REPORT

Annual Groundwater Report - 2018

Great River Energy - Coal Creek Station

Submitted to:

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1.0 INTRODUCTION

Golder Associates Inc. (Golder) has prepared this report of the 2018 groundwater sampling and comparative statistical analysis for Great River Energy's (GRE) Coal Creek Station (CCS) to meet the requirements of the Coal Combustion Residuals (CCR) rule's sections on groundwater monitoring and corrective action, 40 Code of Federal Regulations (CFR) 257.90 through 257.98.

1.1 Purpose

The CCR rule established specific requirements for reporting of actions related to groundwater monitoring and corrective actions in 40 CFR 257.90. Per part (e) of 40 CFR 257.90, owners or operators of CCR units must prepare an annual groundwater monitoring and corrective action report.

1.2 Site Background

GRE's Coal Creek Station is a coal-fired electric generation facility located in McLean County, North Dakota, approximately 10 miles northwest of Washburn, ND. CCRs are managed in composite-lined surface water impoundment cells and dry waste facilities regulated and permitted by the North Dakota Department of Health (NDDH) in accordance with North Dakota Administrative Code Article 33-10, Solid Waste Management and Land Protection.

Coal Creek Station has four CCR facilities that are within the purview of the United States Environmental Protection Agency (USEPA) CCR rule:

- Drains Pond System CCR Surface Impoundment (Drains Pond System)
- Upstream Raise 91 CCR Surface Impoundment (Upstream Raise 91)
- Upstream Raise 92 CCR Surface Impoundment (Upstream Raise 92)
- Southeast Section 16 CCR Landfill (Southeast 16)

These CCR facilities are currently divided into 3 monitoring network units:

- Drains Pond System
- Upstream Raise 91 and Upstream Raise 92
- Southeast 16

Beginning in 2019, Upstream Raise 91 and Upstream Raise 92 will be monitored as separate facilities, resulting in four monitoring network units.

Locations of the facilities, groundwater monitoring network units, and groundwater monitoring wells are shown in Figure 1 and Figure 2.

2.0 GROUNDWATER MONITORING NETWORK PROGRAM STATUS

The CCR groundwater monitoring system at CCS consists of a total of 22 monitoring locations (eight upgradient and fourteen downgradient wells). The monitoring locations are shown on Figures 1 and 2 and listed on Table 1. Additional information on the groundwater monitoring system can be found in the Coal Combustion Residuals Groundwater Monitoring System Certification (Golder 2017a). Each CCR facility is part of monitoring network consisting of at least one upgradient and three downgradient monitoring wells.

- The Drains Pond System has two upgradient and three downgradient monitoring wells.
- Upstream Raise 91 and Upstream Raise 92 have four upgradient and six downgradient monitoring wells.
- Southeast 16 has two upgradient and five downgradient monitoring wells.

2.1 Completed Key Actions in 2018

The following key actions were completed in 2018:

- The first annual CCR groundwater monitoring and corrective action report was completed and placed within the operating record and on the publicly accessible CCR website (Golder 2018).
- Baseline statistical analysis was established for the Appendix III parameters following the methodology outlined in the Groundwater Monitoring Statistical Methods Certification, Great River Energy – Coal Creek Station (Golder 2017b).
- Detection monitoring samples were collected in June and October 2018, respectively, and analyzed for the Appendix III constituent list associated with the CCR rule for the majority of program wells.
- Comparative statistical analysis was completed for the Quarter 4 (Q4) 2017 and Quarter 2 (Q2) 2018 detection monitoring samples, which were collected in October 2017 and June 2018, respectively.
- Baseline samples (a minimum of eight) were collected between January and October 2018 for wells MW-16-0, MW-91-1, and MW-91-2, associated with Upstream Raise 91 and Upstream Raise 92, following installation in November and December 2017.
- A new downgradient monitoring well (MW-DP2B) associated with the Drains Pond was installed in November 2018.

2.2 Installation and Decommissioning of Wells

One well was installed to serve as a companion for a current well within the CCR monitoring well network in 2018 (Figure 1 and Figure 2).

- Well MW-DP2B – downgradient well in the Drains Pond System CCR Unit

This well was installed to serve as a companion to well MW-DP2, which has recently experienced decreasing water levels, resulting in intermittent dry periods. The well was installed and completed by Terracon Consultants Inc. in November 2018 and will be developed in early 2019 by Golder. Information on the installation and completion of this well is included in Appendix A.

Following completion of the well development, sampling of the well to establish baseline conditions will begin in early 2019. The well will initially be sampled as often as monthly through 2019 to obtain a minimum of eight baseline samples.

No wells were decommissioned from the CCR monitoring well network during 2018.

2.3 Problems and Resolutions

As described in Section 2.2, Well MW-DP2 in the Drains Pond System has experienced decreasing water levels, resulting in intermittent dry periods throughout 2018. To continue to adequately monitor the Drains Pond System, GRE installed MW-DP2B, located approximately 50 feet to the south of MW-DP2 and with a completion depth

approximately 5 feet deeper than well MW-DP2. Well MW-DP2 will continue to be monitored as part of the CCR monitoring program when enough water is present within the well, while MW-DP2B will be incorporated into the monitoring program as an additional point of compliance.

2.4 Key Activities for 2019

The following key actions are anticipated to be completed in 2019:

- Comparative statistics for the Q4 2018 detection monitoring event (see Section 3.3 for further details).
- Update network certification to reflect division of Upstream Raise 91 and Upstream Raise 92 into separate monitoring units following evaluation of baseline statistics for additional wells installed in 2017.
- Detection monitoring sampling events will occur in the second and fourth quarter of 2019, and will consist of sampling, evaluation of data, and comparative statistics.
- Baseline samples (a minimum of eight) will be collected for well MW-DP2B and will be analyzed for both the Appendix III and Appendix IV constituent lists in the CCR rule.

3.0 GROUNDWATER MONITORING ANALYTICAL PROGRAM STATUS

Analytical activities associated with the groundwater monitoring program are described below.

3.1 Collected Samples

For the majority of wells, detection monitoring samples were collected by GRE staff in June 2018 and October 2018. Precise dates vary between locations and can be found in Tables 2 through 23. Baseline samples (a minimum of eight, with final number varying between locations) were collected for wells MW-16-0, MW-91-1, and MW-91-2 by field staff from Minnesota Valley Testing Laboratory and GRE staff. As discussed in Section 3.4.4, an additional compliance sample for fluoride was collected at MW-49 in July 2018. For select locations to aid in establishing more conservative statistical limits in the future, an additional baseline sample for the Appendix IV constituent list was collected in October 2018. Results for the various samples collected throughout 2018 can be found in Tables 2 through 23.

Samples were collected using low-flow methodology with dedicated bladder pumps. The sampling procedures and analytical test methods are in accordance with USEPA-accepted procedures.

Additionally, beginning with the June 2018 detection monitoring sampling event, GRE switched analytical laboratories from Minnesota Valley Testing Laboratory to TestAmerica. As a result of this transition, a different methodology for fluoride was used during the initial June 2018 event with TestAmerica, resulting in a higher detection limit. During data validation of the June 2018 results, the difference in methodology and practical quantitation limits was noted, and a number of locations were reanalyzed with the original methodology, resulting in out-of-hold-time results, indicated with the ‘H’ qualifier provided by the laboratory in Tables 2 through 23. During the October 2018 detection monitoring sampling event, fluoride was analyzed with the original methodology and practical quantitation limit for all sampling locations.

3.1.1 Groundwater Elevation and Flow Rate

Groundwater elevations were measured in each well during each sampling event prior to purging. Elevation measurements can be found in Tables 2 through 23. Groundwater elevations and interpolated groundwater contours from the June 2018 detection monitoring event are shown on Figure 1. Groundwater elevations and

interpolated groundwater contours from the October 2018 detection monitoring event are shown on Figure 2. Based on both the June 2018 and October 2018 groundwater elevations/contours, the shallow groundwater at the CCR facilities generally follows surface topography, flowing to the east and north. The dates for groundwater information shown in the figures generally display site seasonal variability in groundwater levels between the spring/summer and fall/winter.

The groundwater flow rate across each facility was estimated with the equation $V_s = k \times i/n_e$, where:

- V_s is the groundwater flow rate, in feet per day (ft/day);
- k is the hydraulic conductivity, estimated from slug testing results from system wells, in ft/day;
- i is the hydraulic gradient, calculated based on groundwater elevations for each monitoring event, in feet per feet (ft/ft);
- n_e is the effective porosity, estimated to be 0.1 for intact glacial till, which can vary from 0.06 to 0.16 and is reflective of site soils (Duffield 2007).

The range of groundwater flow rates calculated for each unit during the June 2018 and October 2018 detection monitoring sampling events are shown below. Groundwater flow rates are presented based on a range of measured hydraulic conductivity values for each unit, also shown below.

- Drains Pond (range of k values: 0.35 ft/day to 21.60 ft/day):
  - June 2018: 0.08 – 5.12 ft/day
  - October 2018: 0.09 – 5.34 ft/day
- Upstream Raise 91 and Upstream Raise 92 (range of k values: 0.35 ft/day to 12.96 ft/day):
  - June 2018: 0.03 – 1.28 ft/day
  - October 2018: 0.03 – 1.29 ft/day
- Southeast 16 (range of k values: 1.51 ft/day to 2.59 ft/day):
  - June 2018: 0.03 – 0.05 ft/day
  - October 2018: 0.03 – 0.06 ft/day

3.2 Monitoring Data (Analytical Results)

Analytical results for samples collected in 2018 for monitoring wells within the network are shown in Tables 2 through 23.

3.3 Baseline Statistical Analysis

Baseline was established for the Appendix III parameters following the methodology outlined in the Groundwater Monitoring Statistical Methods Certification, Great River Energy – Coal Creek Station (Golder 2017b). Either a parametric or non-parametric method was used to generate the baseline statistical limit for each constituent. The methods vary between well-constituent pairs and are based on the percentage of non-detect values in the baseline period and the baseline data distribution for each well-constituent pair, in accordance with the Unified Guidance (USEPA 2009). A full description of the steps taken for baseline statistical analyses can be found in the Coal

Combustion Residuals Groundwater Statistical Method Certification, Great River Energy – Coal Creek Station, available on the publicly accessible CCR website (Golder 2017b).

The following well-constituent pairs required additional information during development of the baseline period:

- MW-16-5 (downgradient, Southeast 16), Boron: Based on Sen's Slope analysis of the baseline data, the data set was found to have a statistically significant downward trend. Inclusion of the Q4 2017 data in the data set resulted in a data set that was no longer statistically trending. A baseline period for this constituent-well pair was established to include the Q4 2017 data, and a CUSUM statistical limit was calculated from the baseline period. The Q2 2018 result and the associated calculated CUSUM value were determined to be within the established limit.
- MW-16-1, Boron: A statistically significant trend was identified in the data collected for the baseline. Upon review of the data collected as part of the CCR program, visual differences were noted between the CCR baseline period sampling results and recent historical data. Total boron data collected at MW-16-1 between June 13, 2013 and August 12, 2015 as part of the NDDH monitoring program at the site was evaluated for addition to the baseline dataset. The complete baseline period data set was first analyzed to determine if the older data belonged to the same statistical population as the data collected during the CCR baseline period sampling events. Upon determining that the two sets belonged to the same statistical population, a full baseline analysis for the extended baseline data period was conducted. The baseline data set extending from June 13, 2013 to June 14, 2017 was found to have a normal distribution, no outliers, and was not statistically trending. A Shewhart-CUSUM statistical limit was set, and both the Q4 2017 and Q2 2018 results and associated calculated CUSUM values were found to be within established limit.

3.4 Comparative Statistical Analysis

The comparative statistical analysis for the October 2017 and June 2018 detection monitoring events is summarized below, and the results are presented in Tables 24 through 42. Based on the timing of the October 2018 detection monitoring sample, comparative statistical analysis for the third detection monitoring event will occur within 90 days of data validation following receipt of the analytical data. Comparative statistical analysis for the Q4 2018 event will be completed during the first quarter of 2019. Establishment of baseline statistics for wells MW-91-2, MW-91-1, and MW-16-0 will also occur during the first quarter of 2019. A full description of the steps taken for comparative statistical analyses can be found in the Coal Combustion Residuals Groundwater Statistical Method Certification, Great River Energy – Coal Creek Station, available on the publicly accessible CCR website (Golder 2017b).

Comparative statistical analysis is conducted following each detection monitoring event, consisting of the Appendix III parameters (USEPA 2015). For both Shewhart-CUSUM limits and non-parametric prediction limits (NPPL), the comparative statistical analysis consists of a comparison of detection monitoring results collected during the period of interest to the statistical limit calculated from the baseline data collection period. For constituent-well pairs with increasing trends identified during the baseline period, an alternative trend test, such as that described by the Electric Power Research Institute (EPRI 2015) has been used to determine statistical significance. For constituent-well pairs with decreasing trends identified during the baseline period, a Sen's Slope trend test was used to assess the results.

3.4.1 Definitions

The following definitions will be used in discussion of the comparative statistical analysis:

- Elevated CUSUM – an elevated CUSUM occurs when the CUSUM is greater than the Shewhart-CUSUM limit established by the baseline statistical analysis, but the analytical result does not exceed the Shewhart-CUSUM limit. An elevated CUSUM is an indication that concentrations are gradually increasing and that analytical results may exceed the Shewhart-CUSUM limit in the future.
- Potential Exceedance – is defined as an initial elevated CUSUM or an initial analytical result that exceeds the Shewhart-CUSUM limit or non-parametric statistical limit established by the baseline statistical analysis. Confirmatory resampling will determine if the potential exceedance is a false-positive or a verified statistically significant increase (SSI). Non-detect results that exceed either the Shewhart-CUSUM limit or the non-parametric statistical limit are not considered potential exceedances.
- False-positive – is defined as an analytical result that exceeds the statistical limit that can clearly be attributed to laboratory error, changes in analytical precision, or is invalidated through confirmatory re-sampling. False-positives are not used in calculation of any subsequent CUSUMs.
- Confirmatory re-sampling – is designated as the next scheduled sampling event.
- Verified SSI – is interpreted as two consecutive statistically significant increases (the original sample and the confirmatory re-sample for analytical results, or two consecutive elevated CUSUMs) for the same constituent at the same well.

3.4.2 Elevated CUSUMs

No elevated CUSUMs were identified during either the Q4 2017 or the Q2 2018 detection monitoring events.

3.4.3 Potential Exceedances

The following potential exceedance was identified during the Q2 2018 detection monitoring event:

- MW-16-6 (upgradient, Upstream Raise 91 and Upstream Raise 92) – Fluoride

Confirmatory re-sampling occurred for this constituent during the Q4 2018 detection monitoring sampling event, for which comparative statistics will be finalized during the first quarter of 2019.

3.4.4 False-Positives

The following false-positives were identified during the Q2 2018 detection monitoring sampling event based on potential exceedances identified during the Q4 2017 detection monitoring sampling event:

- MW-75 (upgradient, Upstream Raise 91 and Upstream Raise 92), TDS: The TDS potential exceedance at MW-75 identified during the Q4 2017 detection monitoring event was shown to be a false-positive through confirmatory re-sampling during the Q2 2018 detection monitoring event.
- MW-49 (downgradient, Upstream Raise 91 and Upstream Raise 92), Fluoride: The fluoride potential exceedance at MW-49 identified during the Q4 2017 detection monitoring event was shown to be a false-positive through confirmatory re-sampling during the Q2 2018 detection monitoring event. Further, to support an alternative source demonstration, if one became required, for the well-constituent pair, an additional

statistically independent compliance sample was collected during July 2018, which was also below the established statistical limit.

- MW-42 (upgradient, Southeast 16), Boron: The boron potential exceedance identified during the Q4 2017 detection monitoring event was shown to be a false-positive through confirmatory re-sampling during the Q2 2018 detection monitoring event.

3.4.5 Verified SSIs

No verified SSIs were identified during either the Q4 2017 or the Q2 2018 detection monitoring events.

3.4.6 Trending Data

During establishment of baseline statistical periods, a few wells at the site were found to have trending data, preventing establishment of a statistical limit using data solely from the baseline sampling period. A description of the methods used for determining statistical significance at these wells follows.

3.4.6.1 Increasing Trends in Baseline Data

- MW-DP2 (downgradient, Drains Pond System), TDS: For comparative statistics, an alternative trend test, as described in EPRI guidance (2015), was used. First, both the complete data set, including the most recent data, and the most recently collected eight data points were analyzed with Sen's Slope trend tests to determine if the data continued to show a statistically significant trend. Both data sets were found to exhibit a statistically significant trend. Linear trend lines were then made for both the baseline data and the complete data set, including the most recent data, following both the Q4 2017 and Q2 2018 detection monitoring sampling events. The regression residuals for the linear trend lines were tested for normalcy and shown to be normal or transform-normal. The slopes of the two lines were then compared. Per the EPRI guidance, as the trend line for each of the complete data sets had a lower slope than that of the baseline data set, the Q4 2017 and Q2 2018 detection monitoring points are not considered statistically significant. Data for this well-constituent pair will continue to be reassessed following collection of further data to determine if the trend continues or if a baseline period can be established.

- MW-72 (upgradient, Southeast 16), TDS: As an upgradient location, the facility was determined not be the source of the increasing TDS trend at MW-72. For comparative statistics, an alternative trend test, as described in EPRI guidance (2015), was used. First, both the complete data set, including the most recent data, and the most recently collected eight data points were analyzed with Sen's Slope trend tests to determine if the data continued to show a statistically significant trend. Both data sets were found to exhibit a statistically significant trend. Linear trend lines were then made for both the baseline data and the complete data set, including the most recent data, following both the Q4 2017 and Q2 2018 detection monitoring sampling events. The regression residuals for the linear trend lines were tested for normalcy and shown to be normal or transform-normal. The slopes of the two lines were then compared. Per the EPRI guidance, as the trend line for each of the complete data sets had a lower slope than that of the baseline data set, the Q4 2017 and Q2 2018 detection monitoring points are not considered statistically significant. Data for this well-pair will continue to be reassessed following collection of further data to determine if the trend continues or if a baseline period can be established.

3.4.6.2 Decreasing Trends in Baseline Data

- MW-DP2 (downgradient, Drains Pond System), Fluoride: Based on Sen's Slope analysis of the baseline data, the data set was found to have a statistically significant downward trend. By including the Q4 2017 and Q2

2018 detection monitoring sampling results, the complete data set continues to have a statistically significant downward trend using Sen's Slope analysis. Following collection of further data, the data set will be reassessed to determine if the trend continues or if a baseline period can be established.

4.0 PROGRAM TRANSITIONS

Beginning in the fourth quarter of 2017, the groundwater monitoring program at CCS transitioned from the baseline period to detection monitoring for the majority of program wells. During the baseline period, at least eight independent samples from each well within the program were collected and analyzed for the constituents listed in Appendix III and Appendix IV of the rule prior to October 17, 2017, as specified in 40 CFR 257.94(b). The first detection monitoring samples were collected in the fourth quarter of 2017.

4.1 Detection Monitoring

The site is currently in detection monitoring. Samples for the detection monitoring program are collected on a semi-annual basis, beginning with the samples collected in the fourth quarter of 2017. GRE plans to collect the fourth and fifth semi-annual samples for the detection monitoring program in the second and fourth quarters of 2019.

4.2 Assessment Monitoring

Results to date from the current CCR groundwater monitoring program at CCS do not trigger the need to implement assessment monitoring as described in 40 CFR 257.95. As such, no alternative source demonstrations have been made and there are no actions that are required as part of the assessment monitoring program.

4.3 Corrective Measures and Assessment

Results to date from the CCR groundwater monitoring program at CCS do not trigger the need to assess or implement corrective measures. Since the CCR groundwater monitoring program does not required corrective measures, an assessment of corrective measures, as described in 40 CFR 257.96, has not be initiated and no actions are required.

5.0 CLOSING

This report presents the results from the Q2 2018 and Q4 2018 detection monitoring events of the CCR program at CCS, and results from the baseline period for new system wells. Comparative statistics for the Q4 2017 and Q2 2018 detection monitoring events are also included. Comparative statistics for the Q4 2018 detection monitoring event, conducted in October 2018, will occur within 90 days of finalization of data evaluation, during the first quarter of 2019. The groundwater monitoring and analytical procedures implemented meet the requirements of the CCR rule and are consistent with the approach described in the Groundwater Monitoring System Certification (Golder 2017a) and the Groundwater Monitoring Statistical Methods Certification (Golder 2017b). Results presented within this report support remaining in detection monitoring, and do not trigger assessment monitoring nor an assessment of corrective measures.

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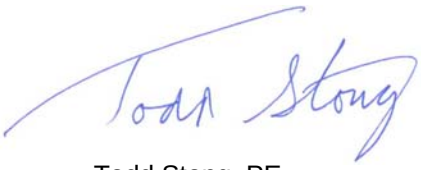

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6.0 REFERENCES

Duffield, Glenn M., 2007. AQTESOLV for Windows Version 4.5 User's Guide.

Electric Power Research Institute (EPRI), 2015. Groundwater Monitoring Guidance for the Coal Combustion Residuals Rule – 2015 Technical Report. November 2015.

Golder, 2017a. Coal Combustion Residuals Groundwater Monitoring System Certification, Great River Energy – Coal Creek Station. October 12, 2017.

Golder, 2017b. Coal Combustion Residuals Groundwater Monitoring Statistical Method Certification, Great River Energy – Coal Creek Station. October 12, 2017.

Golder, 2018. Annual Groundwater Report – 2017, Great River Energy – Coal Creek Station. January 29, 2018.

United States Environmental Protection Agency (USEPA), 2015. Code of Federal Regulations Title 40 Part 257: Hazardous and Solid Waste Management System; *Disposal of Coal Combustion Residuals from Electric Utilities*. April 17, 2015.

Tables

Table 1: Monitoring Network Well Summary

Facility	Location	Well ID	Date Constructed	TOC Elevation (ft amsl)	Ground Surface Elevation (ft amsl)	Screen Interval (ft bgs)	Top of Screen Elevation (ft amsl)	Bottom of Screen Elevation (ft amsl)	Sand Pack Interval (ft bgs)	Geologic Unit(s) Completed In
Drains Pond System	Upgradient	MW-DP3	4/3/2015	1,932.7	1,929.6	9.0-19.0	1,920.6	1,910.6	6.0-19.0	fill, coal, clay
		MW-DP5 [1]	11/18/2015	1,939.2	*1,935.0*	18.0-43.0	1,919.0	1,892.0	16.0-43.0	sandy lean clay, clayey sand
	Downgradient	MW-DP1 [2]	6/10/2014	1,913.6	1,911.1	25.0-45.0	1,886.1	1,866.1	21.0-45.0	silt with sand, silty sand
		MW-DP2	4/3/2015	1,898.1	1,894.9	7.0-17.0	1,887.9	1,877.9	5.0-17.0	sandy lean clay, clay sand
		MW-DP4	4/3/2015	1,917.4	1,914.2	19.0-29.0	1,895.2	1,885.2	17.0-29.0	sandy clay, sand with silt/gravel, clay, clayey sand
Upstream Raise 91 and Upstream Raise 92	Upgradient	MW-75	7/19/1989	1,941.4	1,938.9	30.0-40.0	1,908.9	1,898.9	27.7-40	clayey silt, silty sand
		MW-16-6	7/14/2015	1,917.2	1,913.9	4.0-14.0	1,909.9	1,899.9	3.0-14.0	sandy lean clay, coal, lean clay
		MW-91-2	11/6/2017	1,938.5	1,938.7	21.0-31.0	1,917.7	1,907.7	19.0-31.0	fat clay, coal
		MW-16-7	7/14/2015	1,889.1	1,886.6	22.0-32.0	1,864.6	1,854.6	20.0-32.0	fat clay, clayey sand, sandy clay
	Downgradient	MW-49	5/20/1988	1,905.9	1,903.6	9.85-19.85	1,893.8	1,883.8	4.85-19.85	sandy gravelly clay, sandy silt, shale (rock)
		MW-51	5/20/1988	1,896.7	1,895.3	8.8-18.8	1,886.5	1,876.5	3.8-18.8	sand with silt and gravel
		MW-91-1	11/6/2017	1,905.1	1,902.0	16.0-26.0	1,886.0	1,876.0	14.0-26.0	sand with silt and gravel, fat clay
		MW-10	11/2/1979	1,895.2	1,892.2	15-25	1,877.2	1,867.2	13-25	sand
		MW-16-0	12/8/2017	1,883.4	1,880.4	4.5-9.5	1,875.9	1,870.9	2.5-9.5	lean clay with sand
		MW-16-1	10/31/2007	1,879.5	1,876.1	6.5-11.5	1,869.6	1,864.6	4.5-11.5	silty sand
Southeast Section 16 Facility	Upgradient	MW-42	5/28/1986	1,881.6	1,878.8	9.4-14.4	1,869.4	1,864.4	9-14.4	silty sand, lean clay
		MW-72	7/18/1989	1,884.6	1,882.4	7.5-17.5	1,874.9	1,864.9	6.5-23.0	silty clay, silty sand
	Downgradient	MW-15	11/7/1979	1,877.3	1,874.3	10-20	1,864.3	1,854.3	9-20	sand, clay till
		MW-16-2	10/31/2007	1,880.6	1,877.8	7-12	1,870.8	1,865.8	5-12	sandy lean clay
		MW-16-3	10/31/2007	1,878.5	1,875.6	7-12	1,868.6	1,863.6	5-12	sandy lean clay
		MW-16-4	10/31/2007	1,877.5	1,874.6	7-17	1,867.6	1,857.6	5-17	sandy lean clay
		MW-16-5	10/31/2007	1,880.2	1,877.1	6.5-11.5	1,870.6	1,865.6	4.5-11.5	sand with silt and gravel

Notes:
TOC: top of casing
ft amsl: feet above mean sea level
ft bgs: feet below ground surface
1. For MW-DP5, the ground surface elevation is taken from the original bore log, but is inconsistent with the available survey for the top of casing.
2. For MW-DP1 only the top of casing elevation was provided. The PVC riser was assumed to be 2.5 ft above ground surface.
Well construction measurements are from the original bore log, well data sheet, or well construction form.
For some wells, elevations have been updated with more recent survey information than the original driller's logs.

Table 2: Sample Results Summary Table - MW-DP3

		MW-DP3			
		Additional Baseline Data	Detection Monitoring		
	Units	18-Oct-18	16-Oct-17	7-Jun-18	18-Oct-18
Water Elevation	ft AMSL	1921.0	1920.9	1920.8	1921.0
Appendix III Parameters					
Boron	mg/L	---	0.61	0.63	0.62
Calcium	mg/L	---	246	230	220
Chloride	mg/L	---	10.6	12	13
Fluoride	mg/L	---	< 0.10	< 0.50	< 0.10
pH, Field	s.u.	---	6.31	6.37	6.31
Sulfate	mg/L	---	1080	1200	1200
Total Dissolved Solids	mg/L	---	2100	2300	2300
Appendix IV Parameters					
Antimony	mg/L	< 0.0020	---	---	---
Arsenic	mg/L	< 0.0050	---	---	---
Barium	mg/L	0.057	---	---	---
Beryllium	mg/L	< 0.0010	---	---	---
Cadmium	mg/L	< 0.0010	---	---	---
Chromium	mg/L	< 0.0020	---	---	---
Cobalt	mg/L	0.0037	---	---	---
Fluoride	mg/L	< 0.10	---	---	---
Lead	mg/L	< 0.0010	---	---	---
Lithium	mg/L	0.16	---	---	---
Mercury	mg/L	< 0.0002	---	---	---
Molybdenum	mg/L	< 0.0020	---	---	---
Radium 226	pCi/L	0.761 ± 0.186	---	---	---
Radium 228	pCi/L	0.924 ± 0.381	---	---	---
Radium 226 and 228 combined	pCi/L	1.68 ± 0.424	---	---	---
Selenium	mg/L	< 0.0050	---	---	---
Thallium	mg/L	< 0.0010	---	---	---

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Table 3: Sample Results Summary Table - MW-DP5

		MW-DP5			
		Additional Baseline Data	Detection Monitoring		
	Units	18-Oct-18	17-Oct-17	7-Jun-18	18-Oct-18
Water Elevation	ft AMSL	1913.1	1914.7	1913.0	1913.1
Appendix III Parameters					
Boron	mg/L	---	<0.50 @	0.1	0.1
Calcium	mg/L	---	292	260	250
Chloride	mg/L	---	70.7	67	67
Fluoride	mg/L	---	0.24	0.19 H	0.31
pH, Field	s.u.	---	7.19	7.19	7.14
Sulfate	mg/L	---	2890	3600	3400
Total Dissolved Solids	mg/L	---	5210	5400	5600
Appendix IV Parameters					
Antimony	mg/L	< 0.010	---	---	---
Arsenic	mg/L	< 0.025	---	---	---
Barium	mg/L	0.014	---	---	---
Beryllium	mg/L	< 0.0010	---	---	---
Cadmium	mg/L	< 0.0010	---	---	---
Chromium	mg/L	< 0.0020	---	---	---
Cobalt	mg/L	< 0.0010	---	---	---
Fluoride	mg/L	0.31	---	---	---
Lead	mg/L	< 0.0010	---	---	---
Lithium	mg/L	0.48	---	---	---
Mercury	mg/L	< 0.0002	---	---	---
Molybdenum	mg/L	< 0.0020	---	---	---
Radium 226	pCi/L	0.287 ± 0.113	---	---	---
Radium 228	pCi/L	0.000 U ± 0.262	---	---	---
Radium 226 and 228 combined	pCi/L	0.287 U ± 0.285	---	---	---
Selenium	mg/L	0.29	---	---	---
Thallium	mg/L	< 0.0010	---	---	---

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Laboratory Provided Qualifiers:
@ = Analyte required a dilution due to sample matrix, resulting in an elevated RL.
U (Radiochem) = Result is less than the sample detection limit (varies by sample)
H = Sample was prepped or analyzed beyond the specified holding time, per request.

Table 4: Sample Results Summary Table - MW-DP1

		MW-DP1			
		Additional Baseline Data	Detection Monitoring		
	Units	22-Oct-18	17-Oct-17	7-Jun-18	22-Oct-18
Water Elevation	ft AMSL	1882.5	1882.9	1883.6	1882.5
Appendix III Parameters					
Boron	mg/L	---	0.87	0.76	0.76
Calcium	mg/L	---	74.9	72	62
Chloride	mg/L	---	2.4	< 3.0	< 3.0
Fluoride	mg/L	---	0.29	< 0.50	0.24
pH, Field	s.u.	---	7.41	7.44	7.45
Sulfate	mg/L	---	423	510	490
Total Dissolved Solids	mg/L	---	1280	1400	1300
Appendix IV Parameters					
Antimony	mg/L	< 0.0020	---	---	---
Arsenic	mg/L	< 0.0050	---	---	---
Barium	mg/L	0.12	---	---	---
Beryllium	mg/L	< 0.0010	---	---	---
Cadmium	mg/L	0.0011	---	---	---
Chromium	mg/L	0.016	---	---	---
Cobalt	mg/L	0.0051	---	---	---
Fluoride	mg/L	0.24	---	---	---
Lead	mg/L	0.005	---	---	---
Lithium	mg/L	0.15	---	---	---
Mercury	mg/L	< 0.0002	---	---	---
Molybdenum	mg/L	< 0.0020	---	---	---
Radium 226	pCi/L	1.01 ± 0.320	---	---	---
Radium 228	pCi/L	0.424 U ± 0.480	---	---	---
Radium 226 and 228 combined	pCi/L	1.43 ± 0.577	---	---	---
Selenium	mg/L	< 0.0050	---	---	---
Thallium	mg/L	< 0.0010	---	---	---

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Laboratory Provided Qualifiers:
U (Radiochem) = Result is less than the sample detection limit (varies by sample)

Table 5: Sample Results Summary Table - MW-DP2

		MW-DP2		
		Detection Monitoring		
	Units	**17-Oct-17**	**14-Jun-18**	**22-Oct-18**
Water Elevation	ft AMSL	1880.5	1880.5	***
Appendix III Parameters				
Boron	mg/L	2.06	1.8	---
Calcium	mg/L	286	300	---
Chloride	mg/L	56.3	58	---
Fluoride	mg/L	1.18	0.95	---
pH, Field	s.u.	6.86	6.81	---
Sulfate	mg/L	1490	1900	---
Total Dissolved Solids	mg/L	3310	3400	---

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.
*** - MW-DP2 had insufficient volume during the October 2018 sampling event. See text for further details.

Table 6: Sample Results Summary Table - MW-DP4

		MW-DP4		
		Detection Monitoring		
	Units	**17-Oct-17**	**11-Jun-18**	**22-Oct-18**
Water Elevation	ft AMSL	1894.9	1895.9	1893.8
Appendix III Parameters				
Boron	mg/L	< 0.5 @	0.53	0.4
Calcium	mg/L	308	230	270
Chloride	mg/L	53.8	48	65
Fluoride	mg/L	0.11	< 0.50	0.14
pH, Field	s.u.	7.04	7.11	7.1
Sulfate	mg/L	2320	3100	2800
Total Dissolved Solids	mg/L	4290	4800	4800

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Laboratory Provided Qualifiers:
@ = Analyte required a dilution due to sample matrix, resulting in an elevated RL.

Table 7: Sample Results Summary Table - MW-91-2

		MW-91-2								
		Baseline Period								
	Units	**18-Jan-18**	**14-Feb-18**	**23-Apr-18**	**17-May-18**	**12-Jun-18**	**18-Jul-18**	**13-Aug-18**	**13-Sep-18**	**16-Oct-18**
Water Elevation	ft AMSL	1921.3	1921.3	1921.4	1921.4	1922.0	1922.8	1922.2	1921.8	1922.0
Appendix III Parameters										
Boron	mg/L	0.41	0.44	0.41	0.45	0.41	0.37	0.37	0.4	0.39
Calcium	mg/L	289	284	261	281	280	250	250	250	250
Chloride	mg/L	14.5	16.8	16.5	15.6	14	16	15	15	14
Fluoride	mg/L	< 0.10	< 0.10	< 0.10	< 0.10	< 0.50	< 0.10	< 0.10	< 0.10	< 0.10
pH, Field	s.u.	6.16	6.23	6.43	6.05	6.18	6.13	6.22	6.18	6.21
Sulfate	mg/L	1180	1010	985	938	1100	1100	1200	1100	1100
Total Dissolved Solids	mg/L	1900	1890	1810	1950	2000	2000	1900	960	1900
Appendix IV Parameters										
Antimony	mg/L	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Arsenic	mg/L	0.0022	0.0039	0.0022	< 0.0020	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Barium	mg/L	0.0978	0.128	0.091	0.0633	0.05	0.058	0.053	0.058	0.076
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0010	< 0.0050	< 0.0010	< 0.0010	< 0.0010
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Chromium	mg/L	0.0043	0.0064	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Cobalt	mg/L	0.002	0.0025	< 0.0020	< 0.0020	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Fluoride	mg/L	< 0.10	< 0.10	< 0.10	< 0.10	< 0.50	< 0.10	< 0.10	< 0.10	< 0.10
Lead	mg/L	0.0023	0.0034	0.0012	< 0.0005	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Lithium	mg/L	0.1	0.12	0.1	0.12	0.097	0.092	0.097	0.1	0.094
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Radium 226	pCi/L	0.4 ± 0.1	1.0 ± 0.2	1.1 ± 0.2	1.5 ± 0.2	0.502 ± 0.267	0.779 ± 0.181	0.779 ± 0.181	0.807 ± 0.139	0.796 ± 0.371
Radium 228	pCi/L	< 1	< 2	< 2	< 2	0.156 U ± 0.314	0.105 U ± 0.305	0.473 ± 0.307	0.272 U ± 0.297	0.238 U ± 0.403
Radium 226 and 228 combined	pCi/L	< 1	< 2	< 2	< 2	0.659 ± 0.412	0.884 ± 0.355	1.25 ± 0.356	1.08 ± 0.328	1.03 ± 0.548
Selenium	mg/L	< 0.0050 ^	< 0.0050	< 0.0050	< 0.010 ^	< 0.0050	< 0.025	< 0.0050	< 0.0050	< 0.0050
Thallium	mg/L	< 0.0005	< 0.0010 ^	< 0.0005	< 0.0005	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Laboratory Provided Qualifiers:
^ = Reporting limit elevated due to instrument performance at the lower limit of quantification (LLOQ).
U (Radiochem) = Result is less than the sample detection limit (varies by sample)

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Table 8: Sample Results Summary Table - MW-75

		MW-75		
		Detection Monitoring		
	Units	**16-Oct-17**	**6-Jun-18**	**16-Oct-18**
Water Elevation	ft AMSL	1914.0	1913.2	1913.0
Appendix III Parameters				
Boron	mg/L	0.23	0.22	0.21
Calcium	mg/L	4.9	4.9	5.1
Chloride	mg/L	1.1	< 3.0	< 3.0
Fluoride	mg/L	0.5	< 0.50	0.45
pH, Field	s.u.	8.07	8.19	8.23
Sulfate	mg/L	56.5	73	75
Total Dissolved Solids	mg/L	2630	840	900

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Table 9: Sample Results Summary Table - MW-16-6

		MW-16-6		
		Detection Monitoring		
	Units	**16-Oct-17**	**6-Jun-18**	**16-Oct-18**
Water Elevation	ft AMSL	1910.7	1910.8	1910.2
Appendix III Parameters				
Boron	mg/L	5.76	4.3	4.6
Calcium	mg/L	545	480	500
Chloride	mg/L	43.7	38	35
Fluoride	mg/L	< 0.10	0.81 H	< 0.10
pH, Field	s.u.	5.73	5.76	5.83
Sulfate	mg/L	3350	3600	3800
Total Dissolved Solids	mg/L	5810	5900	6100

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Laboratory Provided Qualifiers:
H = Sample was prepped or analyzed beyond the specified holding time, per request.

Table 10: Sample Results Summary Table - MW-91-1

		MW-91-1									
		Baseline Period									
	Units	**17-Jan-18**	**14-Feb-18**	**20-Mar-18**	**23-Apr-18**	**17-May-18**	**12-Jun-18**	**18-Jul-18**	**13-Aug-18**	**13-Sep-18**	**17-Oct-18**
Water Elevation	ft AMSL	1875.4	1875.6	1875.5	1875.8	1876.0	1876.0	1875.9	1875.7	1875.5	1875.4
Appendix III Parameters											
Boron	mg/L	2.87	3.12	3.19	3.06	3.3	3.1	2.8	2.9	2.9	2.8
Calcium	mg/L	354	245	261	214	218	210	190	200	200	210
Chloride	mg/L	78.4	75.2	69.2	72.5	76.2	76	71	73	72	78
Fluoride	mg/L	0.28	0.27	0.23	0.25	0.21	< 0.50	0.19	0.19	0.18	0.23
pH, Field	s.u.	7.04	6.93	6.87	6.99	6.83	6.98	6.98	7.03	6.97	6.96
Sulfate	mg/L	1180	1200	1010	1200	983	1200	1200	1300	1200	1200
Total Dissolved Solids	mg/L	2240	2240	2300	2300	2250	2400	2300	2300	2300	2300
Appendix IV Parameters											
Antimony	mg/L	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020
Arsenic	mg/L	0.0299	0.0126	0.0115	0.0023	< 0.0020	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Barium	mg/L	0.66	0.286	0.3026	0.0704	0.0537	0.044	0.048	0.099	0.15	0.083
Beryllium	mg/L	0.0029	0.0013	0.0011	< 0.0005	< 0.0005	< 0.0010	< 0.0050	< 0.0010	< 0.0010	< 0.0010
Cadmium	mg/L	0.0015	0.0006	0.0007	< 0.0005	< 0.0005	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Chromium	mg/L	0.0816	0.0304	0.0301	0.0037	< 0.0020	< 0.0020	< 0.0020	0.009	0.013	0.0053
Cobalt	mg/L	0.0284	0.0109	0.0117	0.0021	< 0.0020	0.0011	0.0012	0.0027	0.0043	0.0021
Fluoride	mg/L	0.28	0.27	0.23	0.25	0.21	< 0.50	0.19	0.19	0.18	0.23
Lead	mg/L	0.0327	0.0131	0.015	0.001	< 0.0005	< 0.0010	< 0.0010	0.0035	0.0057	0.0021
Lithium	mg/L	0.18	0.15	0.14	0.13	0.16	0.13	0.12	0.13	0.14	0.14
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0091	0.0102	0.0063	0.0079	0.0053	0.0038	0.0047	0.0035	0.0037	0.0042
Radium 226	pCi/L	< 0.2	0.4 ± 0.1	< 1	< 0.4	0.8 ± 0.2	0.0439 U ± 0.138	0.203 ± 0.0856	0.628 ± 0.199	0.767 ± 0.221	0.354 ± 0.146
Radium 228	pCi/L	< 1	< 2	< 2	< 2	< 2	0.381 U ± 0.270	0.237 U ± 0.281	0.513 U ± 0.550	0.495 U ± 0.559	0.258 U ± 0.310
Radium 226 and 228 combined	pCi/L	< 1	< 2	< 2	< 2	< 2	0.425 ± 0.419	0.441 U ± 0.294	1.14 ± 0.585	1.26 ± 0.601	0.612 ± 0.343
Selenium	mg/L	0.0052	< 0.0050	0.0119	< 0.0050	< 0.010 ^	< 0.0050	< 0.025	< 0.0050	< 0.0050	< 0.0050
Thallium	mg/L	0.0013	< 0.0010 ^	< 0.0005	< 0.0005	< 0.0005	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Laboratory Provided Qualifiers:
^ = Reporting limit elevated due to instrument performance at the lower limit of quantification (LLOQ).
U (Radiochem) = Result is less than the sample detection limit (varies by sample)

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Table 11: Sample Results Summary Table - MW-49

		MW-49			
		Detection Monitoring			
	Units	**16-Oct-17**	**11-Jun-18**	**18-Jul-18**	**16-Oct-18**
Water Elevation	ft AMSL	1887.7	1888.1	1887.9	1887.5
Appendix III Parameters					
Boron	mg/L	5.12	5	---	4.4
Calcium	mg/L	195	200	---	180
Chloride	mg/L	62.3	68	---	72
Fluoride	mg/L	0.22	0.16 H	0.14	0.15
pH, Field	s.u.	6.99	7.05	7.08	7.08
Sulfate	mg/L	1240	1400	---	1400
Total Dissolved Solids	mg/L	2700	2800	---	2800

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Laboratory Provided Qualifiers:
H = Sample was prepped or analyzed beyond the specified holding time, per request.

Table 12: Sample Results Summary Table - MW-51

		MW-51		
		Detection Monitoring		
	Units	**16-Oct-17**	**11-Jun-18**	**16-Oct-18**
Water Elevation	ft AMSL	1879.3	1879.3	1878.8
Appendix III Parameters				
Boron	mg/L	3.56	3.1	2.8
Calcium	mg/L	240	220	220
Chloride	mg/L	49.6	61	60
Fluoride	mg/L	0.36	0.28 H	0.29
pH, Field	s.u.	6.98	7.09	7.26
Sulfate	mg/L	2770	3300	3000
Total Dissolved Solids	mg/L	4830	5200	5300

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Laboratory Provided Qualifiers:
H = Sample was prepped or analyzed beyond the specified holding time, per request.

Table 13: Sample Results Summary Table - MW-10

		MW-10		
		Detection Monitoring		
	Units	**16-Oct-17**	**11-Jun-18**	**16-Oct-18**
Water Elevation	ft AMSL	1878.6	1878.2	1877.9
Appendix III Parameters				
Boron	mg/L	2.84	2.6	2.2
Calcium	mg/L	322	230	210
Chloride	mg/L	22.4	17	18
Fluoride	mg/L	0.22	< 0.50	0.17
pH, Field	s.u.	6.81	6.85	6.92
Sulfate	mg/L	1470	820	820
Total Dissolved Solids	mg/L	2980	2100	2000

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Table 14: Sample Results Summary Table - MW-16-0

		MW-16-0									
		Baseline Period									
	Units	**17-Jan-18**	**14-Feb-18**	**20-Mar-18**	**23-Apr-18**	**17-May-18**	**12-Jun-18**	**18-Jul-18**	**13-Aug-18**	**13-Sep-18**	**17-Oct-18**
Water Elevation	ft AMSL	1874.0	1873.9	1873.9	1874.2	1874.2	1874.2	1874.1	1873.8	1873.7	1873.8
Appendix III Parameters											
Boron	mg/L	6.75	6.66	6.28	5.92	6.98	7.5	7.6	8	7.7	7.2
Calcium	mg/L	457	441	444	414	462	410	370	380	370	370
Chloride	mg/L	36.3	39.9	36.2	35.2	37.8	31	36	37	38	36
Fluoride	mg/L	0.24	0.22	0.19	0.23	0.18	0.17 H	0.21	0.21	0.2	0.22
pH, Field	s.u.	7.31	7.22	7.16	7.44	7.21	7.27	7.26	7.28	7.18	7.21
Sulfate	mg/L	2690	2680	2250	2600	2220	2600	2500	3700	2500	2600
Total Dissolved Solids	mg/L	4200	4140	4140	4080	4190	4200	4200	2800	4100	4400
Appendix IV Parameters											
Antimony	mg/L	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0020	< 0.010	< 0.0020	< 0.0020	< 0.0020
Arsenic	mg/L	0.0029	0.0022	< 0.0020	< 0.0020	< 0.0020	< 0.0050	< 0.025	< 0.0050	< 0.0050	< 0.0050
Barium	mg/L	0.0678	0.0396	0.0368	0.0274	0.0296	0.025	0.031	0.028	0.031	0.03
Beryllium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0010	< 0.0050	< 0.0010	< 0.0010	< 0.0010
Cadmium	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0010	< 0.0050	< 0.0010	< 0.0010	< 0.0010
Chromium	mg/L	0.0037	< 0.0020	< 0.0020	0.0023	< 0.0020	< 0.0020	< 0.010	< 0.0020	< 0.0020	< 0.0020
Cobalt	mg/L	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0020	< 0.0010	< 0.0050	< 0.0010	< 0.0010	< 0.0010
Fluoride	mg/L	0.24	0.22	0.19	0.23	0.18	0.17 H	0.21	0.21	0.2	0.22
Lead	mg/L	0.0014	< 0.0010 ^	< 0.0005	< 0.0005	< 0.0005	< 0.0010	< 0.0050	< 0.0010	< 0.0010	< 0.0010
Lithium	mg/L	0.1	0.1	< 0.10	< 0.10	0.12	0.11	0.12	0.12	0.13	0.12
Mercury	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Molybdenum	mg/L	0.0185	0.02	0.019	0.0162	0.0139	0.014	0.022	0.02	0.023	0.024
Radium 226	pCi/L	0.2 ± 0.1	< 0.2	< 1	< 0.4	0.5 ± 0.1	0.184 U ± 0.144	0.219 ± 0.0832	0.277 ± 0.0907	0.221 ± 0.0815	0.115 U ± 0.171
Radium 228	pCi/L	< 0.2	< 2	< 2	< 2	< 2	0.244 U ± 0.221	0.123 U ± 0.205	0.201 U ± 0.235	0.146 U ± 0.231	-0.143 U ± 0.241
Radium 226 and 228 combined	pCi/L	< 1	< 2	< 2	< 2	< 2	0.428 ± 0.264	0.342 U ± 0.221	0.478 ± 0.252	0.367 U ± 0.245	-0.0281 U ± 0.296
Selenium	mg/L	0.0194	0.0195	0.0147	0.0207	0.0187	0.015	< 0.025	0.016	0.014	0.01
Thallium	mg/L	< 0.0005	< 0.0010 ^	< 0.0005	0.0006	< 0.0005	< 0.0010	< 0.0050	< 0.0010	< 0.0010	< 0.0010

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Laboratory Provided Qualifiers:
^ = Reporting limit elevated due to instrument performance at the lower limit of quantification (LLOQ).
U (Radiochem) = Result is less than the sample detection limit (varies by sample)
H = Sample was prepped or analyzed beyond the specified holding time, per request.

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Table 15: Sample Results Summary Table - MW-16-1

		MW-16-1			
		Additional Baseline Data	Detection Monitoring		
	Units	16-Oct-18	16-Oct-17	11-Jun-18	16-Oct-18
Water Elevation	ft AMSL	1870.3	1869.9	1872.6	1870.3
Appendix III Parameters					
Boron	mg/L	---	16.8	16	13
Calcium	mg/L	---	600	620	590
Chloride	mg/L	---	257	260	340
Fluoride	mg/L	---	0.27	< 0.50	0.16
pH, Field	s.u.	---	7.1	7.13	7.16
Sulfate	mg/L	---	3050	3500	3200
Total Dissolved Solids	mg/L	---	4980	5200	5200
Appendix IV Parameters					
Antimony	mg/L	< 0.0020	---	---	---
Arsenic	mg/L	< 0.0050	---	---	---
Barium	mg/L	0.016	---	---	---
Beryllium	mg/L	< 0.0010	---	---	---
Cadmium	mg/L	< 0.0010	---	---	---
Chromium	mg/L	< 0.0020	---	---	---
Cobalt	mg/L	< 0.0010	---	---	---
Fluoride	mg/L	0.16	---	---	---
Lead	mg/L	< 0.0010	---	---	---
Lithium	mg/L	0.082	---	---	---
Mercury	mg/L	< 0.0002	---	---	---
Molybdenum	mg/L	0.019	---	---	---
Radium 226	pCi/L	0.230 ± 0.137	---	---	---
Radium 228	pCi/L	-0.123 U ± 0.244	---	---	---
Radium 226 and 228 combined	pCi/L	0.107 U ± 0.280	---	---	---
Selenium	mg/L	0.04	---	---	---
Thallium	mg/L	< 0.0010	---	---	---

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Laboratory Provided Qualifiers:
U (Radiochem) = Result is less than the sample detection limit (varies by sample)

Table 15B: Additional Baseline Boron Data

Date	Boron (mg/L)
13-Jun-13	11.0
16-Sep-13	7.9
12-Jun-14	10.6
6-Nov-14	7.7
12-Aug-15	7.6

Table 16: Sample Results Summary Table - MW-16-7

		MW-16-7		
		Detection Monitoring		
	Units	**16-Oct-17**	**14-Jun-18**	**16-Oct-18**
Water Elevation	ft AMSL	1876.6	1878.1	1876.2
Appendix III Parameters				
Boron	mg/L	< 0.10	< 0.10	< 0.10
Calcium	mg/L	359	340	300
Chloride	mg/L	90.8	82	78
Fluoride	mg/L	0.11	< 0.50	< 0.10
pH, Field	s.u.	6.9	7.02	6.98
Sulfate	mg/L	2550	2500	2500
Total Dissolved Solids	mg/L	4080	4300	4100

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Table 17: Sample Results Summary Table - MW-72

		MW-72			
		Additional Baseline Data	Detection Monitoring		
	Units	17-Oct-18	17-Oct-17	19-Jun-18	17-Oct-18
Water Elevation	ft AMSL	1878.1	1877.5	1879.2	1878.1
Appendix III Parameters					
Boron	mg/L	---	< 0.50 @	0.13	0.13
Calcium	mg/L	---	905	770	670
Chloride	mg/L	---	28.5	31	32
Fluoride	mg/L	---	0.21	0.17 H	0.19
pH, Field	s.u.	---	6.74	6.79	6.74
Sulfate	mg/L	---	2870	3100	3100
Total Dissolved Solids	mg/L	---	5160	5000	5300
Appendix IV Parameters					
Antimony	mg/L	< 0.0020	---	---	---
Arsenic	mg/L	< 0.0050	---	---	---
Barium	mg/L	0.022	---	---	---
Beryllium	mg/L	< 0.0010	---	---	---
Cadmium	mg/L	< 0.0010	---	---	---
Chromium	mg/L	< 0.0020	---	---	---
Cobalt	mg/L	< 0.0010	---	---	---
Fluoride	mg/L	0.19	---	---	---
Lead	mg/L	< 0.0010	---	---	---
Lithium	mg/L	0.18	---	---	---
Mercury	mg/L	< 0.0002	---	---	---
Molybdenum	mg/L	0.004	---	---	---
Radium 226	pCi/L	0.143 ± 0.0752	---	---	---
Radium 228	pCi/L	0.0455 U ± 0.236	---	---	---
Radium 226 and 228 combined	pCi/L	0.189 U ± 0.248	---	---	---
Selenium	mg/L	0.049	---	---	---
Thallium	mg/L	< 0.0010	---	---	---

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Laboratory Provided Qualifiers:
@ = Analyte required a dilution due to sample matrix, resulting in an elevated RL.
U (Radiochem) = Result is less than the sample detection limit (varies by sample)
H = Sample was prepped or analyzed beyond the specified holding time, per request.

Table 18: Sample Results Summary Table - MW-42

		MW-42			
		Additional Baseline Data	Detection Monitoring		
	Units	17-Oct-18	17-Oct-17	6-Jun-18	17-Oct-18
Water Elevation	ft AMSL	1875.7	1875.3	1876.3	1875.7
Appendix III Parameters					
Boron	mg/L	---	5.31	0.83	0.93
Calcium	mg/L	---	240	230	210
Chloride	mg/L	---	19.1	21	24
Fluoride	mg/L	---	0.26	< 0.50	1
pH, Field	s.u.	---	7.29	7.33	7.33
Sulfate	mg/L	---	1280	1500	1400
Total Dissolved Solids	mg/L	---	2440	2400	2400
Appendix IV Parameters					
Antimony	mg/L	< 0.0020	---	---	---
Arsenic	mg/L	< 0.0050	---	---	---
Barium	mg/L	0.05	---	---	---
Beryllium	mg/L	< 0.0010	---	---	---
Cadmium	mg/L	< 0.0010	---	---	---
Chromium	mg/L	< 0.0020	---	---	---
Cobalt	mg/L	< 0.0010	---	---	---
Fluoride	mg/L	1	---	---	---
Lead	mg/L	< 0.0010	---	---	---
Lithium	mg/L	0.15	---	---	---
Mercury	mg/L	< 0.0002	---	---	---
Molybdenum	mg/L	0.0049	---	---	---
Radium 226	pCi/L	0.255 ± 0.115	---	---	---
Radium 228	pCi/L	0.191 U ± 0.360	---	---	---
Radium 226 and 228 combined	pCi/L	0.446 U ± 0.378	---	---	---
Selenium	mg/L	< 0.0050	---	---	---
Thallium	mg/L	< 0.0010	---	---	---

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Laboratory Provided Qualifiers:
U (Radiochem) = Result is less than the sample detection limit (varies by sample)

Table 19: Sample Results Summary Table - MW-16-2

		MW-16-2		
		Detection Monitoring		
	Units	**17-Oct-17**	**11-Jun-18**	**18-Oct-18**
Water Elevation	ft AMSL	1869.9	1872.4	1870.1
Appendix III Parameters				
Boron	mg/L	11.1	9.4	8.1
Calcium	mg/L	410	420	370
Chloride	mg/L	166	190	190
Fluoride	mg/L	0.61	< 0.50	0.43
pH, Field	s.u.	7.15	7.13	7.12
Sulfate	mg/L	2040	2500	2400
Total Dissolved Solids	mg/L	3750	4000	4100

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Table 20: Sample Results Summary Table - MW-16-3

		MW-16-3		
		Detection Monitoring		
	Units	**17-Oct-17**	**11-Jun-18**	**18-Oct-18**
Water Elevation	ft AMSL	1869.7	1872.7	1869.8
Appendix III Parameters				
Boron	mg/L	20.5	22	15
Calcium	mg/L	396	470	370
Chloride	mg/L	528	750	620
Fluoride	mg/L	1.77	1.3 H	1.3
pH, Field	s.u.	7.09	7.05	7.09
Sulfate	mg/L	3720	6100	5400
Total Dissolved Solids	mg/L	8420	11000	9200

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Laboratory Provided Qualifiers:
H = Sample was prepped or analyzed beyond the specified holding time, per request.

Table 21: Sample Results Summary Table - MW-16-4

		MW-16-4		
		Detection Monitoring		
	Units	**17-Oct-17**	**11-Jun-18**	**18-Oct-18**
Water Elevation	ft AMSL	1869.0	1871.4	1869.2
Appendix III Parameters				
Boron	mg/L	0.75	0.51	0.47
Calcium	mg/L	457	420	380
Chloride	mg/L	32.2	39	34
Fluoride	mg/L	0.35	0.22 H	0.3
pH, Field	s.u.	6.88	6.88	6.8
Sulfate	mg/L	3190	3300	3400
Total Dissolved Solids	mg/L	4930	5200	5300

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Laboratory Provided Qualifiers:
H = Sample was prepped or analyzed beyond the specified holding time, per request.

Table 22: Sample Results Summary Table - MW-15

		MW-15		
		Detection Monitoring		
	Units	**17-Oct-17**	**11-Jun-18**	**17-Oct-18**
Water Elevation	ft AMSL	1868.5	1871.1	1869.1
Appendix III Parameters				
Boron	mg/L	28.3	29	23
Calcium	mg/L	463	420	390
Chloride	mg/L	238	310	260
Fluoride	mg/L	0.52	0.41 H	0.46
pH, Field	s.u.	7.04	7.1	7.1
Sulfate	mg/L	3660	4200	4000
Total Dissolved Solids	mg/L	5800	7000	6700

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Laboratory Provided Qualifiers:
H = Sample was prepped or analyzed beyond the specified holding time, per request.

Table 23: Sample Results Summary Table - MW-16-5

		MW-16-5		
		Detection Monitoring		
	Units	**17-Oct-17**	**12-Jun-18**	**18-Oct-18**
Water Elevation	ft AMSL	1870.2	1870.9	1870.0
Appendix III Parameters				
Boron	mg/L	14.8	11	13
Calcium	mg/L	368	280	310
Chloride	mg/L	121	110	120
Fluoride	mg/L	0.98	0.61	0.85
pH, Field	s.u.	7.13	7.28	7.15
Sulfate	mg/L	1950	3200	2400
Total Dissolved Solids	mg/L	3560	3400	3900

Legend:
--, not analyzed
ft AMSL, feet above mean sea level
mg/L, milligrams per liter
s.u., standard units for pH
pCi/L, picocuries per liter

Notes:
Non-detects have been listed at the reported primary quantitation limit.
Metal concentrations represent the total fraction (i.e. samples have not been filtered).
Precision is not recorded for samples with radiological concentrations below the reporting limit.

Table 24: Comparative Statistics - MW-DP3

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**16-Oct-17**			**7-Jun-18**		
Boron, Total	mg/L	CUSUM	0.98	0.61	0.64	Yes	0.63	0.64	Yes
Calcium, Total	mg/L	CUSUM	342	246	257	Yes	230	257	Yes
Chloride	mg/L	CUSUM	27.4	10.6	12.2	Yes	12.0	12.2	Yes
Fluoride	mg/L	NP-PL	0.13	< 0.10	---	Yes	< 0.50 U	---	Yes
pH, Field-Measured	s.u.	CUSUM	5.96, 6.69	6.31	6.33, 6.33	Yes	6.37	6.33, 6.33	Yes
Sulfate	mg/L	CUSUM	1687	1080	1221	Yes	1200	1221	Yes
Total Dissolved Solids	mg/L	CUSUM	2562	2100	2276	Yes	2300	2276	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
U: Not detected at the shown reporting limit

Table 25: Comparative Statistics - MW-DP5

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**17-Oct-17**			**7-Jun-18**		
Boron, Total	mg/L	NP-PL	0.50	< 0.50	---	Yes	0.10	---	Yes
Calcium, Total	mg/L	CUSUM	386	292	303	Yes	260	303	Yes
Chloride	mg/L	CUSUM	94.6	70.7	80.46	Yes	67.0	80.5	Yes
Fluoride	mg/L	CUSUM	0.30	0.24	0.24	Yes	0.19 H	0.24	Yes
pH, Field-Measured	s.u.	CUSUM	6.89, 7.46	7.19	7.17, 7.17	Yes	7.19	7.17, 7.17	Yes
Sulfate	mg/L	CUSUM	5676	2890	3472	Yes	3600	3472	Yes
Total Dissolved Solids	mg/L	CUSUM	5762	5210	5281	Yes	5400	5293	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
H: Analyzed outside of holding time

Table 26: Comparative Statistics - MW-DP1

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**17-Oct-17**			**7-Jun-18**		
Boron, Total	mg/L	CUSUM	2.86	0.87	0.90	Yes	0.76	0.90	Yes
Calcium, Total	mg/L	CUSUM	761	75	148	Yes	72	148	Yes
Chloride	mg/L	CUSUM	77	2	10	Yes	< 3 U	10	Yes
Fluoride	mg/L	CUSUM	0.34	0.29	0.28	Yes	< 0.50 U	0.28	Yes
pH, Field-Measured	s.u.	CUSUM	6.99, 7.67	7.41	7.33, 7.33	Yes	7.44	7.33, 7.37	Yes
Sulfate	mg/L	CUSUM	2233	423	674.4	Yes	510	674	Yes
Total Dissolved Solids	mg/L	CUSUM	3321	1280	1534	Yes	1400	1534	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
U: Not detected at the shown reporting limit

Table 27: Comparative Statistics - MW-DP2

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**17-Oct-17**			**14-Jun-18**		
Boron, Total	mg/L	CUSUM	3.59	2.06	1.91	Yes	1.80	1.91	Yes
Calcium, Total	mg/L	CUSUM	357	286	261.8	Yes	300	289	Yes
Chloride	mg/L	CUSUM	87	56	48	Yes	58	49	Yes
Fluoride	mg/L	Decreasing Trend	NLS	1.18	---	---	0.95	---	---
pH, Field-Measured	s.u.	CUSUM	6.63, 7.12	6.86	6.88, 6.88	Yes	6.81	6.87, 6.88	Yes
Sulfate	mg/L	CUSUM	1949	1490	1607	Yes	1900	1824	Yes
Total Dissolved Solids	mg/L	Increasing Trend	NLS	3310	---	Yes	3400 H	---	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
Trend: Trends were identified in the background period. See text for discussion of significance.
NLS: No limit set due to trending data.
H: Re-analyzed outside of holding time

Table 28: Comparative Statistics - MW-DP4

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**17-Oct-17**			**11-Jun-18**		
Boron, Total	mg/L	CUSUM	0.60	< 0.50	0.45	Yes	0.53	0.48	Yes
Calcium, Total	mg/L	NP-PL	325	308	---	Yes	230	---	Yes
Chloride	mg/L	CUSUM	70	54	48	Yes	48	46	Yes
Fluoride	mg/L	CUSUM	0.23	0.11	0.15	Yes	< 0.50 U	0.23	Yes
pH, Field-Measured	s.u.	CUSUM	6.70, 7.29	7.04	7.00, 7.00	Yes	7.11	7.00, 7.04	Yes
Sulfate	mg/L	CUSUM	3296	2320	2478	Yes	3100	2918	Yes
Total Dissolved Solids	mg/L	CUSUM	5354	4290	4098	Yes	4800	4521	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
U: Not detected at the shown reporting limit

Table 29: Comparative Statistics - MW-75

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**16-Oct-17**			**6-Jun-18**		
Boron, Total	mg/L	CUSUM	0.33	0.23	0.21	Yes	0.22	0.21	Yes
Calcium, Total	mg/L	NP-PL	9.0	4.9	---	Yes	4.9	---	Yes
Chloride	mg/L	CUSUM	3.1	1.1	1.6	Yes	< 3.0 U	1.6	Yes
Fluoride	mg/L	CUSUM	0.63	0.50	0.49	Yes	< 0.50 U	0.49	Yes
pH, Field-Measured	s.u.	CUSUM	7.70, 8.46	8.07	8.08, 8.08	Yes	8.19	8.08, 8.11	Yes
Sulfate	mg/L	CUSUM	92	57	74	Yes	73	74	Yes
Total Dissolved Solids	mg/L	CUSUM	929	2630	2609	No	840	835	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
U: Not detected at the shown reporting limit

Table 30: Comparative Statistics - MW-16-6

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**16-Oct-17**			**6-Jun-18**		
Boron, Total	mg/L	CUSUM	6.9	5.8	5.3	Yes	4.3	4.6	Yes
Calcium, Total	mg/L	CUSUM	656	545	523	Yes	480	523	Yes
Chloride	mg/L	CUSUM	50	44	41	Yes	38	41	Yes
Fluoride	mg/L	NP-PL	0.10	< 0.10	---	Yes	0.81 H	---	No
pH, Field-Measured	s.u.	CUSUM	5.55, 5.90	5.73	5.72, 5.72	Yes	5.76	5.72, 5.72	Yes
Sulfate	mg/L	CUSUM	5342	3350	3591	Yes	3600	3591	Yes
Total Dissolved Solids	mg/L	CUSUM	6277	5810	5661	Yes	5900	5805	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
H: Analyzed outside of holding time

Table 31: Comparative Statistics - MW-49

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**		**16-Oct-17**				**11-Jun-18**		
Boron, Total	mg/L	CUSUM	6.3	5.1	4.9	Yes	5.0	4.9	Yes
Calcium, Total	mg/L	NP-PL	207	195	---	Yes	200	---	Yes
Chloride	mg/L	CUSUM	74	62	63	Yes	68	65	Yes
Fluoride	mg/L	NPPL	0.20	0.22	---	No	0.16 H	---	Yes
pH, Field-Measured	s.u.	CUSUM	6.67, 7.36	6.99	7.02, 7.02	Yes	7.05	7.02, 7.02	Yes
Sulfate	mg/L	CUSUM	1819	1240	1242	Yes	1400	1272	Yes
Total Dissolved Solids	mg/L	CUSUM	2824	2700	2658	Yes	2800	2782	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
H: Analyzed outside of holding time

Table 32: Comparative Statistics - MW-51

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**16-Oct-17**			**11-Jun-18**		
Boron, Total	mg/L	NP-PL	5.7	3.6	---	Yes	3.1	---	Yes
Calcium, Total	mg/L	CUSUM	503	240	283	Yes	220	283	Yes
Chloride	mg/L	CUSUM	267	50	71	Yes	61	71	Yes
Fluoride	mg/L	NP-PL	0.50	0.36	---	Yes	0.28 H	---	Yes
pH, Field-Measured	s.u.	CUSUM	6.46, 7.61	6.98	7.03, 7.03	Yes	7.09	7.03, 7.03	Yes
Sulfate	mg/L	CUSUM	6015	2770	3130	Yes	3300	3130	Yes
Total Dissolved Solids	mg/L	CUSUM	7733	4830	5181	Yes	5200	5181	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
H: Analyzed outside of holding time

Table 33: Comparative Statistics - MW-10

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**16-Oct-17**			**11-Jun-18**		
Boron, Total	mg/L	CUSUM	3.8	2.8	2.5	Yes	2.6	2.5	Yes
Calcium, Total	mg/L	CUSUM	364	322	299	Yes	230	260	Yes
Chloride	mg/L	CUSUM	25	22	21	Yes	17	19	Yes
Fluoride	mg/L	CUSUM	0.27	0.22	0.21	Yes	< 0.50 U	0.24	Yes
pH, Field-Measured	s.u.	CUSUM	6.51, 7.13	6.81	6.82, 6.82	Yes	6.85	6.82, 6.82	Yes
Sulfate	mg/L	CUSUM	1531	1470	1337	Yes	820	1041	Yes
Total Dissolved Solids	mg/L	CUSUM	3304	2980	2737	Yes	2100	2383	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
U: Not detected at the shown reporting limit

Table 34: Comparative Statistics - MW-16-1

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**16-Oct-17**			**11-Jun-18**		
Boron, Total	mg/L	CUSUM	22	17	14	Yes	16	18	Yes
Calcium, Total	mg/L	CUSUM	779	600	548	Yes	620	570	Yes
Chloride	mg/L	CUSUM	342	257	254	Yes	260	254	Yes
Fluoride	mg/L	CUSUM	0.65	0.27	0.30	Yes	< 0.50 U	0.30	Yes
pH, Field-Measured	s.u.	CUSUM	6.85, 7.40	7.1	7.12, 7.12	Yes	7.13	7.12, 7.12	Yes
Sulfate	mg/L	CUSUM	3996	3050	2697	Yes	3500	3317	Yes
Total Dissolved Solids	mg/L	CUSUM	6615	4980	4457	Yes	5200	4880	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
U: Not detected at the shown reporting limit

Table 35: Comparative Statistics - MW-16-7

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**16-Oct-17**			**14-Jun-18**		
Boron, Total	mg/L	NP-PL	0.11	< 0.10	---	Yes	< 0.10 U	---	Yes
Calcium, Total	mg/L	CUSUM	515	359	357	Yes	340	357	Yes
Chloride	mg/L	CUSUM	96	91	87	Yes	82	88	Yes
Fluoride	mg/L	CUSUM	0.15	0.11	0.11	Yes	< 0.50 U	0.25	Yes
pH, Field-Measured	s.u.	CUSUM	6.58, 7.17	6.9	6.87, 6.87	Yes	7.02	6.87, 6.96	Yes
Sulfate	mg/L	CUSUM	3300	2550	2381	Yes	2500	2381	Yes
Total Dissolved Solids	mg/L	CUSUM	4711	4080	3941	Yes	4300 H	4129	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
H: Analyzed outside of holding time due to a QC failure
U: Not detected at the shown reporting limit

Table 36: Comparative Statistics - MW-72

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**17-Oct-17**			**19-Jun-18**		
Boron, Total	mg/L	CUSUM	0.24	< 0.50 @	0.22	Yes	0.13	0.21	Yes
Calcium, Total	mg/L	CUSUM	970	905	870.2	Yes	770	813	Yes
Chloride	mg/L	CUSUM	35	29	28	Yes	31	29	Yes
Fluoride	mg/L	CUSUM	0.32	0.21	0.24	Yes	0.17 H	0.24	Yes
pH, Field-Measured	s.u.	CUSUM	6.39, 7.06	6.74	6.73, 6.73	Yes	6.79	6.73, 6.73	Yes
Sulfate	mg/L	CUSUM	4035	2870	3074	Yes	3100	3074	Yes
Total Dissolved Solids	mg/L	Increasing Trend	NLS	5160	---	Yes	5000	---	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
Trend: Trends were identified in the background period. See text for discussion of significance.
NLS: No limit set due to trending data.
H: Analyzed outside of holding time
@ = Per the laboratory, analyte required a dilution due to sample matrix, resulting in an elevated RL.

Table 37: Comparative Statistics - MW-42

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**17-Oct-17**			**6-Jun-18**		
Boron, Total	mg/L	CUSUM	2.49	5.31	5.00	No	0.83	1.09	Yes
Calcium, Total	mg/L	CUSUM	371	240	252	Yes	230	252	Yes
Chloride	mg/L	CUSUM	28	19	20	Yes	21	20	Yes
Fluoride	mg/L	CUSUM	0.42	0.26	0.30	Yes	< 0.50 U	0.30	Yes
pH, Field-Measured	s.u.	CUSUM	6.85, 7.72	7.29	7.29, 7.29	Yes	7.33	7.29, 7.29	Yes
Sulfate	mg/L	CUSUM	2441	1280	1422	Yes	1500	1422	Yes
Total Dissolved Solids	mg/L	CUSUM	3463	2440	2423	Yes	2400	2423	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
U: Not detected at the shown reporting limit

Table 38: Comparative Statistics - MW-16-2

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**17-Oct-17**			**11-Jun-18**		
Boron, Total	mg/L	CUSUM	14.0	11.1	10.3	Yes	9.4	10.3	Yes
Calcium, Total	mg/L	CUSUM	660	410	427	Yes	420	427	Yes
Chloride	mg/L	NP-PL	197	166	---	Yes	190	---	Yes
Fluoride	mg/L	CUSUM	1.28	0.61	0.64	Yes	< 0.50 U	0.64	Yes
pH, Field-Measured	s.u.	CUSUM	6.74, 7.49	7.15	7.12, 7.12	Yes	7.13	7.12, 7.12	Yes
Sulfate	mg/L	CUSUM	3488	2040	2328	Yes	2500	2328	Yes
Total Dissolved Solids	mg/L	NP-PL	4030	3750	---	Yes	4000	---	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
U: Not detected at the shown reporting limit

Table 39: Comparative Statistics - MW-16-3

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**17-Oct-17**			**11-Jun-18**		
Boron, Total	mg/L	CUSUM	25	21	19	Yes	22	21	Yes
Calcium, Total	mg/L	NP-PL	535	396	---	Yes	470	---	Yes
Chloride	mg/L	CUSUM	908	528	584	Yes	750	678	Yes
Fluoride	mg/L	CUSUM	2.08	1.77	1.66	Yes	1.30 H	1.58	Yes
pH, Field-Measured	s.u.	CUSUM	6.75, 7.38	7.09	7.06, 7.06	Yes	7.05	7.06, 7.06	Yes
Sulfate	mg/L	CUSUM	7686	3720	5118	Yes	6100	5553	Yes
Total Dissolved Solids	mg/L	CUSUM	11583	8420	9078	Yes	11000	10443	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
H: Analyzed outside of holding time

Table 40: Comparative Statistics - MW-16-4

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**17-Oct-17**			**11-Jun-18**		
Boron, Total	mg/L	CUSUM	1.25	0.75	0.6005	Yes	0.51	0.58	Yes
Calcium, Total	mg/L	CUSUM	751	457	417	Yes	420	417	Yes
Chloride	mg/L	CUSUM	54	32	34	Yes	39	35	Yes
Fluoride	mg/L	CUSUM	0.40	0.35	0.33	Yes	0.22 H	0.33	Yes
pH, Field-Measured	s.u.	CUSUM	6.15, 7.57	6.88	6.86, 6.86	Yes	6.88	6.86, 6.86	Yes
Sulfate	mg/L	CUSUM	4475	3190	3271	Yes	3300	3271	Yes
Total Dissolved Solids	mg/L	CUSUM	6409	4930	4796	Yes	5200	4796	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
H: Analyzed outside of holding time

Table 41: Comparative Statistics - MW-15

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**17-Oct-17**			**11-Jun-18**		
Boron, Total	mg/L	CUSUM	35	28	27	Yes	29	27	Yes
Calcium, Total	mg/L	CUSUM	561	463	452.4	Yes	420	452	Yes
Chloride	mg/L	CUSUM	405	238	278	Yes	310	282	Yes
Fluoride	mg/L	CUSUM	0.78	0.52	0.58	Yes	0.41 H	0.58	Yes
pH, Field-Measured	s.u.	CUSUM	6.64, 7.46	7.04	7.05, 7.05	Yes	7.10	7.05, 7.05	Yes
Sulfate	mg/L	CUSUM	5055	3660	3866	Yes	4200	3936	Yes
Total Dissolved Solids	mg/L	CUSUM	7189	5800	6090	Yes	7000	6790	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart
H: Analyzed outside of holding time

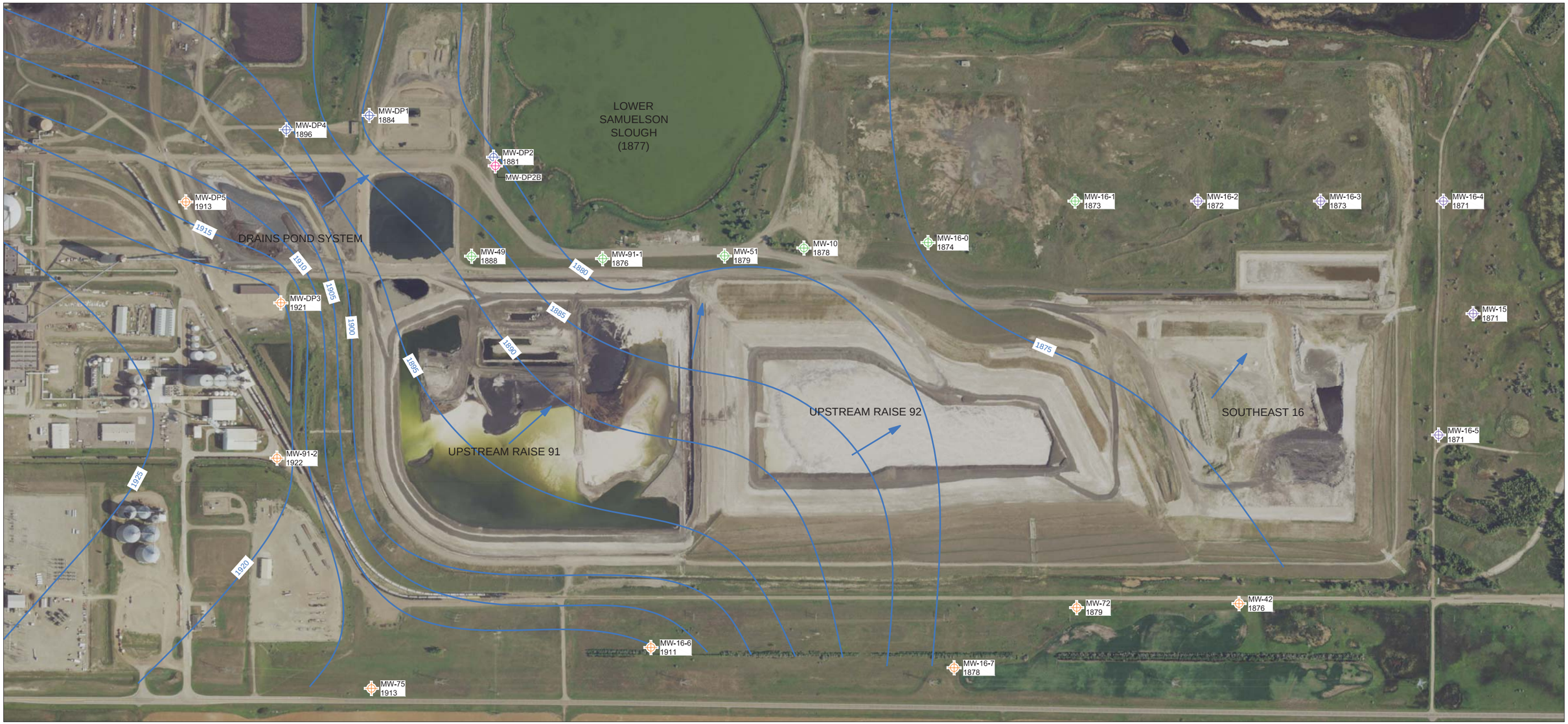
Table 42: Comparative Statistics - MW-16-5

		Statistical Method	Statistical Limit	Q4 2017 Detection Monitoring Result	Q4 2017 CUSUM Value	Q4 2017 - Within Limit?	Q2 2018 Detection Monitoring Result	Q2 2018 CUSUM Value	Q2 2018 - Within Limit?
Appendix III Analytes	**Units**			**17-Oct-17**			**12-Jun-18**		
Boron, Total	mg/L	CUSUM	24	15	---	***	11	14	Yes
Calcium, Total	mg/L	NP-PL	477	368	---	Yes	280	---	Yes
Chloride	mg/L	CUSUM	179	121	130	Yes	110	130	Yes
Fluoride	mg/L	CUSUM	1.14	0.98	0.92	Yes	0.61	0.86	Yes
pH, Field-Measured	s.u.	CUSUM	6.74, 7.55	7.13	7.14, 7.14	Yes	7.28	7.14, 7.19	Yes
Sulfate	mg/L	CUSUM	3203	1950	2171	Yes	3200	2971	Yes
Total Dissolved Solids	mg/L	CUSUM	4472	3560	3626	Yes	3400	3626	Yes

Notes:
mg/L, milligrams per liter
s.u., standard units for pH
NP-PL: Non-Parametric Prediction Limit
CUSUM: Parametric Shewhart-CUSUM Control Chart

*** - Q4 2017 boron result was used to develop the baseline for the constituent, resulting in no comparative statistics.

Figures



LEGEND

- UPGRADIENT MONITORING WELL
- DOWNGRADIENT MONITORING WELL - DRAINS POND SYSTEM
- DOWNGRADIENT MONITORING WELL - UPSTREAM RAISES 91 AND 92
- DOWNGRADIENT MONITORING WELL - SOUTHEAST 16
- NEW WELL (SEE NOTE 4)
- GENERAL DIRECTION OF GROUNDWATER FLOW
- 1930 — POTENTIOMETRIC SURFACE CONTOURS (SEE NOTE 2)

NOTE(S)

1. GROUNDWATER ELEVATIONS SHOWN WERE MEASURED JUNE 2018.
2. POTENTIOMETRIC SURFACE CONTOURS WERE CREATED USING WATER LEVEL INFORMATION FROM THE JUNE 2018 GROUNDWATER ELEVATIONS SHOWN, AS WELL AS SURVEYED SURFACE WATER EXPRESSIONS, ADDITIONAL SITE WELLS, AND PIEZOMETERS NOT SHOWN. CONTOUR INTERVALS ARE 5 FEET.
3. AERIAL IMAGERY OBTAINED FROM UNITED STATES DEPARTMENT OF AGRICULTURE, NATIONAL AERIAL IMAGERY PROGRAM, 2018.
4. MONITORING WELL MW-DP2B WAS INSTALLED IN NOVEMBER, 2018. NO ANALYTICAL DATA HAS BEEN COLLECTED TO DATE.

N

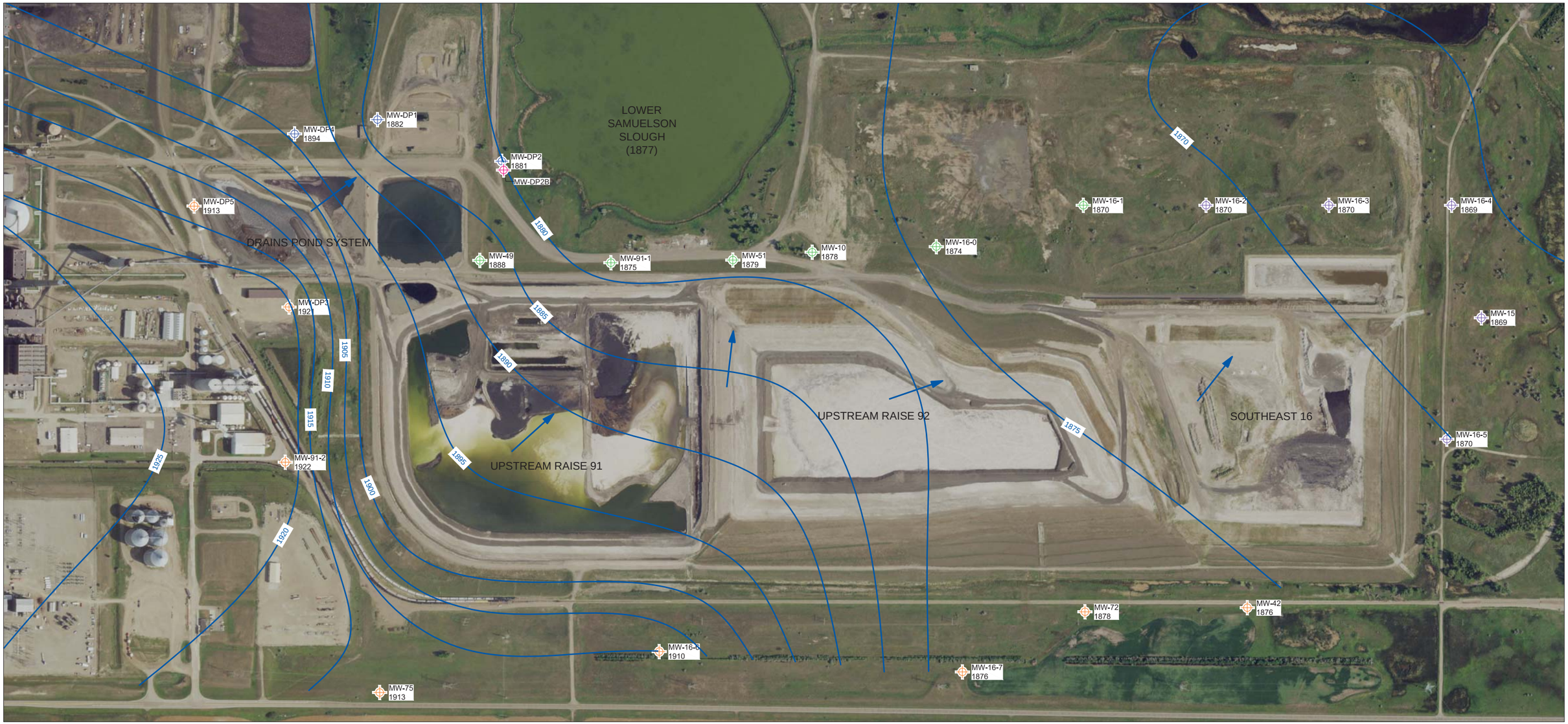
0 300 600
1" = 300' FEET

GOLDER

MONITORING WELL LOCATIONS AND JUNE 2018 GROUNDWATER CONDITIONS
GREAT RIVER ENERGY - COAL CREEK STATION

FIGURE 1

Path: \\Denver\acad\GREAT RIVER ENERGY\COAL CREEK\99_PROJECTS\1893823\Facility Groundwater\ | File Name: 1893823_2018 Water Quality Monitoring_023an19.dwg



LEGEND

- UPGRADIENT MONITORING WELL
- DOWNGRADIENT MONITORING WELL - DRAINS POND SYSTEM
- DOWNGRADIENT MONITORING WELL - UPSTREAM RAISES 91 AND 92
- DOWNGRADIENT MONITORING WELL - SOUTHEAST 16
- NEW WELL (SEE NOTE 4)
- GENERAL DIRECTION OF GROUNDWATER FLOW
- 1930 — POTENTIOMETRIC SURFACE CONTOURS (SEE NOTE 2)

NOTE(S)

1. GROUNDWATER ELEVATIONS SHOWN WERE MEASURED OCTOBER 2018.
2. POTENTIOMETRIC SURFACE CONTOURS WERE CREATED USING WATER LEVEL INFORMATION FROM THE OCTOBER 2018 GROUNDWATER ELEVATIONS SHOWN, AS WELL AS SURVEYED SURFACE WATER EXPRESSIONS, ADDITIONAL SITE WELLS, AND PIEZOMETERS NOT SHOWN. CONTOUR INTERVALS ARE 5 FEET.
3. AERIAL IMAGERY OBTAINED FROM UNITED STATES DEPARTMENT OF AGRICULTURE, NATIONAL AERIAL IMAGERY PROGRAM, 2018.
4. MONITORING WELL MW-DP2B WAS INSTALLED IN NOVEMBER, 2018. NO ANALYTICAL DATA HAS BEEN COLLECTED TO DATE.

N

0 300 600
1" = 300' FEET

GOLDER

MONITORING WELL LOCATIONS AND OCTOBER 2018 GROUNDWATER CONDITIONS
GREAT RIVER ENERGY - COAL CREEK STATION

FIGURE 2

APPENDIX A

New Monitoring Well Installation Information

BORING LOG NO. MW-DP2B

PROJECT: Monitoring Well Installation & Soil Testing

CLIENT: Golder Associates, Inc.
Lakewood, CO

SITE: Coal Creek Station
Underwood, ND

LOCATION See Exploration Plan
Latitude: 47.3806° Longitude: -101.1444°
Surface Elev.: 1895 (Ft.)

DEPTH	ELEVATION (Ft.)	Description
		FILL - SANDY LEAN CLAY, trace gravel, brown
		bulk sample obtained from 1 to 5'
		bulk sample obtained from 9 to 10'
9.5	1885.5	
10.5	1884.5	**ORIGINAL TOPSOIL**, dark brown
		SANDY LEAN CLAY (CL), trace gravel, brown, stiff
13.0	1882	bulk sample obtained from 11 to 12'
		POORLY GRADED SAND WITH SILT AND GRAVEL (SP-SM), brown, medium dense, fine to coarse-grained
18.0	1877	
		SILTY SAND (SM), light brown, medium dense, fine-grained
25.0	1870	
		Boring Terminated at 25 Feet

INSTALLATION DETAILS: Pro Top; Concrete; PVC Riser; Bentonite; PVC Screen; Silica Sand; Sluff

DEPTH (Ft.)	SAMPLE TYPE	FIELD TEST RESULTS	ATTERBERG LIMITS LL-PL-PI	PERCENT FINES
5		7-8-12 N=20	42-16-26	62
10		3-6-9 N=15	39-17-22	59
15		11-14-8 N=22		
20		6-7-10 N=17		
25				

WATER LEVEL OBSERVATIONS; WATER CONTENT (%); DRY UNIT WEIGHT (pcf)

Stratification lines are approximate. In-situ, the transition may be gradual.

Hammer Type: Automatic

Advancement Method:
3¼" I D, Hollow Stem Auger 0-19½'

Abandonment Method:
Boring converted to monitoring well with Type A Surface Completion.

See Exploration and Testing Procedures for a description of field and laboratory procedures used and additional data (If any).

See Supporting Information for explanation of symbols and abbreviations.

Elevations were provided by others.

Notes:
Elevations provided by Golder Associates.
Latitude and Longitude obtained with a handheld GPS unit.

WATER LEVEL OBSERVATIONS

▽ *While drilling*

Reversed Auger Out

Terracon
1805 Hancock Dr, PO Box 2084
Bismarck, ND

Boring Started: 11-20-2018 | Boring Completed: 11-20-2018
Drill Rig: D-90 | Driller: EM
Project No.: M2185118

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