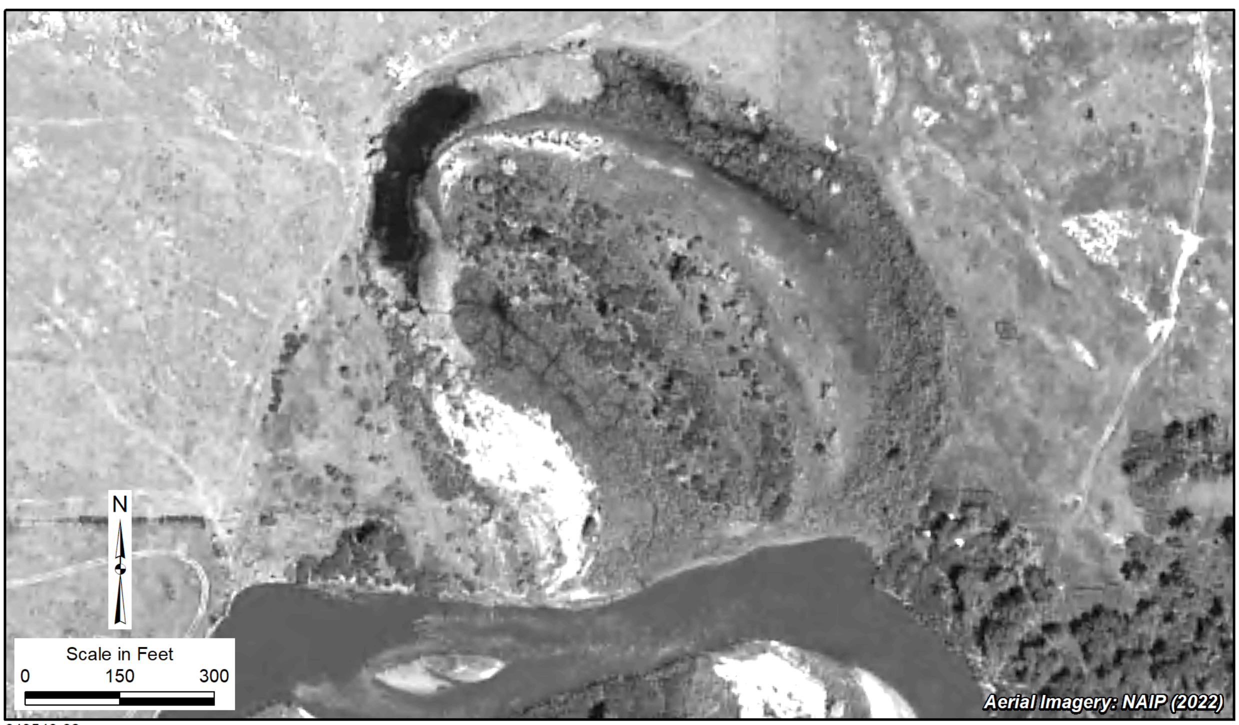

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Figure 24. Satellite Imagery of the Oxbow Lake in 2022

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 2013. In June 2013, however, concentrations were significantly reduced (550 mg/L at location 0749) because of a change in plant processes that reduced sulfate in water discharge and in 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 elevated but variable (Figure 25), with a concentration of 1850 mg/L measured in August 2022 compared to the Chemtrade process water well 0460 with 176 mg/L sulfate. The unlined ditch will continue to be monitored because it is a continual source of sulfate to the surficial aquifer.

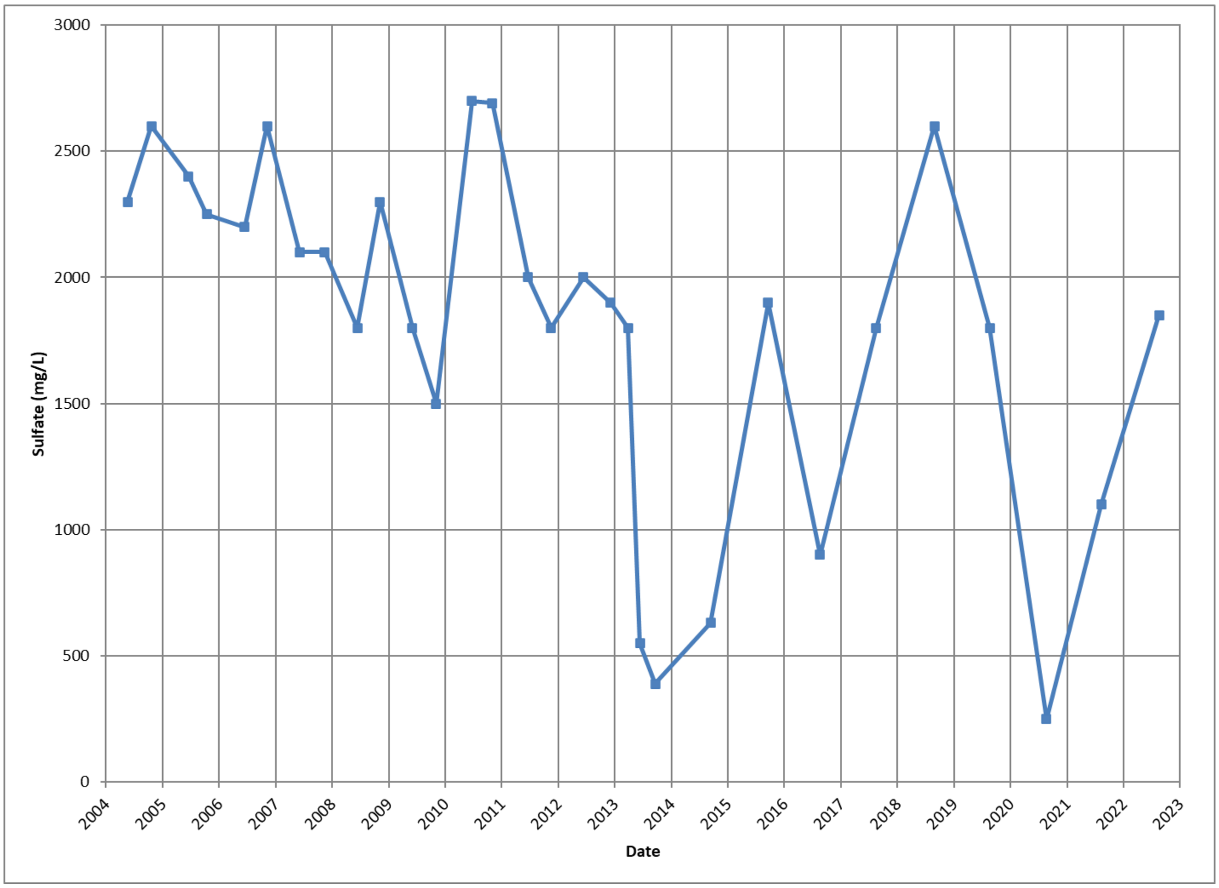

Figure 25. Sulfate Concentrations at Location 0749

Concentrations of molybdenum and uranium in the Chemtrade ditch (location 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 (0.0296 mg/L) was elevated compared to the molybdenum concentration in process water used by the sulfuric acid plant that is supplied by well 0460 (0.00311 mg/L); this indicates some molybdenum input from plant processes. The concentration of uranium in the sample collected from the ditch was low (0.00107 mg/L) but elevated compared to concentrations of the process water used at the plant (not detected, <0.000067 mg/L), which indicates some uranium input from plant processes.

Downstream of the Chemtrade ditch, a sample was collected from the west side irrigation ditch (location 0822). The molybdenum concentrations in this irrigation ditch are consistently lower than the Chemtrade ditch sample (location 0749) (Figure 21), which reflects a mixing of the ditch water with upgradient surface water or groundwater along the ditch flow path from location 0749 to location 0822 (Figure 2). The uranium concentrations in the west side irrigation ditch (0822) (Figure 21) have been relatively consistent through time, are similar to background groundwater and surface water concentrations (locations 810 and 823), and thus indicate no impacts to the water quality in the ditch with respect to uranium.

6.0 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 1998b) in 1998. Before 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. Before 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 reveals that uranium concentrations spiked in monitoring well 0707 in 1991, 1995, 2010, 2016, and 2017 following floods of the Little Wind River (Figure 26). Uranium concentrations in well 0707 decreased from 2020 to 2022 when there was no overbank flooding of the Little Wind River and, therefore, no additional contaminant transfer from the unsaturated zone to the surficial aquifer. Figure 27 shows the average uranium concentration in surficial aquifer wells with a long history above the MCL (wells 0707, 0716, 0718, and 0722/0722R). As shown in Figure 27, the average uranium concentration in these wells increased significantly after the 2010 flood event, increased again after the 2016 and 2017 flood events, and continues to decline in nonflood years.

Although the 2010 flood of the Little Wind River caused significant spikes in contaminant concentrations in the surficial aquifer, uranium concentrations declined to preflood concentrations by 2013 (Figure 26 and Figure 27). These data indicate that the effects of the 2010 flood are relatively short-lived in the context of the 100-year regulatory time frame. In 2016, significant concentration increases were seen again for molybdenum, uranium, and sulfate (Table 4, Figure 26, and Figure 27). Concentrations of uranium generally remained high after the 2016 and 2017 floods compared to preflood levels but have declined since 2017 after 5 years without a significant flood (Figure 26 and Figure 27).

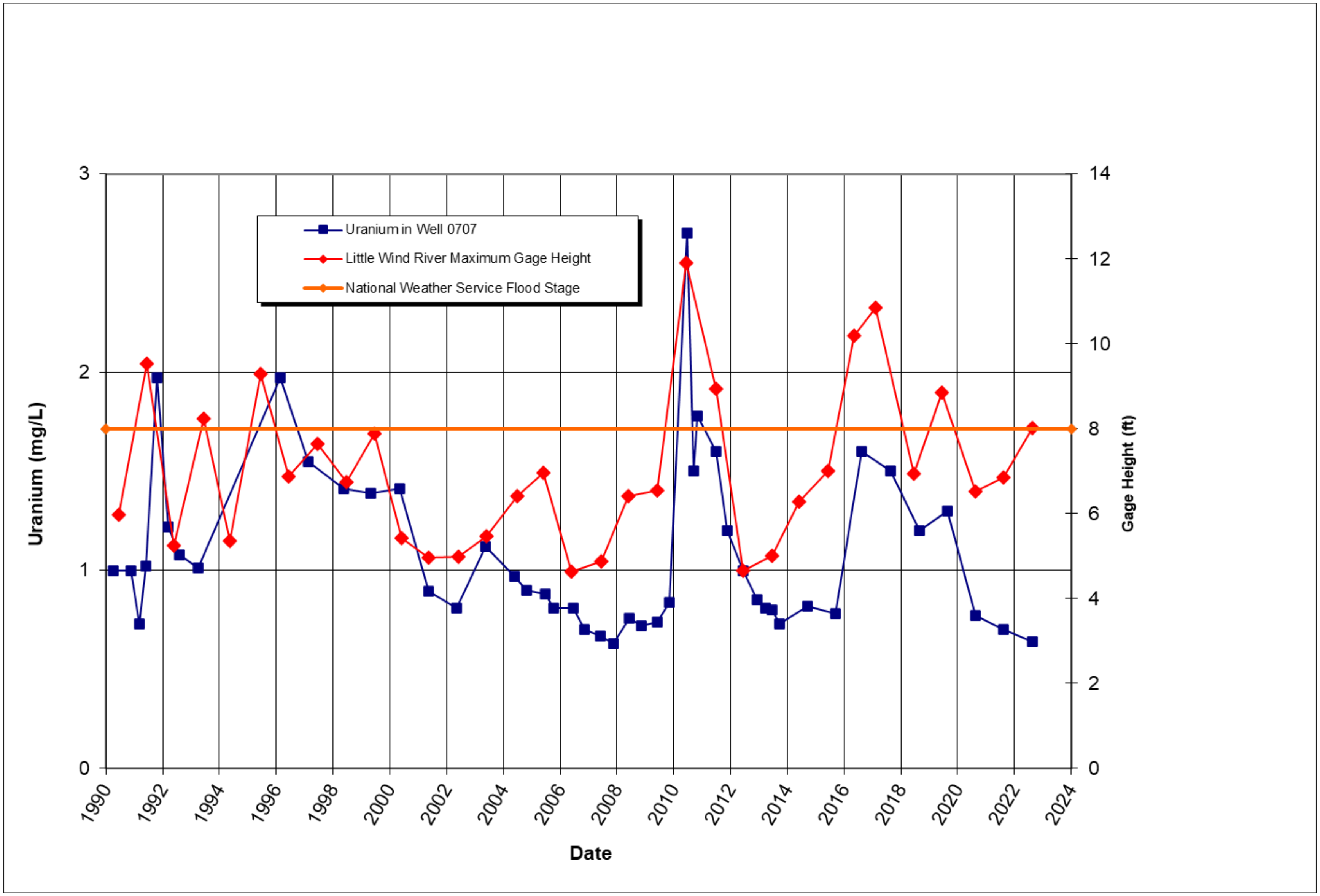

Figure 26. Uranium Concentrations in Monitoring Well 0707 Versus Little Wind River Stage

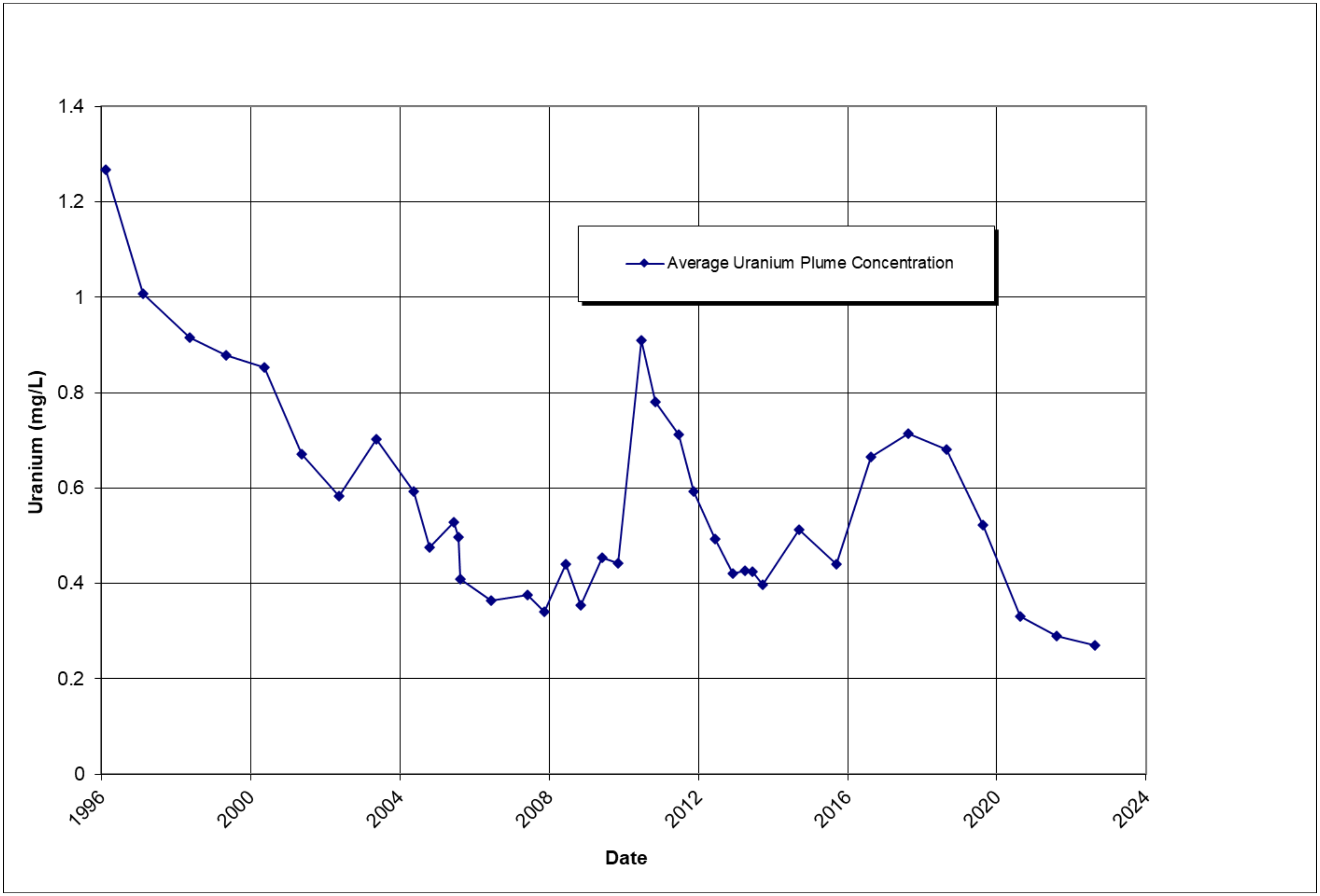

Figure 27. Average Uranium Concentrations in the Surficial Aquifer (Wells 0707, 0716, 0718, and 0722/0722R)

Table 4. Comparison of Preflood (2009 and 2015), Flood (2016), and 2022 Results

Well	Molybdenum			Uranium			Sulfate		
	Preflood[a]	Flood 2016	2022	Preflood[a]	Flood 2016	2022	Preflood[a]	Flood 2016	2022
0707	0.68	1.5	0.876	0.84	1.6	0.642	1900	5800	1820
0788	0.024	0.022	0.0373	0.034	0.059	0.0301	630	2800	1170
0789	0.51	0.67	0.511	1.3	3.1	1.07	3900	11,000	4420
0826	0.023	0.041	0.041	0.041	0.072	0.0266	580	3400	907
0855-4	0.25	0.25	0.347	0.31	1.1	0.576	5100	6600	4820
0856-4	0.30	0.83	0.356	1.1	5.6	0.858	4000	14,000	3790

Notes:
Units are mg/L.
[a] Preflood data are from November 2009 for wells 0707, 0788, 0789, and 0826 and from August 2015 for wells 0855-4 and 0856-4.

Overall, natural flushing (contaminant movement and removal via groundwater flow) in the surficial aquifer is occurring; however, when natural flushing is coupled with the addition of secondary sources from the saturated (former mill site) and unsaturated (near the Little Wind River) zone, the rate does not appear to be fast enough to restore the aquifer within the 100-year regulatory time requirement (DOE 2022c). Several lines of evidence indicate that the natural flushing compliance strategy will not meet the 2098 target date. These include:

- Current plume configurations and magnitude.
    - A uranium concentration of 1.43 mg/L was measured in groundwater beneath the former mill site in 2022. Research indicates that the high uranium concentration is influenced by additional sources in the saturated zone (DOE 2022c).
    - Uranium concentrations in the center of the plume adjacent to the Little Wind River were as high as 1.08 mg/L in 2022, which is 2 orders of magnitude higher than 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 28 and Figure 29).
- At other UMTRCA sites with similar geology and contaminants, concentrations of groundwater COCs are not attenuating as quickly as predicted by groundwater modeling (Shafer et al. 2014).
- Time versus concentration graphs for some individual wells in the contaminant plume at the Riverton site show flat trendlines (Figure 7 and Figure 10).
- 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 (DOE 2022c).
- Additional contaminants in the saturated zone, unsaturated zone, or both (Section 2.0) (DOE 2016) may be acting as additional contaminant sources for elevated concentrations in groundwater (DOE 2022c).

Based on the information above, natural flushing will not reduce contaminant concentrations in the surficial aquifer to levels below the MCL within the 100-year regulatory time frame. Ongoing work will include an assessment of data gaps to be answered to complete reactive transport modeling and assess new compliance strategies for the Riverton site (DOE 2022c). This work will result in a recommendation for a new compliance strategy that will be detailed in a new Groundwater Compliance Action Plan.

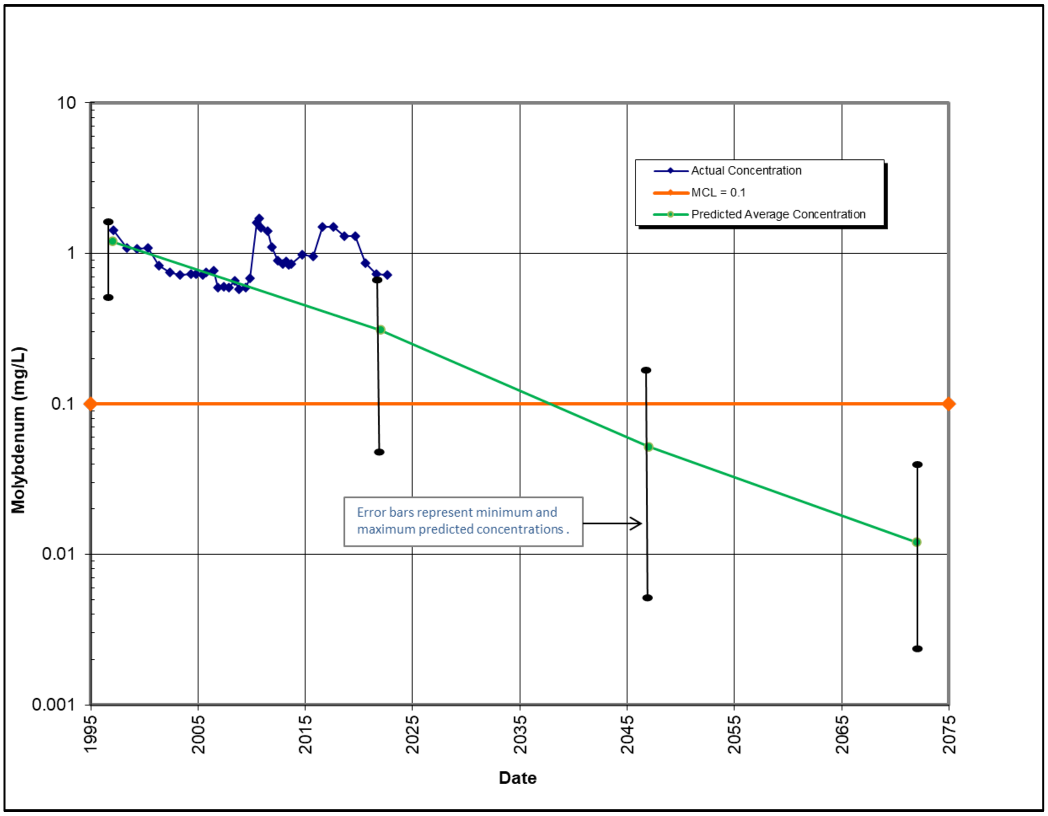

Figure 28. Predicted Versus Measured Molybdenum Concentrations in Well 0707

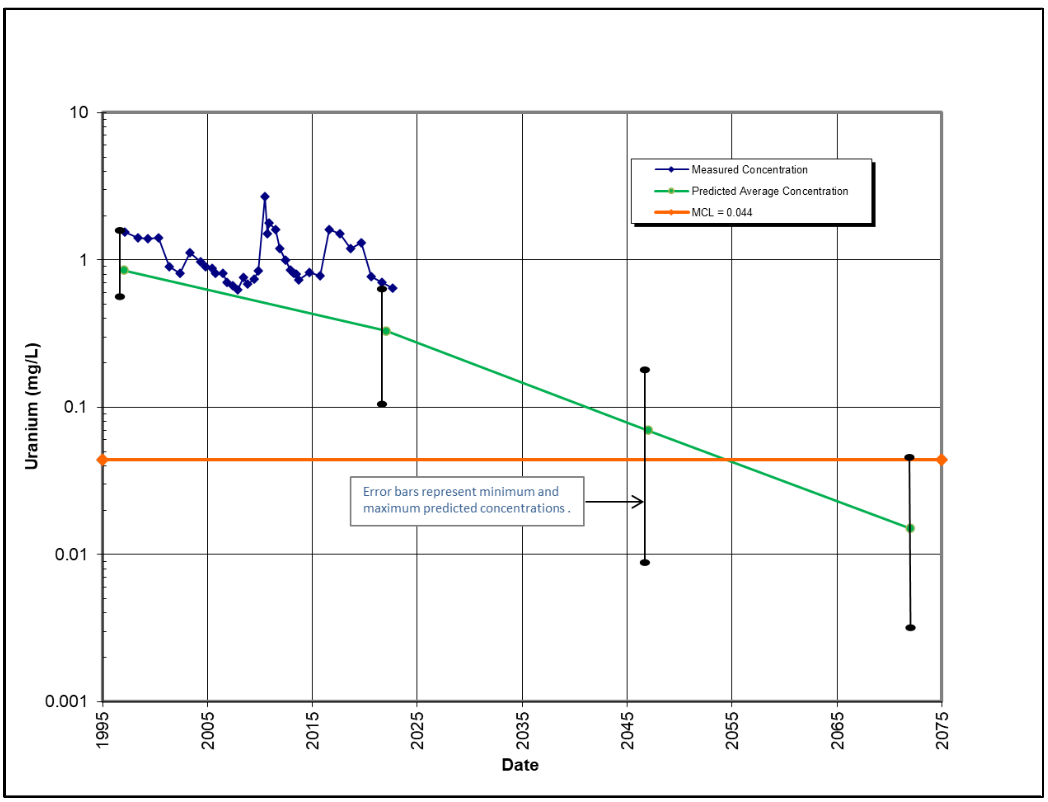

Figure 29. Predicted Versus Measured Uranium Concentrations in Well 0707

7.0 Conclusion and Recommendations

Verification monitoring results from 2022 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. Cooperative work continues with the Northern Arapaho Tribe to ensure that the AWWS functions as a viable IC into the future. Current work includes the engineering assessment and design for upgrades to the AWSS. In addition, verification monitoring results continue to verify that mill-related contamination has not impacted any potable domestic wells within the IC boundary and has not impacted water quality in the Little Wind River or the gravel pit ponds.

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 preflood levels by 2013. A flood in 2016 and two floods on the Little Wind River in 2017 confirmed that contaminant concentrations tend to spike after a flood event in the inundated area. In 2022, contaminant concentrations continued to decline after 5 years without significant flooding of the Little Wind River.

LM has gained a better understanding of the CSM, contaminant distributions, and properties of the surficial aquifer's unsaturated zone at the Riverton site. As a result, LM has determined that the natural flushing compliance strategy will not reduce contaminant concentrations in the surficial aquifer to levels below the MCL within the 100-year regulatory time frame; therefore, new compliance strategies will be evaluated, and a new compliance strategy will be selected and presented to the U.S. Nuclear Regulatory Commission for concurrence.

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Appendix A

Domestic Well Data

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (EQuIS200) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 12/14/2022 11:47:43 AM

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Alkalinity, Total (As CaCO3)													
Alkalinity, Total (As CaCO3)	0405	WL	8/17/2022	(N)F			23	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0430	WL	8/17/2022	(N)F			145	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0436	WL	8/17/2022	(N)F			151	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0460	WL	8/16/2022	(N)F			135	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0828	WL	8/17/2022	(N)F			138	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0841	WL	8/17/2022	(N)F			168.571	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0842	WL	8/17/2022	(N)F			143.333	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0876	WL	8/17/2022	(N)F			16	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0878	WL	8/17/2022	(N)F			122	mg/L			#	-	-
Manganese													
Manganese	0405	WL	8/17/2022	(T)F			0.00309	mg/L	B		#	0.002	-
Manganese	0430	WL	8/17/2022	(T)F			0.00587	mg/L	B		#	0.002	-
Manganese	0436	WL	8/17/2022	(T)F			0.00299	mg/L	B		#	0.002	-
Manganese	0460	WL	8/16/2022	(T)F			0.002	mg/L	U		#	0.002	-
Manganese	0828	WL	8/17/2022	(T)F			0.00302	mg/L	B		#	0.002	-
Manganese	0841	WL	8/17/2022	(T)D			0.107	mg/L			#	0.002	-
Manganese	0841	WL	8/17/2022	(T)F			0.122	mg/L			#	0.002	-
Manganese	0842	WL	8/17/2022	(T)F			0.051	mg/L			#	0.002	-
Manganese	0876	WL	8/17/2022	(T)F			0.00261	mg/L	B		#	0.002	-
Manganese	0878	WL	8/17/2022	(T)F			0.0632	mg/L			#	0.002	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (EQuIS200) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 12/14/2022 11:47:43 AM

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Molybdenum													
Molybdenum	0405	WL	8/17/2022	(T)F			0.00543	mg/L			#	0.0002	-
Molybdenum	0430	WL	8/17/2022	(T)F			0.00257	mg/L	B		#	0.0002	-
Molybdenum	0436	WL	8/17/2022	(T)F			0.00357	mg/L			#	0.0002	-
Molybdenum	0460	WL	8/16/2022	(T)F			0.00311	mg/L			#	0.0002	-
Molybdenum	0828	WL	8/17/2022	(T)F			0.00346	mg/L			#	0.0002	-
Molybdenum	0841	WL	8/17/2022	(T)D			0.0032	mg/L			#	0.0002	-
Molybdenum	0841	WL	8/17/2022	(T)F			0.00374	mg/L			#	0.0002	-
Molybdenum	0842	WL	8/17/2022	(T)F			0.0029	mg/L	B		#	0.0002	-
Molybdenum	0876	WL	8/17/2022	(T)F			0.00402	mg/L			#	0.0002	-
Molybdenum	0878	WL	8/17/2022	(T)F			0.000467	mg/L	B		#	0.0002	-
pH													
pH	0405	WL	8/17/2022	(N)F			8.79	s.u.			#	-	-
pH	0430	WL	8/17/2022	(N)F			8.82	s.u.			#	-	-
pH	0436	WL	8/17/2022	(N)F			8.73	s.u.			#	-	-
pH	0460	WL	8/16/2022	(N)F			9.07	s.u.			#	-	-
pH	0828	WL	8/17/2022	(N)F			8.75	s.u.			#	-	-
pH	0841	WL	8/17/2022	(N)F			7.76	s.u.			#	-	-
pH	0842	WL	8/17/2022	(N)F			7.67	s.u.			#	-	-
pH	0876	WL	8/17/2022	(N)F			9.18	s.u.			#	-	-
pH	0878	WL	8/17/2022	(N)F			8.15	s.u.			#	-	-
Specific Conductance													
Specific Conductance	0405	WL	8/17/2022	(N)F			1026	umhos/cm			#	-	-
Specific Conductance	0430	WL	8/17/2022	(N)F			746	umhos/cm			#	-	-
Specific Conductance	0436	WL	8/17/2022	(N)F			872	umhos/cm			#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (EQuIS200) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 12/14/2022 11:47:43 AM

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Specific Conductance	0460	WL	8/16/2022	(N)F			744	umhos/cm			#	-	-
Specific Conductance	0828	WL	8/17/2022	(N)F			866	umhos/cm			#	-	-
Specific Conductance	0841	WL	8/17/2022	(N)F			794	umhos/cm			#	-	-
Specific Conductance	0842	WL	8/17/2022	(N)F			673	umhos/cm			#	-	-
Specific Conductance	0876	WL	8/17/2022	(N)F			812	umhos/cm			#	-	-
Specific Conductance	0878	WL	8/17/2022	(N)F			852	umhos/cm			#	-	-
Sulfate													
Sulfate	0405	WL	8/17/2022	(N)F			364	mg/L			#	13.3	-
Sulfate	0430	WL	8/17/2022	(N)F			183	mg/L			#	13.3	-
Sulfate	0436	WL	8/17/2022	(N)F			232	mg/L			#	13.3	-
Sulfate	0460	WL	8/16/2022	(N)F			176	mg/L			#	13.3	-
Sulfate	0828	WL	8/17/2022	(N)F			229	mg/L			#	13.3	-
Sulfate	0841	WL	8/17/2022	(N)D			191	mg/L			#	13.3	-
Sulfate	0841	WL	8/17/2022	(N)F			192	mg/L			#	13.3	-
Sulfate	0842	WL	8/17/2022	(N)F			157	mg/L			#	13.3	-
Sulfate	0876	WL	8/17/2022	(N)F			264	mg/L			#	13.3	-
Sulfate	0878	WL	8/17/2022	(N)F			242	mg/L			#	13.3	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (EQuIS200) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 12/14/2022 11:47:43 AM

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Temperature													
Temperature	0405	WL	8/17/2022	(N)F			13.47	C			#	-	-
Temperature	0430	WL	8/17/2022	(N)F			14.83	C			#	-	-
Temperature	0436	WL	8/17/2022	(N)F			24.97	C			#	-	-
Temperature	0460	WL	8/16/2022	(N)F			20.63	C			#	-	-
Temperature	0828	WL	8/17/2022	(N)F			22.51	C			#	-	-
Temperature	0841	WL	8/17/2022	(N)F			18.94	C			#	-	-
Temperature	0842	WL	8/17/2022	(N)F			16.3	C			#	-	-
Temperature	0876	WL	8/17/2022	(N)F			20.68	C			#	-	-
Temperature	0878	WL	8/17/2022	(N)F			18.96	C			#	-	-
Turbidity													
Turbidity	0405	WL	8/17/2022	(N)F			9.48	NTU			#	-	-
Turbidity	0430	WL	8/17/2022	(N)F			1.75	NTU			#	-	-
Turbidity	0436	WL	8/17/2022	(N)F			1.56	NTU			#	-	-
Turbidity	0460	WL	8/16/2022	(N)F			2.58	NTU			#	-	-
Turbidity	0828	WL	8/17/2022	(N)F			1.78	NTU			#	-	-
Turbidity	0841	WL	8/17/2022	(N)F			1.49	NTU			#	-	-
Turbidity	0842	WL	8/17/2022	(N)F			2.89	NTU			#	-	-
Turbidity	0876	WL	8/17/2022	(N)F			2.04	NTU			#	-	-
Turbidity	0878	WL	8/17/2022	(N)F			83.3	NTU			#	-	-
Uranium													
Uranium	0405	WL	8/17/2022	(T)F			0.000067	mg/L	U		#	0.000067	-
Uranium	0430	WL	8/17/2022	(T)F			0.000067	mg/L	U		#	0.000067	-
Uranium	0436	WL	8/17/2022	(T)F			0.000072	mg/L	B		#	0.000067	-
Uranium	0460	WL	8/16/2022	(T)F			0.000067	mg/L	U		#	0.000067	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (EQuIS200) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 12/14/2022 11:47:43 AM

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Uranium	0828	WL	8/17/2022	(T)F			0.000082	mg/L	B		#	0.000067	-
Uranium	0841	WL	8/17/2022	(T)D			0.00267	mg/L			#	0.000067	-
Uranium	0841	WL	8/17/2022	(T)F			0.0029	mg/L			#	0.000067	-
Uranium	0842	WL	8/17/2022	(T)F			0.000279	mg/L		J	#	0.000067	-
Uranium	0876	WL	8/17/2022	(T)F			0.000067	mg/L	U		#	0.000067	-
Uranium	0878	WL	8/17/2022	(T)F			0.000067	mg/L	U		#	0.000067	-

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 compound (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 compound (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:

Fraction:
(T) Total (for metal concentrations)
(D) Dissolved (for dissolved or filtered metal concentrations)
(N) Organic (or other) constituents for which neither total nor dissolved is applicable

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

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

Appendix B

Static Water Level Data

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

REPORT DATE: 12/14/2022 1:20:21 PM

LOCATION CODE	MEASUREMENT DATE/TIME	TOP OF CASING ELEVATION (FT)	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
0101	08/16/2022 09:34	4953.16	10.60	4942.56	
0110	08/16/2022 08:35	4954.58	13.04	4941.54	
0111	08/16/2022 08:37	4951.26	9.74	4941.52	
0700	08/17/2022 09:30	4955.27	7.50	4947.77	
0702	08/17/2022 16:07	4934.44	6.55	4927.89	
0705	08/17/2022 16:28	4934.32	6.71	4927.61	
0707	08/17/2022 16:10	4933.75	5.90	4927.85	
0709	08/17/2022 16:05	4934.17	3.62	4930.55	
0710	08/17/2022 08:12	4950.97	6.18	4944.79	
0716	08/16/2022 14:31	4943.14	8.84	4934.30	
0717	08/16/2022 14:54	4942.79	8.25	4934.54	
0718	08/17/2022 09:21	4941.35	8.33	4933.02	
0719	08/17/2022 09:00	4941.44	7.95	4933.49	
0720	08/17/2022 16:10	4944.44	4.96	4939.48	
0721	08/17/2022 16:26	4944.37	8.50	4935.87	
0722R	08/17/2022 15:07	4941.14	8.56	4932.58	
0723	08/17/2022 15:27	4939.94	7.32	4932.62	
0724	08/16/2022 12:00	4945.14	7.14	4938.00	
0725	08/16/2022 12:00	4945.44	7.26	4938.18	
0726	08/16/2022 12:00	4945.43	7.55	4937.88	
0727	08/16/2022 15:28	4955.62	9.99	4945.63	
0728	08/16/2022 12:00	4949.96	7.41	4942.55	
0729	08/17/2022 13:29	4936.65	2.67	4933.98	
0730	08/17/2022 13:22	4937.16	3.56	4933.60	
0732	08/16/2022 11:03	4949.06	9.06	4940.00	
0733	08/17/2022 17:24	4950.72	5.00	4945.72	
0734	08/17/2022 17:27	4950.33	6.70	4943.63	
0736	08/17/2022 09:00	4949.69	7.56	4942.13	
0784	08/16/2022 10:45	4949.47	7.72	4941.75	
0788	08/16/2022 13:11	4937.96	9.45	4928.51	
0789	08/16/2022 09:28	4936.39	9.63	4926.76	
0824	08/16/2022 15:44	4932.94	1.12	4931.82	
0826	08/17/2022 11:10	4939.89	8.22	4931.67	
0852-1	08/17/2022 09:55	4940.51			D
0852-4	08/17/2022 10:42	4940.80	11.39	4929.41	

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

REPORT DATE: 12/14/2022 1:20:22 PM

LOCATION CODE	MEASUREMENT DATE/TIME	TOP OF CASING ELEVATION (FT)	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
0853-1	08/16/2022 13:45	4938.33			D
0853-4	08/16/2022 14:29	4938.49	10.00	4928.49	
0854-1	08/17/2022 11:29	4939.71			D
0854-4	08/17/2022 12:01	4939.95	8.31	4931.64	
0855-1	08/16/2022 10:14	4934.55			D
0855-4	08/16/2022 11:32	4934.79	7.70	4927.09	
0856-1	08/17/2022 14:07	4936.99			D
0856-4	08/17/2022 14:47	4937.23	8.86	4928.37	
0857-1	08/17/2022 12:55	4938.85			D
0857-4	08/17/2022 13:32	4939.11	9.03	4930.08	
0858-1	08/17/2022 15:12	4935.44			D
0858-4	08/17/2022 15:48	4935.69	7.59	4928.10	
0859-1	08/16/2022 11:30	4948.41			D
0859-4	08/16/2022 11:34	4948.69	9.38	4939.31	
0860-1	08/16/2022 13:05	4946.55			D
0860-4	08/16/2022 13:11	4946.82	11.40	4935.42	

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				

Appendix C

Monitoring Well Data

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (EQuIS200) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 12/14/2022 11:59:44 AM

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Alkalinity, Total (As CaCO3)													
Alkalinity, Total (As CaCO3)	0101	WL	8/16/2022	(N)F			251	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0705	WL	8/17/2022	(N)F			51.786	mg/L		FQ	#	-	-
Alkalinity, Total (As CaCO3)	0707	WL	8/17/2022	(N)F			334.615	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0710	WL	8/17/2022	(N)F			177	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0716	WL	8/16/2022	(N)F			281	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0717	WL	8/16/2022	(N)F			193.182	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0718	WL	8/17/2022	(D)F			300	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0719	WL	8/17/2022	(N)F			73.077	mg/L		FQ	#	-	-
Alkalinity, Total (As CaCO3)	0720	WL	8/17/2022	(N)F			208	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0721	WL	8/17/2022	(N)F			85	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0722R	WL	8/17/2022	(N)F			241.25	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0723	WL	8/17/2022	(N)F			284	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0727	WL	8/16/2022	(N)F			177	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0729	WL	8/17/2022	(N)F			251	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0730	WL	8/17/2022	(N)F			311	mg/L		FQ	#	-	-
Alkalinity, Total (As CaCO3)	0732	WL	8/16/2022	(N)F			233	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0784	WL	8/16/2022	(N)F			177	mg/L		F	#	-	-

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Alkalinity, Total (As CaCO3)	0788	WL	8/16/2022	(N)F			200	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0789	WL	8/16/2022	(N)F			365	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0824	WL	8/16/2022	(N)F			269.388	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0826	WL	8/17/2022	(N)F			330.303	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0852-2	WL	8/17/2022	(N)F			362.121	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0852-3	WL	8/17/2022	(N)F			325	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0852-4	WL	8/17/2022	(N)F			339.286	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0853-2	WL	8/16/2022	(N)F			386	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0853-3	WL	8/16/2022	(N)F			416.667	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0853-4	WL	8/16/2022	(N)F			316.071	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0854-2	WL	8/17/2022	(N)F			361.667	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0854-3	WL	8/17/2022	(N)F			319.643	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0854-4	WL	8/17/2022	(N)F			337.037	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0855-2	WL	8/16/2022	(N)F			406	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0855-3	WL	8/16/2022	(N)F			372	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0855-4	WL	8/16/2022	(N)F			392.308	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0856-2	WL	8/17/2022	(N)F			317.742	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0856-3	WL	8/17/2022	(N)F			310.714	mg/L		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (EQuIS200) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 12/14/2022 11:59:44 AM

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Alkalinity, Total (As CaCO3)	0856-4	WL	8/17/2022	(N)F			318.182	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0857-2	WL	8/17/2022	(N)F			321.739	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0857-3	WL	8/17/2022	(N)F			305.556	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0857-4	WL	8/17/2022	(N)F			303.636	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0858-2	WL	8/17/2022	(N)F			335.185	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0858-3	WL	8/17/2022	(N)F			327.451	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0858-4	WL	8/17/2022	(N)F			289.091	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0859-2	WL	8/16/2022	(N)F			235	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0859-3	WL	8/16/2022	(N)F			217	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0859-4	WL	8/16/2022	(N)F			333.75	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0860-2	WL	8/16/2022	(N)F			262	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0860-3	WL	8/16/2022	(N)F			246	mg/L		F	#	-	-
Alkalinity, Total (As CaCO3)	0860-4	WL	8/16/2022	(N)F			253	mg/L		F	#	-	-
Manganese													
Manganese	0101	WL	8/16/2022	(T)F			0.256	mg/L		F	#	0.002	-
Manganese	0705	WL	8/17/2022	(T)F			0.002	mg/L	U	FQ	#	0.002	-
Manganese	0707	WL	8/17/2022	(T)F			0.72	mg/L		F	#	0.002	-
Manganese	0710	WL	8/17/2022	(T)D			0.034	mg/L		F	#	0.002	-
Manganese	0710	WL	8/17/2022	(T)F			0.0351	mg/L		F	#	0.002	-
Manganese	0716	WL	8/16/2022	(T)F			0.159	mg/L		F	#	0.002	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (EQuIS200) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 12/14/2022 11:59:44 AM

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Manganese	0717	WL	8/16/2022	(T)F			0.158	mg/L		F	#	0.002	-
Manganese	0718	WL	8/17/2022	(D)F			0.245	mg/L		F	#	0.002	-
Manganese	0719	WL	8/17/2022	(T)D			0.119	mg/L		FQ	#	0.002	-
Manganese	0719	WL	8/17/2022	(T)F			0.129	mg/L		FQ	#	0.002	-
Manganese	0720	WL	8/17/2022	(T)F			0.002	mg/L	U	F	#	0.002	-
Manganese	0721	WL	8/17/2022	(T)F			0.00377	mg/L	B	F	#	0.002	-
Manganese	0722R	WL	8/17/2022	(T)F			0.002	mg/L	U	F	#	0.002	-
Manganese	0723	WL	8/17/2022	(T)F			0.382	mg/L		F	#	0.002	-
Manganese	0727	WL	8/16/2022	(T)F			0.121	mg/L		F	#	0.002	-
Manganese	0729	WL	8/17/2022	(T)F			0.207	mg/L		F	#	0.002	-
Manganese	0730	WL	8/17/2022	(T)F			0.0565	mg/L		FQ	#	0.002	-
Manganese	0732	WL	8/16/2022	(T)F			0.0527	mg/L		F	#	0.002	-
Manganese	0784	WL	8/16/2022	(T)F			0.886	mg/L		F	#	0.002	-
Manganese	0788	WL	8/16/2022	(T)F			0.295	mg/L		F	#	0.002	-
Manganese	0789	WL	8/16/2022	(T)F			0.0666	mg/L		F	#	0.002	-
Manganese	0824	WL	8/16/2022	(T)F			0.00887	mg/L	B	F	#	0.002	-
Manganese	0826	WL	8/17/2022	(T)F			1.24	mg/L		F	#	0.002	-
Manganese	0852-2	WL	8/17/2022	(T)F			0.554	mg/L		F	#	0.002	-
Manganese	0852-3	WL	8/17/2022	(T)F			0.517	mg/L		F	#	0.002	-
Manganese	0852-4	WL	8/17/2022	(T)F			0.76	mg/L		F	#	0.002	-
Manganese	0853-2	WL	8/16/2022	(T)F			0.358	mg/L		F	#	0.002	-
Manganese	0853-3	WL	8/16/2022	(T)F			0.84	mg/L		F	#	0.002	-
Manganese	0853-4	WL	8/16/2022	(T)F			0.844	mg/L		F	#	0.002	-
Manganese	0854-2	WL	8/17/2022	(T)F			1.85	mg/L		F	#	0.002	-
Manganese	0854-3	WL	8/17/2022	(T)F			1.49	mg/L		F	#	0.002	-

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Manganese	0854-4	WL	8/17/2022	(T)F			1.62	mg/L		F	#	0.002	-
Manganese	0855-2	WL	8/16/2022	(T)F			0.374	mg/L		F	#	0.002	-
Manganese	0855-3	WL	8/16/2022	(T)F			0.871	mg/L		F	#	0.002	-
Manganese	0855-4	WL	8/16/2022	(T)F			1.49	mg/L		F	#	0.002	-
Manganese	0856-2	WL	8/17/2022	(T)F			0.215	mg/L		F	#	0.002	-
Manganese	0856-3	WL	8/17/2022	(T)F			0.421	mg/L		F	#	0.002	-
Manganese	0856-4	WL	8/17/2022	(T)F			1.15	mg/L		F	#	0.002	-
Manganese	0857-2	WL	8/17/2022	(T)F			2.11	mg/L		F	#	0.002	-
Manganese	0857-3	WL	8/17/2022	(T)F			2.37	mg/L		F	#	0.002	-
Manganese	0857-4	WL	8/17/2022	(T)F			2.64	mg/L		F	#	0.002	-
Manganese	0858-2	WL	8/17/2022	(T)F			0.53	mg/L		F	#	0.002	-
Manganese	0858-3	WL	8/17/2022	(T)F			0.603	mg/L		F	#	0.002	-
Manganese	0858-4	WL	8/17/2022	(T)F			0.676	mg/L		F	#	0.002	-
Manganese	0859-2	WL	8/16/2022	(T)F			0.233	mg/L		F	#	0.002	-
Manganese	0859-3	WL	8/16/2022	(T)F			0.788	mg/L		F	#	0.002	-
Manganese	0859-4	WL	8/16/2022	(T)F			1.06	mg/L		F	#	0.002	-
Manganese	0860-2	WL	8/16/2022	(T)F			0.00391	mg/L	B	F	#	0.002	-
Manganese	0860-3	WL	8/16/2022	(T)F			1.4	mg/L		F	#	0.002	-
Manganese	0860-4	WL	8/16/2022	(T)F			1.33	mg/L		F	#	0.002	-
Molybdenum													
Molybdenum	0101	WL	8/16/2022	(T)F			0.012	mg/L		F	#	0.0002	-
Molybdenum	0705	WL	8/17/2022	(T)F			0.00388	mg/L		FQ	#	0.0002	-
Molybdenum	0707	WL	8/17/2022	(T)F			0.876	mg/L		F	#	0.0002	-
Molybdenum	0710	WL	8/17/2022	(T)D			0.00254	mg/L	B	F	#	0.0002	-
Molybdenum	0710	WL	8/17/2022	(T)F			0.00332	mg/L		F	#	0.0002	-

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Molybdenum	0716	WL	8/16/2022	(T)F			0.104	mg/L		F	#	0.0002	-
Molybdenum	0717	WL	8/16/2022	(T)F			0.0144	mg/L		F	#	0.0002	-
Molybdenum	0718	WL	8/17/2022	(D)F			0.0712	mg/L		F	#	0.0002	-
Molybdenum	0719	WL	8/17/2022	(T)D			0.00855	mg/L		FQ	#	0.0002	-
Molybdenum	0719	WL	8/17/2022	(T)F			0.00957	mg/L		FQ	#	0.0002	-
Molybdenum	0720	WL	8/17/2022	(T)F			0.00173	mg/L	B	F	#	0.0002	-
Molybdenum	0721	WL	8/17/2022	(T)F			0.00276	mg/L	B	F	#	0.0002	-
Molybdenum	0722R	WL	8/17/2022	(T)F			0.106	mg/L		F	#	0.0002	-
Molybdenum	0723	WL	8/17/2022	(T)F			0.0002	mg/L	U	F	#	0.0002	-
Molybdenum	0727	WL	8/16/2022	(T)F			0.00577	mg/L		F	#	0.0002	-
Molybdenum	0729	WL	8/17/2022	(T)F			0.00339	mg/L		F	#	0.0002	-
Molybdenum	0730	WL	8/17/2022	(T)F			0.0055	mg/L		FQ	#	0.0002	-
Molybdenum	0732	WL	8/16/2022	(T)F			0.0229	mg/L		F	#	0.0002	-
Molybdenum	0784	WL	8/16/2022	(T)F			0.0794	mg/L		F	#	0.0002	-
Molybdenum	0788	WL	8/16/2022	(T)F			0.0373	mg/L		F	#	0.0002	-
Molybdenum	0789	WL	8/16/2022	(T)F			0.511	mg/L		F	#	0.001	-
Molybdenum	0824	WL	8/16/2022	(T)F			0.00265	mg/L	B	F	#	0.0002	-
Molybdenum	0826	WL	8/17/2022	(T)F			0.041	mg/L		F	#	0.0002	-
Molybdenum	0852-2	WL	8/17/2022	(T)F			0.00777	mg/L		F	#	0.0002	-
Molybdenum	0852-3	WL	8/17/2022	(T)F			0.0074	mg/L		F	#	0.0002	-
Molybdenum	0852-4	WL	8/17/2022	(T)F			0.00716	mg/L		F	#	0.0002	-
Molybdenum	0853-2	WL	8/16/2022	(T)F			0.0227	mg/L		F	#	0.0002	-
Molybdenum	0853-3	WL	8/16/2022	(T)F			0.0252	mg/L		F	#	0.0002	-
Molybdenum	0853-4	WL	8/16/2022	(T)F			0.0254	mg/L		F	#	0.0002	-
Molybdenum	0854-2	WL	8/17/2022	(T)F			0.0717	mg/L		F	#	0.0002	-

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Molybdenum	0854-3	WL	8/17/2022	(T)F			0.0535	mg/L		F	#	0.0002	-
Molybdenum	0854-4	WL	8/17/2022	(T)F			0.0525	mg/L		F	#	0.0002	-
Molybdenum	0855-2	WL	8/16/2022	(T)F			0.368	mg/L		F	#	0.001	-
Molybdenum	0855-3	WL	8/16/2022	(T)F			0.347	mg/L		F	#	0.001	-
Molybdenum	0855-4	WL	8/16/2022	(T)F			0.347	mg/L		F	#	0.001	-
Molybdenum	0856-2	WL	8/17/2022	(T)F			0.326	mg/L		F	#	0.001	-
Molybdenum	0856-3	WL	8/17/2022	(T)F			0.338	mg/L		F	#	0.001	-
Molybdenum	0856-4	WL	8/17/2022	(T)F			0.356	mg/L		F	#	0.001	-
Molybdenum	0857-2	WL	8/17/2022	(T)F			0.758	mg/L		F	#	0.001	-
Molybdenum	0857-3	WL	8/17/2022	(T)F			0.745	mg/L		F	#	0.001	-
Molybdenum	0857-4	WL	8/17/2022	(T)F			0.734	mg/L		F	#	0.001	-
Molybdenum	0858-2	WL	8/17/2022	(T)F			0.798	mg/L		F	#	0.0002	-
Molybdenum	0858-3	WL	8/17/2022	(T)F			0.862	mg/L		F	#	0.0002	-
Molybdenum	0858-4	WL	8/17/2022	(T)F			0.839	mg/L		F	#	0.0002	-
Molybdenum	0859-2	WL	8/16/2022	(T)F			0.069	mg/L		F	#	0.001	-
Molybdenum	0859-3	WL	8/16/2022	(T)F			0.0655	mg/L		F	#	0.0002	-
Molybdenum	0859-4	WL	8/16/2022	(T)F			0.0981	mg/L		F	#	0.001	-
Molybdenum	0860-2	WL	8/16/2022	(T)F			0.371	mg/L		F	#	0.0002	-
Molybdenum	0860-3	WL	8/16/2022	(T)F			0.247	mg/L		F	#	0.0002	-
Molybdenum	0860-4	WL	8/16/2022	(T)F			0.245	mg/L		F	#	0.0002	-
pH													
pH	0101	WL	8/16/2022	(N)F			7.06	s.u.		F	#	-	-
pH	0705	WL	8/17/2022	(N)F			8.17	s.u.		FQ	#	-	-
pH	0707	WL	8/17/2022	(N)F			7.09	s.u.		F	#	-	-
pH	0710	WL	8/17/2022	(N)F			7.37	s.u.		F	#	-	-

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
pH	0716	WL	8/16/2022	(N)F			7.14	s.u.		F	#	-	-
pH	0717	WL	8/16/2022	(N)F			7.8	s.u.		F	#	-	-
pH	0718	WL	8/17/2022	(N)F			7.05	s.u.		F	#	-	-
pH	0719	WL	8/17/2022	(N)F			7.73	s.u.		FQ	#	-	-
pH	0720	WL	8/17/2022	(N)F			7.22	s.u.		F	#	-	-
pH	0721	WL	8/17/2022	(N)F			8.78	s.u.		F	#	-	-
pH	0722R	WL	8/17/2022	(N)F			6.98	s.u.		F	#	-	-
pH	0723	WL	8/17/2022	(N)F			7.16	s.u.		F	#	-	-
pH	0727	WL	8/16/2022	(N)F			7.75	s.u.		F	#	-	-
pH	0729	WL	8/17/2022	(N)F			7.23	s.u.		F	#	-	-
pH	0730	WL	8/17/2022	(N)F			7.47	s.u.		FQ	#	-	-
pH	0732	WL	8/16/2022	(N)F			7.15	s.u.		F	#	-	-
pH	0784	WL	8/16/2022	(N)F			7.26	s.u.		F	#	-	-
pH	0788	WL	8/16/2022	(N)F			7.21	s.u.		F	#	-	-
pH	0789	WL	8/16/2022	(N)F			7.08	s.u.		F	#	-	-
pH	0824	WL	8/16/2022	(N)F			7.01	s.u.		F	#	-	-
pH	0826	WL	8/17/2022	(N)F			7.32	s.u.		F	#	-	-
pH	0852-2	WL	8/17/2022	(N)F			7.46	s.u.		F	#	-	-
pH	0852-3	WL	8/17/2022	(N)F			7.45	s.u.		F	#	-	-
pH	0852-4	WL	8/17/2022	(N)F			7.43	s.u.		F	#	-	-
pH	0853-2	WL	8/16/2022	(N)F			7.2	s.u.		F	#	-	-
pH	0853-3	WL	8/16/2022	(N)F			7.21	s.u.		F	#	-	-
pH	0853-4	WL	8/16/2022	(N)F			7.24	s.u.		F	#	-	-
pH	0854-2	WL	8/17/2022	(N)F			7.24	s.u.		F	#	-	-
pH	0854-3	WL	8/17/2022	(N)F			7.29	s.u.		F	#	-	-

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
pH	0854-4	WL	8/17/2022	(N)F			7.31	s.u.		F	#	-	-
pH	0855-2	WL	8/16/2022	(N)F			7.13	s.u.		F	#	-	-
pH	0855-3	WL	8/16/2022	(N)F			7.11	s.u.		F	#	-	-
pH	0855-4	WL	8/16/2022	(N)F			7.1	s.u.		F	#	-	-
pH	0856-2	WL	8/17/2022	(N)F			7.15	s.u.		F	#	-	-
pH	0856-3	WL	8/17/2022	(N)F			7.12	s.u.		F	#	-	-
pH	0856-4	WL	8/17/2022	(N)F			7.1	s.u.		F	#	-	-
pH	0857-2	WL	8/17/2022	(N)F			7.09	s.u.		F	#	-	-
pH	0857-3	WL	8/17/2022	(N)F			7.05	s.u.		F	#	-	-
pH	0857-4	WL	8/17/2022	(N)F			7.06	s.u.		F	#	-	-
pH	0858-2	WL	8/17/2022	(N)F			7.09	s.u.		F	#	-	-
pH	0858-3	WL	8/17/2022	(N)F			7.09	s.u.		F	#	-	-
pH	0858-4	WL	8/17/2022	(N)F			7.08	s.u.		F	#	-	-
pH	0859-2	WL	8/16/2022	(N)F			6.9	s.u.		F	#	-	-
pH	0859-3	WL	8/16/2022	(N)F			6.88	s.u.		F	#	-	-
pH	0859-4	WL	8/16/2022	(N)F			6.86	s.u.		F	#	-	-
pH	0860-2	WL	8/16/2022	(N)F			6.96	s.u.		F	#	-	-
pH	0860-3	WL	8/16/2022	(N)F			6.89	s.u.		F	#	-	-
pH	0860-4	WL	8/16/2022	(N)F			6.91	s.u.		F	#	-	-
Specific Conductance													
Specific Conductance	0101	WL	8/16/2022	(N)F			1018	umhos/cm		F	#	-	-
Specific Conductance	0705	WL	8/17/2022	(N)F			1216	umhos/cm		FQ	#	-	-
Specific Conductance	0707	WL	8/17/2022	(N)F			3791	umhos/cm		F	#	-	-
Specific Conductance	0710	WL	8/17/2022	(N)F			547	umhos/cm		F	#	-	-
Specific Conductance	0716	WL	8/16/2022	(N)F			1488	umhos/cm		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (EQuIS200) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 12/14/2022 11:59:46 AM

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Specific Conductance	0717	WL	8/16/2022	(N)F			1883	umhos/cm		F	#	-	-
Specific Conductance	0718	WL	8/17/2022	(N)F			4074	umhos/cm		F	#	-	-
Specific Conductance	0719	WL	8/17/2022	(N)F			1347	umhos/cm		FQ	#	-	-
Specific Conductance	0720	WL	8/17/2022	(N)F			556	umhos/cm		F	#	-	-
Specific Conductance	0721	WL	8/17/2022	(N)F			869	umhos/cm		F	#	-	-
Specific Conductance	0722R	WL	8/17/2022	(N)F			730	umhos/cm		F	#	-	-
Specific Conductance	0723	WL	8/17/2022	(N)F			3715	umhos/cm		F	#	-	-
Specific Conductance	0727	WL	8/16/2022	(N)F			526	umhos/cm		F	#	-	-
Specific Conductance	0729	WL	8/17/2022	(N)F			582	umhos/cm		F	#	-	-
Specific Conductance	0730	WL	8/17/2022	(N)F			821	umhos/cm		FQ	#	-	-
Specific Conductance	0732	WL	8/16/2022	(N)F			2786	umhos/cm		F	#	-	-
Specific Conductance	0784	WL	8/16/2022	(N)F			3326	umhos/cm		F	#	-	-
Specific Conductance	0788	WL	8/16/2022	(N)F			2672	umhos/cm		F	#	-	-
Specific Conductance	0789	WL	8/16/2022	(N)F			7897	umhos/cm		F	#	-	-
Specific Conductance	0824	WL	8/16/2022	(N)F			665	umhos/cm		F	#	-	-
Specific Conductance	0826	WL	8/17/2022	(N)F			2384	umhos/cm		F	#	-	-
Specific Conductance	0852-2	WL	8/17/2022	(N)F			1307	umhos/cm		F	#	-	-
Specific Conductance	0852-3	WL	8/17/2022	(N)F			1265	umhos/cm		F	#	-	-
Specific Conductance	0852-4	WL	8/17/2022	(N)F			1260	umhos/cm		F	#	-	-
Specific Conductance	0853-2	WL	8/16/2022	(N)F			2738	umhos/cm		F	#	-	-
Specific Conductance	0853-3	WL	8/16/2022	(N)F			2903	umhos/cm		F	#	-	-
Specific Conductance	0853-4	WL	8/16/2022	(N)F			2709	umhos/cm		FJ	#	-	-
Specific Conductance	0854-2	WL	8/17/2022	(N)F			3229	umhos/cm		F	#	-	-
Specific Conductance	0854-3	WL	8/17/2022	(N)F			2885	umhos/cm		F	#	-	-
Specific Conductance	0854-4	WL	8/17/2022	(N)F			2921	umhos/cm		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (EQuIS200) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 12/14/2022 11:59:46 AM

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Specific Conductance	0855-2	WL	8/16/2022	(N)F			8971	umhos/cm		F	#	-	-
Specific Conductance	0855-3	WL	8/16/2022	(N)F			8633	umhos/cm		F	#	-	-
Specific Conductance	0855-4	WL	8/16/2022	(N)F			8850	umhos/cm		F	#	-	-
Specific Conductance	0856-2	WL	8/17/2022	(N)F			6460	umhos/cm		F	#	-	-
Specific Conductance	0856-3	WL	8/17/2022	(N)F			6393	umhos/cm		F	#	-	-
Specific Conductance	0856-4	WL	8/17/2022	(N)F			6500	umhos/cm		F	#	-	-
Specific Conductance	0857-2	WL	8/17/2022	(N)F			6072	umhos/cm		F	#	-	-
Specific Conductance	0857-3	WL	8/17/2022	(N)F			5887	umhos/cm		F	#	-	-
Specific Conductance	0857-4	WL	8/17/2022	(N)F			5958	umhos/cm		F	#	-	-
Specific Conductance	0858-2	WL	8/17/2022	(N)F			3658	umhos/cm		F	#	-	-
Specific Conductance	0858-3	WL	8/17/2022	(N)F			3745	umhos/cm		F	#	-	-
Specific Conductance	0858-4	WL	8/17/2022	(N)F			3748	umhos/cm		F	#	-	-
Specific Conductance	0859-2	WL	8/16/2022	(N)F			4261	umhos/cm		F	#	-	-
Specific Conductance	0859-3	WL	8/16/2022	(N)F			4466	umhos/cm		F	#	-	-
Specific Conductance	0859-4	WL	8/16/2022	(N)F			6937	umhos/cm		F	#	-	-
Specific Conductance	0860-2	WL	8/16/2022	(N)F			4531	umhos/cm		F	#	-	-
Specific Conductance	0860-3	WL	8/16/2022	(N)F			3687	umhos/cm		F	#	-	-
Specific Conductance	0860-4	WL	8/16/2022	(N)F			3636	umhos/cm		F	#	-	-
Sulfate													
Sulfate	0101	WL	8/16/2022	(N)F			247	mg/L		F	#	13.3	-
Sulfate	0705	WL	8/17/2022	(N)F			406	mg/L		FQ	#	13.3	-
Sulfate	0707	WL	8/17/2022	(N)F			1820	mg/L		F	#	13.3	-
Sulfate	0710	WL	8/17/2022	(N)D			91.5	mg/L		F	#	13.3	-
Sulfate	0710	WL	8/17/2022	(N)F			93.6	mg/L		F	#	13.3	-
Sulfate	0716	WL	8/16/2022	(N)F			462	mg/L		F	#	13.3	-

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Sulfate	0717	WL	8/16/2022	(N)F			667	mg/L		F	#	13.3	-
Sulfate	0718	WL	8/17/2022	(N)F			3190	mg/L		F	#	26.6	-
Sulfate	0719	WL	8/17/2022	(N)D			518	mg/L		FQ	#	13.3	-
Sulfate	0719	WL	8/17/2022	(N)F			505	mg/L		FQ	#	13.3	-
Sulfate	0720	WL	8/17/2022	(N)F			76.4	mg/L		F	#	13.3	-
Sulfate	0721	WL	8/17/2022	(N)F			267	mg/L		F	#	13.3	-
Sulfate	0722R	WL	8/17/2022	(N)F			132	mg/L		F	#	13.3	-
Sulfate	0723	WL	8/17/2022	(N)F			1760	mg/L		F	#	13.3	-
Sulfate	0727	WL	8/16/2022	(N)F			91.8	mg/L		F	#	13.3	-
Sulfate	0729	WL	8/17/2022	(N)F			65.2	mg/L		FJ	#	13.3	-
Sulfate	0730	WL	8/17/2022	(N)F			122	mg/L		FQ	#	13.3	-
Sulfate	0732	WL	8/16/2022	(N)F			1430	mg/L		F	#	13.3	-
Sulfate	0784	WL	8/16/2022	(N)F			1990	mg/L		F	#	26.6	-
Sulfate	0788	WL	8/16/2022	(N)F			1170	mg/L		F	#	13.3	-
Sulfate	0789	WL	8/16/2022	(N)F			4420	mg/L		F	#	66.5	-
Sulfate	0824	WL	8/16/2022	(N)F			71	mg/L		F	#	13.3	-
Sulfate	0826	WL	8/17/2022	(N)F			907	mg/L		F	#	13.3	-
Sulfate	0852-2	WL	8/17/2022	(N)F			313	mg/L		F	#	13.3	-
Sulfate	0852-3	WL	8/17/2022	(N)F			303	mg/L		F	#	13.3	-
Sulfate	0852-4	WL	8/17/2022	(N)F			294	mg/L		F	#	13.3	-
Sulfate	0853-2	WL	8/16/2022	(N)F			1110	mg/L		F	#	13.3	-
Sulfate	0853-3	WL	8/16/2022	(N)F			1230	mg/L		F	#	13.3	-
Sulfate	0853-4	WL	8/16/2022	(N)F			1160	mg/L		F	#	13.3	-
Sulfate	0854-2	WL	8/17/2022	(N)F			1400	mg/L		F	#	13.3	-
Sulfate	0854-3	WL	8/17/2022	(N)F			1220	mg/L		F	#	13.3	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (EQuIS200) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 12/14/2022 11:59:47 AM

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Sulfate	0854-4	WL	8/17/2022	(N)F			1260	mg/L		F	#	13.3	-
Sulfate	0855-2	WL	8/16/2022	(N)F			4890	mg/L		F	#	133	-
Sulfate	0855-3	WL	8/16/2022	(N)F			4740	mg/L		F	#	66.5	-
Sulfate	0855-4	WL	8/16/2022	(N)F			4820	mg/L		F	#	66.5	-
Sulfate	0856-2	WL	8/17/2022	(N)F			3590	mg/L		F	#	66.5	-
Sulfate	0856-3	WL	8/17/2022	(N)F			3760	mg/L		F	#	26.6	-
Sulfate	0856-4	WL	8/17/2022	(N)F			3790	mg/L		F	#	26.6	-
Sulfate	0857-2	WL	8/17/2022	(N)F			3580	mg/L		F	#	26.6	-
Sulfate	0857-3	WL	8/17/2022	(N)F			3390	mg/L		F	#	26.6	-
Sulfate	0857-4	WL	8/17/2022	(N)F			3470	mg/L		F	#	26.6	-
Sulfate	0858-2	WL	8/17/2022	(N)F			1860	mg/L		F	#	13.3	-
Sulfate	0858-3	WL	8/17/2022	(N)F			2000	mg/L		F	#	13.3	-
Sulfate	0858-4	WL	8/17/2022	(N)F			1960	mg/L		F	#	13.3	-
Sulfate	0859-2	WL	8/16/2022	(N)F			2520	mg/L		F	#	26.6	-
Sulfate	0859-3	WL	8/16/2022	(N)F			2850	mg/L		F	#	26.6	-
Sulfate	0859-4	WL	8/16/2022	(N)F			3790	mg/L		F	#	66.5	-
Sulfate	0860-2	WL	8/16/2022	(N)F			2490	mg/L		F	#	26.6	-
Sulfate	0860-3	WL	8/16/2022	(N)F			1960	mg/L		F	#	26.6	-
Sulfate	0860-4	WL	8/16/2022	(N)F			1970	mg/L		F	#	13.3	-
Temperature													
Temperature	0101	WL	8/16/2022	(N)F			13.76	C		F	#	-	-
Temperature	0705	WL	8/17/2022	(N)F			12.3	C		FQ	#	-	-
Temperature	0707	WL	8/17/2022	(N)F			12.72	C		F	#	-	-
Temperature	0710	WL	8/17/2022	(N)F			11.98	C		F	#	-	-
Temperature	0716	WL	8/16/2022	(N)F			15.02	C		F	#	-	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (EQuIS200) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 12/14/2022 11:59:47 AM

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Temperature	0717	WL	8/16/2022	(N)F			12.49	C		F	#	-	-
Temperature	0718	WL	8/17/2022	(N)F			13.7	C		F	#	-	-
Temperature	0719	WL	8/17/2022	(N)F			12.45	C		FQ	#	-	-
Temperature	0720	WL	8/17/2022	(N)F			13.81	C		F	#	-	-
Temperature	0721	WL	8/17/2022	(N)F			12.41	C		F	#	-	-
Temperature	0722R	WL	8/17/2022	(N)F			18.29	C		F	#	-	-
Temperature	0723	WL	8/17/2022	(N)F			14.82	C		F	#	-	-
Temperature	0727	WL	8/16/2022	(N)F			19.71	C		F	#	-	-
Temperature	0729	WL	8/17/2022	(N)F			16.58	C		F	#	-	-
Temperature	0730	WL	8/17/2022	(N)F			22.86	C		FQ	#	-	-
Temperature	0732	WL	8/16/2022	(N)F			12.68	C		F	#	-	-
Temperature	0784	WL	8/16/2022	(N)F			18.11	C		F	#	-	-
Temperature	0788	WL	8/16/2022	(N)F			13.88	C		F	#	-	-
Temperature	0789	WL	8/16/2022	(N)F			12.57	C		F	#	-	-
Temperature	0824	WL	8/16/2022	(N)F			19.91	C		F	#	-	-
Temperature	0826	WL	8/17/2022	(N)F			11.61	C		F	#	-	-
Temperature	0852-2	WL	8/17/2022	(N)F			11.55	C		F	#	-	-
Temperature	0852-3	WL	8/17/2022	(N)F			11.07	C		F	#	-	-
Temperature	0852-4	WL	8/17/2022	(N)F			10.36	C		F	#	-	-
Temperature	0853-2	WL	8/16/2022	(N)F			14.71	C		F	#	-	-
Temperature	0853-3	WL	8/16/2022	(N)F			13.87	C		F	#	-	-
Temperature	0853-4	WL	8/16/2022	(N)F			12.46	C		F	#	-	-
Temperature	0854-2	WL	8/17/2022	(N)F			13.18	C		F	#	-	-
Temperature	0854-3	WL	8/17/2022	(N)F			12.5	C		F	#	-	-
Temperature	0854-4	WL	8/17/2022	(N)F			11.44	C		F	#	-	-

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Temperature	0855-2	WL	8/16/2022	(N)F			13.82	C		F	#	-	-
Temperature	0855-3	WL	8/16/2022	(N)F			13.19	C		F	#	-	-
Temperature	0855-4	WL	8/16/2022	(N)F			12.47	C		F	#	-	-
Temperature	0856-2	WL	8/17/2022	(N)F			17.12	C		F	#	-	-
Temperature	0856-3	WL	8/17/2022	(N)F			16.5	C		F	#	-	-
Temperature	0856-4	WL	8/17/2022	(N)F			15.28	C		F	#	-	-
Temperature	0857-2	WL	8/17/2022	(N)F			18.94	C		F	#	-	-
Temperature	0857-3	WL	8/17/2022	(N)F			18.03	C		F	#	-	-
Temperature	0857-4	WL	8/17/2022	(N)F			18.73	C		F	#	-	-
Temperature	0858-2	WL	8/17/2022	(N)F			14.46	C		F	#	-	-
Temperature	0858-3	WL	8/17/2022	(N)F			13.82	C		F	#	-	-
Temperature	0858-4	WL	8/17/2022	(N)F			11.88	C		F	#	-	-
Temperature	0859-2	WL	8/16/2022	(N)F			19.15	C		F	#	-	-
Temperature	0859-3	WL	8/16/2022	(N)F			18.05	C		F	#	-	-
Temperature	0859-4	WL	8/16/2022	(N)F			16.26	C		F	#	-	-
Temperature	0860-2	WL	8/16/2022	(N)F			18.32	C		F	#	-	-
Temperature	0860-3	WL	8/16/2022	(N)F			17.21	C		F	#	-	-
Temperature	0860-4	WL	8/16/2022	(N)F			15.71	C		F	#	-	-
Turbidity													
Turbidity	0101	WL	8/16/2022	(N)F			1.25	NTU		F	#	-	-
Turbidity	0705	WL	8/17/2022	(N)F			2.68	NTU		FQ	#	-	-
Turbidity	0707	WL	8/17/2022	(N)F			2.07	NTU		F	#	-	-
Turbidity	0710	WL	8/17/2022	(N)F			1.04	NTU		F	#	-	-
Turbidity	0716	WL	8/16/2022	(N)F			2.14	NTU		F	#	-	-
Turbidity	0717	WL	8/16/2022	(N)F			1.39	NTU		F	#	-	-

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Turbidity	0718	WL	8/17/2022	(N)F			17.8	NTU		F	#	-	-
Turbidity	0719	WL	8/17/2022	(N)F			2.11	NTU		FQ	#	-	-
Turbidity	0720	WL	8/17/2022	(N)F			0.88	NTU		F	#	-	-
Turbidity	0721	WL	8/17/2022	(N)F			4.66	NTU		F	#	-	-
Turbidity	0722R	WL	8/17/2022	(N)F			1.07	NTU		F	#	-	-
Turbidity	0723	WL	8/17/2022	(N)F			0.88	NTU		F	#	-	-
Turbidity	0727	WL	8/16/2022	(N)F			3.31	NTU		F	#	-	-
Turbidity	0729	WL	8/17/2022	(N)F			1.14	NTU		F	#	-	-
Turbidity	0730	WL	8/17/2022	(N)F			4.42	NTU		FQ	#	-	-
Turbidity	0732	WL	8/16/2022	(N)F			0.72	NTU		F	#	-	-
Turbidity	0784	WL	8/16/2022	(N)F			0.98	NTU		F	#	-	-
Turbidity	0788	WL	8/16/2022	(N)F			3.73	NTU		F	#	-	-
Turbidity	0789	WL	8/16/2022	(N)F			3.58	NTU		F	#	-	-
Turbidity	0824	WL	8/16/2022	(N)F			3.61	NTU		F	#	-	-
Turbidity	0826	WL	8/17/2022	(N)F			1.63	NTU		F	#	-	-
Turbidity	0852-2	WL	8/17/2022	(N)F			3.44	NTU		F	#	-	-
Turbidity	0852-3	WL	8/17/2022	(N)F			1.94	NTU		F	#	-	-
Turbidity	0852-4	WL	8/17/2022	(N)F			3.69	NTU		F	#	-	-
Turbidity	0853-2	WL	8/16/2022	(N)F			2.29	NTU		F	#	-	-
Turbidity	0853-3	WL	8/16/2022	(N)F			1.79	NTU		F	#	-	-
Turbidity	0853-4	WL	8/16/2022	(N)F			2.63	NTU		F	#	-	-
Turbidity	0854-2	WL	8/17/2022	(N)F			1.97	NTU		F	#	-	-
Turbidity	0854-3	WL	8/17/2022	(N)F			2	NTU		F	#	-	-
Turbidity	0854-4	WL	8/17/2022	(N)F			3.07	NTU		F	#	-	-
Turbidity	0855-2	WL	8/16/2022	(N)F			4.17	NTU		F	#	-	-

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Turbidity	0855-3	WL	8/16/2022	(N)F			2.58	NTU		F	#	-	-
Turbidity	0855-4	WL	8/16/2022	(N)F			2.15	NTU		F	#	-	-
Turbidity	0856-2	WL	8/17/2022	(N)F			2.07	NTU		F	#	-	-
Turbidity	0856-3	WL	8/17/2022	(N)F			1.59	NTU		F	#	-	-
Turbidity	0856-4	WL	8/17/2022	(N)F			2.08	NTU		F	#	-	-
Turbidity	0857-2	WL	8/17/2022	(N)F			2.4	NTU		F	#	-	-
Turbidity	0857-3	WL	8/17/2022	(N)F			2.56	NTU		F	#	-	-
Turbidity	0857-4	WL	8/17/2022	(N)F			2.16	NTU		F	#	-	-
Turbidity	0858-2	WL	8/17/2022	(N)F			1.94	NTU		F	#	-	-
Turbidity	0858-3	WL	8/17/2022	(N)F			1.97	NTU		F	#	-	-
Turbidity	0858-4	WL	8/17/2022	(N)F			1.78	NTU		F	#	-	-
Turbidity	0859-2	WL	8/16/2022	(N)F			0.98	NTU		F	#	-	-
Turbidity	0859-3	WL	8/16/2022	(N)F			0.7	NTU		F	#	-	-
Turbidity	0859-4	WL	8/16/2022	(N)F			1.86	NTU		F	#	-	-
Turbidity	0860-2	WL	8/16/2022	(N)F			3.52	NTU		F	#	-	-
Turbidity	0860-3	WL	8/16/2022	(N)F			2.11	NTU		F	#	-	-
Turbidity	0860-4	WL	8/16/2022	(N)F			2.68	NTU		F	#	-	-
Uranium													
Uranium	0101	WL	8/16/2022	(T)F			0.0157	mg/L		F	#	0.000067	-
Uranium	0705	WL	8/17/2022	(T)F			0.000068	mg/L	B	FQ	#	0.000067	-
Uranium	0707	WL	8/17/2022	(T)F			0.642	mg/L		F	#	0.000067	-
Uranium	0710	WL	8/17/2022	(T)D			0.00296	mg/L		FJ	#	0.000067	-
Uranium	0710	WL	8/17/2022	(T)F			0.00371	mg/L		FJ	#	0.000067	-
Uranium	0716	WL	8/16/2022	(T)F			0.18	mg/L		F	#	0.000067	-
Uranium	0717	WL	8/16/2022	(T)F			0.000067	mg/L	U	F	#	0.000067	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (EQuIS200) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 12/14/2022 11:59:48 AM

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Uranium	0718	WL	8/17/2022	(D)F			0.111	mg/L		F	#	0.000067	-
Uranium	0719	WL	8/17/2022	(T)D			0.000213	mg/L		FJQ	#	0.000067	-
Uranium	0719	WL	8/17/2022	(T)F			0.000188	mg/L	B	FQ	#	0.000067	-
Uranium	0720	WL	8/17/2022	(T)F			0.00362	mg/L		F	#	0.000067	-
Uranium	0721	WL	8/17/2022	(T)F			0.000077	mg/L	B	F	#	0.000067	-
Uranium	0722R	WL	8/17/2022	(T)F			0.144	mg/L		F	#	0.000067	-
Uranium	0723	WL	8/17/2022	(T)F			0.000067	mg/L	U	F	#	0.000067	-
Uranium	0727	WL	8/16/2022	(T)F			0.00295	mg/L		F	#	0.000067	-
Uranium	0729	WL	8/17/2022	(T)F			0.00487	mg/L		F	#	0.000067	-
Uranium	0730	WL	8/17/2022	(T)F			0.00435	mg/L		FQ	#	0.000067	-
Uranium	0732	WL	8/16/2022	(T)F			0.00465	mg/L		F	#	0.000067	-
Uranium	0784	WL	8/16/2022	(T)F			0.00323	mg/L		F	#	0.000067	-
Uranium	0788	WL	8/16/2022	(T)F			0.0301	mg/L		F	#	0.000067	-
Uranium	0789	WL	8/16/2022	(T)F			1.07	mg/L		F	#	0.000067	-
Uranium	0824	WL	8/16/2022	(T)F			0.00448	mg/L		F	#	0.000067	-
Uranium	0826	WL	8/17/2022	(T)F			0.0266	mg/L		F	#	0.000067	-
Uranium	0852-2	WL	8/17/2022	(T)F			0.0147	mg/L		F	#	0.000067	-
Uranium	0852-3	WL	8/17/2022	(T)F			0.0144	mg/L		F	#	0.000067	-
Uranium	0852-4	WL	8/17/2022	(T)F			0.0142	mg/L		F	#	0.000067	-
Uranium	0853-2	WL	8/16/2022	(T)F			0.026	mg/L		F	#	0.000067	-
Uranium	0853-3	WL	8/16/2022	(T)F			0.0243	mg/L		F	#	0.000067	-
Uranium	0853-4	WL	8/16/2022	(T)F			0.024	mg/L		F	#	0.000067	-
Uranium	0854-2	WL	8/17/2022	(T)F			0.0442	mg/L		F	#	0.000067	-
Uranium	0854-3	WL	8/17/2022	(T)F			0.0356	mg/L		F	#	0.000067	-
Uranium	0854-4	WL	8/17/2022	(T)F			0.0337	mg/L		F	#	0.000067	-

GROUNDWATER QUALITY DATA BY PARAMETER WITH DEPTH (EQuIS200) FOR SITE RVT01, Riverton Processing Site

REPORT DATE: 12/14/2022 11:59:48 AM

PARAMETER	LOCATION CODE/TYPE		SAMPLE DATE	SAMPLE TYPE	DEPTH RANGE (FT BLS)		RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECTION LIMIT	UNCERTAINTY
Uranium	0855-2	WL	8/16/2022	(T)F			0.832	mg/L		F	#	0.000335	-
Uranium	0855-3	WL	8/16/2022	(T)F			0.763	mg/L		F	#	0.000067	-
Uranium	0855-4	WL	8/16/2022	(T)F			0.576	mg/L		F	#	0.000335	-
Uranium	0856-2	WL	8/17/2022	(T)F			1.02	mg/L		F	#	0.000067	-
Uranium	0856-3	WL	8/17/2022	(T)F			0.954	mg/L		F	#	0.000067	-
Uranium	0856-4	WL	8/17/2022	(T)F			0.858	mg/L		F	#	0.000067	-
Uranium	0857-2	WL	8/17/2022	(T)F			1.08	mg/L		F	#	0.000067	-
Uranium	0857-3	WL	8/17/2022	(T)F			1.01	mg/L		F	#	0.000067	-
Uranium	0857-4	WL	8/17/2022	(T)F			0.989	mg/L		F	#	0.000067	-
Uranium	0858-2	WL	8/17/2022	(T)F			0.653	mg/L		F	#	0.000067	-
Uranium	0858-3	WL	8/17/2022	(T)F			0.604	mg/L		F	#	0.000067	-
Uranium	0858-4	WL	8/17/2022	(T)F			0.586	mg/L		F	#	0.000067	-
Uranium	0859-2	WL	8/16/2022	(T)F			0.0377	mg/L		F	#	0.000067	-
Uranium	0859-3	WL	8/16/2022	(T)F			0.0551	mg/L		F	#	0.000067	-
Uranium	0859-4	WL	8/16/2022	(T)F			0.164	mg/L		F	#	0.000335	-
Uranium	0860-2	WL	8/16/2022	(T)F			1.43	mg/L		F	#	0.000067	-
Uranium	0860-3	WL	8/16/2022	(T)F			0.928	mg/L		F	#	0.000067	-
Uranium	0860-4	WL	8/16/2022	(T)F			0.795	mg/L		F	#	0.000067	-

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 compound (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 compound (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:

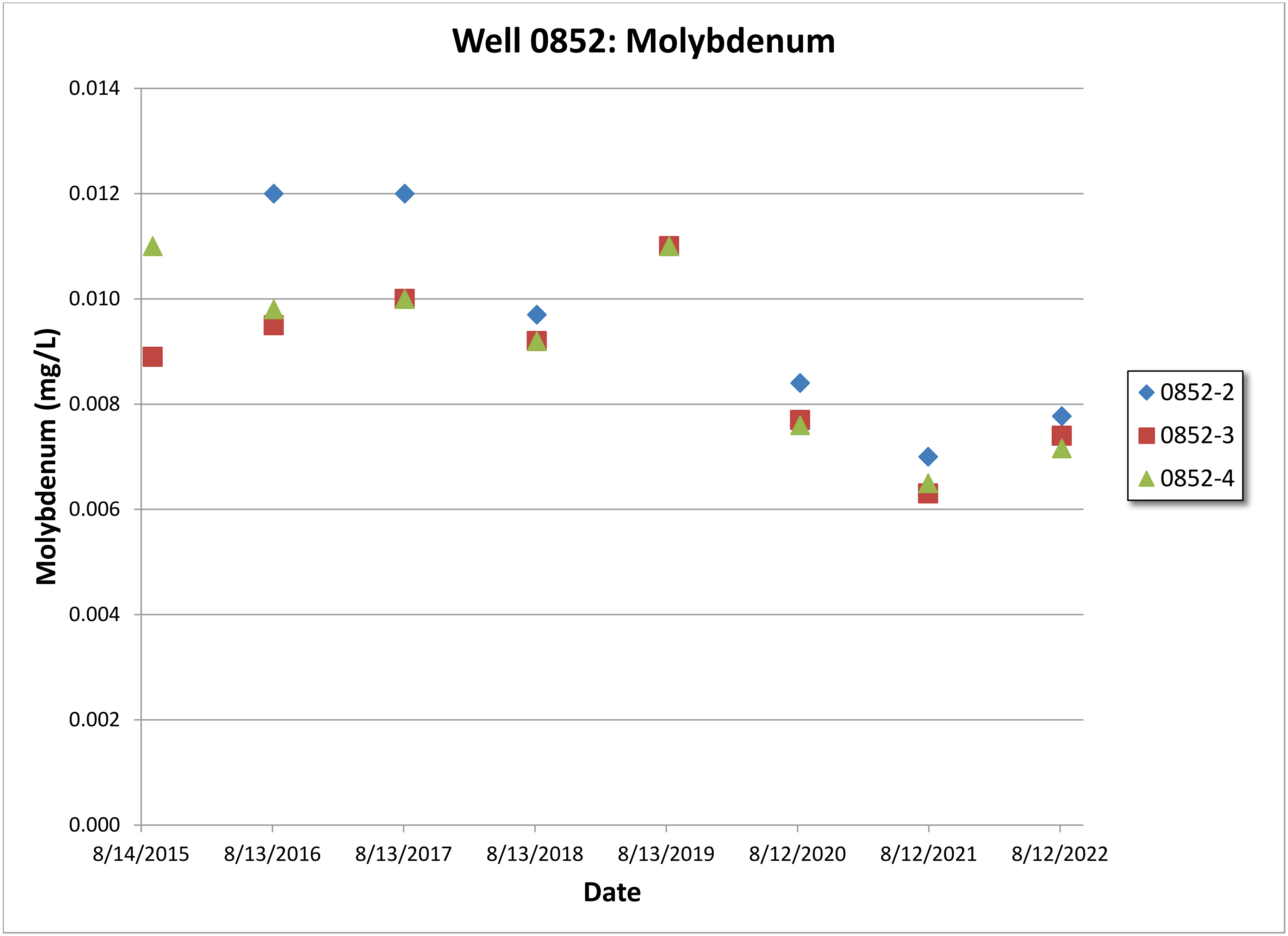
Fraction:
(T) Total (for metal concentrations)
(D) Dissolved (for dissolved or filtered metal concentrations)
(N) Organic (or other) constituents for which neither total nor dissolved is applicable

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

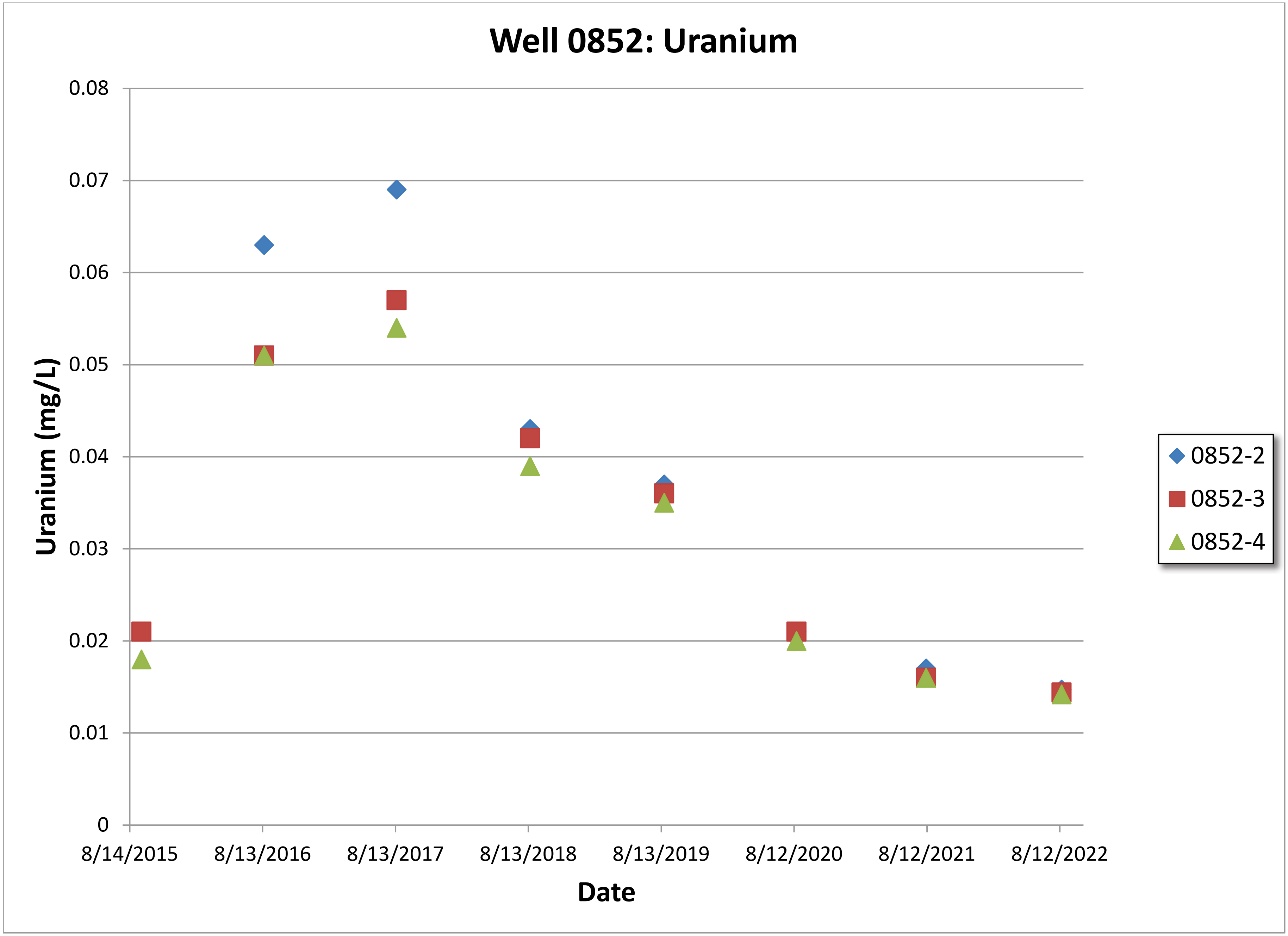
QA QUALIFIER: # = validated according to Quality Assurance guidelines.

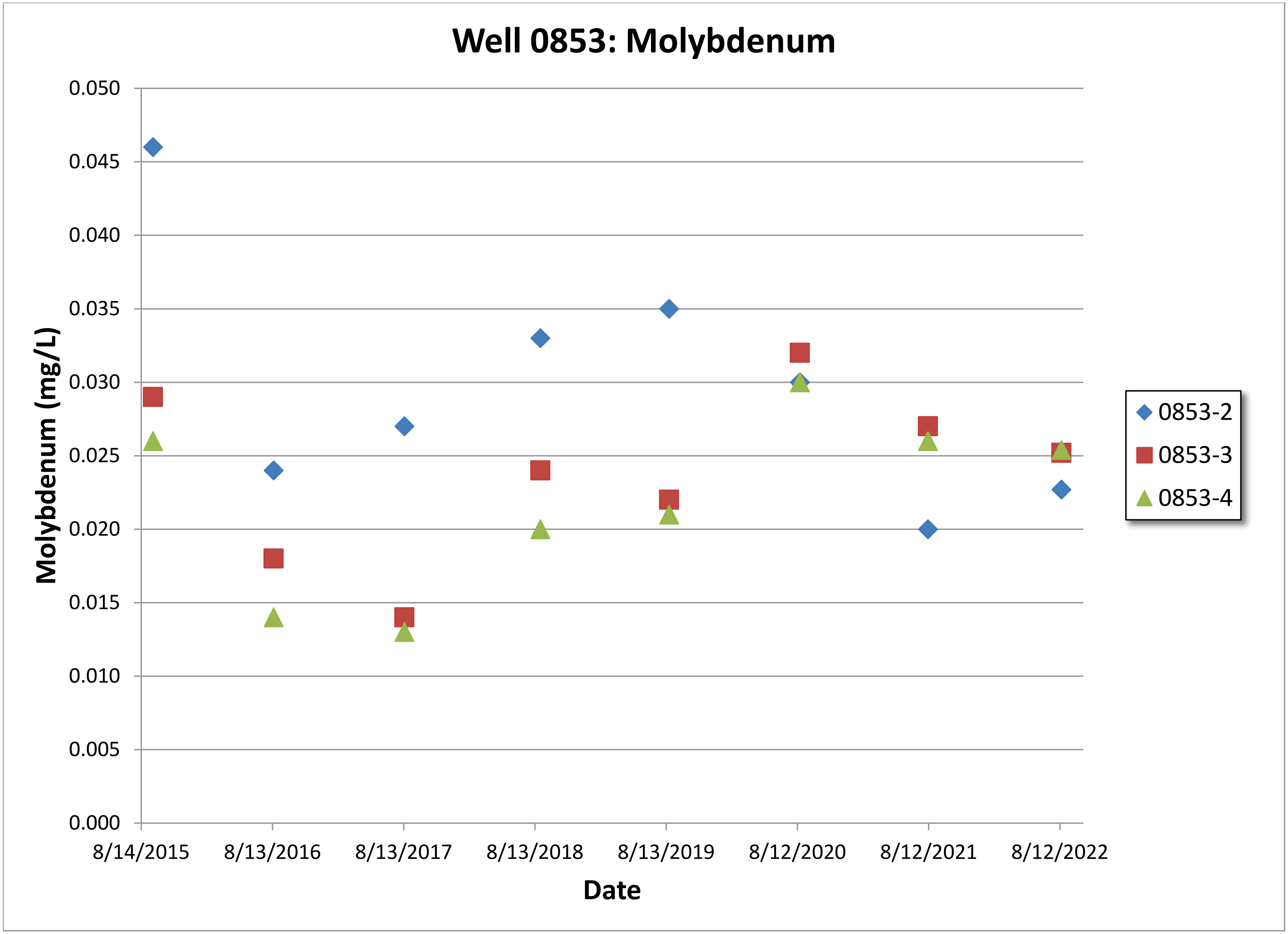
Appendix D

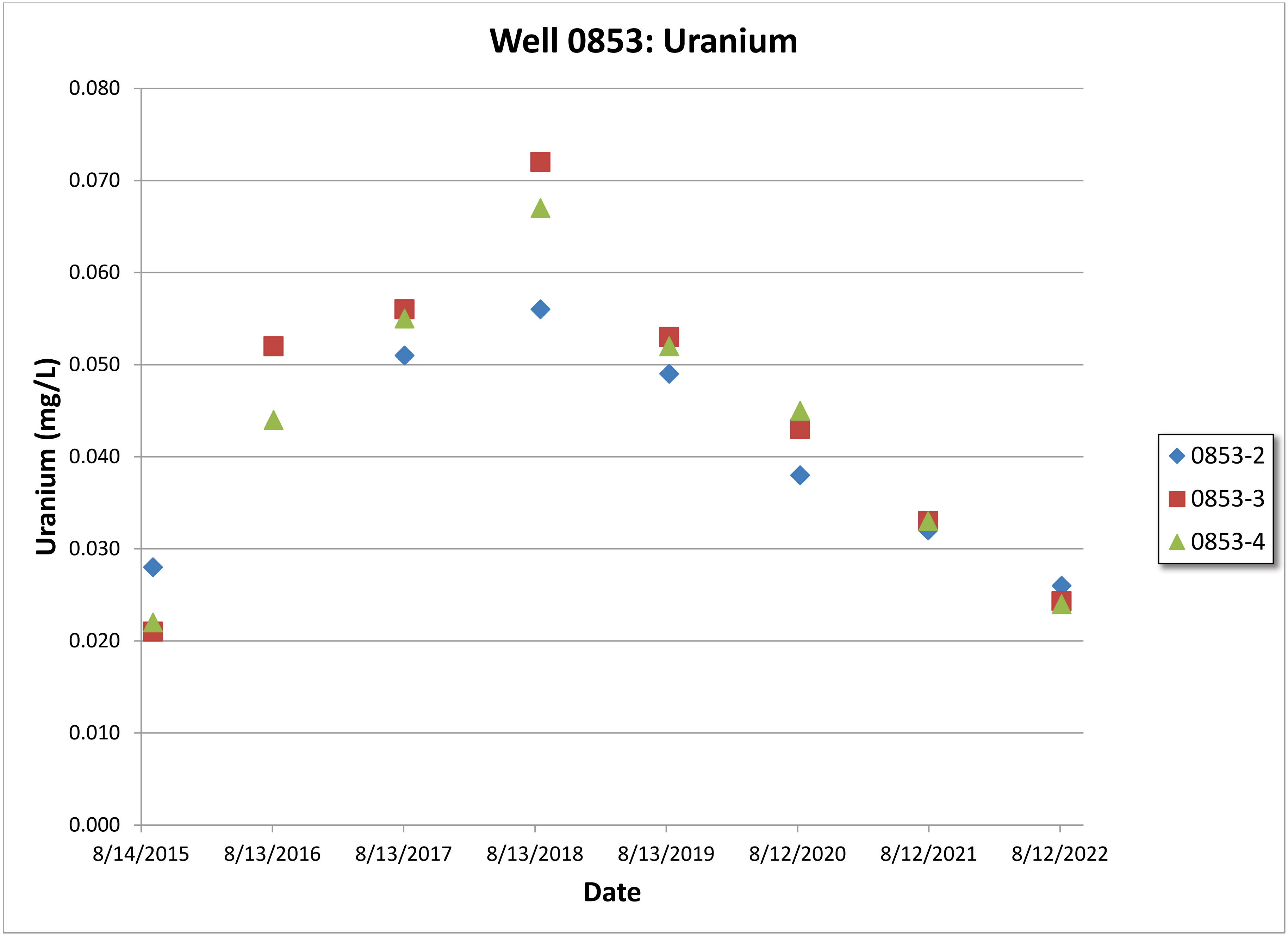
Multilevel Monitoring Well Graphs



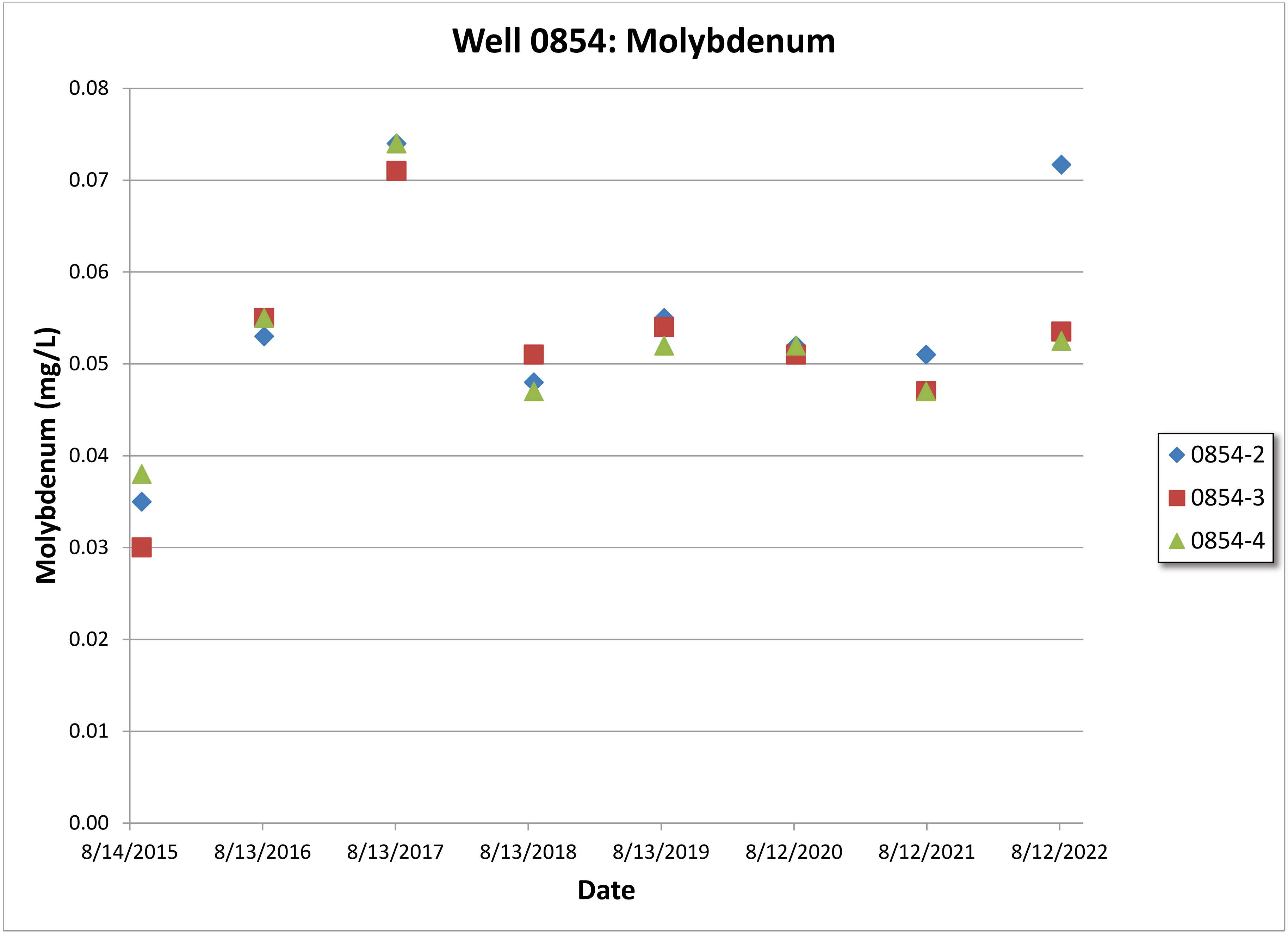
Well 0852: Molybdenum
0.014
0.012
0.010
0.008
0.006
0.004
0.002
0.000
Molybdenum (mg/L)
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0852-2
0852-3
0852-4


Well 0852: Uranium
Uranium (mg/L)
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0852-2
0852-3
0852-4

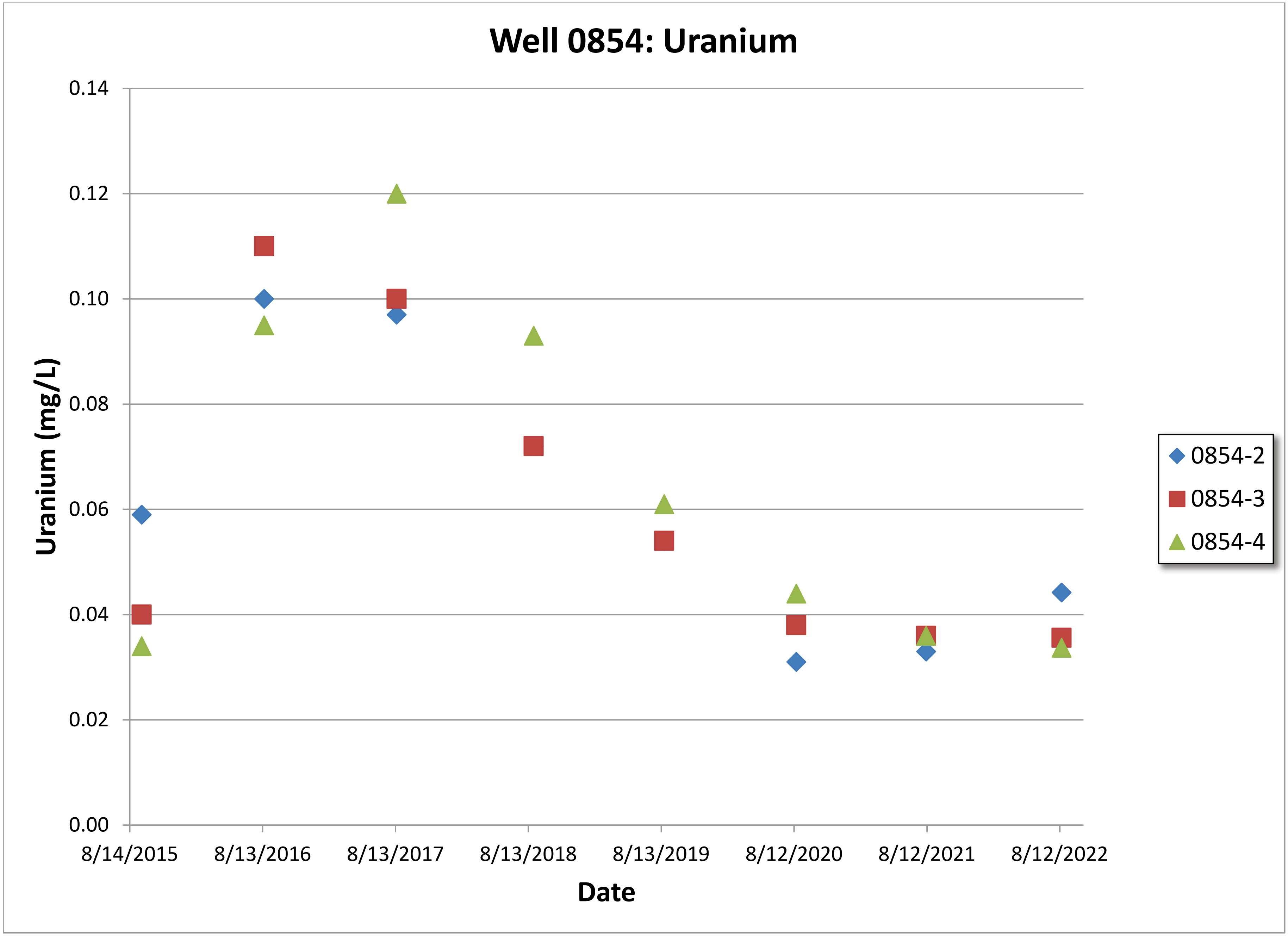

Well 0853: Molybdenum
Molybdenum (mg/L)
0.050
0.045
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0853-2
0853-3
0853-4

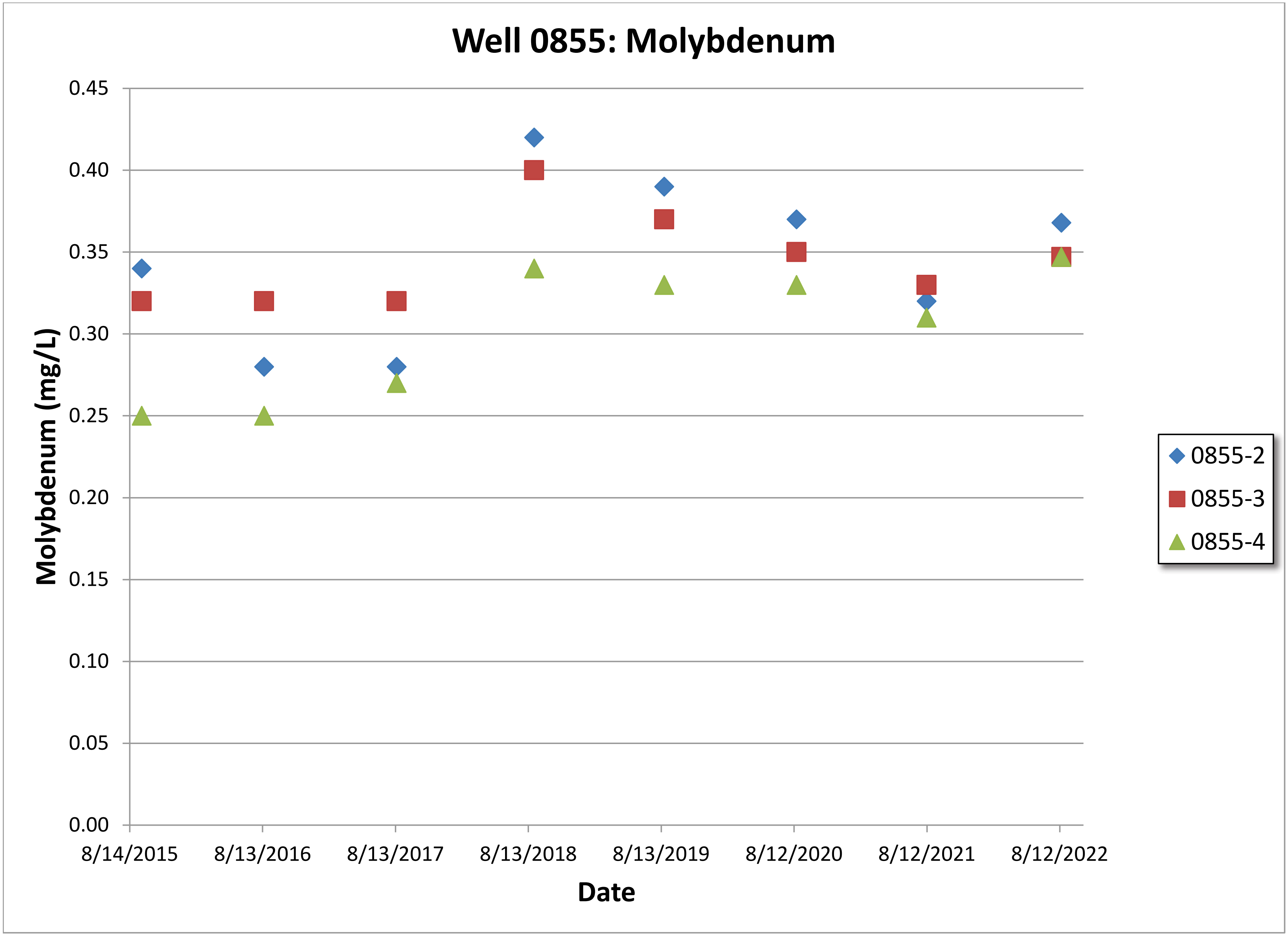


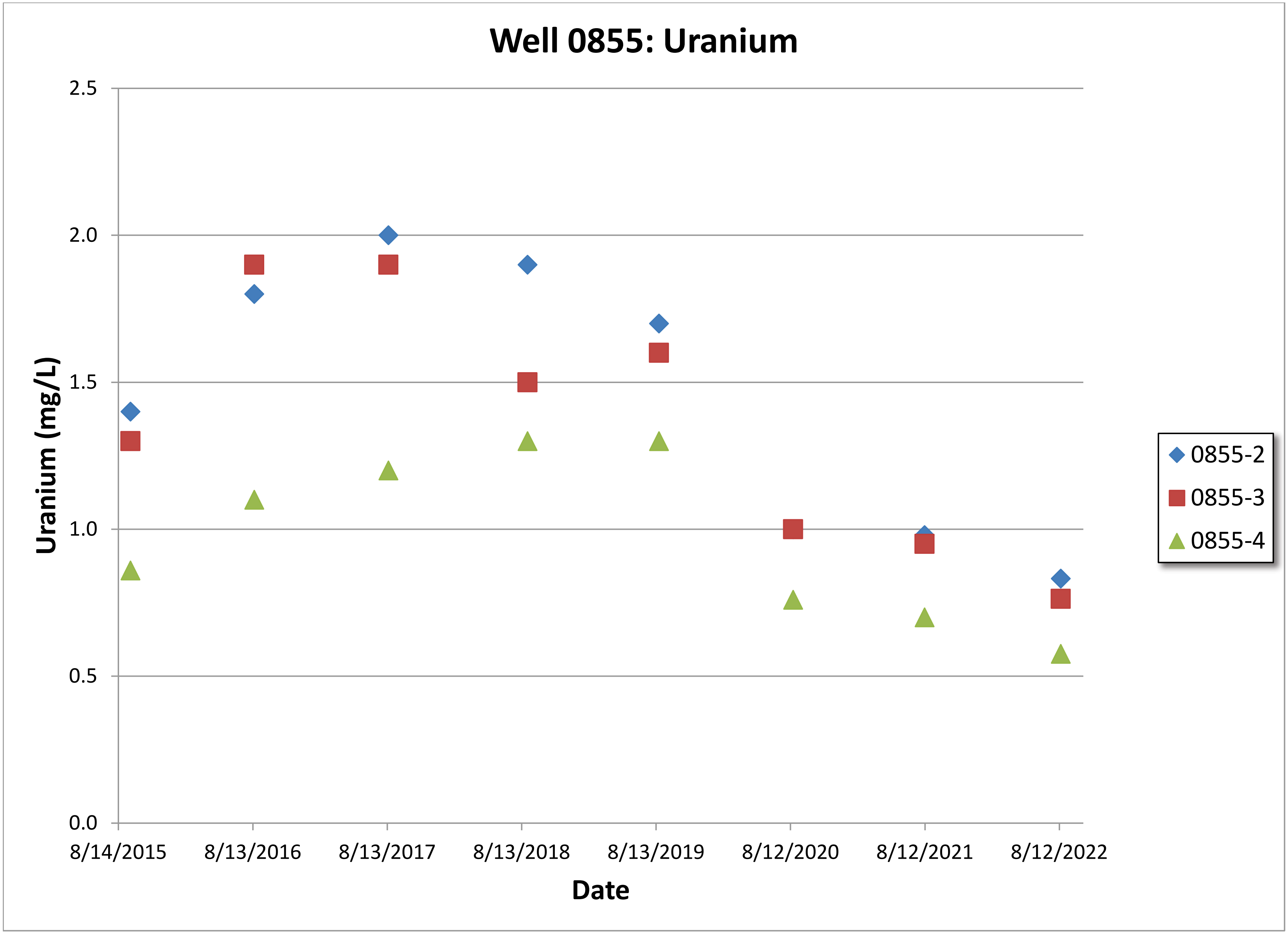
Well 0853: Uranium
0.080
0.070
0.060
0.050
0.040
0.030
0.020
0.010
0.000
Uranium (mg/L)
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0853-2
0853-3
0853-4

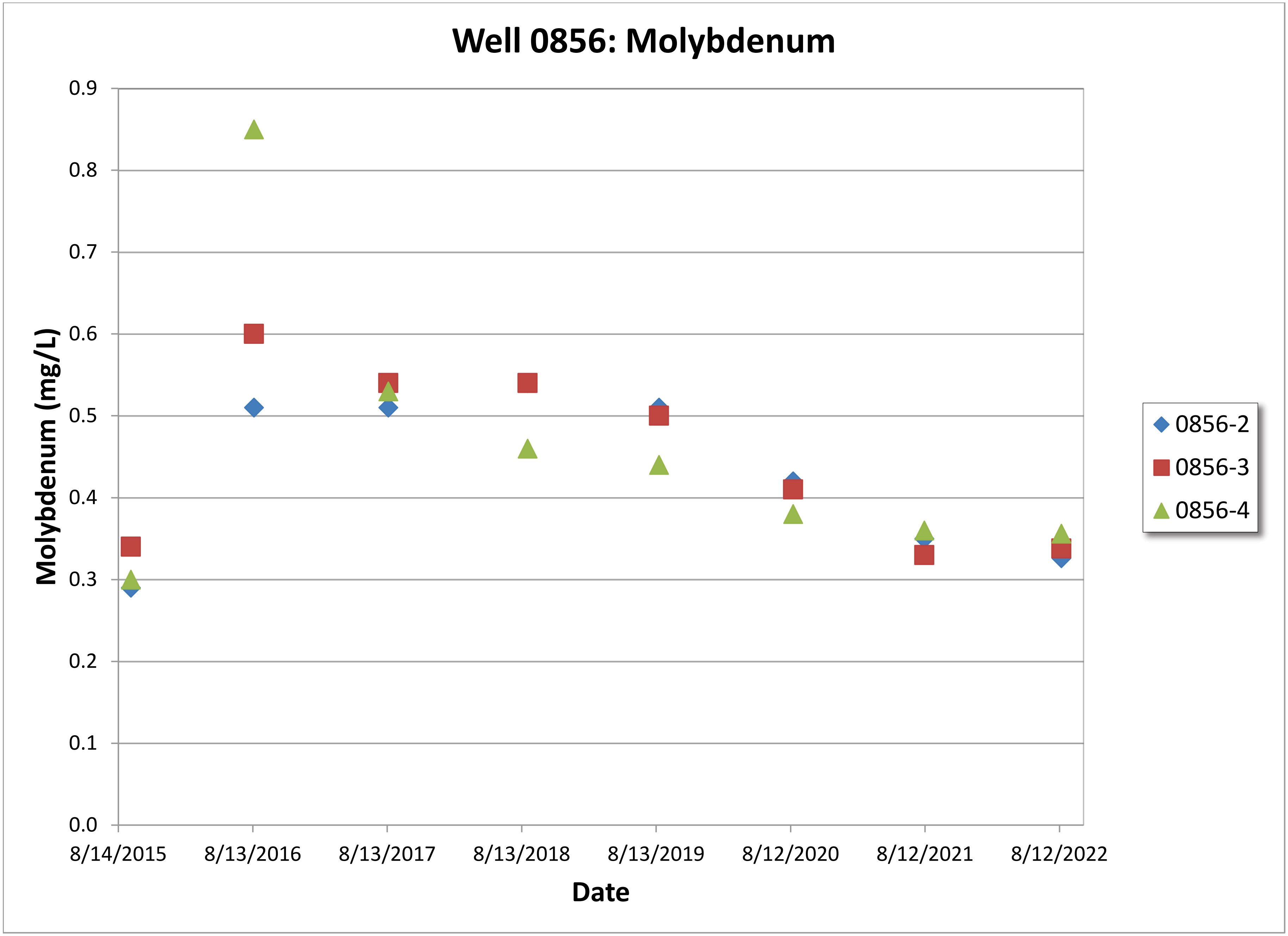


Well 0854: Molybdenum
Molybdenum (mg/L)
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0854-2
0854-3
0854-4

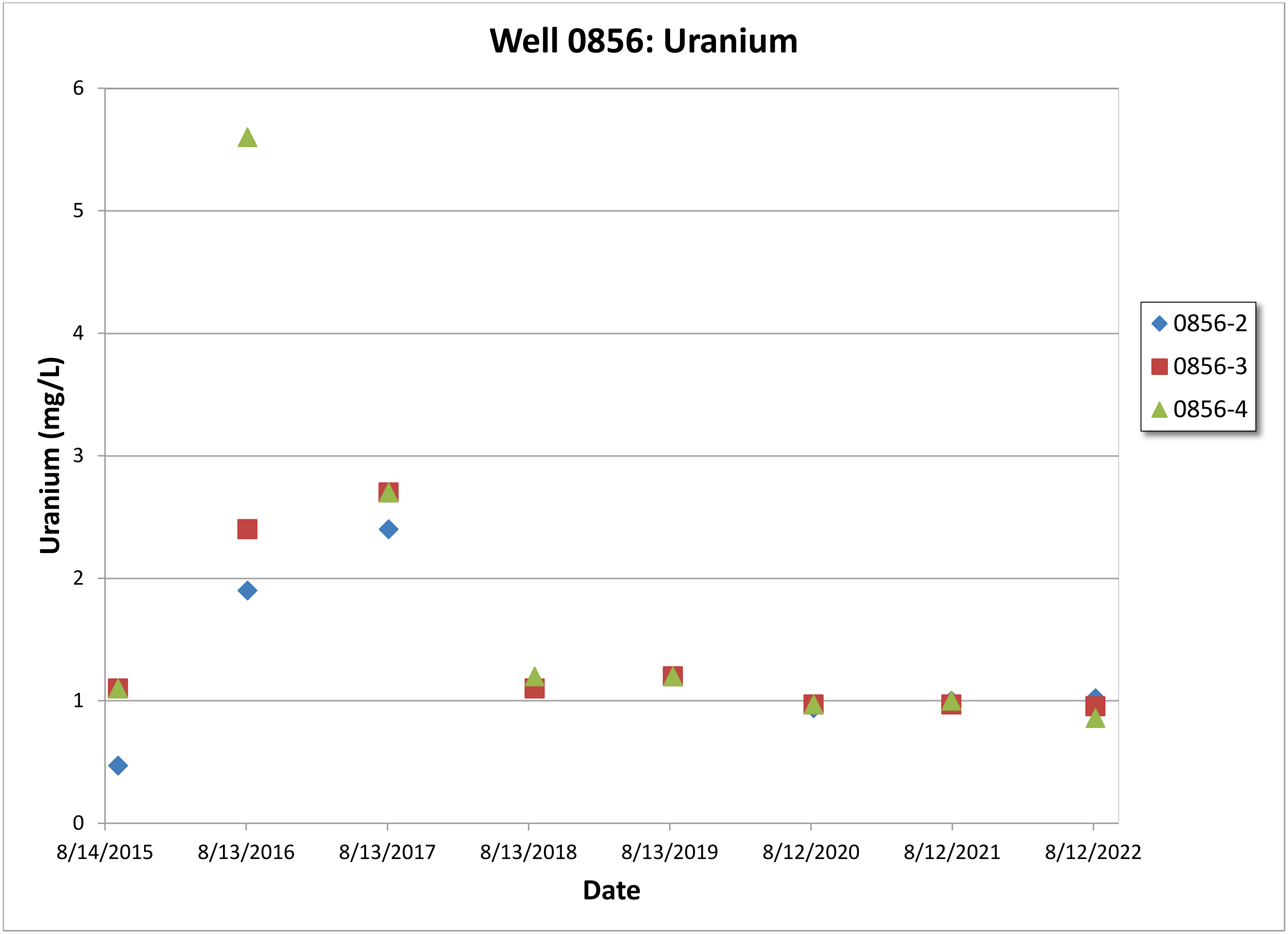

Well 0854: Uranium
Uranium (mg/L)
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0854-2
0854-3
0854-4

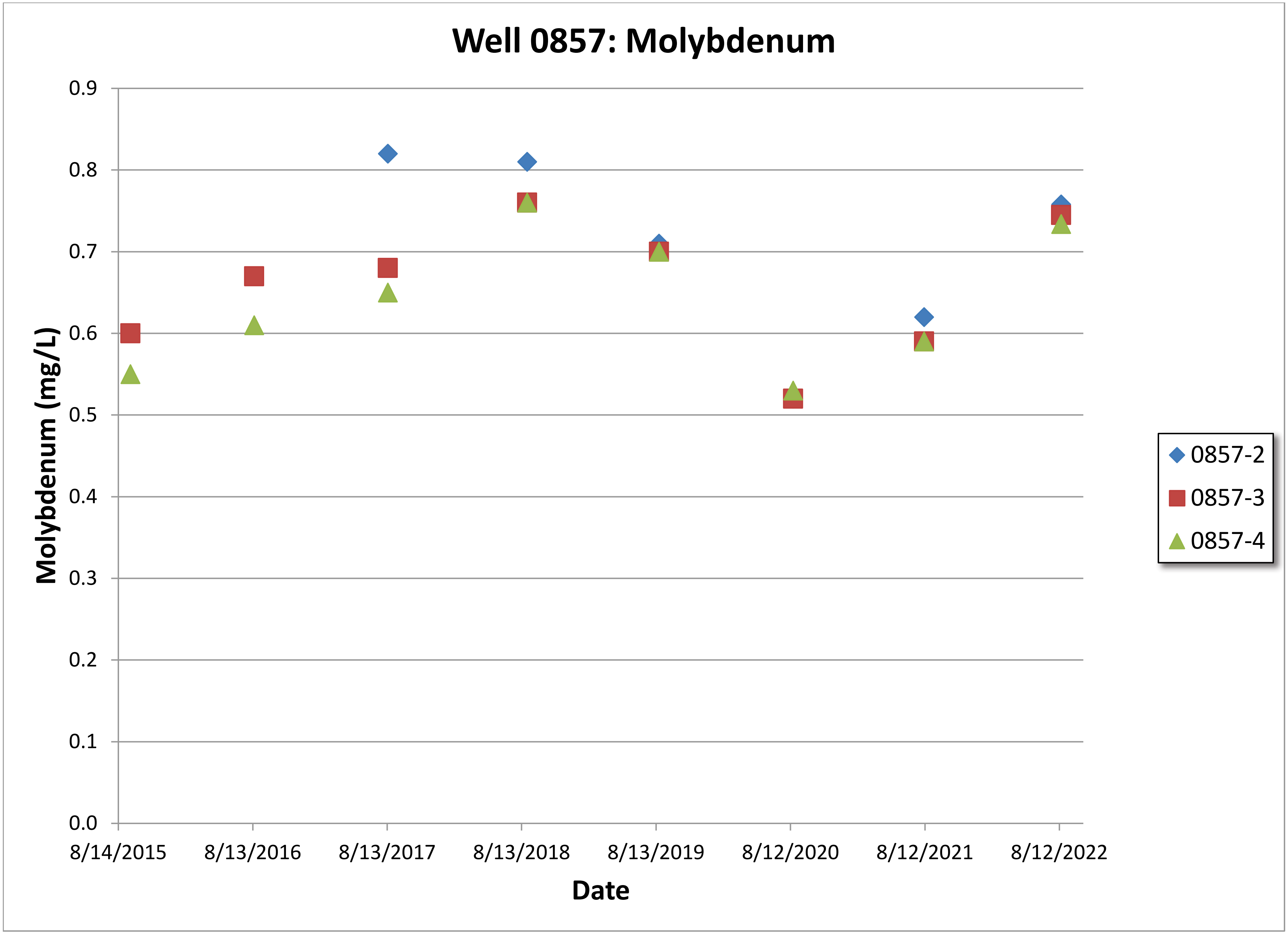

Well 0855: Molybdenum
Molybdenum (mg/L)
0.45
0.40
0.35
0.30
0.25
0.20
0.15
0.10
0.05
0.00
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0855-2
0855-3
0855-4

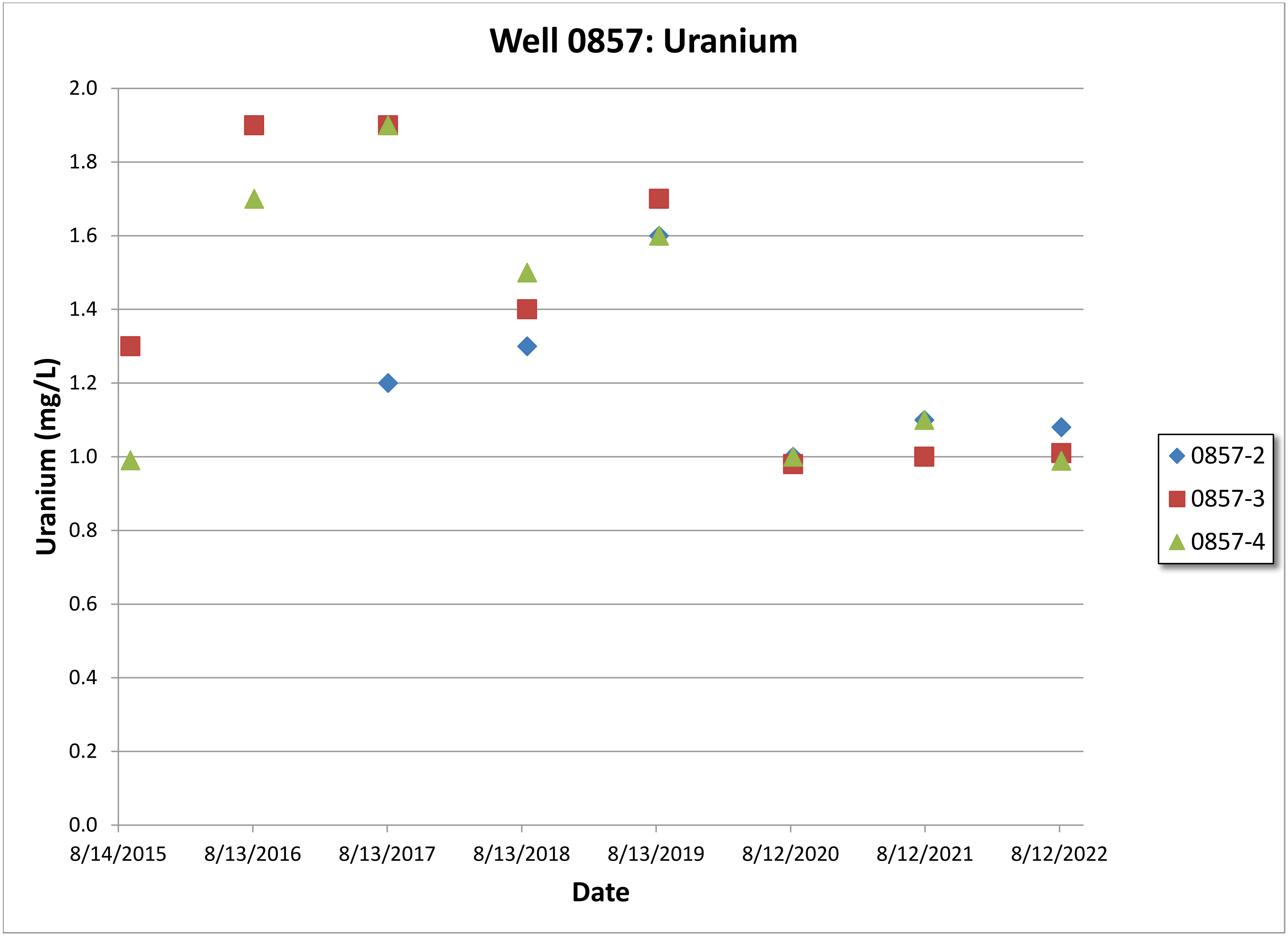

Well 0855: Uranium
Uranium (mg/L)
2.5
2.0
1.5
1.0
0.5
0.0
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0855-2
0855-3
0855-4



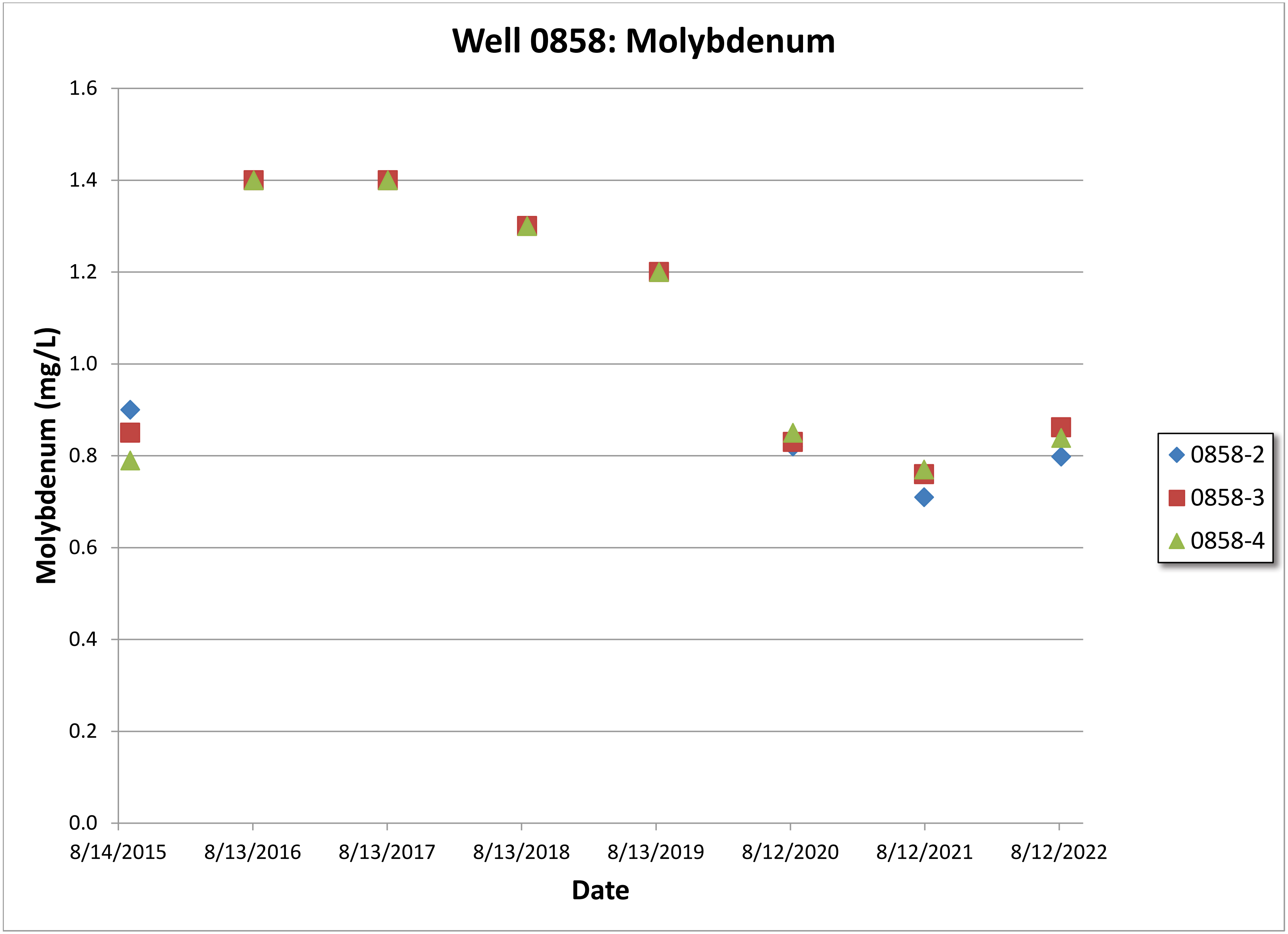
Well 0856: Molybdenum
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Molybdenum (mg/L)
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0856-2
0856-3
0856-4


Well 0856: Uranium
Uranium (mg/L)
6
5
4
3
2
1
0
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0856-2
0856-3
0856-4

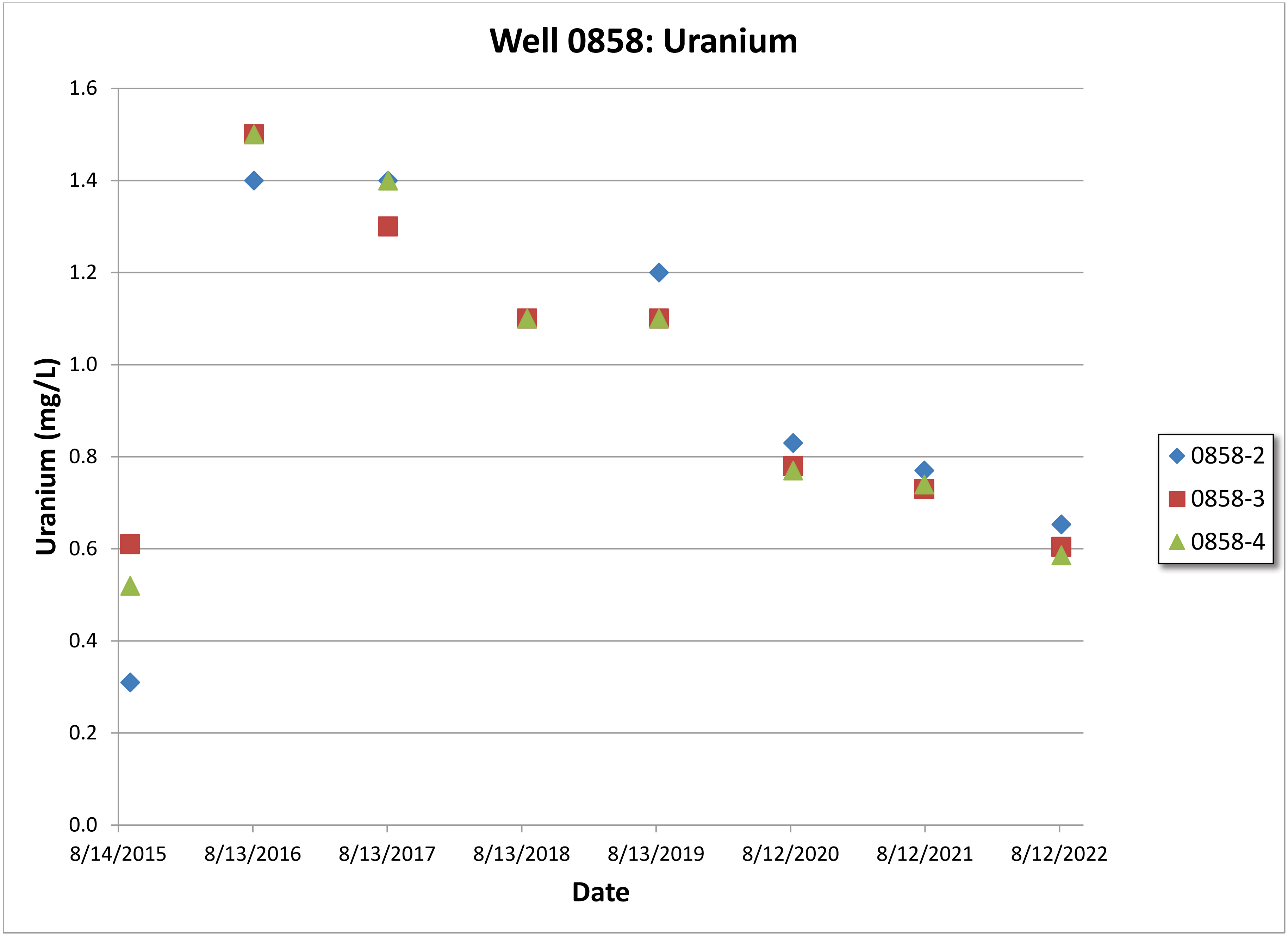

Well 0857: Molybdenum
Molybdenum (mg/L)
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0857-2
0857-3
0857-4

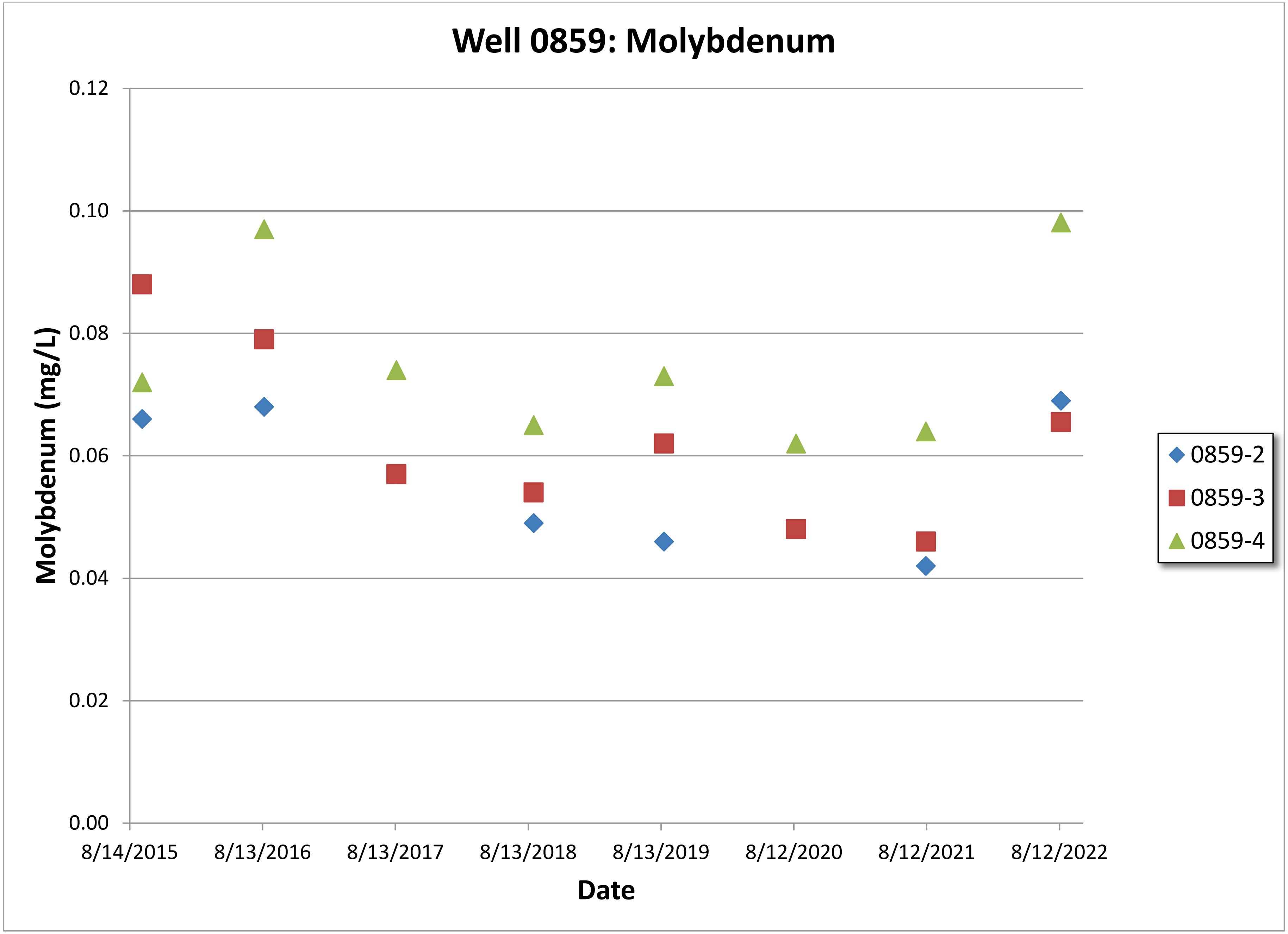


Well 0857: Uranium
Uranium (mg/L)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0857-2
0857-3
0857-4

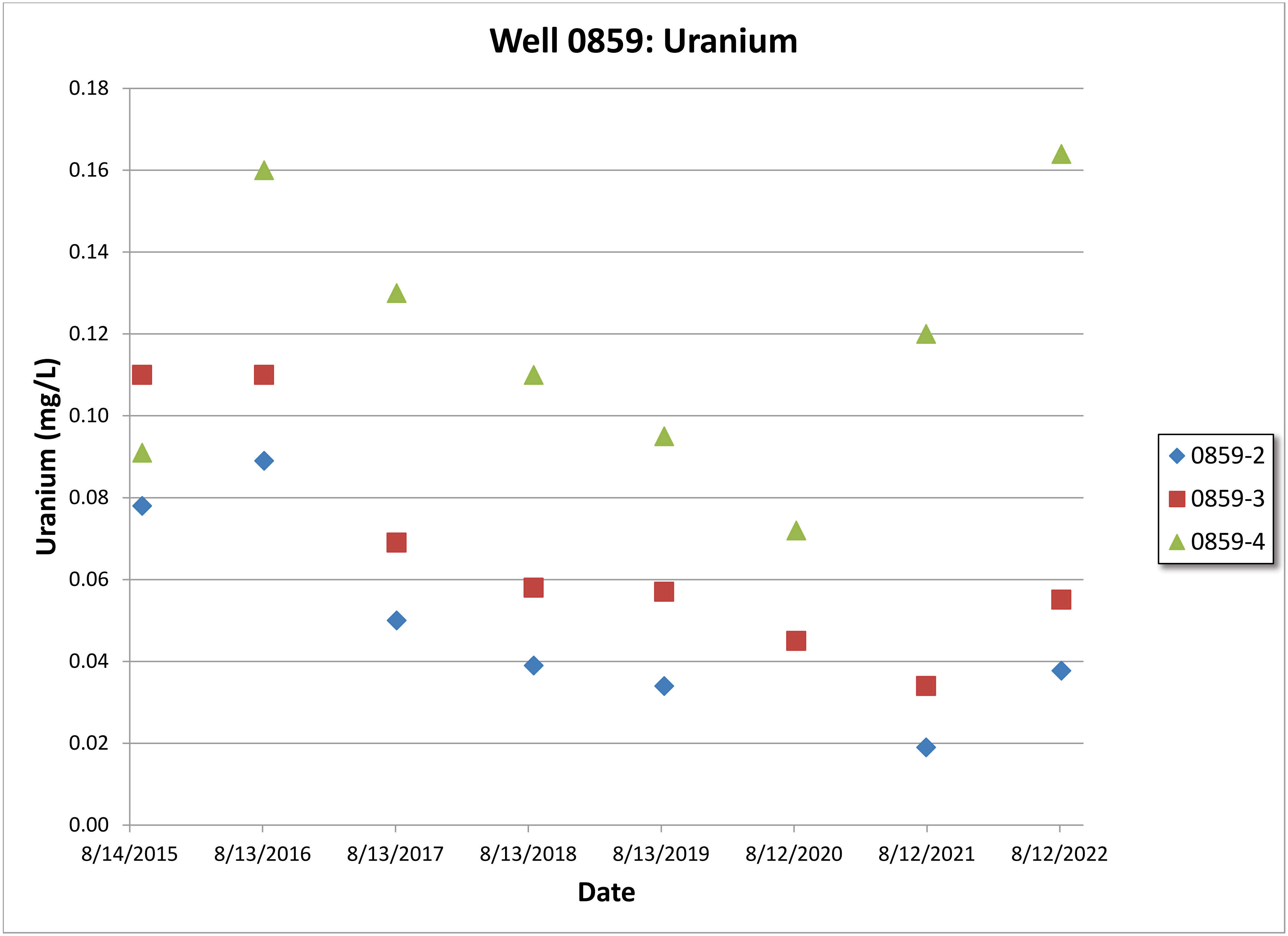


Well 0858: Molybdenum
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Molybdenum (mg/L)
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0858-2
0858-3
0858-4

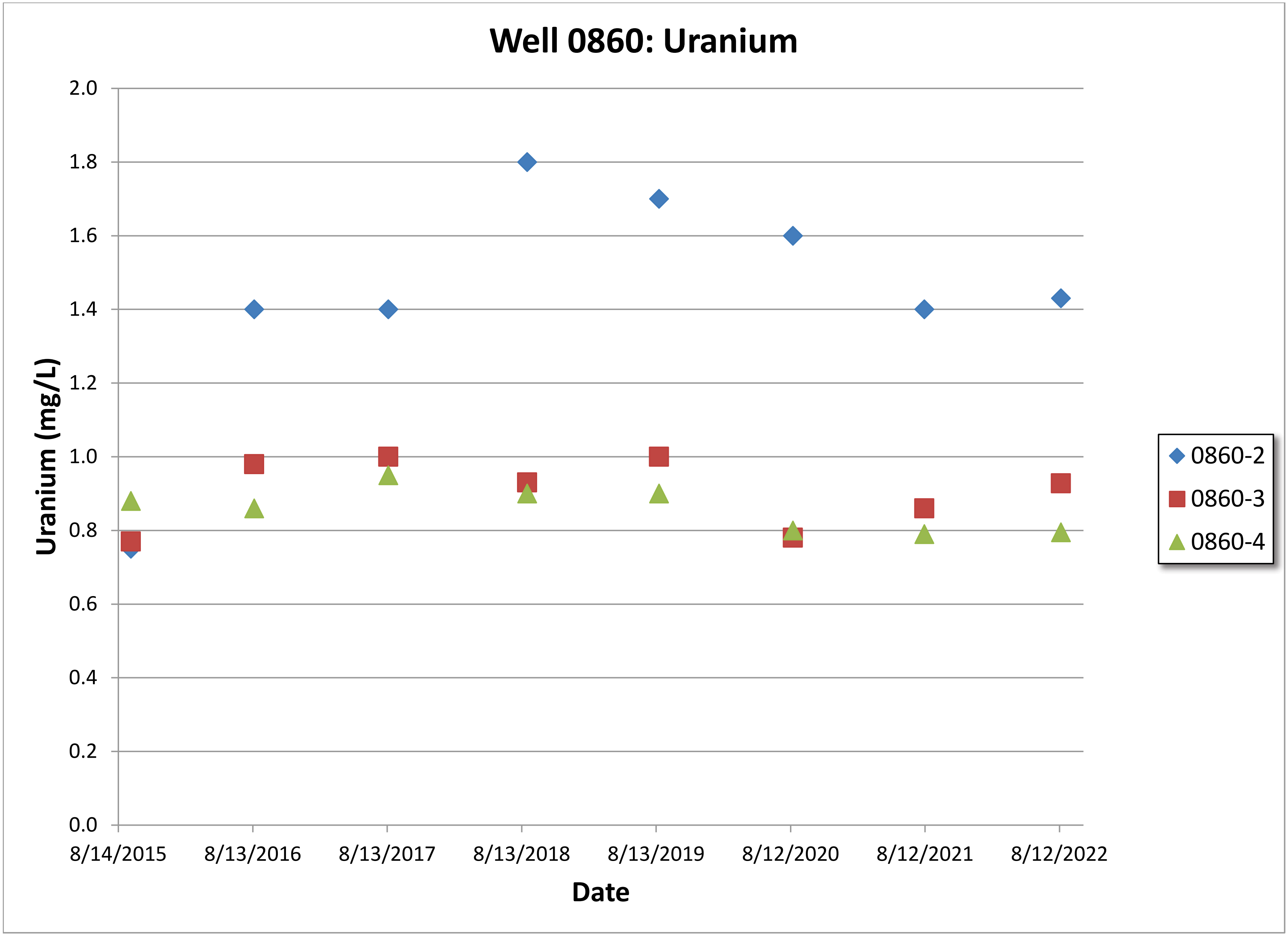

Well 0858: Uranium
Uranium (mg/L)
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0858-2
0858-3
0858-4



Well 0859: Molybdenum
0.12
0.10
0.08
0.06
0.04
0.02
0.00
Molybdenum (mg/L)
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0859-2
0859-3
0859-4


Well 0859: Uranium
Uranium (mg/L)
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02
0.00
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0859-2
0859-3
0859-4


Well 0860: Molybdenum
Molybdenum (mg/L)
0.6
0.5
0.4
0.3
0.2
0.1
0.0
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0860-2
0860-3
0860-4



Well 0860: Uranium
Uranium (mg/L)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
8/14/2015
8/13/2016
8/13/2017
8/13/2018
8/13/2019
8/12/2020
8/12/2021
8/12/2022
Date
0860-2
0860-3
0860-4

Appendix E

Surface Water Data

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

REPORT DATE: 12/14/2022 11:10:25 AM

PARAMETER	LOCATION CODE	SAMPLE DATE	SAMPLE TYPE	RESULT	UNITS	QUALIFIERS LAB/DATA		QA	DETECT. LIMIT	UNCERTAINTY
Alkalinity, Total (As CaCO3)										
Alkalinity, Total (As CaCO3)	0747	8/16/2022	(D)F	325	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0749	8/17/2022	(N)F	0	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0794	8/17/2022	(D)F	164.286	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0796	8/17/2022	(D)F	160.417	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0810	8/17/2022	(N)F	459	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0811	8/16/2022	(D)F	188	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0812	8/16/2022	(D)F	133.929	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0822	8/17/2022	(D)F	440	mg/L			#	-	-
Alkalinity, Total (As CaCO3)	0823	8/17/2022	(N)F	82	mg/L			#	-	-
Manganese										
Manganese	0747	8/16/2022	(D)F	0.812	mg/L			#	0.002	-
Manganese	0749	8/17/2022	(T)F	0.19	mg/L			#	0.002	-
Manganese	0794	8/17/2022	(D)F	0.0167	mg/L			#	0.002	-
Manganese	0796	8/17/2022	(D)F	0.0135	mg/L			#	0.002	-
Manganese	0810	8/17/2022	(T)D	0.0239	mg/L			#	0.002	-
Manganese	0810	8/17/2022	(T)F	0.0258	mg/L			#	0.002	-
Manganese	0811	8/16/2022	(D)F	0.0153	mg/L			#	0.002	-
Manganese	0812	8/16/2022	(T)F	0.0135	mg/L			#	0.002	-
Manganese	0822	8/17/2022	(D)F	0.0105	mg/L			#	0.002	-
Manganese	0823	8/17/2022	(T)F	0.141	mg/L			#	0.002	-
Molybdenum										
Molybdenum	0747	8/16/2022	(D)F	0.0141	mg/L			#	0.0002	-
Molybdenum	0749	8/17/2022	(T)F	0.0296	mg/L			#	0.0002	-
Molybdenum	0794	8/17/2022	(D)F	0.00182	mg/L	B		#	0.0002	-
Molybdenum	0796	8/17/2022	(D)F	0.00156	mg/L	B		#	0.0002	-
Molybdenum	0810	8/17/2022	(T)D	0.000624	mg/L	B		#	0.0002	-
Molybdenum	0810	8/17/2022	(T)F	0.000856	mg/L	B		#	0.0002	-
Molybdenum	0811	8/16/2022	(D)F	0.00155	mg/L	B		#	0.0002	-
Molybdenum	0812	8/16/2022	(T)F	0.00157	mg/L	B		#	0.0002	-
Molybdenum	0822	8/17/2022	(D)F	0.00866	mg/L			#	0.0002	-
Molybdenum	0823	8/17/2022	(T)F	0.000901	mg/L	B		#	0.0002	-

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

REPORT DATE: 12/14/2022 11:10:25 AM

PARAMETER	LOCATION CODE	SAMPLE DATE	SAMPLE TYPE	RESULT	UNITS	QUALIFIERS LAB	QUALIFIERS DATA	QA	DETECT. LIMIT	UNCERTAINTY
pH										
pH	0747	8/16/2022	(N)F	7.6	s.u.			#	-	-
pH	0749	8/17/2022	(N)F	3.09	s.u.			#	-	-
pH	0794	8/17/2022	(N)F	8.42	s.u.			#	-	-
pH	0796	8/17/2022	(N)F	8.45	s.u.			#	-	-
pH	0810	8/17/2022	(N)F	8.95	s.u.			#	-	-
pH	0811	8/16/2022	(N)F	8.14	s.u.			#	-	-
pH	0812	8/16/2022	(N)F	8.47	s.u.			#	-	-
pH	0822	8/17/2022	(N)F	9.24	s.u.			#	-	-
pH	0823	8/17/2022	(N)F	9.07	s.u.			#	-	-
Specific Conductance										
Specific Conductance	0747	8/16/2022	(N)F	1109.3	umhos/cm			#	-	-
Specific Conductance	0749	8/17/2022	(N)F	3440	umhos/cm			#	-	-
Specific Conductance	0794	8/17/2022	(N)F	708	umhos/cm			#	-	-
Specific Conductance	0796	8/17/2022	(N)F	678	umhos/cm			#	-	-
Specific Conductance	0810	8/17/2022	(N)F	1435	umhos/cm			#	-	-
Specific Conductance	0811	8/16/2022	(N)F	687.9	umhos/cm			#	-	-
Specific Conductance	0812	8/16/2022	(N)F	685	umhos/cm			#	-	-
Specific Conductance	0822	8/17/2022	(N)F	1353	umhos/cm			#	-	-
Specific Conductance	0823	8/17/2022	(N)F	3452	umhos/cm			#	-	-
Sulfate										
Sulfate	0747	8/16/2022	(N)F	213	mg/L			#	13.3	-
Sulfate	0749	8/17/2022	(N)F	1850	mg/L			#	13.3	-
Sulfate	0794	8/17/2022	(N)F	188	mg/L			#	13.3	-
Sulfate	0796	8/17/2022	(N)F	182	mg/L			#	13.3	-
Sulfate	0810	8/17/2022	(N)D	301	mg/L			#	13.3	-
Sulfate	0810	8/17/2022	(N)F	302	mg/L			#	13.3	-
Sulfate	0811	8/16/2022	(N)F	183	mg/L			#	13.3	-
Sulfate	0812	8/16/2022	(N)F	183	mg/L			#	13.3	-
Sulfate	0822	8/17/2022	(N)F	328	mg/L			#	13.3	-
Sulfate	0823	8/17/2022	(N)F	1540	mg/L			#	13.3	-

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

REPORT DATE: 12/14/2022 11:10:26 AM

PARAMETER	LOCATION CODE	SAMPLE DATE	SAMPLE TYPE	RESULT	UNITS	QUALIFIERS LAB	QUALIFIERS DATA	QA	DETECT. LIMIT	UNCERTAINTY
Temperature										
Temperature	0747	8/16/2022	(N)F	18.61	C			#	-	-
Temperature	0749	8/17/2022	(N)F	22.13	C			#	-	-
Temperature	0794	8/17/2022	(N)F	26.41	C			#	-	-
Temperature	0796	8/17/2022	(N)F	25.71	C			#	-	-
Temperature	0810	8/17/2022	(N)F	26.12	C			#	-	-
Temperature	0811	8/16/2022	(N)F	20.89	C			#	-	-
Temperature	0812	8/16/2022	(N)F	26.01	C			#	-	-
Temperature	0822	8/17/2022	(N)F	24.39	C			#	-	-
Temperature	0823	8/17/2022	(N)F	22.88	C			#	-	-
Turbidity										
Turbidity	0747	8/16/2022	(N)F	72.2	NTU			#	-	-
Turbidity	0749	8/17/2022	(N)F	9.27	NTU			#	-	-
Turbidity	0794	8/17/2022	(N)F	19.7	NTU			#	-	-
Turbidity	0796	8/17/2022	(N)F	16.2	NTU			#	-	-
Turbidity	0810	8/17/2022	(N)F	4.33	NTU			#	-	-
Turbidity	0811	8/16/2022	(N)F	12.8	NTU			#	-	-
Turbidity	0812	8/16/2022	(N)F	13.1	NTU			#	-	-
Turbidity	0822	8/17/2022	(N)F	94.6	NTU			#	-	-
Turbidity	0823	8/17/2022	(N)F	1.64	NTU			#	-	-
Uranium										
Uranium	0747	8/16/2022	(D)F	0.079	mg/L			#	0.000067	-
Uranium	0749	8/17/2022	(T)F	0.00107	mg/L			#	0.000067	-
Uranium	0794	8/17/2022	(D)F	0.00486	mg/L			#	0.000067	-
Uranium	0796	8/17/2022	(D)F	0.00407	mg/L			#	0.000067	-
Uranium	0810	8/17/2022	(T)D	0.00318	mg/L			#	0.000067	-
Uranium	0810	8/17/2022	(T)F	0.00369	mg/L			#	0.000067	-
Uranium	0811	8/16/2022	(D)F	0.00403	mg/L			#	0.000067	-
Uranium	0812	8/16/2022	(T)F	0.00429	mg/L			#	0.000067	-
Uranium	0822	8/17/2022	(D)F	0.00248	mg/L			#	0.000067	-
Uranium	0823	8/17/2022	(T)F	0.00249	mg/L			#	0.000067	-

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 compound (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 compound (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:
(T) Total (for metal concentrations)
(D) Dissolved (for dissolved or filtered metal concentrations)
(N) Organic (or other) constituents for which neither total nor dissolved is applicable

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

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