JANUARY 2026

East Bay Municipal Utility District

Second Semi-Annual 2025 Groundwater Monitoring Report

Camanche Reservoir South Shore Recreation Area Wastewater Treatment Plant

Submitted to:

CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

Prepared by:

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Prepared for

East Bay Municipal Utility District

January 2026

The material and data in this report, including all attachments and supplemental information, were prepared under the supervision and direction of the undersigned. The information submitted is, to the best of my knowledge, true, accurate, and complete.

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1.0 Introduction

Larry Walker Associates prepared this *Second Semi-Annual 2025 Monitoring Report* (Monitoring Report) for the East Bay Municipal Utility District (EBMUD) Camanche Reservoir South Shore Recreation Area (CASS) Wastewater Treatment Plant (WWTP). This Monitoring Report documents the analysis of groundwater elevation and quality results representative of the second half of 2025 for background and compliance monitoring wells at the WWTP. The analysis of surface water elevation and quality results for the second half of 2025 for two onsite freshwater ponds is also documented.

The purpose of this Monitoring Report is to detail the evaluation of the groundwater and surface water data with respect to requirements of the WWTP's 2002 *Waste Discharge Requirements Order No. R5-2002-0070*[1] (WDRs) and 2011 *Revised Monitoring and Reporting Program No. R5-2002-0070*[2] (MRP) issued by the Central Valley Regional Water Quality Control Board (Regional Board). This Monitoring Report is specifically intended to satisfy the requirements in the MRP for a semi-annual monitoring report. The MRP also requires annual groundwater monitoring of specific standard minerals and evaluation of the annual monitoring results. The annual groundwater data collected for 2025 were included in the *First Semi-Annual 2025 Monitoring Report* submitted in July 2025, and are therefore not discussed herein.

The remainder of this Monitoring Report focuses on the following topics:

- Site Overview
- Regulatory Requirements
- Sampling and Analysis Activities
- Groundwater and Surface Water Elevation Results and Analysis
- Groundwater Quality Results and Analysis
- Compliance Assessment
- Surface Water Quality Results and Evaluations
- Conclusions

[1] Central Valley Regional Water Quality Control Board. *Order No. R-5-2002-0070, Waste Discharge Requirements for East Bay Municipal Utility District, Camanche Reservoir South Shore Recreation Area, Calaveras County*. Adopted April 26, 2002.

[2] Central Valley Regional Water Quality Control Board. *Revised Monitoring and Reporting Program No. R5-2002-0070, for East Bay Municipal Utility District, Camanche Reservoir South Shore Recreation Area, Calaveras County*. Adopted December 14, 2011.

2.0 Site Overview

EBMUD owns and operates the WWTP, which is located approximately 5.5 miles west-northwest of the unincorporated community of Valley Springs in Calaveras County, at the eastern edge of the Camanche Reservoir, as shown in **Figure 1**. The WWTP treats domestic wastewater generated from the CASS campgrounds and residences, which are located generally north and south of the WWTP.

The WWTP includes three unlined ponds, through which wastewater flow direction may be modified. Wastewater Treatment Ponds No. 1 and No. 2 may operate in series or in tandem and then flow to Pond No. 3. Ponds No. 1 and No. 2 include mechanical aeration, and Pond No. 3 provides storage and disposal through evaporation and percolation. The WWTP produces secondary, undisinfected effluent. The locations of the treatment ponds and storage and disposal pond are shown in **Figure 2**.

Also shown in **Figure 2** are four constructed freshwater recreation ponds that surround the WWTP (Catfish, Catfish Annex, Trout, and Beaver). Surface water from Camanche Reservoir feeds Catfish Pond. Water flows by gravity from Catfish Pond to Catfish Annex Pond, then to Trout Pond, and then returns by gravity to Camanche Reservoir. Beaver Pond has no outlet and is replenished by occasional pumping from Catfish Pond.

Installation of a "sufficient number of monitoring wells" was required per the WDRs to allow for an evaluation of groundwater quality beneath, upgradient and downgradient of the WWTP treatment ponds and surrounding freshwater ponds. The monitoring wells would also be used to establish groundwater elevations, flow directions, and gradients. Accordingly, in December 2002 EBMUD completed a *Groundwater Quality Assessment Work Plan* (Work Plan)[3] that includes a recommendation to install six monitoring wells (MW-5, MW-6, MW-7, MW-8, MW-9, and MW-10) for monitoring groundwater quality and four piezometers (P-1, P-2, P-3, and P-4) for monitoring groundwater elevations. (Monitoring well number started with MW-5 to avoid confusion with nearby abandoned wells for a former landfill). These monitoring wells and piezometers were installed in September 2003, as described in the 2005 *Groundwater Monitoring Well Installation Report* (Installation Report).[4]

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[3] Kennedy/Jenks Consultants. *Groundwater Quality Assessment Work Plan, Camanche South Shore Recreation Area Wastewater Treatment Plant*. Prepared for EBMUD. December 18, 2002.

[4] Cambria Environmental Technology, Inc. *Groundwater Monitoring Well Installation Report, Camanche South Shore Recreation Area Wastewater Treatment Plant*. Letter Report from Brandon Wilken to Mr. Scott Kranhold, Regional Board. July 21, 2005.

The Installation Report also describes the installation of two additional monitoring wells (MW-11 and MW-12) in June 2005. The additional monitoring wells were installed because groundwater elevations for the initial wells and piezometers indicated that the freshwater ponds and treatment ponds had created a recharge mound that made determination and assessment of background quality difficult. The two additional monitoring wells were intended to be uninfluenced by the treatment and freshwater ponds, such that background groundwater quality could be adequately assessed.

MW-12 was later discontinued from considerations as a background well and groundwater elevations and quality are no longer monitored or reported for MW-12. As detailed in the *First Quarter 2009 Site Status Report*[5] for the WWTP, the reasons for discontinuing use of MW-12 included the well's location relative to the WWTP (approximately 2,400 feet west), its location in a separate drainage area, and consistently lower groundwater elevations that correlated with Camanche Reservoir levels. Data for this well were considered to represent a separate, localized groundwater signature for MW-12 which was not relevant to the study of the WWTP site. Recent semi-annual monitoring reports for the WWTP have subsequently only used MW-11 as the background well for the WWTP monitoring network. A later evaluation prepared for EBMUD in response to an August 2016 Notice of Violation (NOV) from the Regional Board[6] re-confirmed MW-11 to be an appropriate background well for the monitoring network.

[5] Conestoga Rovers & Associates. *First Quarter 2009 Site Status Report, Camanche South Shore Recreation Area Wastewater Treatment Plant (WWTO) Calaveras County, California*. April 29, 2009.

[6] Larry Walker Associates. *Camanche South Shore Wastewater Treatment Plant Groundwater Monitoring Network Technical Report*. Prepared for EBMUD. March 2017.

3.0 Regulatory Requirements

This report is intended to describe third and fourth quarter 2025 groundwater conditions and results (including groundwater levels and quality), and surface water conditions around the CASS WWTP facility and ponds. This Monitoring Report is intended to satisfy the requirement in the MRP for a semi-annual monitoring report which requires the following information:

Table 1: MRP Semi-Annual Monitoring Report Requirements

Requirement in the MRP	Description	Location in this report
B.1	Results of groundwater monitoring	Section 5.0 Section 6.0 Appendix A
B.2	Results of surface water monitoring	Section 5.0 Section 8.0
B.3	A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for groundwater monitoring. The narrative shall be sufficiently detailed to verify compliance with the WDR, this MRP, and the Standard Provisions and Reporting Requirements. The narrative shall be supported by field logs for each well documenting depth to groundwater; parameters measured before, during, and after purging; method of purging; calculation of casing volume; and total volume of water purged.	Section 4.0 Appendix B
B.4	Calculation of groundwater elevations, an assessment of the groundwater flow direction and gradient on the date of measurement, comparison to previous flow direction and gradient data, and discussion of seasonal trends, if any.	Section 5.0
B.5	A narrative discussion of the analytical results for all media and locations monitored, including spatial and temporal trends, with reference to summary data tables, graphs, and appended analytical reports (as applicable).	Section 6.0 Section 7.0
B.6	Summary data tables of historical and current groundwater table elevations and analytical results.	Section 5.0 Section 6.0
B.7	A comparison of monitoring data to the groundwater limitations and an explanation of any violation of those requirements.	Section 7.0
B.8	A scaled map showing relevant structures and features of the facility, the locations of monitoring wells and any other sampling stations, and groundwater elevation contours referenced to mean sea level datum.	Figure 1 - Figure 3
B.9	Copies of laboratory analytical report(s) for groundwater monitoring.	Appendix C

The groundwater limitations referenced in item B.7 above are found in Section E of the WDRs which states the following:

E. Groundwater Limitations:

1. Release of waste constituents from any wastewater treatment or storage system component (i.e., ponds) associated with the WWTP shall not cause groundwater under and beyond that system component, as determined by an approved well monitoring network, to:

a. Contain any of the following constituents in concentrations greater than as listed or greater than ambient background quality, whichever is greater:

Table 2: Numeric Groundwater Limitations

Constituent	Units	Limitation
pH	SU	6.5 – 8.5
Total Coliform Organisms	MPN/100mL	Non-detect
Chloride	mg/L	106
Sodium	mg/L	69
Total Dissolved Solids[a]	mg/L	450
Nitrate as N	mg/L	10
Nitrite as N	mg/L	1
Ammonia as N	mg/L	0.5
Total Nitrogen	mg/L	10
Iron	mg/L	0.3
Manganese	µg/L	50
Boron	mg/L	0.6

[a] A cumulative impact limit that accounts for several dissolved constituents in addition to those listed here separately [e.g. alkalinity, (carbonate and bicarbonate), calcium, hardness, phosphate, and potassium.]

b. Contain any constituent not identified in Groundwater Limitation E.1.a in concentrations greater than background quality (whether chemical, physical, biological, bacteriological, radiological, or some other property or characteristic).

c. Exhibit a pH of less than 6.5 or greater than 8.5 pH units.

d. Impart taste, odor, or color that creates nuisance or impairs any beneficial use.

In addition, Item C of the MRP requires various monitoring data and information to be submitted to the Regional Board as part of an Annual Report that is due annually on February 1 (concurrent with the second semi-annual report for the year). Most of the Annual Report requirements are beyond the scope of the current report and are thus not

addressed herein unless they are relevant to groundwater and surface water monitoring. Directly applicable requirements are to submit (1) tabular and graphical summaries of data collected during the year (Item C.2) and (2) an evaluation of the groundwater quality beneath the WWTP site. The WDRs also included several provisions (Section G) relevant to the analyses detailed in this Monitoring Report. These require the following:

- Submittal of a work plan to assess groundwater quality at the WWTP, assess background water quality in the freshwater ponds, and assess whether the ponds are impacting underlying groundwater.
- Submittal of a Background Groundwater Quality Study Report that includes determining background quality and recommended final groundwater limitations.
- Submittal and implementation of a work plan for a Best Practicable Treatment or Control (BPTC) Evaluation Report.

The previous fulfillment of these requirements and findings are discussed later in this Monitoring Report.

4.0 Sampling and Analysis Activities

This section presents a narrative description of all preparatory, monitoring, sampling, and analytical testing activities for groundwater monitoring and fulfills MRP requirement B.3.

4.1 GROUNDWATER WATER SAMPLING AND ANALYSIS

The revised MRP requires groundwater monitoring and reporting for each groundwater monitoring well to include the following:

- Semi-annual measurement and reporting of depth to groundwater;
- Semi-annual monitoring and reporting of groundwater quality for the "semi-annual analytes"; and
- Annual monitoring and reporting of groundwater quality for the "annual analytes" (*not applicable to the current Monitoring Report*).

For semi-annual and annual monitoring and reporting purposes, EBMUD staff conducted the following activities:

- Measured depth to groundwater:
    - August 22, 2025 for MW-5 through MW-11 and P-1 through P-4, and
    - November 20, 2025 for MW-5 through MW-11 and P-1 through P-4.
- Collected groundwater samples for water quality analysis:
    - August 26, 2025 for MW-5 through MW-8, and
    - August 28, 2025 for MW-9 through MW-11.

Groundwater depth measurements and water quality samples were collected following the prescribed procedures detailed in the *Standard Operating Procedure (SOP) for Groundwater Monitoring* Technical Memorandum[7] prepared for EBMUD.[8] Procedures to ensure adequate sampling are detailed in the SOP, a copy of which has been submitted with previous

[7] Conner, Charles Kenneth (Brown and Caldwell). *Standard Operating Procedure for Groundwater Monitoring, Pardee and Camanche Wastewater Treatment Plants, Calaveras and Amador Counties, CA*. Prepared for Colin Moy, EBMUD. August 16, 2010.

[8] This document has been provided to the Regional Board with previous reports and is thus, for conciseness, not included with the current report.

monitoring reports for Pardee and Camanche Wastewater Treatment Plants. The SOP is summarized as follows:

- Prior to sampling, static water level and total well depth were measured to the nearest 0.01 foot with an electronic water level meter and recorded on the field data sheet.
- Following depth monitoring, the wells were sampled with passive diffusion method using HYDRASleeve™ disposable groundwater samplers and decanted into clean containers supplied by the EBMUD analytical laboratory.
- Samples were stored in coolers chilled to 4°C for shipment to the EBMUD analytical laboratory.

Field logs from the second semi-annual 2025 monitoring events are included in **Appendix B**. Analytical lab reports for the groundwater samples are included in **Appendix C**.

4.2 SURFACE WATER SAMPLING AND ANALYSIS

In addition, the MRP requires the following surface water monitoring and reporting for Trout and Beaver Ponds:

- Semi-annual measurement and reporting of surface water elevations,
- Semi-annual monitoring and reporting of surface water quality for nitrate, total alkalinity, chloride, and TDS.

EBMUD staff measure surface water elevations in the freshwater ponds periodically, typically once a month. Surface water elevation data collected from July through December 2025 are reported herein. For the second semi-annual 2025 monitoring event, EBMUD staff collected surface water grab samples for water quality analysis on August 27, 2025 from the freshwater ponds (Beaver Pond and Trout Pond). The water quality samples were stored in coolers chilled to 4°C for shipment to EBMUD's analytical laboratory. Analytical lab reports for the surface water samples are included in **Appendix C**.

5.0 Elevation Results and Analysis

This section presents groundwater elevations, surface water elevations, groundwater flow direction and gradient, and a comparison to previous data and seasonal trends.

5.1 SURFACE WATER ELEVATIONS

Surface water elevations for the freshwater ponds surrounding the WWTP and the WWTP treatment ponds were measured monthly during the second half of 2025. Semi-annual monitoring and reporting elevations for Trout and Beaver ponds are requirements of the MRP. All data collected for these sites between July and December 2025 are reported in **Table 3**. Data corresponding to the months in which groundwater elevation sampling was performed are shown for illustrative purposes in **Figure 2** (August 2025) and **Figure 3** (November 2025).

Monitoring and reporting elevations of the treatment ponds is not a requirement of the MRP but has historically been reported. Representative treatment pond elevation data corresponding to the months and days on which groundwater elevation sampling was performed (August and November 2025) is included in **Table 3**.

Table 3: Current Surface Water Elevations for Freshwater Ponds and WWTP Treatment Ponds

Pond Name	Monitoring Date	Surface Water Elevation feet above Mean Sea Level (amsl)
Trout Pond	7/8/2025	241.0
	8/8/2025	241.0
	9/30/2025	240.7
	10/1/2025	240.7
	11/11/2025	240.7
	12/10/2025	241.0
Beaver Pond	7/8/2025	241.0
	8/8/2025	240.3
	9/30/2025	240.1
	10/1/2025	240.1
	11/11/2025	241.0
	12/10/2025	241.8
WWTP Pond No. 1[a]	8/25/2025	248.5
	11/20/2025	249.0
WWTP Pond No. 2[a]	8/25/2025	248.5
	11/20/2025	249.0
WWTP Pond No. 3[a]	8/25/2025	244.0
	11/20/2025	244.0

Pond Name	Monitoring Date	Surface Water Elevation feet above Mean Sea Level (amsl)

[a] The MRP does not require reporting of surface water elevations (only freeboard). However, surface water elevations for the treatment ponds have been historically reported and are useful in reviewing the groundwater elevation contours for the site (See **Figure 2** and **Figure 3**).

5.1 GROUNDWATER ELEVATIONS

Groundwater elevations were calculated using the measured depths to groundwater and reported top of casing elevations[9]. Current depth to groundwater and groundwater elevations results are shown in **Table 4**. Historical groundwater elevation data are plotted in time-series in **Figure 4** and provided in **Appendix A**.

Table 4: Current Groundwater Monitoring Well Elevations

Monitoring Well	Monitoring Date	Top of Casing, Feet amsl[a]	Depth to groundwater, Feet	Groundwater Elevation, Feet amsl[a]
MW-5	8/22/2025	260.65	15.10	245.55
	11/20/2025		15.25	245.40
MW-6	8/22/2025	256.09	13.30	242.79
	11/20/2025		11.55	244.54
MW-7	8/22/2025	254.68	10.50	244.18
	11/20/2025		12.60	242.08
MW-8	8/22/2025	250.20	17.4	232.80
	11/20/2025		17.3	232.90
MW-9	8/22/2025	240.46	7.80	232.66
	11/20/2025		6.90	233.56
MW-10	8/22/2025	240.42	9.50	230.92
	11/20/2025		7.00	233.42
MW-11	8/22/2025	295.7	70.6	225.10
	11/20/2025		70.2	225.50
P-1[b]	8/22/2025	255.84	2.10	253.74
	11/20/2025		1.90	253.94
P-2[b]	8/22/2025	255.63	10.5	245.13
	11/20/2025		10.4	245.23
P-3[b]	8/22/2025	256.28	13.8	242.48
	11/20/2025		13.6	242.68

[9] Cambria Environmental Technology, Inc. *Groundwater Monitoring Well Installation Report, Camanche South Shore Recreation Area Wastewater Treatment Plant*. Letter Report from Bandon Wilken to Mr. Scott Kranhold, Regional Board. July 21, 2005.

Monitoring Well	Monitoring Date	Top of Casing, Feet amsl[a]	Depth to groundwater, Feet	Groundwater Elevation, Feet amsl[a]
P-4[b]	8/22/2025	251.14	12.65	238.49
	11/20/2025		12.50	238.64

[a] amsl = above mean sea level

[b] Monitoring of onsite piezometers (P-1 through P-4) is not required by the MRP. However, elevation results for the piezometers are helpful in preparing groundwater elevation contours for the site (Figure 2 and Figure 3).

5.2 GROUNDWATER FLOW DIRECTION AND GRADIENT

The current groundwater elevations results were used to prepare groundwater contour mapping and calculate the groundwater gradient and direction. Contour maps for the current data are shown in **Figure 2** and **Figure 3**.

Groundwater flow directions and gradients are controlled by the site topography and interactions with the surface water ponds. Because the surface water-groundwater interactions are not well understood, the details of the groundwater elevations contours and flow gradients cannot be defined in detail. At the scale of the site, as approximately delineated by the lateral extent of the compliance monitoring well network and the roads bounding the ponds, the overall flow direction was southwesterly with a gradient of approximately 0.030 feet/foot. This gradient is calculated from the average of the compliance well with the highest groundwater elevation and the compliance well with the lowest elevation in the southwesterly flow direction.

The groundwater levels in the compliance wells follow the general form of the topography, which is sloping to the southwest in **Figure 2** and **Figure 3**. Given the uncertainty of a hydraulic connection, surface water elevations have not been used in estimating groundwater flow directions and gradients. Locally, the groundwater flow directions vary from west-southwesterly to southerly.

5.3 COMPARISON TO PREVIOUS DATA AND TRENDS

The historical hydrographs for the compliance monitoring wells, piezometers and the background well, MW-11, are shown in **Figure 4**. The hydrographs for the wells and piezometers have been relatively stable on a per well basis and with respect to one another for the entire period of record extending from September 2003 through the current season. The relative stability in groundwater levels between wells indicates the groundwater flow directions have been consistent through time, which is confirmed by groundwater contour mapping in the prior monitoring reports.

The wells and piezometers fall into three groundwater elevation groupings, as shown in **Figure 4**, although the reason for these groupings has been less obvious since fall 2019. Also, P-1 and MW-11 are outliers from these groupings.

The groundwater levels in P-1 are stable, without any significant seasonal trends, and higher than other wells in the monitoring network.

Groundwater level measurements in the background well, MW-11, have consistently been lower than levels in the compliance wells and exhibited no seasonal trends until between fall 2019- spring 2024, when an annual cycle briefly appeared, with lower levels occurring during the fall. Geologic variation and relatively lower recharge rates are the most likely reasons for the lower groundwater elevations at MW-11. Given that MW-11 is nearly half a mile from the WWTP ponds, it is reasonable to conclude that MW-11 is beyond their influence.

Groundwater levels in MW-5, MW-6, MW-7, and P-2 have been consistently high and MW-6 generally exhibits seasonal variation. The similarity in the groundwater levels in the wells may be influenced by their similar land surface elevations. MW-6 typically exhibits an annual cycle with maxima occurring in the spring and minima occurring in the summer/fall. This well is located near the mostly dry WWTP Pond No. 3. The correlation between the high groundwater levels at the end of the rainy season and the low groundwater levels at the end of the dry season may be an indication that the level in the well is influenced by winter precipitation. MW-7 occasionally exhibits an annual cycle, with peaks in January 2017, June 2018, May 2023, November 2024, and August 2025 that were similar to MW-6. Well MW-7 is located by the Trout Pond, and the measured groundwater levels may reflect seasonal changes in pond stage resulting from fishery management actions.

Groundwater level measurements in P-3 and P-4 have been similar to one another and lower than the preceding group of wells. Neither piezometer has exhibited a consistent seasonal trend. During spring 2023, levels in these wells increased significantly, most likely due to large amounts of precipitation during the winter of 2022-2023. Although levels in these wells fluctuate more from year-to-year than the other wells, over the long-term, their levels have remained relatively stable.

Groundwater level measurements in MW-8, MW-9 and MW-10 as a group have exhibited the lowest groundwater elevations other than MW-11, consistent with their low topographic elevations relative to the other wells. The wells have not generally exhibited consistent seasonal trends, but appear to exhibit trends correlated with multi-year wet and dry cycles. For example, levels were low in 2022, a dry year, and higher in 2023, a wet year. The groundwater levels in these wells were near historical lows between 2014-2016 and between 2021-2022 in response to the corresponding droughts, with subsequent recovery in 2023 and the spring of 2024. In the fall of 2024, MW-8 dropped back to drought levels, but quickly recovered again in spring 2025.

6.0 Groundwater Quality Results and Analysis

This section presents groundwater monitoring water quality results and includes a narrative discussion of the analytical results for all media and locations monitored, including spatial and temporal trends, with reference to summary data tables, graphs, and appended analytical reports (as applicable) fulfills MRP requirement B.5 & B.6.

6.1 GROUNDWATER QUALITY ANALYTICAL RESULTS

Groundwater quality results for the second 2025 semi-annual monitoring event are presented in **Table 5** and the analytical lab reports provided in **Appendix C**. Current and historical water quality results are presented in **Appendix A** which also lists the WQO for each analyte (if applicable) and median values of the previous 12 monitoring events for each analyte and well. A piper diagram of the last twelve monitoring events as reported by the analytical lab is shown in **Figure 5**.

Table 5: Current Water Quality Results of Groundwater Monitoring

Sample Date	8/28/2025	8/26/2025				8/28/2025	
Monitoring Well	Background MW 11	MW 5	MW 6	MW 7	MW 8	MW 9	MW 10
Semi-Annual Analytes							
pH, SU	3.1	5.4	6.4	4.9	5.0	5.2	6.4
Total Coliform, MPN/100 mL	<1.8	<1.8	<1.8	<1.8	<1.8	2.0	70
Chloride, mg/L	13	200	52	27	54	24	3.4
Sodium, mg/L	28.4	63.8	52.2	17.1	25.4	18.5	16.6
TDS, mg/L	3,500	650	290	180	190	140	240
Nitrate as N, mg/L	J 0.011	J 0.87	<0.0048	J 0.29	1.2	<0.0048	<0.0048
Conductivity, µmhos/cm	2,824	770	577	197	245	144	382

Sample Date	8/28/2025	8/26/2025				8/28/2025	
Monitoring Well	Background MW 11	MW 5	MW 6	MW 7	MW 8	MW 9	MW 10

Qualifiers: < indicates non-detect (ND) results, with the Method Detection Limit shown as the value.
J indicates an estimated result between the MDL and Reporting Level.

6.2 PREVIOUS EVALUATIONS OF GROUNDWATER QUALITY

In 2006, a Background Groundwater Quality Study Report[10] (Background Report) was prepared for the WWTP (as required per Provision G.1.g of the WDRs). The Background Report contains an evaluation of background quality and a conclusion that the background concentrations from MW-11 are not statistically greater than the Groundwater Limitations in the WDRs. Thus, no revised groundwater limitations were proposed in the Background Report.

In addition, the Background Report discussed a comparison of average (mean) concentrations from MW-5 through MW-10 to the background concentrations in MW-11. It is stated based on this comparison that "there is no impact to groundwater from the use of the [WWTP's] evaporation pond except for" chloride, TDS, ammonia, nitrate, sum of nitrate and nitrite, and manganese. A summary of the discussion in the Background Report of the background exceedances for these analytes is shown in **Table 6**.

Table 6: Analytes with Potential Impact to Groundwater Established in 2006 Background Report

Analyte	Monitoring Wells with Exceedances	Discussion of Exceedances Presented in Background Report
Chloride	MW-5 MW-8	Effluent monitoring of chloride was recommended to be added to the WDRs and the effluent concentrations from this monitoring should be compared to background concentrations and the Groundwater Limitation prior to determining whether or not groundwater is being impacted by chloride.
TDS	MW-5 MW-8	The effluent was dismissed as a cause of TDS exceedances of background since the effluent TDS is less than both the average background concentration and Groundwater Limitation.

[10] Cambria Environmental Technology, Inc. *Background groundwater Quality Study Report, Camanche South Shore Recreation Area Wastewater Treatment Plant (WWTP), Calaveras County, California*. Prepared for EBMUD. June 30, 2006.

Analyte	Monitoring Wells with Exceedances	Discussion of Exceedances Presented in Background Report
Ammonia as N	MW-6	Ammonia concentrations in this well rapidly declined below the Groundwater Limitation and background groundwater concentration.
Nitrate as N	MW-5 MW-8	Average monitoring well concentrations of nitrate for these wells statistically exceeded background concentrations but were below the Groundwater Limitation.
Sum of Nitrate and Nitrite as N	MW-5 MW-8	Average monitoring well concentrations of nitrate plus nitrite for these wells statistically exceeded background concentrations but were below the Groundwater Limitation.
Manganese	MW-8	Manganese concentrations in this well were likely ambient concentrations from natural sources near the WWTP.

Based on the discussions in **Table 6**, the final conclusion of the Background Report is that a BPTC Evaluation Workplan be prepared for chloride, as required by the WDRs, only if the WWTP's effluent chloride concentration is found to be statistically greater than the mean background concentration and Groundwater Limitation. In other words, only chloride was identified as a potential analyte of concern, and additional effluent monitoring of chloride was needed before determining that the WWTP was the cause of chloride exceedances in the groundwater.

To adequately analyze effluent chloride data, EBMUD collected 14 monthly samples of WWTP effluent (i.e., a representative sample from Pond No. 3) between July 2006 and April 2008 and analyzed them for chloride. The results ranged from 35 mg/L to 59 mg/L, with an average of 44 mg/L. None of the effluent chloride results exceeded the Groundwater Limitation of 106 mg/L, but the chloride concentrations were found to statistically exceed background groundwater concentrations. However, as reported in previous monitoring reports, a comparison of chloride concentrations from the monitoring well network to the effluent concentrations suggested that chloride levels in the WWTP effluent did not appear to be influencing chloride levels in wells near the ponds. Thus, a BPTC workplan or report has not been prepared for the WWTP.

Historically some analytes have exceeded the Groundwater Limitations; however, most of the analytes evaluated were not found to statistically exceed background. Analytes that exceed only the Groundwater Limitations indicate compliance with the regulatory requirements (i.e. "whichever is greater" between the Groundwater Limitations or background quality).

Groundwater Monitoring Network Technical Report

In response to the August 2016 Regional Board NOV, a *Groundwater Monitoring Network Technical Report*[11] (2017 Technical Report) was prepared to evaluate the effectiveness of the current groundwater monitoring well network at the CASS WWTP. The 2017 Technical Report concludes that "The current groundwater monitoring network adequately represents the groundwater quality under, and surrounding, the site" but also that the "monitoring network samples a combination of the unimpacted groundwater, represented by the background well [MW-11], and background groundwater affected by point sources of contamination not related to the wastewater ponds."

The 2017 Technical Report further notes that the site "is downgradient of several possible point sources such as historic gold mining tailings, an abandoned landfill and the recreation ponds, which are not sampled by the current background well." The report also concludes that "The current background well represents background quality with only the influence of the local geology" and "is representative of the *unimpacted* underlying groundwater" (emphasis in original). Additional findings detailed in the 2017 Technical Report relevant to the current Monitoring Report are:

- "Most importantly, the monitoring network shows that the WWTP is not negatively affecting the local groundwater. High levels of iron, manganese and TDS, and low pH stem from local background conditions."
- "The monitoring network clearly shows that the wastewater ponds are not responsible for the high pH[12] and constituent levels. They also indicate potential influences from other point sources that differ across the site."
- "MW-5 is situated near a shallow pocket of Catfish Pond, which can explain the high TDS [concentrations]…"

The Regional Board provided a review of the 2017 Technical Report in a letter dated February 13, 2018. District and Regional Board staff met on May 23, 2018, to clarify the next steps on evaluating the potential impact of the wastewater ponds to the underlying groundwater table.

[11] Larry Walker Associates. *Camanche South Shore Wastewater Treatment Plant Groundwater Monitoring Network Technical Report*. Prepared for EBMUD. March 2017.

[12] The report should say "low pH" instead of "high pH," which is clear in the context of the rest of the report.

2019 Special Study Monitoring Results

A special sampling event was conducted at CASS WWTP in the first quarter of 2019 to determine whether there were domestic wastewater markers in the underlying groundwater. Samples were collected in January 2019 except Wastewater Treatment Pond No. 3, which was sampled in March 2019, as there was previously no water in the pond. The monitoring results are included as *Appendix F* of the 2020 First Semi-Annual Report. Based on the sampling data collected, it did not appear that there are significant wastewater markers in the groundwater wells, as concentrations of nutrients and bacteria in the wells were below detection levels and/or lower than concentrations in the Wastewater Treatment Ponds. Generally, concentrations of nutrients and bacteria in the wells were most similar to concentrations in the nearby surface water ponds.

6.3 GROUNDWATER QUALITY TREND ANALYSIS

Intrawell analysis for non-detect analytes (Tier 1a)

Tier 1a: *For analytes consistently reported as non-detect (ND) in the compliance and background wells,* a statistical analysis is not appropriate to determine a trend. Instead, data for the last twelve monitoring events is used to evaluate potential data trends. For this analysis, estimated data, between the method detection limit (MDL) and reporting limit (RL) are considered valid data points. "Consistently" is defined for the purpose of this analysis as a majority of the data points for the current and previous 11 monitoring events.

Of the monitored analytes with groundwater limitations, the following were consistently reported as non-detected by the analytical laboratory (**Appendix A**):

- Total Coliform Organisms in MW-11, MW-5, MW-6, MW-7, and MW-9, and
- Nitrate in MW-11, MW-6, MW-9, and MW-10.

The aforementioned analytes and wells have been consistently non-detected and their current median values are equivalent to non-detect results. Therefore, the CASS WWTP is in compliance with groundwater limitations for these analytes.

Intrawell analysis for detected analytes (Tier 1b)

Tier 1b: *For analytes consistently reported as detected in the compliance wells*, an intrawell analysis is conducted of the monitoring data for the last twelve monitoring events for an analyte and monitoring well to determine data trends. The intrawell analysis is used to evaluate temporal trends in the data per reporting requirement Item B.4 of the MRP.

As shown in **Appendix A**, there are several analytes that have applicable WQOs or other limits and have been consistently detected during the last twelve monitoring events. The data for these analytes was evaluated to establish any downward or upward temporal

trends. A readily available Microsoft Excel add-in (RealStatistics Data Analysis Tools) was used to perform the Mann-Kendall test. A detailed description of the Mann-Kendall statistical method and the results of the analysis are included in **Appendix D**. Non-detected values are assumed to be one-half the method detection limit for the statistical analysis. Trend results in **Appendix D** are summarized in **Table 7**.

Table 7: Trend Results for Wells (based on Mann-Kendall Test)

Analyte	Results by Monitoring Well[a]						
	MW-11	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10
Semi-Annual Analytes							
pH	No trend	No trend	No trend	No trend	**Increase**	No trend	No trend
Total Coliform[b]	N/A	N/A	N/A	N/A	No trend	N/A	No trend
Chloride	No trend	No trend	No trend	**Increase**	No trend	No trend	No trend
Sodium	**Decrease**	No trend	No trend	No trend	No trend	No trend	No trend
TDS	No trend	No trend	No trend	No trend	No trend	No trend	**Increase**
Nitrate as N[b]	N/A	**Decrease**	N/A	**Decrease**	**Decrease**	N/A	N/A

[a] "Decrease" results indicate a decreasing trend in recent data. "Increase" results indicate an increasing trend in recent data.

[b] "N/A" indicates that recent data are consistently non-detected (ND), and a statistical trend analysis is not necessary.

The results in **Table 7** show the following increasing or decreasing trends:

- pH shows an increasing trend in compliance well MW-8,

- Chloride shows an increasing trend in compliance well MW-7,
- Sodium shows a decreasing trend in background well MW-11,
- TDS shows an increasing trend in compliance well MW-10, and
- Nitrate shows a decreasing trend in compliance wells MW-5, MW-7, and MW-8.

7.0 Compliance Assessment

This section presents a comparison of compliance monitoring well data to the Groundwater Limitations and background concentrations (i.e. upgradient well concentrations) and a discussion of any violation of those requirements. This section fulfills MRP requirement B.5 and B.7.

Interwell Analysis for Detected Analytes (Tier 2)

Tier 2: *For analytes consistently reported as detected in the compliance and background wells,* a Wilcoxon Rank-Sum (WRS) test was used to perform an interwell analysis of the data for the last twelve monitoring events for the analyte and compliance well relative to the defined background data for that analyte from the corresponding background well (MW-11). WRS is a non-parametric statistical analysis that is used to evaluate differences in the median between two independent data sets. The test does not require data to be normally distributed. Non-detected values are assumed to be one-half the method detection limit. The interwell analysis is also used to evaluate spatial trends of the data per reporting requirement Item B.4 of the MRP.

If the analysis indicates the compliance well data set is not statistically different from the background well data set, then the compliance well is considered to indicate compliance with the Groundwater Limitation for that analyte and well. If the analysis indicates the two data sets are statistically different, then the medians of the data sets are compared to determine if the compliance well data set is higher or lower than the background well data set.

1) If the median for the compliance well data is less than the median for the background well data, the compliance well is considered to indicate compliance with the Groundwater Limitation for that analyte and well.

2) If the median for the compliance well data is greater than the median for the background well data, the compliance well is considered to indicate potential noncompliance with the Groundwater Limitation for that analyte and additional analysis is required to determine whether the WWTP is the cause of the apparent noncompliance.

A readily available Microsoft Excel add-in (XLStat) was used to perform the WRS test (Mann-Whitney test). A detailed description of the WRS method and results of the analysis are included in **Appendix E**. A summary of the results along with median values, the p-values from the test, and test interpretation is provided in **Table 8**.

Table 8: Results of the Wilcoxon Rank Sum Test (Tier 2 Analysis)

Analyte	Compliance Well Analyzed	Median Values		P-Values[a]	WRS Test Interpretation[b]
		Compliance Well	MW-11		
Semi-Annual Analytes					
pH	MW-5	5.4	3.1	**<0.0001**	Higher
	MW-6	6.5		**<0.0001**	Higher
	MW-7	5.0		**<0.0001**	Higher
	MW-8	4.9		**<0.0001**	Higher
	MW-9	5.4		**<0.0001**	Higher
	MW-10	6.5		**<0.0001**	Higher
Total Coliform, MPN/100mL	MW-5	<1.8	<1.8	-	-
	MW-6	<1.8		-	-
	MW-7	<1.8		-	-
	MW-8	4.9		**0.0078**	Higher
	MW-9	<1.9		-	-
	MW-10	4.4		**0.0078**	Higher
Chloride, mg/L	MW-5	230	15	**<0.0001**	Higher
	MW-6	72		**<0.0001**	Higher
	MW-7	21.5		**0.0004**	Higher
	MW-8	50		**<0.0001**	Higher
	MW-9	21		0.325	-
	MW-10	4.5		**<0.0001**	Lower
Sodium, mg/L	MW-5	70	44	**0.0025**	Higher
	MW-6	106		**0.0083**	Higher
	MW-7	18		**0.0002**	Lower
	MW-8	23		**0.0087**	Lower
	MW-9	19		**<0.0001**	Lower
	MW-10	11		**<0.0001**	Lower
Total Dissolved Solids (TDS), mg/L	MW-5	650	4,000	**<0.0001**	Lower
	MW-6	345		**<0.0001**	Lower
	MW-7	175		**<0.0001**	Lower
	MW-8	220		**<0.0001**	Lower
	MW-9	150		**<0.0001**	Lower
	MW-10	160		**<0.0001**	Lower

Analyte	Compliance Well Analyzed	Median Values		P-Values[a]	WRS Test Interpretation[b]
		Compliance Well	MW-11		
Nitrate as N, mg/L	MW-5	1.09	<0.07	**<0.0001**	Higher
	MW-6	<0.12		-	-
	MW-7	0.54		**<0.0001**	Higher
	MW-8	2.65		**0.0001**	Higher
	MW-9	<0.048		-	-
	MW-10	<0.045		-	-

[a] Values shown are the two-tailed p-value results from the Wilcoxon Rank-Sum test. Values greater than or equal to 0.05 indicate that compliance well data are not statistically different from the background well data. Values less than 0.05 indicate statistically different data sets, and a comparison of medians is needed to determine which data set is greater.

[b] The WRS Test results are interpreted as follows:
- "Higher" indicates a p-value less than 0.05 and median of the compliance well greater than the background well (MW-11).
- "Lower" indicates a p-value less than 0.05 and a median of the compliance well less than the background well (MW-11).
A p-value greater than or equal to 0.05 represents datasets that are not statistically different.

The interpretation of the WRS Test in **Table 8** indicates whether concentrations in downgradient wells are or are not statistically different from background data. If they are not statistically different, they can be considered in compliance with groundwater limitations. Analytes and wells statistically different from *and higher than* background include:

- pH in all compliance wells,
- Total Coliform in MW-8 and MW-10,
- Chloride in MW-5, MW-6, MW-7, and MW-8,
- Sodium in MW-5 and MW-6, and
- Nitrate as N in MW-5, MW-7, and MW-8.

Results and Explanation of Any Exceedances of Applicable Water Quality Objectives

Concentrations in the background and compliance monitoring wells for the current monitoring event were evaluated against the groundwater limitations listed in **Table 2** and results are shown in **Table 9**.

Table 9: Comparison of Results to Groundwater Limitations

Analyte	Groundwater Limitation	Well	Most Recent Measured Value[a]	Result[b]
Semi-Annual Analytes				
pH	6.5 – 8.5	MW-11	**3.1**	**Below**
		MW-5	**5.4**	**Below**
		MW-6	**6.4**	**Below**
		MW-7	**4.9**	**Below**
		MW-8	**5.0**	**Below**
		MW-9	**5.2**	**Below**
		MW-10	**6.4**	**Below**
Total Coliform, MPN/100mL	Non-detect	MW-11	<1.8	Complies
		MW-5	<1.8	Complies
		MW-6	<1.8	Complies
		MW-7	<1.8	Complies
		MW-8	<1.8	Complies
		MW-9	**2.0**	**Exceeds**
		MW-10	**70**	**Exceeds**
Chloride, mg/L	106	MW-11	13	Complies
		MW-5	**200**	**Exceeds**
		MW-6	52	Complies
		MW-7	27	Complies
		MW-8	54	Complies
		MW-9	24	Complies
		MW-10	3.4	Complies
Sodium, mg/L	69	MW-11	28.4	Complies
		MW-5	63.8	Complies
		MW-6	52.2	Complies
		MW-7	17.1	Complies
		MW-8	25.4	Complies

Analyte	Groundwater Limitation	Well	Most Recent Measured Value[a]	Result[b]
		MW-9	18.5	Complies
		MW-10	16.6	Complies
Total Dissolved Solids (TDS), mg/L	450	MW-11	**3,500**	**Exceeds**
		MW-5	**650**	**Exceeds**
		MW-6	290	Complies
		MW-7	180	Complies
		MW-8	190	Complies
		MW-9	140	Complies
		MW-10	240	Complies
Nitrate as N, mg/L	10	MW-11	J 0.011	Complies
		MW-5	J 0.87	Complies
		MW-6	<0.0048	Complies
		MW-7	J 0.29	Complies
		MW-8	1.2	Complies
		MW-9	<0.0048	Complies
		MW-10	<0.0048	Complies

[a] **Bold** values indicate an exceedance of the applicable water quality objective.

[b] The following are used to indicate compliance with applicable Groundwater limits based on the most recent monitoring data:

- "Below" indicates compliance well data are below the minimum groundwater limitation (for pH only),
- "Exceeds" indicates well data have exceeded the groundwater limitation (or maximum limit for pH).
- "Complies" indicates well data are below the groundwater limitation (or within limits for pH).

Effluent Quality

To determine whether WWTP effluent is potentially causing or contributing to exceedances, a review of recent WWTP effluent data is necessary. In accordance with the MRP, water quality samples for the WWTP effluent were collected from Pond 3 during 2024. During 2025 and prior to 2024, Pond 3 had insufficient water for measurement. The water quality results are summarized in **Table 10** for the analytes of concern.

Table 10. Recent WWTP Effluent Water Quality (Pond 3)

Analyte	Units	Result	Sample Date
Monthly Analytes			
pH	SU	7.3 7.3 7.1 7.5	2/28/2024 3/20/2024 4/10/2024 5/15/2024
Total Coliform	MPN/100mL	1,600 16,000 5,400 9,200	2/28/2024 3/20/2024 4/10/2024 5/15/2024
Chloride	mg/L	44 45 45 50	2/28/2024 3/20/2024 4/10/2024 5/15/2024
Sodium	mg/L	41.9 41.7 41.3 44.4	2/28/2024 3/20/2024 4/10/2024 5/15/2024
TDS	mg/L	270 260 260 280	2/28/2024 3/20/2024 4/10/2024 5/15/2024
Nitrate as N	mg/L	0.34 0.71 0.80 0.43	2/28/2024 3/20/2024 4/10/2024 5/15/2024
Annual Analytes			
Iron	mg/L	1.91	2/28/2024
Manganese	µg/L	200	2/28/2024
Barium	mg/L	0.079	2/28/2024
Calcium	mg/L	19.1	2/28/2024
Magnesium	mg/L	5.68	2/28/2024
Potassium	mg/L	16.8	2/28/2024

Analyte	Units	Result	Sample Date
Sulfate	mg/L	12	2/28/2024
Hardness (as CaCO3)	mg/L	76	2/28/2024
Total Alkalinity	mg/L	100	2/28/2024
Bicarbonate	mg/L	100	2/28/2024
Carbonate	mg/L	<5	2/28/2024
Hydroxide	mg/L	<5	2/28/2024

Compliance with Groundwater Limitations Discussion

Historical trends over time for each analyte are provided in **Figure 6 – Figure 14**. Occasionally, a comparison is made with effluent water quality to determine whether the WWTP is contributing to higher groundwater concentrations. WWTP effluent water quality is monitored in Pond 3 when water levels are sufficient for sample collection (most recently in May 2024).

pH

pH values in all wells were below the lower groundwater limitation for pH (6.5 SU) during the August 2025 event (**Table 9**). The 12-event median pH values for wells MW-11, MW-5, MW-7, MW-8, MW-9 are also below the lower groundwater limitation for pH, although the compliance well concentrations are statistically higher than background (**Table 8**). pH values in background well MW-11 obtained during the last eleven monitoring events are noted to be exceptionally low (**Appendix A-2**). pH levels showed no trends in any compliance well, with the exception of an increasing trend in MW-8 (**Table 7**).

Based on the recent background well values, the WWTP discharge is not likely to be the cause of low pH in the compliance wells, and another cause is suspected. In addition, the effluent samples collected in 2024 show that effluent levels are within limits (7.1-7.5 SU) (**Table 10**). This conclusion is consistent with the Technical Report prepared in March 2017 for the WWTP that found that low pH stemmed from local background conditions and that the wastewater ponds were not responsible for low pH levels. Since the WWTP is likely not the cause of the pH exceedances and is attributable to background, all monitoring wells can be considered in compliance with pH groundwater limitations.

Total Coliform

The 12-event median total coliform results in the background well and compliance wells MW-5, MW-6, MW-7, and MW-9 were consistently reported below detection levels (**Table 8**). These wells can therefore be considered in compliance with the total coliform groundwater limitation without further evaluation. Total coliform in MW-8 and MW-10 is statistically higher than background (**Table 8**) and shows no trends (**Table 7**). Total coliform was below detection levels at MW-8 but exceeded the groundwater limitation at MW-10 during August 2025 (**Table 9**).

The effluent samples collected in 2024 had total coliform concentrations between 1,600 and 16,000 MPN/100mL (**Table 10**). As part of an ongoing investigation into total coliform exceedances, EBMUD inspected the surface seals and disinfected the wells at the WWTP in mid-2016. These efforts were conducted because of the possibility that bacteria had been inadvertently introduced into the wells and previously detected exceedances were not reflective of groundwater conditions in the aquifer. The well inspection results indicate good or fair condition of each of the wells at the WWTP. Post-disinfection, one of the wells with previous exceedances (MW-5) has typically shown total coliform concentrations below detection levels. The remaining well with previous exceedances (MW-8) continues to have measurable total coliform. During the second quarter 2020, the District replaced all above-ground plugs and gaskets for the CASS WWTP monitoring well network.

EBMUD also collected "field blank" samples during both days of the second semi-annual 2017 groundwater sampling period at the WWTP to determine whether sample contamination could be a factor for total coliform detections. Collecting the field blanks entailed taking a HydraSleeve to the site, treating it in the same manner as the HydraSleeve's for the well samples, with the exception that it was filled with sterile deionized water and not placed in a monitoring well. The filled HydraSleeve was then treated as a sample and the collected sample was analyzed for total coliform. The field blank samples showed non-detect results, demonstrating that sample contamination is likely not a factor for Total Coliform Organisms. The field blank results were included as Appendix C of the *Second Semi-Annual 2017 Monitoring Report*.

While total coliform can indicate the presence of fecal bacteria (i.e. from wastewater effluent) it can also represent naturally occurring bacteria. Waterfowl frequent the nearby recreation ponds. EBMUD field staff have noted waterfowl excrement in the area near the monitoring wells, which presents another potential source of total coliform. Based on the preceding information, the WWTP effluent cannot be definitively ruled out as contributing to elevated levels in MW-8 and MW-10.

Chloride

Chloride concentrations showed an increasing trends in well MW-7 (**Table 7**). Chloride concentrations in MW-5, MW-6, MW-7, and MW-8 are statistically higher than background, while chloride in MW-9 is not statistically different from background and chloride in MW-10 is lower than background (**Table 8**). Chloride in well MW-5 was above the groundwater limitation during August 2025 (**Table 9**).

It has been concluded in previous reports that the WWTP effluent is likely not the cause of chloride exceedances. Effluent samples collected in 2024 had an average chloride concentration of 46 mg/L (**Table 10**), consistent with low chloride concentrations previously reported. Recent chloride concentrations in MW-5 are far greater than the chloride concentrations in effluent (**Appendix A-2**). Based on this information, a source other than the WWTP is suspected to be causing the relatively high chloride concentrations in MW-5. However, since chloride concentrations in MW-5 are statistically higher than concentrations in the background well, the WWTP effluent cannot be definitively ruled out as contributing to the chloride exceedance.

Sodium

Sodium concentrations show no trends in any well, other than a decreasing trend in the background well MW-11 (**Table 7**). Sodium in wells MW-7, MW-8, MW-9, and MW-10 is statistically lower than background while sodium in MW-5 and MW-6 is statistically higher than background (**Table 8**). Measurements of sodium during August 2025 were below the groundwater limitation in all wells (**Table 9**). Wells MW-5, MW-7, MW-8, MW-9, and MW-10 are therefore in compliance with the sodium groundwater limitation.

It has been concluded in previous reports that the WWTP effluent is likely not the cause of high sodium levels. Effluent samples collected in 2024 had an average sodium concentration of 42 mg/L (**Table 10**), which is below the groundwater limitation for sodium of 69 mg/L, below median background (MW-11) results (**Appendix A-2**), and lower than the August 2025 results at MW-6 (**Table 5**). Therefore, a source other than the WWTP is suspected to be causing the relatively high sodium concentrations in MW-6.

Total Dissolved Solids

TDS concentrations showed no significant trends in any well with the exception of an increasing trend in compliance well MW-10 (**Table 7**). TDS in all compliance wells is statistically lower than background (**Table 8**). Measurements of TDS during August 2025 in MW-6, MW-7, MW-8, MW-9, and MW-10 were below the groundwater limitation (**Table 9**). These wells are therefore in compliance with the TDS groundwater limitation.

August 2025 measurements of TDS in compliance wells MW-5 and the background well MW-11 exceeded the groundwater limitation (**Table 9**). As previously mentioned, TDS in all compliance wells was statistically lower than background (**Table 8**). In addition, effluent samples collected in 2024 had an average TDS concentration of 268 mg/L (**Table 10**), below the recent TDS concentrations in compliance wells MW-5 and the background well MW-11 (**Table 5**) and the 12-sample median TDS concentrations (**Table 8**). Therefore, TDS in MW-5 is suspected to represent ambient, or background-like conditions, as discussed in the Background Report. Based on the preceding information, MW-5 is in compliance with the groundwater limitation for TDS.

Nitrate as N

Nitrate was estimated or below the detection level in background well MW-11 and compliance wells MW-5, MW-6, MW-7, MW-9, and MW-10 during the August 2025 monitoring event (**Table 5**). Recent nitrate concentrations at MW-11, MW-6, MW-9, and MW-10 have consistently been below detection levels (**Table 8**). Compliance wells MW-6, MW-9, and MW-10 can therefore be considered in compliance with nitrate groundwater limitation without further evaluation.

Nitrate in MW-5, MW-7, and MW-8 is statistically higher than background (**Table 8**). All nitrate concentrations were below the groundwater limitation during the August 2025 event (**Table 9**). Decreasing trends were observed in MW-5, MW-7, and MW-8 (**Table 7**). Effluent results collected in 2024 had an average nitrate-N concentration of 0.56 mg/L (**Table 10**). Therefore, concentrations in MW-5, MW-7, and MW-8 can also be considered in compliance with the nitrate groundwater limitation.

8.0 Surface Water Quality Results and Evaluation

This section documents the results for the second semi-annual 2025 surface water quality monitoring event (along with data from the previous 11 monitoring events). In addition, a narrative discussion of the analytical results for surface water samples, including spatial and temporal trends is presented. This section fulfills MRP requirement B.5 and B.7.

8.1 SURFACE WATER QUALITY RESULTS

The analytical lab reports for the August 2025 surface water quality monitoring event are provided in **Appendix C**. Water quality results for this event and the previous 11 monitoring events are presented in **Table 11**. The current Monitoring Report includes only current and recent data. Previous reports can be consulted for historical data.

8.2 EVALUATION OF SURFACE WATER QUALITY

Surface water quality results shown in **Table 11** indicate that the concentrations measured in the second half of 2025 are generally consistent with previously measured concentrations for each analyte. No significant temporal trends are apparent.

During the second half of 2025, concentrations in Beaver Pond were very similar to concentrations in Trout Pond. Historically, higher concentrations have been observed in Beaver Pond, which is not surprising given the difference in operation of these ponds. Freshwater flows through Trout Pond, whereas Beaver Pond is a terminal pond with no flow, thus Beaver Pond is more likely to be a sink for analytes such as chloride, TDS, and alkalinity. These constituents are likely concentrated by evaporation from the pond surface, whereas nitrate-N concentrations have remained similar in the two ponds, or occasionally higher in Trout Pond.

Table 11: Current and Recent Water Quality Results of Semi-Annual Surface Water Monitoring

Sample Date	Nitrate (as N), mg/L[a]	Total Alkalinity, mg/L as $CaCO_3$	Chloride, mg/L	TDS, mg/L
Trout Pond				
1/22/2020	J 0.012	16	1.5	34
7/22/2020	<0.0035	22	2	50
1/27/2021	0.02	21	2.2	39
7/15/2021	<0.0071	23	2.6	49
1/26/2022	<0.0023	J 28	2.9	50
7/27/2022	<0.0023	J 26	2.9	51
1/26/2023	0.048	J 23	2.8	55
8/23/2023	J 0.0093	J 28	2.4	50
2/28/2024	<0.0048	J 23	2.3	61
8/28/2024	J 0.0049	J 24	2.1	41
2/26/2025	<0.0048	J 24	2.3	43
8/27/2025	<0.0048	J 29	2.0	49
Beaver Pond				
1/22/2020	<0.0070	35	3.2	44
7/22/2020	<0.0035	36	2.7	71
1/27/2021	0.0120	46	4.2	53
7/15/2021	<0.0071	36	3.7	59
1/26/2022	J 0.0055	40	5.4	64
7/27/2022	J 0.0070	48	4.7	75
1/26/2023	<0.0023	J 29	4.2	59
8/23/2023	J 0.022	J 22	2.2	45
2/28/2024	<0.0048	J 21	1.7	41
8/28/2024	J 0.0055	J 28	2.1	41
2/26/2025	J 0.0068	32	3.3	48
8/27/2025	<0.0048	J 30	1.8	52

[a] "<" indicates non-detect (ND) results. The Method Detection Limit (MDL) is shown as the value. "J" indicates data reported between the MDL and Reporting Levels. Estimated concentrations are shown.

9.0 Conclusions

The following conclusions can be drawn from the monitoring results and subsequent analysis presented in this Monitoring Report:

- The most recent pH levels in the background well and all compliance wells but MW-6 and MW-10 are below the lower groundwater limitation for pH. However, the 12-event median pH values in all compliance wells are statistically higher than the background median pH. The most recent pH measured in the WWTP treatment ponds is within the groundwater limitation range. Therefore, the WWTP discharge cannot be the cause of the low pH values and the WWTP is in compliance with the groundwater limitations for pH.
- Total coliform was only detected above the WQO in compliance well MW-10 during the recent monitoring event, and has been consistently non-detected in MW-5, MW-6, MW-7, and MW-9. Wells MW-5, MW-6, MW-7, and MW-9 are therefore in compliance with the groundwater limitation for total coliform.
- Total coliform in MW-8 and MW-10 is statistically higher than background and total coliform in MW-10 exceeded the groundwater limitation during the most recent monitoring event. Sources other than the WWTP are suspected of causing detected levels of total coliform in MW-8 and MW-10, although the WWTP effluent cannot be definitively ruled out.
- Chloride exceeded the groundwater limitation in MW-5 during the recent monitoring event. Chloride in all other compliance wells met the groundwater limitations, as did sodium in all compliance wells. The most recent salts measured in the WWTP effluent were below the groundwater limitation. A source other than the WWTP effluent is suspected to be causing the salts exceedances. However, since chloride and sodium concentrations in MW-5 and MW-6 are statistically higher than the background well, the WWTP effluent cannot be definitively ruled out as causing exceedances.
- TDS concentrations in the background well MW-11 and compliance well MW-5 exceeded the groundwater limitation during the recent monitoring event. However, TDS in MW-5 is statistically lower than background. Therefore, TDS in MW-5 represents ambient, or background-like conditions and the WWTP is in compliance with the groundwater limitation. TDS in all other compliance wells is below the groundwater limitation.

- Nitrate concentrations in all wells were below the groundwater limitation during the recent monitoring event. Therefore, the WWTP is in compliance with the groundwater limitation for nitrate.

EBMUD will continue to monitor and evaluate groundwater conditions at the WWTP and report the results on a semi-annual basis.

Figures

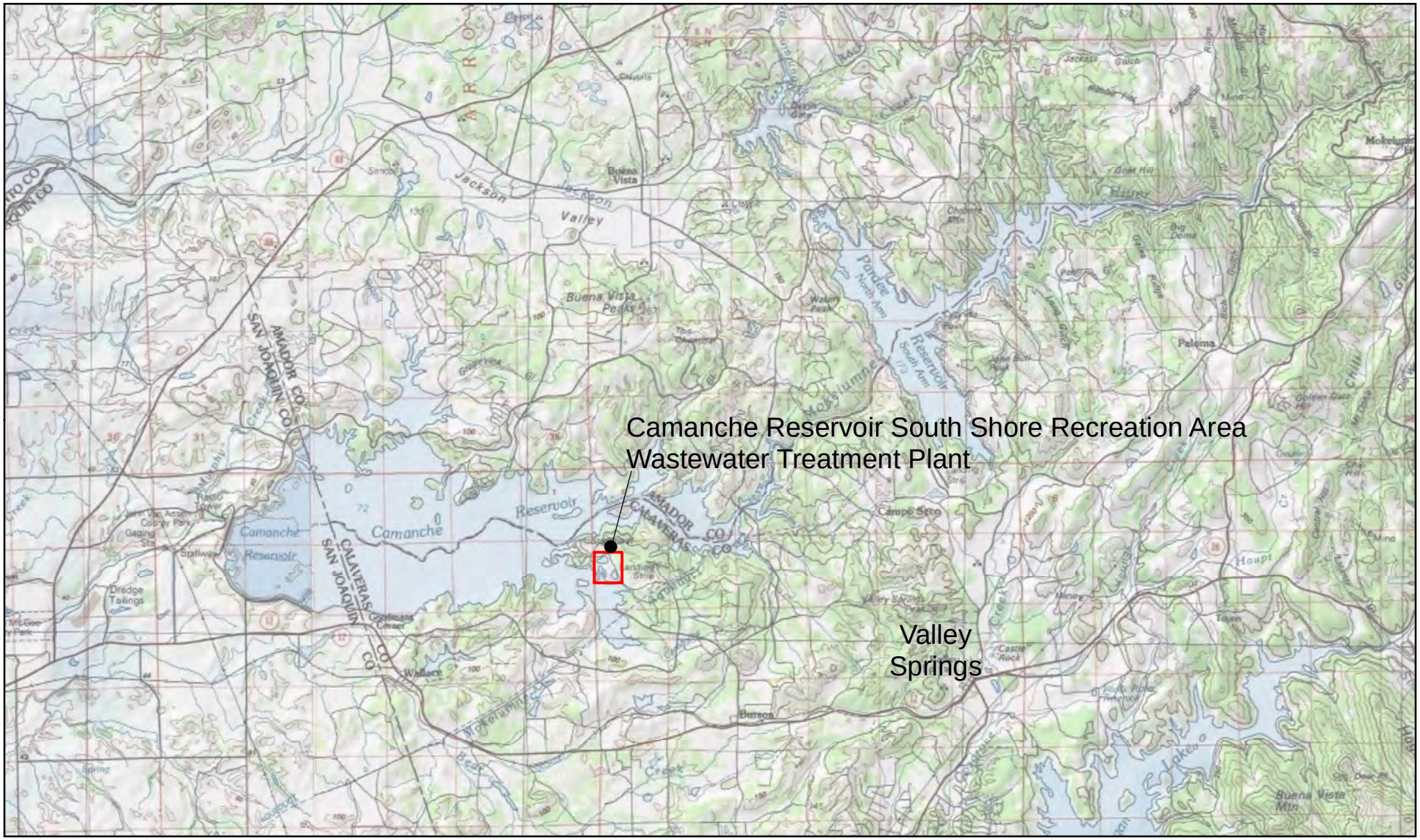


FIGURE 1

East Bay Municipal Utility District

VICINITY MAP
CASS WWTP

N

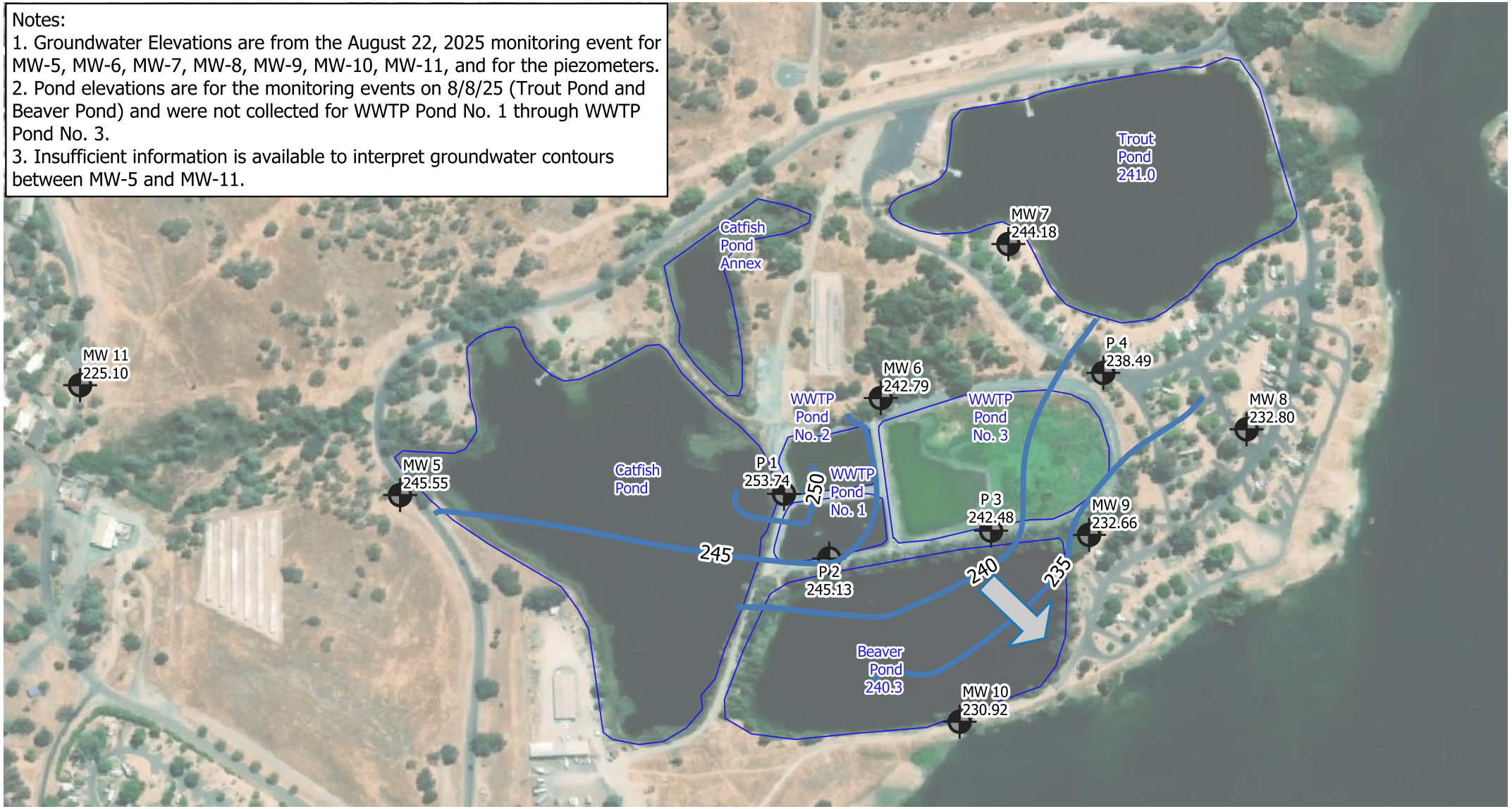
0 1 2

Miles

EBMUD

LARRY WALKER ASSOCIATES

Notes:
1. Groundwater Elevations are from the August 22, 2025 monitoring event for MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-11, and for the piezometers.
2. Pond elevations are for the monitoring events on 8/8/25 (Trout Pond and Beaver Pond) and were not collected for WWTP Pond No. 1 through WWTP Pond No. 3.
3. Insufficient information is available to interpret groundwater contours between MW-5 and MW-11.



0 200 400 600 800 1,000 ft

lwa

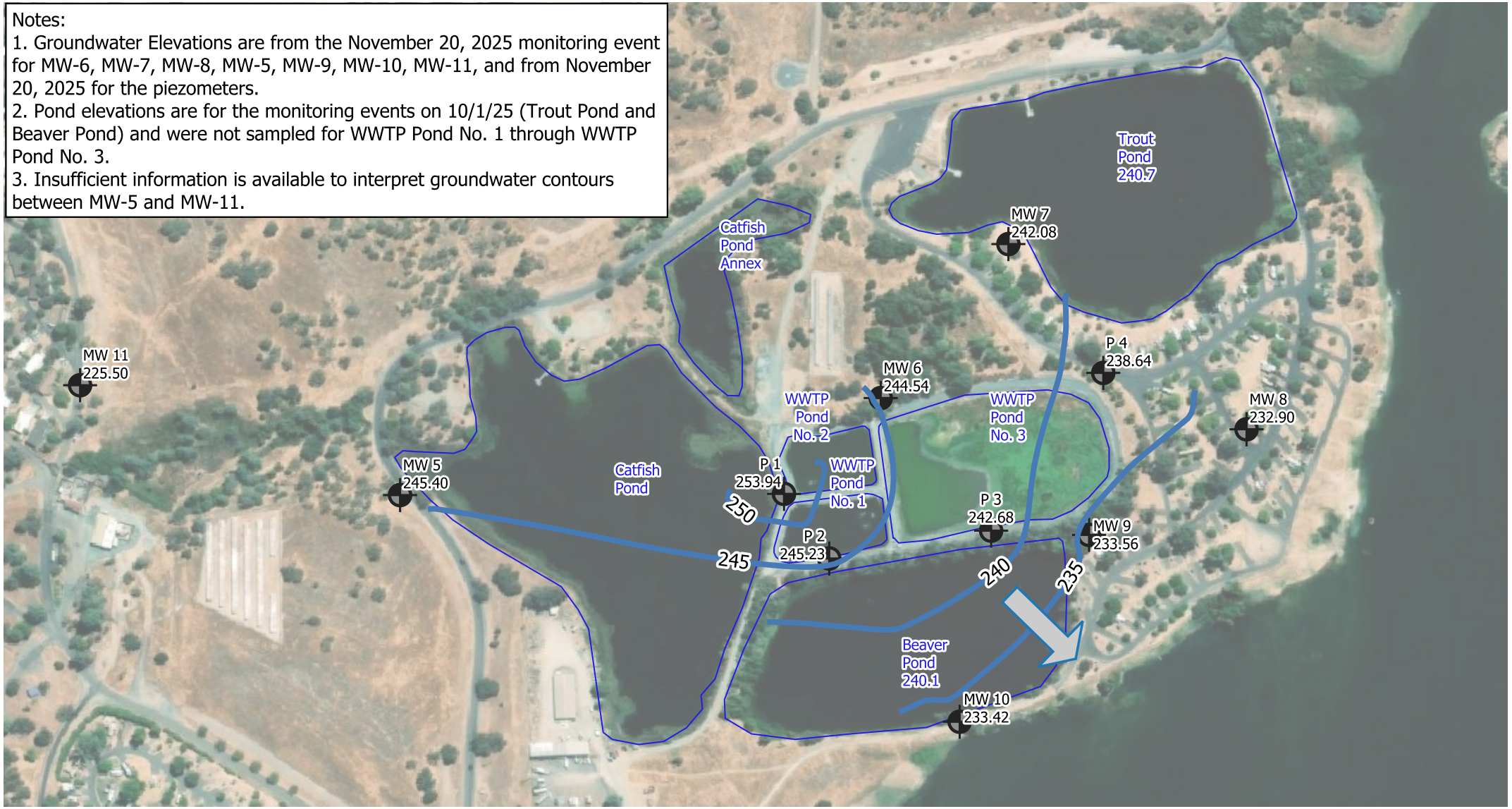
Legend

- Approximate monitoring well location with groundwater elevation (feet above mean sea level)
- Groundwater elevation contour in feet above mean sea level
- Flow Direction

Figure 2

East Bay Municipal Utility District
Quarter 3 - 2025 Groundwater Elevations
CASS WWTP

Notes:
1. Groundwater Elevations are from the November 20, 2025 monitoring event for MW-6, MW-7, MW-8, MW-5, MW-9, MW-10, MW-11, and from November 20, 2025 for the piezometers.
2. Pond elevations are for the monitoring events on 10/1/25 (Trout Pond and Beaver Pond) and were not sampled for WWTP Pond No. 1 through WWTP Pond No. 3.
3. Insufficient information is available to interpret groundwater contours between MW-5 and MW-11.



0 200 400 600 800 1,000 ft

lwa

Legend

- Approximate monitoring well location with groundwater elevation (feet above mean sea level)
- Groundwater elevation contour in feet above mean sea level
- Flow Direction

Figure 3

East Bay Municipal Utility District
Quarter 4 - 2025 Groundwater Elevations
CASS WWTP

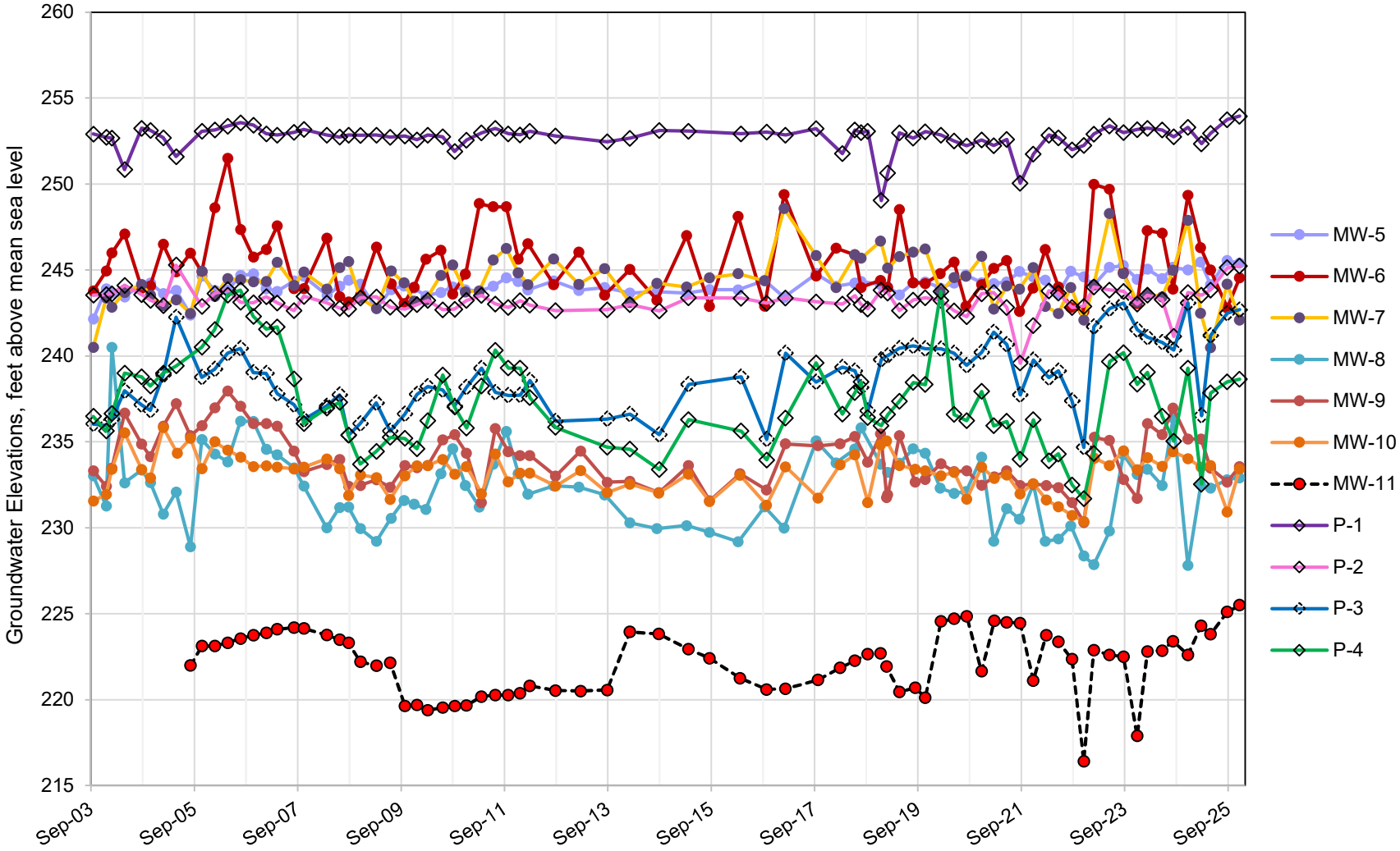


Figure 4: Historical Groundwater Elevations

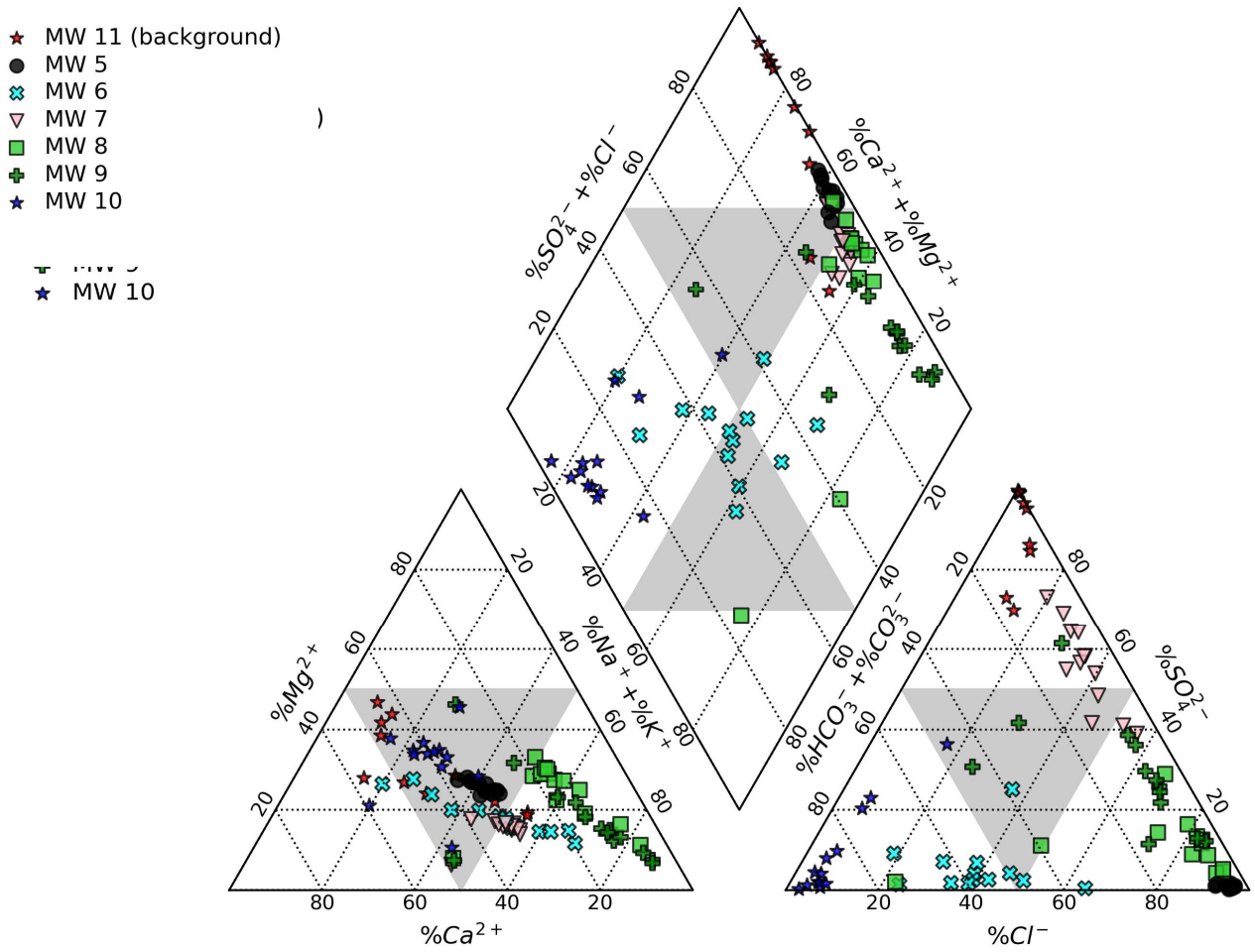


Figure 5: CASS Piper Diagram 2015-2025, as Reported by Analytical Laboratory

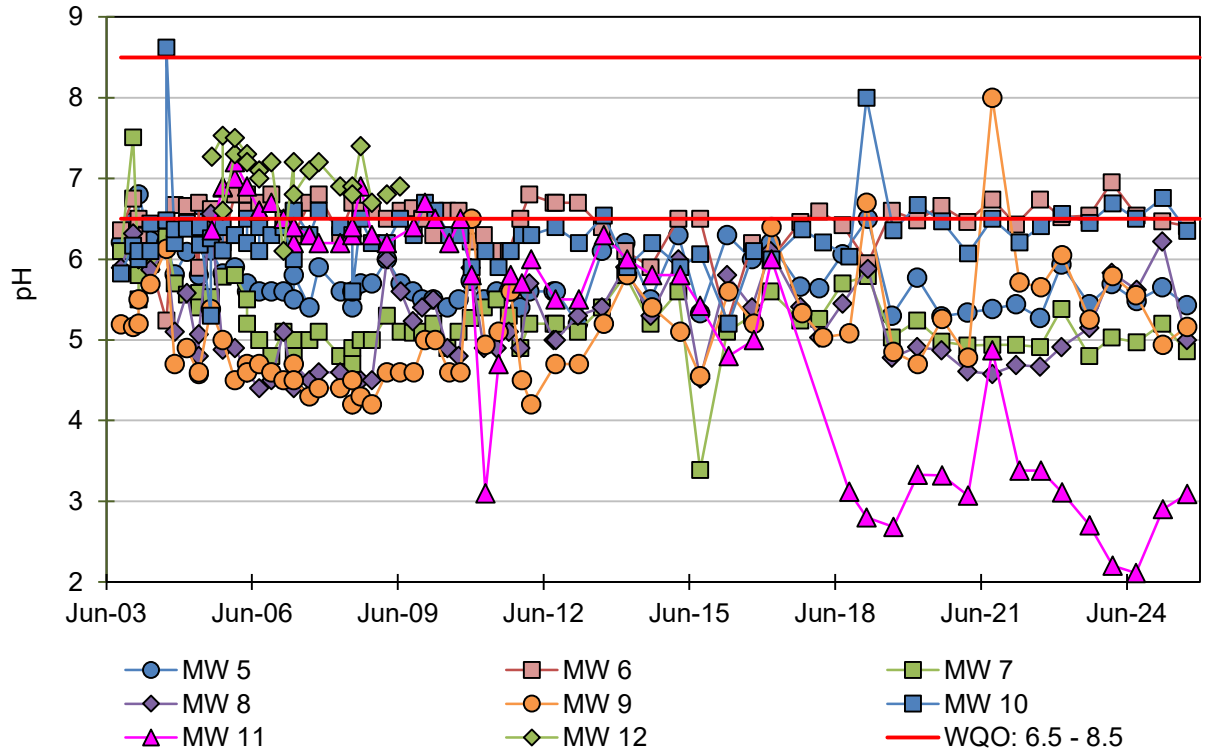


Figure 6: Historical Groundwater Monitoring Results – pH

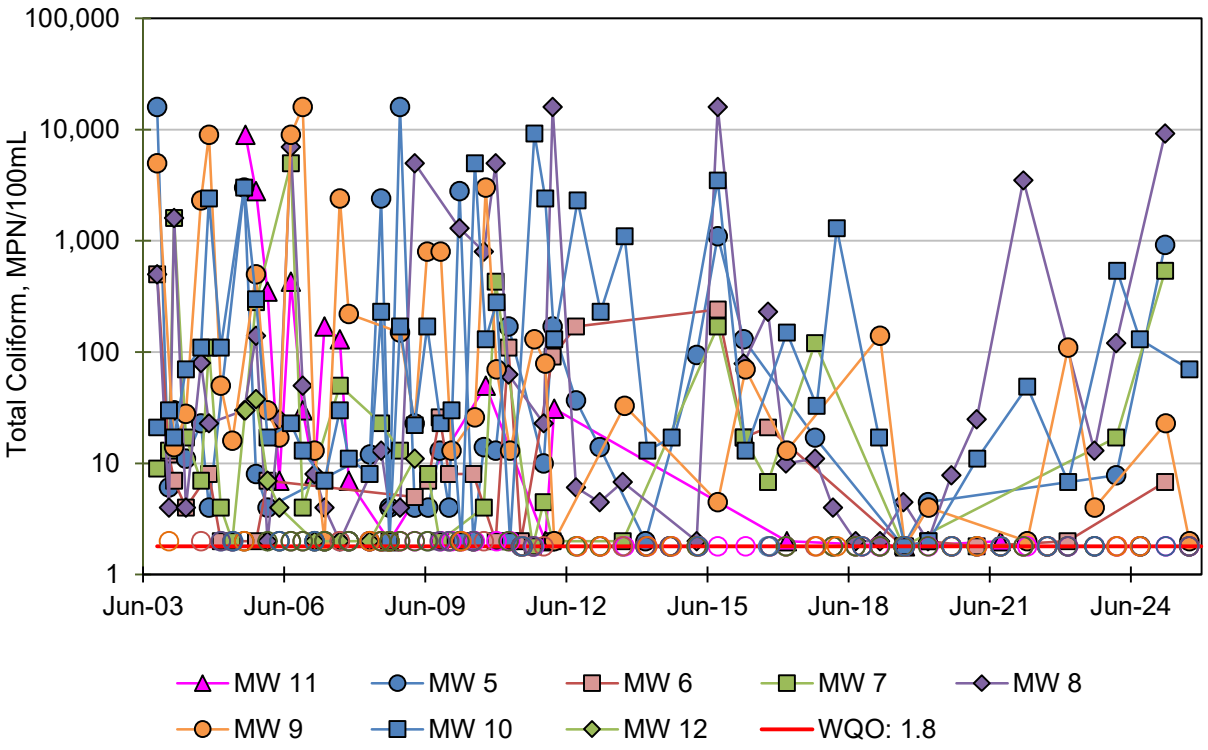


Figure 7: Historical Groundwater Monitoring Results – Total Coliform

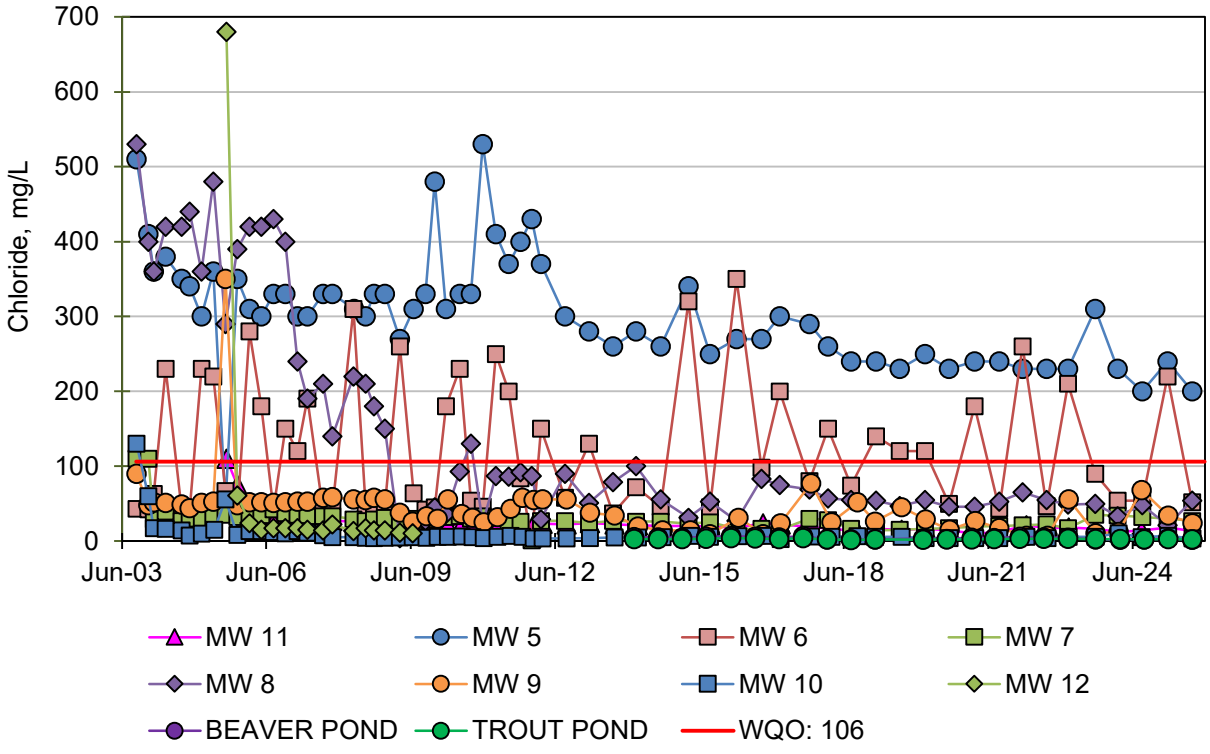


Figure 8: Historical Groundwater Monitoring Results – Chloride

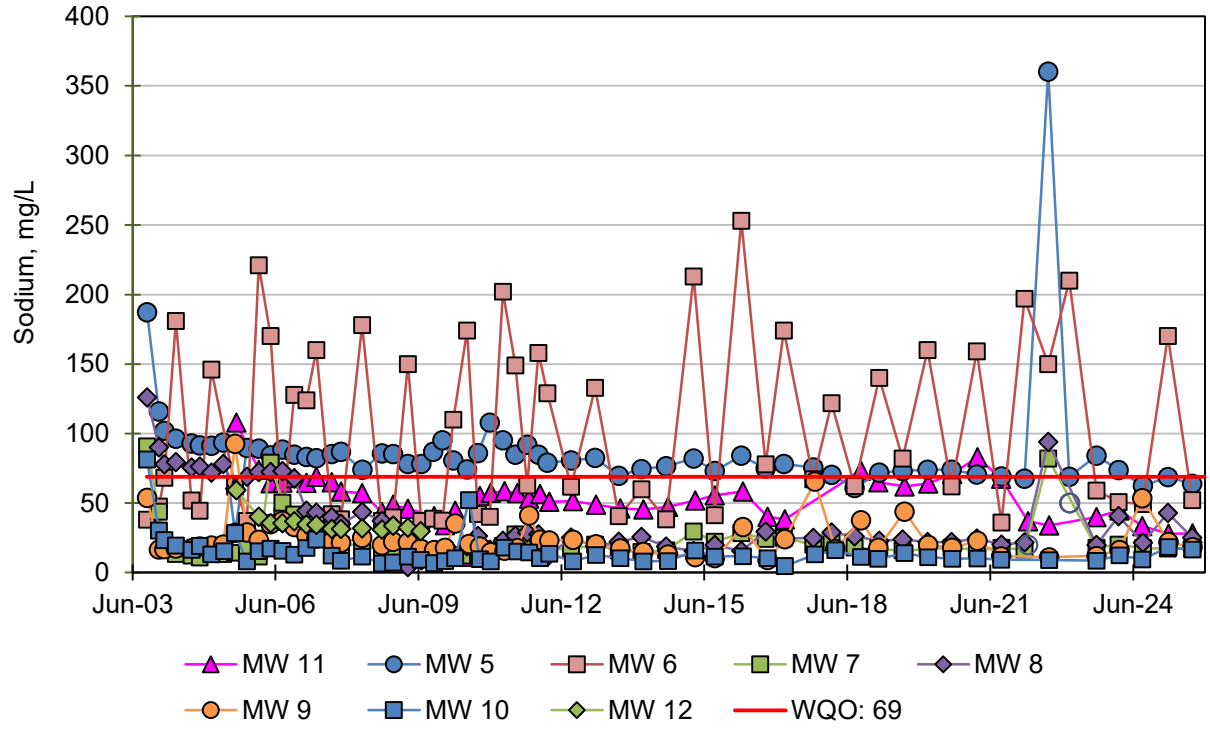


Figure 9: Historical Groundwater Monitoring Results – Sodium

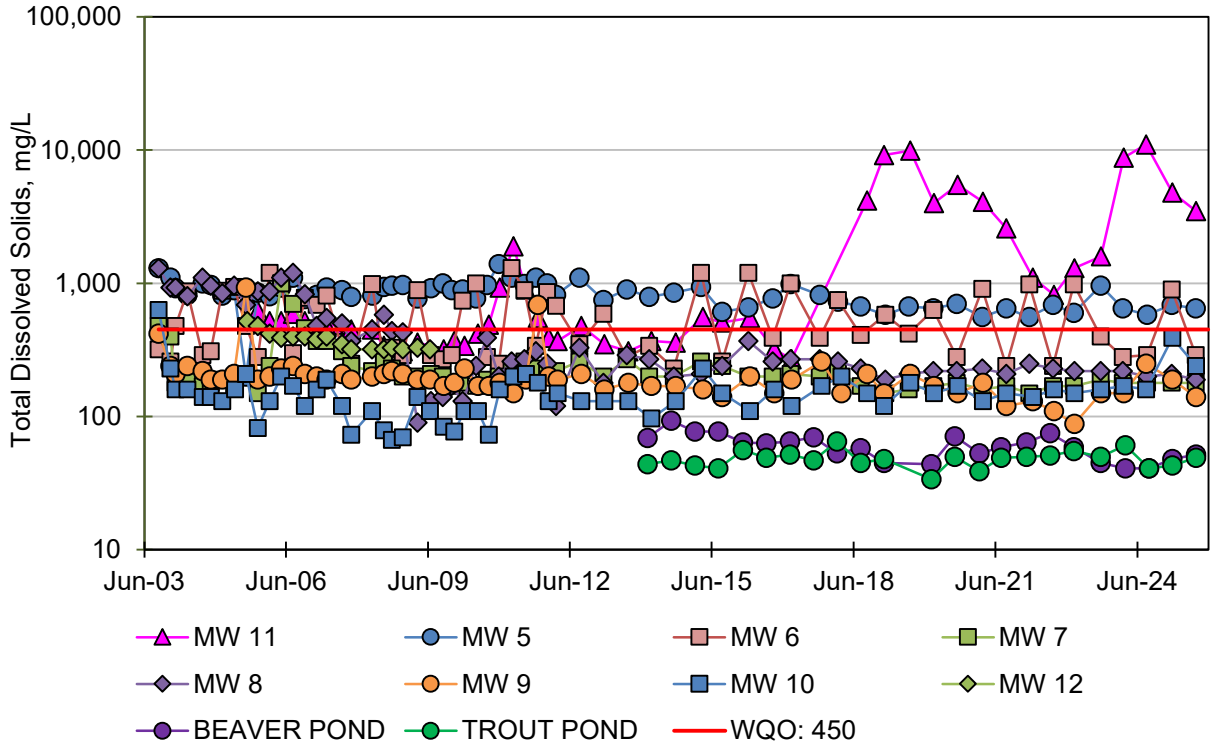


Figure 10: Historical Groundwater Monitoring Results – Total Dissolved Solids

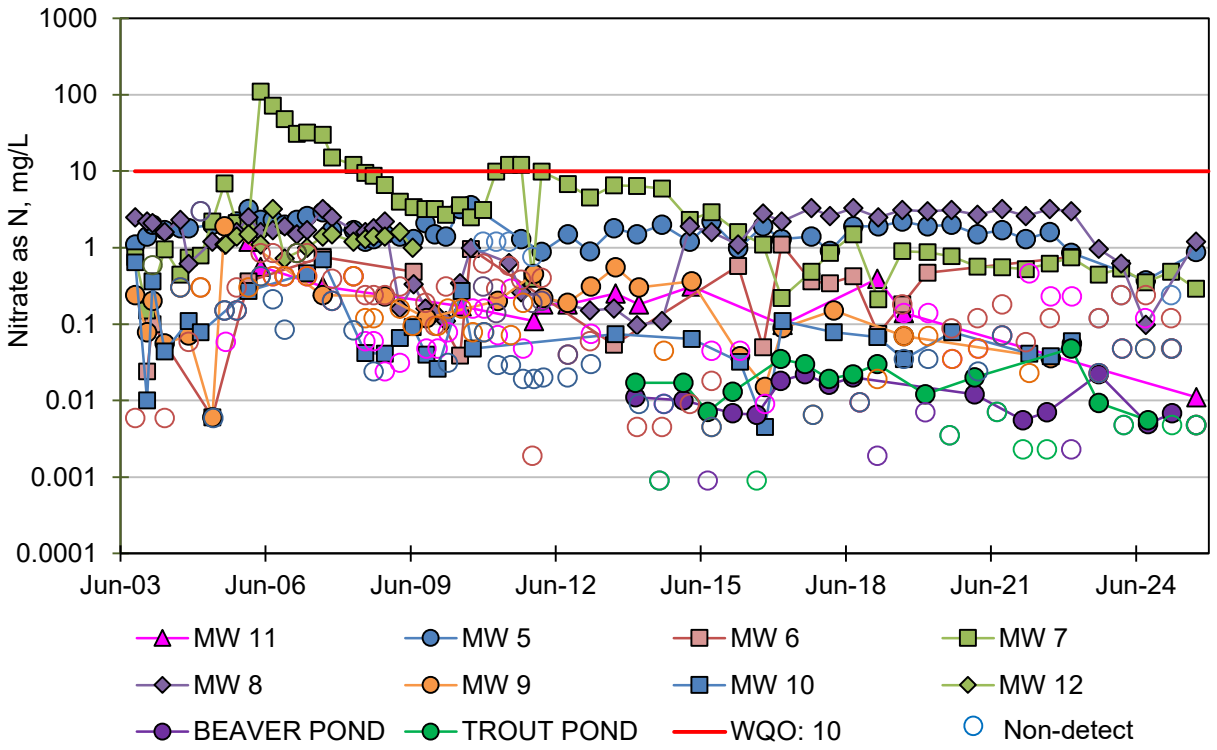


Figure 11: Historical Groundwater Monitoring Results – Nitrate as N

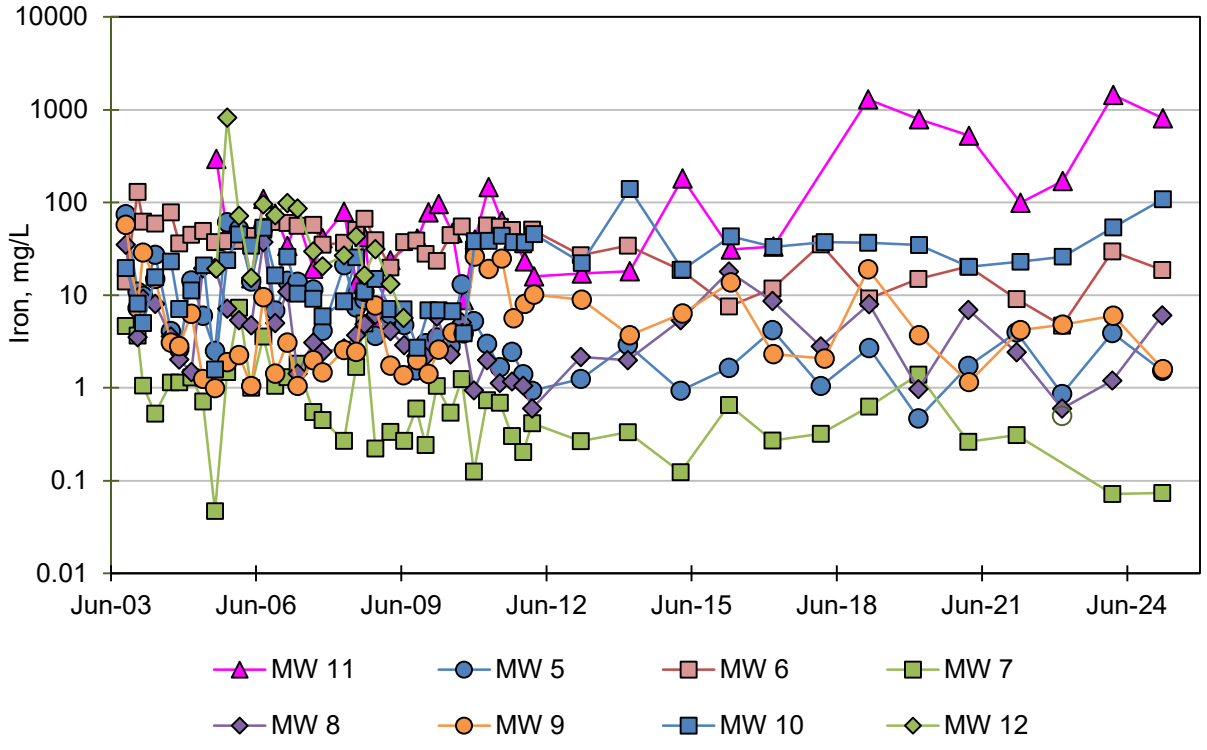


Figure 12: Historical Groundwater Monitoring Results – Iron

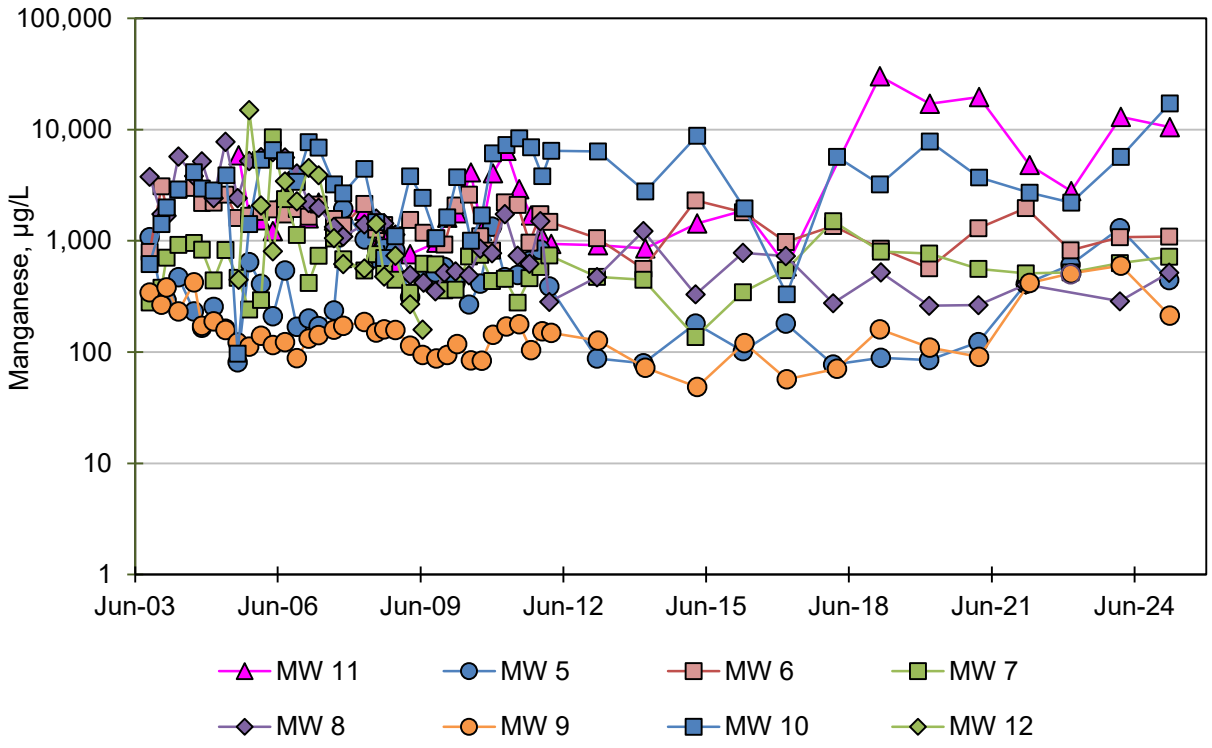


Figure 13: Historical Groundwater Monitoring Results – Manganese

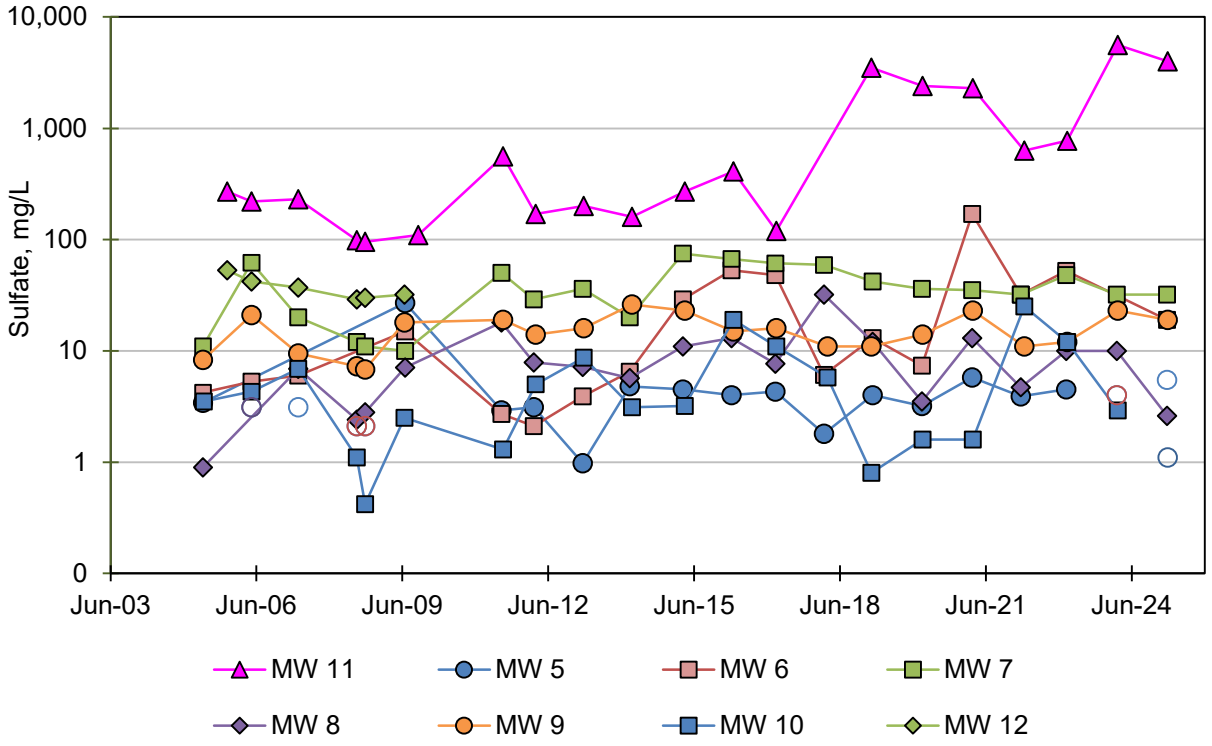


Figure 14: Historical Groundwater Monitoring Results – Sulfate

Appendix A – Historical Groundwater Elevations and Water Quality

Appendix A-1. Current and Historical Groundwater Elevation Data, feet

Sample Date	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	P-1	P-2	P-3	P-4
9/18/2003	242.14	243.78	240.49	233.02	233.31	231.55		252.90	243.53	236.04	236.48
12/18/2003	243.90	244.93	243.36	231.26	232.41	231.94		252.71	243.56	235.96	235.63
1/27/2004	243.65	245.99	242.83	240.50	233.46	233.41		252.67	243.61	236.31	236.64
4/26/2004	243.43	247.09	243.69	232.61	236.66	235.53		250.84	244.10	237.97	238.99
8/24/2004	244.16	243.93	244.15	233.35	234.87	233.39		253.24	243.56	237.15	238.78
10/25/2004	244.23	244.07	243.53	232.63	234.13	232.90		253.12	243.23	236.83	238.24
1/24/2005	243.62	246.49	242.93	230.80	235.91	235.83		252.69	242.93	238.88	238.99
4/25/2005	243.80	244.89	243.26	232.07	237.21			251.59	245.28	242.25	239.41
5/3/2005						234.34					
8/4/2005	242.38	245.98	242.46	228.88	235.35	235.20	221.99	(a)	(a)	(a)	(a)
10/24/2005	244.65	244.89	244.92	235.13	235.93	233.43	223.12	253.06	242.88	238.75	240.51
1/23/2006	243.80	248.62	243.46	234.29	236.97	235.00	223.12	253.14	243.63	239.23	241.53
4/24/2006	243.82	251.50	244.50	233.83	237.95	234.52	223.31	253.36	243.85	240.15	243.54
7/24/2006	244.67	247.34	244.43	236.20	237.06	234.11	223.55	253.56	243.12	240.43	243.82
10/23/2006	244.77	245.74	244.31	236.18	236.05	233.55	223.74	253.42	243.09	239.03	242.29
1/21/2007	243.90										
1/22/2007		246.19	244.33	234.56	236.06	233.60	223.89	252.92	243.44	238.98	241.55
4/9/2007	243.75	247.56	245.44	234.24	235.91	233.52	224.09	252.84	243.08	237.80	241.68
8/6/2007	244.35	243.92	244.10	233.48	234.45	233.42	224.19	253.00	242.63	237.16	238.65
10/15/2007	244.63	243.92	244.88	232.42	233.26	233.52	224.14	253.17	243.46	236.29	236.06
3/24/2008		246.85	243.89	230.00	233.68	234.00	223.76	252.84	243.08	237.08	236.95
3/27/2008	243.52										
6/23/2008	244.05	243.44	245.14	231.18	233.96	233.44	223.48	252.73	242.77	237.73	237.29
8/25/2008	244.40	243.14	245.48	231.20	232.41	231.88	223.30	252.84	242.73	235.38	235.39
11/17/2008	244.18	243.54	243.36	229.95	232.46	233.06	222.20	252.83	243.37	236.06	233.70
3/10/2009	242.75	246.33	242.76	229.20	232.79	232.92	221.97	252.84	243.43	237.27	234.44
6/16/2009					232.35	231.65	222.15	252.72	242.83	235.63	235.26
6/22/2009	243.85	244.19	244.93	230.55							
9/21/2009	244.07	243.04	244.25	231.58							
9/28/2009					233.61	233.02	219.63	252.79	242.71	236.62	235.20
12/1/2009	243.95	243.99	243.18	231.38							
12/22/2009					233.50	233.60	219.68	252.57	242.98	237.76	234.60
2/22/2010	243.48	245.62	243.24	231.07							
3/8/2010					233.61	233.62	219.38	252.84	243.22	238.22	236.23

Appendix A-1. Current and Historical Groundwater Elevation Data, feet

Sample Date	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	P-1	P-2	P-3	P-4
6/8/2010 6/22/2010	243.69	246.14	244.68	233.15	235.11	233.97	219.54	252.74	242.68	238.02	238.88
8/31/2010 9/14/2010	244.00	243.59	245.28	234.60	235.41	233.12	219.63	251.89	242.71	237.08	237.02
11/29/2010 12/6/2010	243.84	244.76	243.72	232.45	234.33	233.56	219.65	252.55	243.22	238.18	235.80
3/7/2011 3/22/2011	243.75	248.85	243.78	231.20	231.46	231.97	220.18	252.97	243.51	239.28	238.24
6/13/2011 6/27/2011	244.05	248.67	245.58	233.70	235.76	234.29	220.26	253.23	243.02	237.88	240.33
9/13/2011 9/27/2011	244.54	248.67	246.25	235.60	234.42	232.67	220.26	252.92	242.81	237.70	239.29
12/7/2011 12/20/2011	244.32	245.62	244.83	233.15	234.19	233.18	220.38	252.86	243.21	237.72	239.29
2/14/2012 2/27/2012	243.84	246.52	244.15	231.95	234.20	233.17	220.80	253.06	242.95	238.57	237.56
8/14/2012 8/27/2012	244.35	244.14	245.64	232.44	233.00	232.42	220.53	252.79	242.63	236.20	235.84
2/7/2013 2/20/2013	243.81	246.04	244.16	232.36	234.46	233.32	220.50	(a)	(a)	(a)	(a)
8/9/2013 8/26/2013	243.97	243.54	245.08	231.91	232.64	232.04	220.56	252.45	242.68	236.33	234.69
2/3/2014	243.65	245.03	243.10	230.29	232.70	232.54	223.94	252.66	242.98	236.61	234.57
8/12/2014 8/26/2014 8/29/2014	243.72	243.25	244.22	229.95	232.04	232.02	223.82	253.11	242.61	235.42	233.38
3/10/2015 3/24/2015	243.65	246.99	244.00	230.13	233.61	233.12	222.93	253.07	243.38	238.34	236.29
8/20/2015	243.85	242.87	244.54	229.73	231.57	231.52	222.41	(a)	(a)	(a)	(a)
3/9/2016 3/22/2016 3/30/2016	243.84	248.11	244.78	229.18	233.14	233.05	221.25	252.92	243.35	238.78	235.63

Appendix A-1. Current and Historical Groundwater Elevation Data, feet

Sample Date	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	P-1	P-2	P-3	P-4
9/12/2016	244.38	242.89	244.37	231.22							
9/26/2016					232.19	231.32	220.59				
9/27/2016								253.02	243.06	235.15	233.94
1/27/2017	243.40	249.39	248.56	229.98							
2/6/2017					234.88	233.54	220.63	252.84	243.37	240.16	236.37
9/11/2017	244.78	244.64	245.83	235.05				253.22	243.14	238.48	239.59
9/25/2017					234.77	231.73	221.15				
1/30/2018	244.05	246.27	243.98	233.77							
2/27/2018					234.89	233.66	221.85				
3/15/2018								251.77	243.01	239.34	236.61
6/12/2018	244.23	245.88	245.88	234.58	235.31	234.24	222.26	253.14	243.50	239.13	237.86
7/25/2018	244.32	243.98	245.68	235.81				252.99	242.99	238.16	238.49
9/11/2018					233.81	231.47	222.65	253.07	242.73	236.80	236.41
12/11/2018	244.15	244.39	246.68	233.70	235.46	234.82	222.70				
12/14/2018								249.04	243.83	239.78	235.94
1/22/2019					231.76	235.05	221.93				
1/30/2019	244.00	243.97	245.11	233.22	231.92			250.64	243.66	240.01	236.59
4/22/2019	243.55	248.50	245.78	233.75	235.36	233.62	220.45	252.97	242.63	240.44	237.36
7/29/2019	244.25	244.25	246.03	234.60				252.67	243.25	240.58	238.45
8/12/2019					232.65	233.40	220.69				
10/22/2019	244.30	244.21	246.22	234.34	232.81	233.31	220.11	253.04	243.38	240.42	238.33
2/5/2020	243.95	244.79	243.73	232.30							
2/20/2020					233.73	233.02	224.55	252.84	243.23	240.41	243.74
5/13/2020	244.23	245.46	244.56	232.00	233.26	233.22	224.70	252.50	242.62	240.16	236.59
8/5/2020	244.70	242.89	244.63	232.10							
8/10/2020					233.31	231.67	224.85	252.22	242.28	239.45	236.23
11/24/2020	244.25	244.14	245.79	234.10	232.47	233.52	221.65	252.56	243.61	240.20	237.93
2/17/2021	244.20	245.09	242.73	229.20				252.23	243.68	241.38	235.93
2/22/2021					232.96	232.87	224.59				
5/20/2021	244.30	245.54	244.06	231.12	233.31	233.07	224.50	252.59	242.81	240.66	236.19
8/18/2021	244.90	242.59	243.88	230.50							
8/23/2021					232.46	231.97	224.45	250.04	239.58	237.73	233.99
11/23/2021	244.60	243.94	245.13	232.53	232.54	232.57	221.10	251.74	241.76	239.76	236.28

Appendix A-1. Current and Historical Groundwater Elevation Data, feet

Sample Date	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-11	P-1	P-2	P-3	P-4
2/16/2022	244.40	246.19	242.88	229.20							
2/23/2022					232.46	231.62	223.75				
3/14/2022								252.84	243.78	238.73	233.89
5/20/2022	243.62	244.01	242.47	229.34	232.34	231.22	223.36	252.69	243.65	239.13	234.29
8/16/2022	244.92	242.82	243.98	230.10							
8/24/2022					231.46	230.72	222.35	251.99	242.81	237.38	232.49
11/16/2022	244.60	242.59	242.08	228.35	230.31	230.37	216.40	252.24	242.88	234.68	231.69
1/25/2023	244.10	249.98	244.13	227.85	235.26	234.04	222.88	252.90			234.32
1/30/2023									244.00	241.70	
5/16/2023	245.15	249.69	248.28	229.80	235.08	233.62	222.60	253.38	243.83	242.74	239.67
8/21/2023	245.25	244.84	244.78	234.25							
8/23/2023					232.81	234.47	222.50	252.99	243.75	243.07	240.19
11/28/2023	244.45	243.04	243.13	233.10	231.71	233.37	217.88	253.16	243.01	241.52	238.34
2/7/2024		247.29	243.58	233.40							
2/8/2024	245.05				236.06	234.07	222.80	253.24	243.53	241.08	239.04
5/22/2024	244.50	247.14	243.43	232.45	235.41	233.57	222.85	253.14	243.28	240.78	236.49
8/7/2024	245.15	243.89	244.98	236.40	236.96	234.42	223.40				
8/12/2024								252.74	241.13	240.33	235.04
11/20/2024	245.00	249.34	247.88	227.80	235.16	234.02	222.60	253.29	243.68	243.08	239.29
2/18/2025	245.45	246.29	242.48	232.50							
2/21/2025					235.16	233.52	224.30				
2/24/2025								252.34	243.53	236.53	232.54
4/29/2025	244.15	244.99	240.48	232.30	233.46	233.62	223.80	252.94	243.83	241.18	237.84
8/25/2025	245.55	242.79	244.18	232.80	232.66	230.92	225.10	253.74	245.13	242.48	238.49
11/20/2025	245.40	244.54	242.08	232.90	233.56	233.42	225.50	253.94	245.23	242.68	238.64

(a) The well was not monitored.

Appendix A-2. Current and Recent Water Quality Results of Semi-Annual Groundwater Monitoring

Well	Sample Date	Conventional Parameters		Inorganic Parameters					
		pH	Total Coliform, MPN/100 mL	Chloride, mg/L	Sodium, mg/L	TDS, mg/L	Nitrate as N, mg/L	Iron, mg/L[a]	Manganese, µg/L[a]
	GW Limit [b]	*6.5 - 8.5*	*<1.8* [c]	*106*	*69*	*450*	*10*	*0.30*	*50*
MW-11 (Background Monitoring Well)									
	8/4/2005	6.36	9,000	110	108	790	<0.059	B 295	5,900
	10/25/2005	6.89	2,800	75	---	620	<0.15	47.6	1,710
	1/24/2006	7.0	350	40	73.9	520	1.2	46.2	1,530
	4/25/2006	6.9	7.0	28	64.4	520	0.560	15.2	1,220
	7/25/2006	6.63	430	26	64.7	590	<0.420	109	2,710
	10/24/2006	6.70	30.0	25	67.9	520	<0.420	76.0	2,210
	1/23/2007	6.5	8.0	25	64.5	470	<0.850	34.2	1,590
	4/10/2007	6.4	170	24	B 68.8	480	<0.420	66.3	2,200
	8/7/2007	6.3	130	24	65.1	490	0.310	19.3	1,520
	10/16/2007	6.2	7.0	27	58.3	450	<0.200	41.2	1,830
	3/25/2008	6.2	<2.0	26	B 57.1	450	<0.420	79.5	1,870
	6/24/2008	6.4	<2.0	26	---	340	<0.060	13.3	814
	8/26/2008	6.9	2.0	25	43.7	330	<0.060	42.4	1,200
	11/18/2008	6.3	<2.0	26	49.0	310	<0.024	4.79	606
	3/11/2009	6.2	<2.0	24	45.9	360	<0.031	23.9	760
	9/29/2009	6.4	<2.0	22	40.6	320	<0.048	40.8	964
	12/22/2009	6.7	<2.0	22	34.2	370	<0.048	78.2	1,610
	3/9/2010	6.5	<2.0	21	44.7	340	<0.078	96.2	1,770
	6/22/2010	6.2	<2.0	22	11.3	420	0.170	47.2	4,120
	9/14/2010	6.5	50.0	19	55.1	490	<0.160	8.84	1,230
	12/7/2010	5.8	<2.0	20	57.5	930	<0.160	40.0	4,040
	3/22/2011	3.1	<2.0	19	58.5	1,900	<0.072	147.0	6,450
	6/28/2011	4.7	<1.8	20	57.3	900	<0.290	63.3	2,910
	9/27/2011	5.8	<1.8	22	53.2	550	<0.048	40.8	1,690
	12/20/2011	5.7	2.0	23	56.5	390	0.110	23.2	1,070
	2/28/2012	6.0	31.0	23	51.1	370	0.180	15.9	936
	8/28/2012	5.5	<1.8	22	51.4	480	0.180	---	---
	2/21/2013	5.5	<1.8	24	48.9	350	<0.075	17.1	915
	8/27/2013	6.3	<1.8	22	46.2	310	J 0.25	---	---
	2/19/2014	6.0	<1.8	21	45.4	370	J 0.18	18.1	858
	8/26/2014	5.8	<1.8	20	47.4	360	<0.009	---	---
	3/24/2015	5.8	<1.8	20	51.9	560	0.310	B 182	1,430

Appendix A-2. Current and Recent Water Quality Results of Semi-Annual Groundwater Monitoring

Well	Sample Date	Conventional Parameters		Inorganic Parameters					
		pH	Total Coliform, MPN/100 mL	Chloride, mg/L	Sodium, mg/L	TDS, mg/L	Nitrate as N, mg/L	Iron, mg/L[a]	Manganese, µg/L[a]
	GW Limit [b]	*6.5 - 8.5*	*<1.8* [c]	*106*	*69*	*450*	*10*	*0.30*	*50*
MW-11 cont.	8/20/2015	5.4	<1.8	19	55.7	510	<0.045	---	---
	3/22/2016	4.8	<1.8	18	58.3	550	<0.045	B 31.2	1,880
	9/27/2016	5.0	<1.8	24	40.2	320	<0.009	---	---
	2/7/2017	6.0	2.0	22	38.5	270	0.098	33.6	593
	9/12/2017[d]	---	---	---	---	---	---	---	---
	1/31/2018[d]	---	---	---	---	---	---	---	---
	9/13/2018	3.1	<1.8	13	73.3	4,200	<0.01	---	---
	1/23/2019	2.8	<1.8	16	65.0	9,200	J 0.39	1,300	30,000
	8/13/2019	2.7	<1.8	15	62.0	9,900	<0.14	---	---
	2/11/2020	3.3	<1.8	16	64.0	4,000	<0.14	790	17,000
	8/11/2020	3.3	<1.8	14	71.0	5,500	<0.035	---	---
	2/23/2021	3.1	<1.8	10	82.9	4,100	<0.048	523	19,600
	8/23/2021	4.9	2.0	12	67.6	2,600	<0.071	---	---
	3/17/2022	3.4	<1.8	J 21	J 37	1,100	<0.46	99	4,800
	8/25/2022	3.4	<1.8	J 17	34.0	820	<0.23	---	---
	1/31/2023	3.1	<1.8	J 18	<50	1,300	<0.23	170	2,800
	8/24/2023	2.7	<1.8	16	40	1,600	<0.023	---	---
	2/15/2024	2.2	<1.8	12	45	8,800	<0.048	1,450	13,000
	8/8/2024	2.1	<1.8	14	33.5	11,000	<0.12	---	---
	2/25/2025	2.9	<1.8	18	28.1	4,800	<0.048	811	10,500
	8/28/2025	3.1	<1.8	13	28.4	3,500	J 0.011	---	---
	MW-11 12 Event Median	***3.1***	***<1.8***	***15***	***45***	***4,000***	***<0.07***	***176***	***3,800***

Appendix A-2. Current and Recent Water Quality Results of Semi-Annual Groundwater Monitoring

Well	Sample Date	Conventional Parameters		Inorganic Parameters					
		pH	Total Coliform, MPN/100 mL	Chloride, mg/L	Sodium, mg/L	TDS, mg/L	Nitrate as N, mg/L	Iron, mg/L[(a)]	Manganese, µg/L[(a)]
	GW Limit [(b)]	*6.5 - 8.5*	*<1.8* [(c)]	*106*	*69*	*450*	*10*	*0.30*	*50*
MW-5 (Compliance Monitoring Well)									
	9/18/2003	6.21	16,000	510	187	1,300	1.1	74.9	1,080
	12/18/2003	6.46	6.1	410	116	1,100	1.4	10.9	322
	1/28/2004	6.40	30	360	102	920	2.0	9.86	293
	4/27/2004	6.23	11	380	96.2	820	1.7	27.2	471
	8/25/2004	6.21	23	350	92.8	1,000	1.8	4.10	232
	10/26/2004	5.81	4	340	91.3	970	1.8	2.61	165
	1/25/2005	6.09	<2.0	300	91.2	810	<3.0	B 14.4	255
	4/26/2005	6.67	<2.0	360	93.5	890	2.0	6.01	162
	7/27/2005	6.11	3,000	49	28.7	200	<0.15	B 2.51	80.9
	10/25/2005	5.82	8.0	350	89.5	850	2.2	61.40	645
	1/24/2006	5.9	4.0	310	89.1	800	3.2	51.60	412
	4/25/2006	5.7	<2.0	300	84.4	930	2.3	14.00	210
	7/25/2006	5.6	<2.0	330	88.4	1,100	2.3	N 53.3	541
	10/24/2006	5.6	<2.0	330	84.8	760	2.0	6.84	168
	1/23/2007	5.6	<2.0	300	83.2	820	2.3	N 14.3	200
	4/10/2007	5.8	<2.0	300	B 82.2	930	2.6	13.90	171
	8/7/2007	5.4	<2.0	330	85.2	890	2.9	11.50	236
	10/16/2007	5.9	<2.0	330	86.7	790	1.7	4.15	1,940
	3/28/2008	5.6	12.0	310	73.9	810	1.7	21.10	1,030
	6/24/2008	5.6	2,400	300	---	940	1.2	7.40	699
	8/26/2008	5.7	4.0	330	85.7	960	1.3	8.94	855
	11/18/2008	5.7	>16,000	330	85.1	970	1.5	3.66	825
	3/11/2009	6.0	4.0	270	78.0	770	1.4	6.22	314
	6/23/2009	5.7	4.0	310	78.2	920	1.3	4.77	516
	9/22/2009	5.6	13.0	330	86.9	1,000	2.1	1.55	521
	12/1/2009	5.5	4.0	480	95.0	890	1.5	3.04	582
	2/23/2010	5.5	2,800	310	80.7	900	1.4	3.51	423
	6/8/2010	5.4	2.0	330	74.3	770	3.2	2.82	267
	8/31/2010	5.5	14.0	330	86.0	970	3.6	13.1	415
	11/30/2010	5.7	13.0	530	108.0	1,400	<1.2	5.25	1,340
	3/9/2011	5.5	170.0	410	95.0	1,100	<1.2	3.00	471
	6/14/2011	5.6	<1.8	370	84.8	990	<1.2	1.68	493

Appendix A-2. Current and Recent Water Quality Results of Semi-Annual Groundwater Monitoring

Well	Sample Date	Conventional Parameters		Inorganic Parameters					
		pH	Total Coliform, MPN/100 mL	Chloride, mg/L	Sodium, mg/L	TDS, mg/L	Nitrate as N, mg/L	Iron, mg/L[a]	Manganese, µg/L[a]
	GW Limit [b]	*6.5 - 8.5*	*<1.8* [c]	*106*	*69*	*450*	*10*	*0.30*	*50*
MW-5 cont.	9/13/2011	5.6	<1.8	400	91.8	1,100	1.3	2.46	663
	12/7/2011	5.4	10.0	430	84.8	1,000	<0.76	1.41	836
	2/14/2012	5.6	170.0	370	78.9	820	0.88	0.931	390
	8/14/2012	5.6	37.0	300	80.6	1,100	1.50	---	---
	2/14/2013	5.2	14.0	280	82.4	750	0.89	1.25	88
	8/13/2013	6.1	<1.8	260	69.5	900	1.80	---	---
	2/4/2014	6.2	2.0	280	74.4	790	1.50	2.93	80
	8/12/2014	5.5	<1.8	260	76.4	850	2.00	---	---
	3/10/2015	6.3	94.0	340	81.9	940	1.20	0.94	180
	8/20/2015	5.3	1,100	250	73.0	610	2.20	---	---
	3/9/2016	6.3	130	270	84.0	660	0.98	B 1.65	102
	9/13/2016	6.0	<2	270	74.8	770	1.90	---	---
	1/31/2017	6.2	<1.8	300	78.2	990	1.30	4.19	180
	9/12/2017	5.7	17.0	290	75.6	820	1.40	---	---
	1/31/2018	5.6	<1.8	260	70.2	730	0.91	1.05	77
	7/26/2018	6.1	<1.8	240	60.8	670	1.90	---	---
	1/31/2019[g]	6.5	<1.8	240	72.0	580	1.90	2.70	89
	7/30/2019	5.3	<1.8	230	73.0	670	2.20	---	---
	2/6/2020	5.8	4.5	250	74.0	650	1.90	0.47	85
	8/6/2020	5.3	<1.8	230	74.0	700	2.00	---	---
	2/18/2021	5.3	<1.8	240	70.5	560	1.50	1.73	123
	8/24/2021	5.4	<1.8	240	69.2	650	1.70	---	---
	2/17/2022	5.4	<1.8	230	67.6	560	1.30	3.97	411
	8/18/2022	5.3	<1.8	230	360	690	1.60	---	---
	1/26/2023	5.9	<1.8	230	J 69	600	J 0.86	J 0.86	J 610
	8/22/2023	5.4	<1.8	310	84	960	<0.12	---	---
	2/8/2024	5.7	7.8	230	74	650	<0.24	3.91	1,300
	8/13/2024	5.5	<1.8	200	62.6	580	0.37	---	---
	2/20/2025	5.7	920	240	68.7	690	<0.24	1.54	446
	8/26/2025	5.4	<1.8	200	63.8	650	J 0.87	---	---
	MW-5 12 Event Median	***5.4***	***<1.8***	***230***	***70***	***650***	***1.09***	***1.69***	***152***

Appendix A-2. Current and Recent Water Quality Results of Semi-Annual Groundwater Monitoring

Well	Sample Date	Conventional Parameters		Inorganic Parameters					
		pH	Total Coliform, MPN/100 mL	Chloride, mg/L	Sodium, mg/L	TDS, mg/L	Nitrate as N, mg/L	Iron, mg/L[a]	Manganese, µg/L[a]
	GW Limit [b]	*6.5 - 8.5*	*<1.8* [c]	*106*	*69*	*450*	*10*	*0.30*	*50*
MW-6 (Compliance Monitoring Well)									
	9/18/2003	6.36	500	43	38.2	320	<0.0059	14.0	795
	12/18/2003	6.75	12	42	47.6	260	0.024	130	3,080
	1/28/2004	6.50	7	63	68.3	480	0.10	62.3	1,970
	4/27/2004	5.94	4	230	181	870	<0.0059	59.5	2,860
	8/25/2004	5.24	<2.0	42	51.9	290	<0.30	78.2	2,990
	10/26/2004	6.67	8	41	44.6	310	<0.059	36.2	2,190
	1/25/2005	6.66	2.0	230	146	880	<0.30	B 44.9	2,200
	4/26/2005	5.89	<2.0	220	---	940	0.0060	49.5	2,590
	7/27/2005	6.62	<2.0	67	61.9	480	<0.15	B 37.5	1,600
	10/25/2005	6.21	2.0	36	37.3	280	<0.30	38.4	1,680
	1/24/2006	6.80	7.0	280	221	1,200	0.36	38.8	1,820
	4/25/2006	6.80	<2.0	180	170	1,000	<0.85	43.7	1,910
	7/25/2006	6.7	<2.0	42	40.8	300	<0.85	50.9	1,720
	10/24/2006	6.8	<2.0	150	128	780	<0.42	61.7	1,930
	1/23/2007	6.5	<2.0	120	124	690	<0.85	60.4	1,650
	4/10/2007	6.3	<2.0	190	B 160	810	<0.85	56.1	2,120
	8/7/2007	6.7	<2.0	41	42.1	330	0.76	57.7	1,570
	10/16/2007	6.8	<2.0	43	38.4	250	<0.39	35.3	1,370
	3/25/2008	6.3	<2.0	310	B 178	990	<0.42	36.9	2,150
	6/24/2008	6.7	<2.0	46	---	260	<0.24	50.5	1,260
	8/26/2008	6.6	<2.0	42	37.3	330	<0.24	66.9	1,390
	11/18/2008	6.6	<2.0	47	39.8	290	<0.24	39.3	1,120
	3/11/2009	6.5	5.0	260	150	890	<0.31	19.9	1,540
	6/23/2009	6.6	7.0	64	37.2	290	0.48	37.6	1,180
	9/22/2009	6.6	26.0	42	38.8	270	<0.19	39.0	1,050
	12/1/2009	6.5	8.0	45	37.4	290	<0.10	27.9	928
	2/23/2010	6.3	<2.0	180	110	740	<0.31	23.5	2,080
	6/8/2010	6.6	8.0	230	174	1,000	0.04	44.8	2,600
	8/31/2010	6.6	<2.0	54	42.4	280	0.96	55.1	1,100
	11/30/2010	6.22	2.0	46	40.3	250	<0.62	31.2	818
	3/9/2011	6.3	110	250	202	1,300	<0.29	56.7	2,220
	6/14/2011	6.1	2.0	200	149	890	<0.58	55.0	2,100

Appendix A-2. Current and Recent Water Quality Results of Semi-Annual Groundwater Monitoring

Well	Sample Date	Conventional Parameters		Inorganic Parameters					
		pH	Total Coliform, MPN/100 mL	Chloride, mg/L	Sodium, mg/L	TDS, mg/L	Nitrate as N, mg/L	Iron, mg/L[a]	Manganese, µg/L[a]
	GW Limit [b]	*6.5 - 8.5*	*<1.8* [c]	*106*	*69*	*450*	*10*	*0.30*	*50*
MW-6 cont.	9/13/2011	6.1	<1.8	84	62.7	340	<0.38	50.8	966
	12/7/2011	6.5	<1.8	1.1	158	860	<0.00	35.6	1,730
	2/14/2012	6.8	91	150	129	680	<0.40	51.0	1,480
	8/14/2012	6.7	170	58	61.7	350	<0.40	---	---
	2/14/2013	6.7	<1.8	130	133	590	<0.06	27.1	1,060
	8/13/2013	6.4	<1.8	37	40.6	280	J 0.054	---	---
	2/4/2014	6.1	<1.8	72	60.0	340	<0.0045	34.4	559
	8/12/2014	5.9	<1.8	46	38.4	230	<0.0045	---	---
	3/10/2015	6.5	<1.8	320	213	1,200	<0.0090	18.6	2,300
	8/20/2015	6.5	240	45	41.4	260	<0.018	---	---
	3/9/2016	5.2	17.0	350	253	1,200	0.57	B 7.57	1,800
	9/13/2016	6.2	21.0	98	77.9	390	J 0.05	---	---
	1/31/2017	6.0	<1.8	200	174	1,000	1.10	11.8	976
	9/12/2017	6.5	<1.8	80	67.0	390	0.36	---	---
	1/31/2018	6.6	<1.8	150	122	750	J 0.34	35.4	1,360
	7/26/2018	6.4	<1.8	74	62.2	410	0.42	---	---
	1/31/2019[g]	6.0	<1.8	140	140	580	J 0.075	9.2	850
	7/30/2019	6.6	<1.8	120	82.0	420	<0.18	---	---
	2/6/2020	6.5	2.0	120	160	630	0.47	15.0	570
	8/6/2020	6.7	<1.8	50	62.0	280	<0.088	---	---
	2/18/2021	6.5	1.8	180	159	910	<0.12	20.4	1,300
	8/24/2021	6.7	<1.8	43	36.1	240	<0.18	---	---
	2/17/2022	6.4	<1.8	260	197	980	<0.058	9.08	1,970
	8/18/2022	6.7	<1.8	47	150	240	<0.12	---	---
	1/26/2023	6.5	2.0	210	210	980	0.760	4.70	J 820
	8/22/2023	6.5	<1.8	90	59	400	<0.120	---	---
	2/8/2024	7.0	<1.8	54	51	280	<0.240	29.8	1,080
	8/13/2024	6.5	<1.8	54	49.4	290	<0.24	---	---
	2/20/2025	6.5	6.8	220	170	900	<0.12	18.7	1,090
	8/26/2025	6.4	<1.8	52	52	290	<0.0048	---	---
	MW-6 12 Event Median	***6.5***	***<1.8***	***72***	***106***	***345***	***<0.12***	***16.8***	***1,085***

Appendix A-2. Current and Recent Water Quality Results of Semi-Annual Groundwater Monitoring

Well	Sample Date	Conventional Parameters		Inorganic Parameters					
		pH	Total Coliform, MPN/100 mL	Chloride, mg/L	Sodium, mg/L	TDS, mg/L	Nitrate as N, mg/L	Iron, mg/L[a]	Manganese, µg/L[a]
	GW Limit [b]	*6.5 - 8.5*	*<1.8* [c]	*106*	*69*	*450*	*10*	*0.30*	*50*
MW-7 (Compliance Monitoring Well)									
	9/18/2003	6.10	9	110	90.6	480	0.75	4.67	278
	12/18/2003	7.51	13	110	43.9	400	0.15	3.68	379
	1/28/2004	5.80	1,600	29	16.3	180	<0.59	1.06	708
	4/27/2004	5.95	17	39	13.3	200	0.95	0.527	923
	8/25/2004	6.28	7.0	27	12.3	170	0.44	1.15	957
	10/26/2004	5.70	110	30	10.9	180	0.74	1.15	835
	1/25/2005	5.56	4.0	29	13.8	190	0.79	B 1.30	442
	4/26/2005	5.58	2.0	32	13.4	170	2.2	0.72	829
	7/27/2005	5.53	<2.0	35	14.3	210	6.9	B 0.0472	467
	10/25/2005	5.78	280	32	18.3	150	2.1	1.49	241
	1/24/2006	5.80	<2.0	30	11.6	240	2.0	7.34	293
	4/25/2006	5.50	<2.0	32	78.9	1,000	110	1.00	8,500
	7/25/2006	5.0	5,000	42	50.3	700	72	3.60	2,360
	10/24/2006	4.8	4.0	37	41.9	460	48	1.05	1,130
	1/23/2007	5.1	<2.0	35	30.7	370	31	1.31	418
	4/10/2007	4.8	<2.0	33	B 29.1	370	32	1.83	734
	8/7/2007	5.0	50.0	33	24.2	310	30	0.550	1,050
	10/16/2007	5.1	<2.0	33	19.9	240	15	0.449	682
	3/25/2008	4.8	<2.0	29	B 20.4	220	12	0.269	543
	6/24/2008	4.9	23.0	27	---	260	9.5	1.69	762
	8/26/2008	5.0	<2.0	29	15.8	230	8.7	4.98	583
	11/18/2008	5.0	13.0	31	15.7	200	6.6	0.223	448
	3/11/2009	5.3	<2.0	27	14.8	200	4.0	0.335	342
	6/23/2009	5.1	8.0	30	13.7	210	3.4	0.268	625
	9/22/2009	5.1	2.0	28	12.7	200	3.2	0.600	616
	12/1/2009	5.1	<2.0	31	13.1	170	3.2	0.242	361
	2/23/2010	5.2	<2.0	32	12.7	180	2.7	1.05	365
	6/8/2010	4.9	<2.0	33	12.2	170	3.6	0.542	726
	8/31/2010	5.1	4.0	30	11.9	190	2.5	1.25	749
	11/30/2010	5.27	430	33	13.2	200	3.1	0.126	436
	3/9/2011	5.4	<2.0	31	19.4	220	9.8	0.733	457
	6/14/2011	5.5	<1.8	23	27.6	260	12	0.689	279

Appendix A-2. Current and Recent Water Quality Results of Semi-Annual Groundwater Monitoring

Well	Sample Date	Conventional Parameters		Inorganic Parameters					
		pH	Total Coliform, MPN/100 mL	Chloride, mg/L	Sodium, mg/L	TDS, mg/L	Nitrate as N, mg/L	Iron, mg/L[a]	Manganese, µg/L[a]
	GW Limit [b]	*6.5 - 8.5*	*<1.8* [c]	*106*	*69*	*450*	*10*	*0.30*	*50*
MW-7 cont.	9/13/2011	5.3	1.8	26	21.0	230	12	0.302	464
	12/7/2011	4.9	4.5	1.0	17.6	220	0.39	0.203	584
	2/14/2012	5.2	2.0	27	17.3	220	9.8	0.415	740
	8/14/2012	5.2	<1.8	27	17.0	260	6.8	---	---
	2/14/2013	5.1	<1.8	24	20.2	200	4.5	0.266	474
	8/13/2013	5.4	2.0	27	15.9	270	6.5	---	---
	2/4/2014	5.8	<1.8	26	15.0	200	6.40	0.334	448
	8/12/2014	5.2	<1.8	26	16.1	200	5.90	---	---
	3/10/2015	5.6	<1.8	23	29.7	260	2.30	0.124	136
	8/20/2015	3.4[e]	170	25	22.4	240	2.90	---	---
	3/9/2016	5.1	17.0	16	28.5	200	1.60	B 0.652	346
	9/13/2016	5.3	6.8	16	24.3	200	1.10	---	---
	1/31/2017	5.6	<1.8	15	25.1	210	0.22	0.270	545
	9/12/2017	5.2	120	30	20.2	200	0.48	---	---
	1/31/2018	5.3	<1.8	28	21.4	220	0.85	0.319	1,500
	7/26/2018	5.7	<1.8	16	17.9	170	1.50	---	---
	1/31/2019	5.8	<1.8	14	17.0	150	J 0.21	0.630	800
	7/30/2019	5.0	<1.8	15	16.0	160	0.90	---	---
	2/6/2020	5.2	<1.8	16	17.0	170	0.87	1.40	770
	8/6/2020	5.0	<1.8	17	18.0	180	0.77	---	---
	2/18/2021	4.9	<1.8	19	16.7	160	0.56	0.26	559
	8/24/2021	4.9	<1.8	20	18.0	170	0.55	---	---
	2/17/2022	4.9	<1.8	21	16.5	150	0.52	0.31	510
	8/18/2022	4.9	<1.8	22	82.0	170	0.62	---	---
	1/26/2023	5.4	<1.8	17	<50.0	170	0.74	<0.50	J 520
	8/22/2023	4.8	<1.8	35	18.0	190	0.44	---	---
	2/8/2024	5.0	17.0	34	20.2	180	0.53	0.072	632
	8/13/2024	5.0	<1.8	32	17.8	180	0.35	---	---
	2/20/2025	5.2	540	30	17.2	180	0.48	0.074	721
	8/26/2025	4.9	<1.8	27	17.1	180	J 0.29	---	---
	MW-7 12 Event Median	***5.0***	***<1.8***	***21.5***	***17.9***	***175***	***0.54***	***0.32***	***552***

Appendix A-2. Current and Recent Water Quality Results of Semi-Annual Groundwater Monitoring

Well	Sample Date	Conventional Parameters		Inorganic Parameters					
		pH	Total Coliform, MPN/100 mL	Chloride, mg/L	Sodium, mg/L	TDS, mg/L	Nitrate as N, mg/L	Iron, mg/L[(a)]	Manganese, µg/L[(a)]
	GW Limit [(b)]	*6.5 - 8.5*	*<1.8* [(c)]	*106*	*69*	*450*	*10*	*0.30*	*50*
MW-8 (Compliance Monitoring Well)									
	9/18/2003	5.89	500	530	126	1,300	2.5	35.2	3,750
	12/18/2003	6.32	4	400	90.0	930	2.2	3.54	1,740
	1/28/2004	6.00	1,600	360	77.9	930	2.1	9.18	1,680
	4/27/2004	5.87	4	420	79.5	800	1.6	8.08	5,720
	8/25/2004	6.12	80	420	75.6	1,100	2.3	3.59	3,810
	10/26/2004	5.10	23	440	76.2	960	0.61	2.03	5,190
	1/25/2005	5.58	<2.0	360	71.8	840	<3.0	B 1.49	2,420
	4/26/2005	5.07	<2.0	480	78.0	960	1.2	19.4	7,750
	7/27/2005	6.56	30	290	60.5	690	1.1	B 19.8	2,420
	10/25/2005	4.88	140	390	68.8	870	1.6	7.14	5,230
	1/24/2006	4.9	2.0	420	72.4	870	2.5	5.37	5,650
	4/25/2006	4.6	25	420	72.4	1,100	1.6	4.75	6,300
	7/25/2006	4.4	7,000	430	73.1	1,200	1.7	37.4	5,630
	10/24/2006	4.5	50.0	400	67.8	830	1.9	5.01	4,050
	1/23/2007	5.1	8.0	240	44.6	480	1.5	10.9	2,180
	4/10/2007	4.4	4.0	190	B 43.1	550	1.7	1.43	1,980
	8/7/2007	4.5	2.0	210	40.0	500	3.2	3.08	1,330
	10/16/2007	4.6	<2.0	140	35.2	370	2.5	2.45	1,090
	3/25/2008	4.6	<2.0	220	B 43.7	450	1.7	2.68	1,400
	6/24/2008	4.5	13.0	210	---	580	1.6	3.71	1,580
	8/26/2008	4.5	4.0	180	37.3	440	1.8	4.87	1,430
	11/18/2008	4.5	4.0	150	33.9	430	2.2	6.16	1,140
	3/11/2009	6.0	5,000	4	4.1	90	0.16	4.11	495
	6/23/2009	5.6	<2.0	17	8.7	130	0.33	2.90	421
	9/22/2009	5.2	<2.0	27	11.3	140	0.16	2.21	353
	12/1/2009	5.4	<2.0	45	14.5	170	0.14	2.18	518
	2/23/2010	5.5	1,300	36	13.5	130	0.11	5.87	532
	6/8/2010	4.9	<2.0	93	18.8	240	0.34	2.30	491
	8/31/2010	4.8	800	130	26.5	390	0.99	5.08	851
	11/30/2010	5.89	5,000	24	16.5	200	<0.31	0.94	774
	3/9/2011	4.9	63.0	87	23.0	260	<0.14	2.00	1,730
	6/14/2011	4.9	<1.8	86	26.7	270	0.63	1.13	734

Appendix A-2. Current and Recent Water Quality Results of Semi-Annual Groundwater Monitoring

Well	Sample Date	Conventional Parameters		Inorganic Parameters					
		pH	Total Coliform, MPN/100 mL	Chloride, mg/L	Sodium, mg/L	TDS, mg/L	Nitrate as N, mg/L	Iron, mg/L[a]	Manganese, µg/L[a]
	GW Limit [b]	*6.5 - 8.5*	*<1.8* [c]	*106*	*69*	*450*	*10*	*0.30*	*50*
MW-8 cont.	9/13/2011	5.1	<1.8	92	29.1	310	0.26	1.17	625
	12/7/2011	4.9	23.0	87	27.5	250	<0.19	1.06	1,500
	2/14/2012	5.7	>16,000	29	11.4	120	<0.20	0.60	283
	8/14/2012	5.0	6.1	90	25.3	330	<0.04	---	---
	2/14/2013	5.3	4.5	51	19.0	180	0.15	2.2	473
	8/13/2013	5.4	6.8	79	22.4	290	J 0.16	---	---
	2/4/2014	5.9	<1.8	100	25.8	270	J 0.097	1.99	1,220
	8/12/2014	5.3	<1.8	56	19.0	200	J 0.11	---	---
	3/10/2015	6.0	2.0	31	15.6	210	1.90	5.37	331
	8/20/2015	4.5	16,000	53	20.0	240	1.60	---	---
	3/9/2016	5.8	79	27	15.6	370	1.10	B 18.0	780
	9/13/2016	5.4	230	83	29.7	260	2.80	---	---
	1/31/2017	6.1	10.0	75	24.6	270	2.20	8.63	732
	9/12/2017	5.4	11.0	69	25.0	270	3.30	---	---
	1/31/2018	5.0	4.0	57	29.1	260	2.60	2.80	275
	7/26/2018	5.5	2.0	55	26.3	230	3.30	---	---
	1/31/2019	5.9	2.0	54	23.0	190	2.50	8.00	520
	7/30/2019	4.8	4.5	47	24.0	210	3.10	---	---
	2/6/2020	4.9	2.0	55	22.0	220	3.00	0.97	260
	8/6/2020	4.9	7.8	46	22.0	220	3.10	---	---
	2/18/2021	4.6	25.0	46	24.7	230	2.70	6.95	264
	8/24/2021	4.6	<1.8	53	20.2	210	3.20	---	---
	2/17/2022	4.7	3,500	65	21.9	250	2.60	2.44	406
	8/18/2022	4.7	<1.8	55	94.0	230	3.20	---	---
	1/26/2023	4.9		49	<50		3.00	J 0.60	<500
	1/31/2023		<1.8			220			
	8/22/2023	5.2	13	50	20.0	220	0.96	---	---
	2/8/2024	5.8	120	33	40.8	220	0.62	1.20	286
	8/13/2024	5.6	<1.8	48	21.6	200	J0.098	---	---
	2/20/2025	6.2	9,200	21	42.9	210	<0.048	6.04	519
	8/26/2025	5.0	<1.8	54	25.4	190	1.2	---	---
	MW-8 12 Event Median	***4.9***	***4.9***	***49.5***	***23.4***	***220***	***2.65***	***4.09***	***453***

Appendix A-2. Current and Recent Water Quality Results of Semi-Annual Groundwater Monitoring

Well	Sample Date	Conventional Parameters		Inorganic Parameters					
		pH	Total Coliform, MPN/100 mL	Chloride, mg/L	Sodium, mg/L	TDS, mg/L	Nitrate as N, mg/L	Iron, mg/L[a]	Manganese, µg/L[a]
	GW Limit [b]	*6.5 - 8.5*	*<1.8* [c]	*106*	*69*	*450*	*10*	*0.30*	*50*
MW-9 (Compliance Monitoring Well)									
	9/18/2003	5.19	5,000	90	53.7	420	0.24	57.5	344
	12/18/2003	5.16	<2.0	48	16.7	240	0.08	7.29	265
	1/28/2004	5.20	14	52	16.9	210	0.20	28.9	383
	4/27/2004	5.69	28	51	17.2	240	0.06	15.0	231
	8/25/2004	6.13	2,300	49	17.4	220	<0.30	3.10	424
	10/26/2004	4.70	9,000	44	19.0	190	0.071	2.83	172
	1/25/2005	4.90	50	51	19.5	190	<0.30	B 6.32	188
	4/26/2005	4.58	16	53	20.3	210	0.006	1.25	158
	7/27/2005	5.38	<2.0	350	92.6	930	1.9	B 0.995	122
	10/25/2005	5.00	500	48	29.0	190	<0.15	N 1.91	112
	1/24/2006	4.5	30	52	23.8	200	<0.30	2.27	140
	4/25/2006	4.6	17	52	35.0	230	<0.42	1.05	116
	7/25/2006	4.7	9,000	51	37.2	240	<0.42	9.52	123
	10/24/2006	4.6	>=16000	52	32.8	210	<0.42	1.43	88
	1/23/2007	4.5	13.0	53	26.6	200	<0.85	3.08	132
	4/10/2007	4.7	2.0	53	B 24.6	190	<0.42	1.05	142
	8/7/2007	4.3	2,400	58	22.6	210	0.24	1.99	159
	10/16/2007	4.4	220	59	21.7	190	<0.20	1.48	172
	3/25/2008	4.4	<2.0	56	B 25.0	200	<0.42	2.57	186
	6/24/2008	4.5	<2.0	55	---	210	<0.12	2.45	150
	8/26/2008	4.3	<2.0	58	19.9	220	<0.12	10.9	160
	11/18/2008	4.2	150	56	22.3	210	0.23	7.72	158
	3/11/2009	4.6	23.0	38	21.8	190	<0.16	1.74	114
	6/17/2009	4.6	800	26	17.2	190	<0.10	1.38	94
	9/29/2009	4.6	800	33	16.3	170	0.12	2.00	88
	12/22/2009	5.0	13.0	30	17.9	180	<0.10	1.42	94
	3/9/2010	5.0	<2.0	56	35.4	230	<0.16	2.59	118
	6/22/2010	4.6	26.0	36	20.7	170	<0.16	3.95	84
	9/14/2010	4.6	3,000	31	18.9	170	<0.08	3.88	84
	12/7/2010	6.5	70	25	14.8	180	<0.08	26.1	143
	3/22/2011	4.9	13	32	15.7	150	0.20	19.1	170
	6/28/2011	5.1	<1.8	43	17.8	190	<0.07	24.8	178

Appendix A-2. Current and Recent Water Quality Results of Semi-Annual Groundwater Monitoring

Well	Sample Date	Conventional Parameters		Inorganic Parameters					
		pH	Total Coliform, MPN/100 mL	Chloride, mg/L	Sodium, mg/L	TDS, mg/L	Nitrate as N, mg/L	Iron, mg/L[a]	Manganese, µg/L[a]
	GW Limit [b]	*6.5 - 8.5*	*<1.8* [c]	*106*	*69*	*450*	*10*	*0.30*	*50*
MW-9 cont.	9/27/2011	5.6	130	58	41.2	690	<0.19	5.6	104
	12/20/2011	4.5	79	55	23.7	200	0.45	8.1	154
	2/28/2012	4.2	2.0	56	23.2	190	0.22	10.1	149
	8/28/2012	4.7	<1.8	56	23.8	210	J 0.19	---	---
	2/21/2013	4.7	<1.8	38	20.6	160	0.31	8.9	127
	8/27/2013	5.2	33	34	17.6	180	0.55	---	---
	2/19/2014	5.8	<1.8	19.0	15.0	170	J 0.30	3.70	73
	8/26/2014	5.4	<1.8	14.0	13.2	170	<0.045	---	---
	3/24/2015	5.1	<1.8	14.0	11.2	160	0.360	B 6.36	49
	8/20/2015	4.6	4.5	8.9	10.3	140	<0.005	---	---
	3/22/2016	5.6	70.0	31.0	32.9	200	J 0.038	B 13.7	120
	9/27/2016	5.2	<1.8	9.0	9.0	150	J 0.015	---	---
	2/7/2017	6.4	13.0	24.0	24.2	190	0.089	N 2.33	57
	9/26/2017	5.3	<1.8	77.0	65.5	260	<0.007	---	---
	2/28/2018	5.0	<1.8	25.0	17.1	150	J 0.15	2.07	71
	9/13/2018	5.1	<1.8	52.0	37.8	210	<0.010	---	---
	1/23/2019	6.7	140[f]	26.0	18.0	150	<0.019	19.0	160
	8/13/2019	4.9	<1.8	45.0	44.0	210	<0.070	---	---
	2/11/2020	4.7	4.0	29.0	20.0	170	<0.070	3.70	110
	8/11/2020	5.3	<1.8	15.0	18.0	150	<0.035	---	---
	2/23/2021	4.8	<1.8	27.0	23.0	180	<0.048	1.16	90.8
	8/23/2021	8.0	<1.8	17.0	11.7	120	<0.071	---	---
	3/17/2022	5.7	2.0	6.6	<20	130	<0.023	4.2	420
	8/25/2022	5.7	<1.8	6.8	11.0	110	J 0.036	---	---
	1/31/2023	6.1	110	56.0	<50	88	J 0.056	4.8	J 510
	8/24/2023	5.3	4.0	10.0	12	150	<0.023	---	---
	2/15/2024	5.8	<1.8	12.0	16	150	<0.048	6.0	598
	8/8/2024	5.6	<1.8	68.0	54	250	<0.048	---	---
	2/25/2025	4.9	23.0	34.0	22	190	<0.048	1.6	212
	8/28/2025	5.2	2.0	24.0	19	140	<0.0048	---	---
	MW-9 12 Event Median	***5.4***	***<1.9***	***20.5***	***19.3***	***150***	***<0.048***	***4.0***	***115***

Appendix A-2. Current and Recent Water Quality Results of Semi-Annual Groundwater Monitoring

Well	Sample Date	Conventional Parameters		Inorganic Parameters					
		pH	Total Coliform, MPN/100 mL	Chloride, mg/L	Sodium, mg/L	TDS, mg/L	Nitrate as N, mg/L	Iron, mg/L[(a)]	Manganese, µg/L[(a)]
	GW Limit [(b)]	*6.5 - 8.5*	*<1.8 [(c)]*	*106*	*69*	*450*	*10*	*0.30*	*50*
MW-10 (Compliance Monitoring Well)									
	9/18/2003	5.82	21	130	81.3	630	0.64	19.5	621
	12/18/2003	6.17	30	60	30.4	230	0.01	8.09	1,410
	1/28/2004	6.10	17	17	23.4	160	0.36	5.00	1,990
	4/27/2004	6.10	70	16	19.6	160	0.044	15.6	2,890
	8/25/2004	8.62	110	14	16.3	140	<0.30	23.2	4,140
	10/26/2004	6.37	2,400	7.1	19.3	140	0.11	7.07	2,940
	1/25/2005	6.38	110	9.9	13.2	130	0.078	B 11.2	2,830
	5/3/2005	6.18	<2.0	15	15.5	160	<0.0059	21.1	3,880
	7/27/2005	6.26	3,000	56	28.5	210	<0.15	B 1.59	97
	10/25/2005	6.11	300	8	8.2	82	<0.15	23.9	1,410
	1/24/2006	6.3	17	13	15.4	130	0.27	45.2	5,360
	4/25/2006	6.5	<2.0	13	17.2	200	<0.42	34.3	6,540
	7/25/2006	6.36	23.0	12.0	15.7	170	<0.210	53.5	5,310
	10/24/2006	6.3	13.0	10.0	12.9	120	<0.085	16.3	3,370
	1/23/2007	6.4	<2.0	13.0	17.8	160	<0.850	26.1	7,700
	4/10/2007	6.6	7.0	11.0	B 23.9	190	0.460	10.4	6,920
	8/7/2007	6.3	30.0	7.5	12.2	120	0.700	9.18	3,210
	10/16/2007	6.6	11.0	5.2	8.5	73	<0.200	5.90	2,660
	3/25/2008	6.4	8.0	5.1	B 11.5	110	<0.083	8.58	4,420
	6/24/2008	6.3	230	4.1	---	79	0.042	25.6	1,470
	8/26/2008	6.5	2.0	4.0	6.4	67	<0.024	11.0	704
	11/18/2008	6.2	170	4.4	7.3	70	0.041	15.0	1,100
	3/11/2009	6.2	22.0	4.5	11.5	140	0.066	7.08	3,810
	6/17/2009	6.5	170	4.9	9.3	110	0.091	7.02	2,430
	9/29/2009	6.3	23.0	4.4	6.8	84	0.040	2.73	1,060
	12/22/2009	6.7	30.0	5.4	8.4	77	0.026	6.90	1,620
	3/9/2010	6.6	2.0	5.3	10.5	110	<0.031	6.88	3,730
	6/22/2010	6.3	5,000	6.0	52.1	110	0.270	6.72	1,000
	9/14/2010	6.3	130	5.2	9.7	73	0.048	3.90	1,690
	12/7/2010	5.9	280	3.7	8.1	160	<0.078	38.4	6,140
	3/22/2011	6.1	2.0	5.7	17.9	200	<0.029	38.7	7,250
	6/28/2011	5.9	<1.8	6.6	15.3	210	<0.029	43.9	8,340

Appendix A-2. Current and Recent Water Quality Results of Semi-Annual Groundwater Monitoring

Well	Sample Date	Conventional Parameters		Inorganic Parameters					
		pH	Total Coliform, MPN/100 mL	Chloride, mg/L	Sodium, mg/L	TDS, mg/L	Nitrate as N, mg/L	Iron, mg/L[a]	Manganese, µg/L[a]
	GW Limit [b]	*6.5 - 8.5*	*<1.8* [c]	*106*	*69*	*450*	*10*	*0.30*	*50*
MW-10 cont.	9/27/2011	6.1	9,200	5.6	14.5	180	<0.019	37.5	6,930
	12/20/2011	6.3	2,400	3.3	10.3	130	<0.019	37.3	3,800
	2/28/2012	6.3	130	3.3	13.7	150	<0.020	45.8	6,460
	8/28/2012	6.4	2,300	3.4	8.2	130	<0.020	---	---
	2/21/2013	6.2	230	3.8	12.8	130	<0.030	22.3	6,380
	8/27/2013	6.5	1,100	4.8	10.4	130	J 0.074	---	---
	2/19/2014	5.9	13	4.6	8.1	97	<0.009	140	2,770
	8/26/2014	6.2	17	5.2	8.4	130	<0.009	---	---
	3/24/2015	5.9	<1.8	6.8	15.8	230	0.064	B 18.8	8,810
	8/20/2015	6.1	3,500	5.3	11.6	150	<0.005	---	---
	3/22/2016	5.2	13	6.4	11.8	110	J 0.032	B 43.1	1,950
	9/27/2016	6.1	<2	6.6	10.3	160	J 0.0045	---	---
	2/7/2017	6.0	150	2.5	4.7	120	0.110	33.2	330
	9/26/2017	6.4	33	6.1	13.2	170	<0.007	---	---
	2/28/2018	6.2	1,300	5.7	16.1	200	J 0.078	37.5	5,700
	9/13/2018	6.0	<1.8	6.3	11.3	150	<0.010	---	---
	1/23/2019	8.0	17	5.3	10.0	120	J 0.068	37.0	3,200
	8/13/2019	6.4	<1.8	5.6	14.0	180	<0.035	---	---
	2/11/2020	6.7	2.0	3.6	11.0	150	<0.035	35.0	7,800
	8/11/2020	6.5	<1.8	3.7	10.0	170	0.078	---	---
	2/23/2021	6.1	11.0	3.8	10.2	130	<0.024	20.2	3,720
	8/23/2021	6.5	<1.8	3.7	9.2	150	<0.071	---	---
	3/17/2022	6.2	49.0	5.5	<20	140	J 0.041	23.0	2,700
	8/25/2022	6.4	<1.8	3.9	J 9	160	J 0.038	---	---
	1/31/2023	6.6	6.8	5.5	<50	150	J 0.06	26.0	2,200
	8/24/2023	6.5	<1.8	5.6	J 8.6	160	<0.023	---	---
	2/15/2024	6.7	540	10.0	12.5	170	<0.048	54.1	5,680
	8/8/2024	6.5	130	5.0	9.4	160	<0.048	---	---
	2/25/2025	6.8	<1.8	6.7	18.5	390	<0.048	108	17,200
	8/28/2025	6.4	70	3.4	16.6	240	<0.0048	---	---
	MW-10 12 Event Median	***6.5***	***4.4***	***4.5***	***10.6***	***160***	***<0.045***	***36.0***	***3,460***

Appendix A-2. Current and Recent Water Quality Results of Semi-Annual Groundwater Monitoring

Well	Sample Date	Conventional Parameters		Inorganic Parameters					
		pH	Total Coliform, MPN/100 mL	Chloride, mg/L	Sodium, mg/L	TDS, mg/L	Nitrate as N, mg/L	Iron, mg/L[(a)]	Manganese, µg/L[(a)]
	GW Limit [(b)]	*6.5 - 8.5*	*<1.8* [(c)]	*106*	*69*	*450*	*10*	*0.30*	*50*

Qualifiers:
< = Non-detect (ND) results, with the Method Detection Limit shown as the value.
--- = No result was reported for the analyte on the corresponding sample date.
J = Estimated value between the MDL and Reporting Level.
B = Analyte was detected in a blank sample.
N = Spike recovery outside control limits.
(a) Iron and manganese are required to be sampled annually, however prior to 2012 these parameters were monitored semi-annually. Therefore, the historical data for iron and manganese are included in the semi-annual results.
(b) Groundwater Limitations shown are from Regional Board *Order No. R5-2002-0070* (WDRs), Section E.1.
(c) Groundwater Limitation listed for Total Coliform Organisms in the WDRs is "Nondetect" (Section F.1.a). The typical Method Detection Limit for Total Coliforms is 1.8 MPN/100 mL, so 1.8 MPN/100 mL is used as the value of the limit.
(d) EBMUD staff were not able to sample MW-11 during the second semi-annual 2017 and first semi-annual 2018 sampling events because there was insufficient water.
(e) The reported pH for MW-7 on 8/20/15 is uncharacteristically low. This value is not considered to be representative because of calibration issue with the pH meter that was noted by the field crew the day before.
(f) Sample taken on 1/23/2019 was lost. Resample was conducted on 1/31/2019.
(g) Samples for MW-5 and MW-6 on 1/31/2019 were potentially switched and values were reversed. Values as shown in the table are reported correctly.

Appendix A-3. Current and Historical Water Quality Results of Annual Groundwater Monitoring

Well	Sample Date	Barium, mg/L	Calcium, mg/L	Magnesium, mg/L	Potassium, mg/L	Sulfate, mg/L	Hardness, mg/L (as $CaCO_3$)	Alkalinity Series (as $CaCO_3$), mg/L			
								Total	Bicarbonate	Carbonate	Hydroxide
MW-11 (Background Monitoring Well)											
	10/25/2005	0.376	75.2	29.9	21.0	270	280	120	121	<0.10	<0.10
	4/25/2006	0.149	60.8	20.7	15.1	220	---	---	---	---	---
	4/10/2007	0.433	57.7	22.6	16.2	230	380	95	95	0.10	<0.10
	6/24/2008	0.0968	---	---	---	99	120	140	140	<0.10	<0.10
	8/25/2008	0.275	29.9	13.4	12.4	96	---	98	98	<0.10	<0.10
	9/29/2009	0.225	26.6	12.1	10.6	110	100	120	120	<0.10	<0.10
	6/28/2011	0.041	66.4	28.5	12.0	560	260	<5	<5	<0.10	<0.10
	2/28/2012	0.036	25.4	11.5	9.63	170	72	47	47	<0.10	<0.10
	2/21/2013	0.052	27.3	11.7	11.3	200	140	15	15	<0.10	<0.10
	4/22/2014	0.036	28.3	11.9	12.1	160	120	46	46	<0.10	<0.10
	3/24/2015	0.068	42.2	19.7	11.3	270	180	17	17	<0.10	<0.10
	3/22/2016	0.036	60.6	26.3	12.6	410	300	<5	<5	<0.10	<0.10
	2/7/2017	0.069	18.7	8.1	9.37	120	95	36	36	<0.10	<0.10
	1/31/2018[(b)]	---	---	---	---	---	---	---	---	---	---
	1/23/2019	0.032	330	210	13.0	3,500	1,600	<5	<5	<0.10	<0.10
	2/11/2020	0.028	210	130	17.0	2,400	720	<5	<5	<0.10	<0.10
	2/23/2021	0.0266	326	97	26.7	2,300	1,100	<5	<5	<0.10	<0.10
	3/17/2022	J 0.015	87	J 29	21	630	330	<1.1	<1.1	<1.1	<1.1
	1/31/2023	J 0.022	J 78	25	17	770	320	<1.1	<1.1	<1.1	<1.1
	2/15/2024	J 0.114	156	75.7	8.48	5,600	1,400	<1.1	<1.1	<1.1	<1.1
	2/25/2025	J 0.004	109	60	7.12	4,000	700	<1.1	<1.1	<1.1	<1.1
MW-11 12 Event Median		***0.034***	***82.5***	***27.7***	***12.4***	***700***	***325***	***<5***	***<5***	***<0.10***	***<0.10***

Appendix A-3. Current and Historical Water Quality Results of Annual Groundwater Monitoring

Well	Sample Date	Barium, mg/L	Calcium, mg/L	Magnesium, mg/L	Potassium, mg/L	Sulfate, mg/L	Hardness, mg/L (as $CaCO_3$)	Alkalinity Series (as $CaCO_3$), mg/L			
								Total	Bicarbonate	Carbonate	Hydroxide
MW-5 (Compliance Monitoring Well)											
	4/26/2005	0.641	76.7	35.7	6.96	3.40	320	36	36	<0.10	<0.10
	4/25/2006	0.774	69.2	31.7	2.43	<3.10	290	18	18	<0.10	<0.10
	4/10/2007	0.793	64.0	29.9	2.30	<3.10	260	20	20	<0.10	<0.10
	6/24/2008	0.846	---	---	---	<2.10	270	32	32	<0.10	<0.10
	8/25/2008	0.975	67.8	32.6	3.40	<2.10	---	29	29	<0.10	<0.10
	6/23/2009	0.844	60.5	28.5	4.17	27.00	270	23	23	<0.10	<0.10
	6/14/2011	0.982	72.3	33.8	3.81	2.90	360	29	29	<0.10	<0.10
	2/14/2012	0.954	68.3	30.7	3.36	---	330	24	24	<0.10	<0.10
	2/14/2013	0.796	55.8	25.7	2.94	0.98	250	21	21	<0.10	<0.10
	4/22/2014	0.755	49.7	25.5	2.98	4.80	240	16	16	<0.10	<0.10
	3/10/2015	0.922	64.9	31.9	2.84	4.50	300	17	17	<0.10	<0.10
	3/9/2016	0.748	55.0	26.9	3.56	4.00	250	22	22	<0.10	<0.10
	1/31/2017	0.839	B 56.4	27.0	2.85	4.30	260	15	15	<0.10	<0.10
	1/31/2018	0.700	48.7	B 23.1	4.38	1.80	220	15	15	<0.10	<0.10
	1/31/2019[(c)]	0.630	45.0	21.0	2.20	4.00	210	11	11	<0.10	<0.10
	2/6/2020	0.680	50.0	23.0	2.80	3.20	210	12	12	<0.10	<0.10
	2/18/2021	0.610	41.2	20.8	2.08	5.80	200	14	14	<0.10	<0.10
	2/17/2022	0.649	40.2	20.0	2.62	J 3.90	180	15	15	<1.1	<1.1
	1/26/2023	0.610	<50.0	21.0	J 4.10	J 4.50	190	17	17	<1.1	<1.1
	2/8/2024	0.904	42.5	21.0	4.09	<4.0	210	27	27	<1.1	<1.1
	2/20/2025	0.715	42	20.9	3.53	<6	200	26	26	<1.1	<1.1
MW-5 12 Event Median		***0.708***	***49.2***	***22.0***	***2.92***	***4.15***	***210***	***16***	***16***	***<0.10***	***<0.10***

Appendix A-3. Current and Historical Water Quality Results of Annual Groundwater Monitoring

Well	Sample Date	Barium, mg/L	Calcium, mg/L	Magnesium, mg/L	Potassium, mg/L	Sulfate, mg/L	Hardness, mg/L (as $CaCO_3$)	Alkalinity Series (as $CaCO_3$), mg/L			
								Total	Bicarbonate	Carbonate	Hydroxide
MW-6 (Compliance Monitoring Well)											
	4/26/2005	1.13	133	46.0	5.91	4.2	510	580	577	<0.10	<0.10
	4/25/2006	0.925	112	38.8	3.91	5.3	450	610	613	0.23	<0.10
	4/10/2007	0.984	102	36.6	4.05	6.0	390	490	488	0.18	<0.10
	6/24/2008	0.546	---	---	---	<2.1	120	[a]	210	<0.10	<0.10
	8/25/2008	0.662	24.7	11.6	9.58	<2.1	---	---	---	---	---
	6/23/2009	0.445	25.0	10.4	7.02	15.0	120	170	170	<0.10	<0.10
	6/14/2011	0.912	106	34.3	5.92	2.7	450	530	530	<0.10	<0.10
	2/14/2012	0.805	67.8	24.5	2.99	---	320	380	380	0.23	<0.10
	2/14/2013	0.666	63.4	23.0	3.68	3.9	270	330	330	0.16	<0.10
	4/22/2014	0.413	20.9	9.67	5.48	6.5	120	160	160	<0.10	<0.10
	3/10/2015	0.765	127	42.1	3.71	29.0	510	510	510	0.15	<0.10
	3/9/2016	0.773	165	49.4	3.99	53.0	550	530	530	<0.10	<0.10
	1/31/2017	0.623	B 120	34.6	2.99	48.0	460	530	530	<0.10	<0.10
	1/31/2018	0.950	77.6	B 25.2	1.98	6.1	350	400	400	<0.10	<0.10
	1/31/2019[c]	0.550	70.0	23.0	2.30	13.0	270	360	360	<0.10	<0.10
	2/6/2020	0.630	61.0	21.0	2.50	7.4	240	320	320	<0.10	<0.10
	2/18/2021	0.611	93.3	31.9	2.82	170.0	360	330	330	<0.10	<0.10
	2/17/2022	0.514	103	30.9	1.56	32.0	390	470	470	<5.0	<5.0
	1/26/2023	J 0.49	110	35.0	<4.00	52.0	420	520	520	<5.0	<5.0
	2/8/2024	0.368	18.2	6.9	7.6	<4.0	76	160	160	<5.0	<5.0
	2/20/2025	0.802	92.9	32.2	2.9	19.0	390	480	480	<5.0	<5.0
MW-6 12 Event Median		***0.617***	***93.1***	***31.4***	***2.95***	***24.0***	***375***	***435***	***435***	***<0.10***	***<0.10***

Appendix A-3. Current and Historical Water Quality Results of Annual Groundwater Monitoring

Well	Sample Date	Barium, mg/L	Calcium, mg/L	Magnesium, mg/L	Potassium, mg/L	Sulfate, mg/L	Hardness, mg/L (as $CaCO_3$)	Alkalinity Series (as $CaCO_3$), mg/L			
								Total	Bicarbonate	Carbonate	Hydroxide
MW-7 (Compliance Monitoring Well)											
	4/26/2005	0.0877	12.6	4.62	2.04	11	48	16.0	15.8	<0.10	<0.10
	4/25/2006	0.403	91.7	27.1	6.94	62	380	6.0	5.97	<0.10	<0.10
	4/10/2007	0.383	32.3	10.2	3.43	20	110	5.2	5.2	<0.10	<0.10
	6/24/2008	0.222	---	---	---	12	60	10.0	10.0	<0.10	<0.10
	8/25/2008	0.448	13.7	4.9	2.78	11	---	7.8	7.8	<0.10	<0.10
	6/23/2009	0.157	11.3	3.7	2.01	10	46	5.0	5.0	<0.10	<0.10
	6/14/2011	0.238	17.6	5.2	3.97	50	74	8.0	8.0	<0.10	<0.10
	2/14/2012	0.229	14.7	4.5	2.84	---	64	7.0	7.0	<0.10	<0.10
	2/14/2013	0.193	14.3	4.3	2.99	36	58	9.8	9.8	<0.10	<0.10
	4/22/2014	0.177	12.9	4.3	2.57	20	55	7.8	7.8	<0.10	<0.10
	3/10/2015	0.144	15.2	4.4	3.21	75	60	9.1	9.1	<0.10	<0.10
	3/9/2016	0.414	13.0	3.8	3.15	67	47	9.0	9.0	<0.10	<0.10
	1/31/2017	0.139	B 10.7	3.0	1.96	61	41	11.0	11.0	<0.10	<0.10
	1/31/2018	0.171	15.6	B 4.3	3.35	59	66	5.9	5.9	<0.10	<0.10
	1/31/2019	0.360	9.3	2.7	1.80	42	38	<5.0	<5.0	<0.10	<0.10
	2/6/2020	0.660	9.5	2.8	2.10	36	34	<5.0	<5.0	<0.10	<0.10
	2/18/2021	0.177	8.6	2.7	1.90	35	40	<5.0	<5.0	<0.10	<0.10
	2/17/2022	0.236	914	2.9	2.14	32	34	J 4.8	J 4.8	<1.1	<1.1
	1/26/2023	J 0.43	<50	<4.0	<4.00	48	38	J 2.2	J 2.2	<1.1	<1.1
	2/8/2024	0.134	11.7	3.6	2.4	32	48	J 2.8	J 2.8	<1.1	<1.1
	2/20/2025	0.156	10.0	3.17	1.9	32	44	J 4.4	J 4.4	<1.1	<1.1
MW-7 12 Event Median		***0.177***	***12.3***	***3.38***	***2.25***	***39***	***43***	***5.0***	***5.0***	***<0.10***	***<0.10***

Appendix A-3. Current and Historical Water Quality Results of Annual Groundwater Monitoring

Well	Sample Date	Barium, mg/L	Calcium, mg/L	Magnesium, mg/L	Potassium, mg/L	Sulfate, mg/L	Hardness, mg/L (as $CaCO_3$)	Alkalinity Series (as $CaCO_3$), mg/L			
								Total	Bicarbonate	Carbonate	Hydroxide
MW-8 (Compliance Monitoring Well)											
	4/26/2005	5.06	70.8	72.4	21.6	0.90	470	<5.0	3.6	<0.10	<0.10
	4/25/2006	4.87	63.9	65.8	19.1	<3.1	420	<5.0	1.2	<0.10	<0.10
	4/10/2007	2.39	33.4	33.3	12.8	6.9	240	5.8	5.8	<0.10	<0.10
	6/24/2008	2.26	---	---	---	2.4	200	10	10	<0.10	<0.10
	8/25/2008	2.17	24.8	27.1	12.6	2.8	---	<10	10	<0.10	<0.10
	6/23/2009	0.211	6.28	2.41	4.83	7.1	22	13	13	<0.10	<0.10
	6/14/2011	0.687	10.80	10.4	7.19	18.0	95	<5.0	<5.0	<0.10	<0.10
	2/14/2012	0.246	3.93	3.28	3.36	---	27	10	10	<0.10	<0.10
	2/14/2013	0.412	6.56	5.58	5.80	7.2	43	7.8	7.8	<0.10	<0.10
	4/22/2014	0.896	10.80	12.4	9.10	5.7	92	<5.0	<5.0	<0.10	<0.10
	3/10/2015	0.352	7.34	5.47	4.73	11.0	100	12	12	<0.10	<0.10
	3/9/2016	1.380	7.60	8.07	6.12	13.0	38	6.0	6.0	<0.10	<0.10
	1/31/2017	1.390	B 10.4	9.92	8.84	7.7	61	<5.0	<5.0	<0.10	<0.10
	1/31/2018	0.837	7.39	B 7.66	5.93	32.0	58	<5.0	<5.0	<0.10	<0.10
	1/31/2019	1.900	7.20	8.00	5.50	12.0	50	<5.0	<5.0	<0.10	<0.10
	2/6/2020	0.840	6.60	7.40	4.90	3.5	42	<5.0	<5.0	<0.10	<0.10
	2/18/2021	0.939	4.57	5.77	4.82	13.0	38	<5.0	<5.0	<0.10	<0.10
	2/17/2022	0.781	6.34	7.34	13.4	4.7	42				
	3/17/2022							J 1.5	J 1.5	<1.1	<1.1
	1/26/2023	0.530	<50	J 5.1	J 5.5	10.0	36				
	1/31/2023							J 1.7	J 1.7	<1.1	<1.1
	2/8/2024	0.322	2.7	3.1	5.1	10.0	22	43	43	<1.1	<1.1
	2/20/2025	0.396	3.98	5.35	6.82	2.6	42	110	110	<5.0	<5.0
MW-8 12 Event Median		***0.839***	***7.27***	***7.37***	***5.72***	***10.0***	***42***	***5.0***	***5.0***	***<0.10***	***<0.10***

Appendix A-3. Current and Historical Water Quality Results of Annual Groundwater Monitoring

Well	Sample Date	Barium, mg/L	Calcium, mg/L	Magnesium, mg/L	Potassium, mg/L	Sulfate, mg/L	Hardness, mg/L (as $CaCO_3$)	Alkalinity Series (as $CaCO_3$), mg/L			
								Total	Bicarbonate	Carbonate	Hydroxide
MW-9 (Compliance Monitoring Well)											
	4/26/2005	0.538	7.70	5.44	4.33	8.3	40	<5.0	3.11	<0.10	<0.10
	4/25/2006	0.407	5.22	3.62	2.79	21	27	<5.0	0.76	<0.10	<0.10
	4/10/2007	0.449	5.77	4.19	3.18	9.5	30	<5.0	3.0	<0.10	<0.10
	6/24/2008	0.603	---	---	---	7.3	42	7.5	7.5	<0.10	<0.10
	8/25/2008	0.714	6.96	5.89	4.61	6.8	---	<6.2	6.2	<0.10	<0.10
	6/17/2009	0.380	4.53	3.14	3.63	18	26	<5.0	<5.0	<0.10	<0.10
	6/28/2011	0.798	5.80	5.31	5.31	19	30	---	---	---	---
	2/28/2012	0.586	5.40	4.56	3.61	---	24	<5.0	<5.0	<0.10	<0.10
	2/21/2013	0.493	4.23	3.68	3.18	16	24	<5.0	<5.0	<0.10	<0.10
	4/22/2014	0.300	2.65	2.12	2.21	26	18	<5.0	<5.0	<0.10	<0.10
	3/24/2015	0.277	1.60	1.48	2.18	23	14	<5.0	<5.0	<0.10	<0.10
	3/22/2016	0.633	3.34	3.04	3.32	15	28	5.0	5.0	<0.10	<0.10
	2/7/2017	0.147	2.26	1.56	2.18	16	16	<5.0	<5.0	<0.10	<0.10
	2/28/2018	0.164	2.08	B 1.59	1.99	11	19	<5.0	<5.0	<0.10	<0.10
	1/23/2019	0.520	4.00	3.70	4.20	11	18	<5.0	<5.0	<0.10	<0.10
	2/11/2020	0.280	3.10	2.40	2.50	14	16	<5.0	<5.0	<0.10	<0.10
	2/23/2021	0.150	2.44	2.14	1.75	23	18	<5.0	<5.0	<0.10	<0.10
	3/17/2022	0.21	<20	<20	J 1.80	11	24	18	18	<1.1	<1.1
	3/31/2023	J 0.24	<50	J 4.7	J 6.50	12	38	19	19	<1.1	<1.1
	2/15/2024	0.294	3.18	2.49	2.04	23	26	18	18	<1.1	<1.1
	2/25/2025	0.228	3.08	2.38	1.92	19	18	J 3.4	J 3.4	<1.1	<1.1
MW-9 12 Event Median		***0.259***	***3.1***	***2.39***	***2.18***	***15.5***	***18***	***<5.0***	***<5.0***	***<0.10***	***<0.10***

Appendix A-3. Current and Historical Water Quality Results of Annual Groundwater Monitoring

Well	Sample Date	Barium, mg/L	Calcium, mg/L	Magnesium, mg/L	Potassium, mg/L	Sulfate, mg/L	Hardness, mg/L (as $CaCO_3$)	Alkalinity Series (as $CaCO_3$), mg/L			
								Total	Bicarbonate	Carbonate	Hydroxide
MW-10 (Compliance Monitoring Well)											
	5/3/2005	0.170	16.1	8.50	3.26	3.5	90	110	118	<0.10	<0.10
	4/25/2006	0.565	18.6	10.2	3.70	4.3	100	130	129	<0.10	<0.10
	4/10/2007	0.456	20.2	11.1	3.05	6.9	140	150	154	<0.10	<0.10
	6/24/2008	0.199	---	---	---	1.1	16	28	28	<0.10	<0.10
	8/25/2008	0.117	2.13	1.42	1.67	0.42	---	26	26	<0.10	<0.10
	6/17/2009	0.240	7.74	4.36	2.54	2.5	50	42	42	<0.10	<0.10
	6/28/2011	0.753	25.3	13.2	3.19	1.3	130	---	---	---	---
	2/28/2012	0.598	17.8	10.1	2.56	5.0	100	130	130	<0.10	<0.10
	2/21/2013	0.546	19.3	9.87	2.42	8.7	100	120	120	<0.10	<0.10
	4/22/2014	0.575	11.8	6.24	2.54	3.1	50	67	67	<0.10	<0.10
	3/24/2015	0.739	24.8	13.9	1.76	3.2	140	180	180	<0.10	<0.10
	3/22/2016	0.333	9.21	4.93	2.07	19.0	39	31	31	<0.10	<0.10
	2/7/2017	0.182	16.1	3.47	2.49	11.0	200	50	50	<0.10	<0.10
	2/28/2018	0.473	20.8	B 9.95	4.32	5.8	120	160	160	<0.10	<0.10
	1/23/2019	0.420	15.0	8.10	3.30	0.8	72	120	120	<0.10	<0.10
	2/11/2020	0.360	20.0	9.80	1.50	1.6	92	150	150	<0.10	<0.10
	2/23/2021	0.295	11.7	6.44	1.66	1.6	62	95	95	<0.10	<0.10
	3/17/2022	0.49	J 20	<20	J 3.9	25	100	87	87	<5.0	<5.0
	3/31/2023	J 0.33	<50	J 6.9	J 4.1	12	120	120	120	<5.0	<5.0
	2/15/2024	0.589	24.0	11.4	3.53	2.9	110	190	190	<5.0	<5.0
	2/25/2025	1.020	51.4	25.4	3.02	<1.1	280	410	410	<5.0	<5.0
MW-10 12 Event Median		***0.447***	***20.0***	***8.95***	***2.78***	***3.15***	***105***	***120***	***120***	***<0.10***	***<0.10***

Qualifiers:
< = Non-detect (ND) results, with the Method Detection Limit shown as the value.
--- = No result was reported for the analyte on the corresponding sample date.
J = Estimated value between the MDL and Reporting Level.
B = Analyte was detected in a blank sample.
(a) MW-6 had a reported Total Alkalinity on 6/24/2008 of 32 mg/L (as CaCO3). However, this result is a low outlier, and bicarbonate alkalinity, a component of total alkalinity, is substantially higher. The Total Alkalinity result has thus been censored from this data set.
(b) EBMUD staff were not able to sample MW-11 during the first semi-annual 2018 sampling event because there was not sufficient water.
(c) Samples for MW-5 and MW-6 on 1/31/2019 were potentially switched and values were reversed. Values as shown in the table are reported appropriately.

Appendix B – Field Logs

GROUND WATER MONITORING WELL SAMPLING FORM

easurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # P1
Project Number: B762-0004-1	Well yield:	Date: 8/22/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS
		Well Diameter: 2"
Initial Depth to Water: 7.1 feet	Total Well Depth: 13.82 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

	Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
3						
4						
5						
6						
7						
8						
9						

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P					

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

Measurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # P2
Project Number: B762-0004-1	Well yield:	Date: 8/22/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS
		Well Diameter: 2"
Initial Depth to Water: 10.50 feet	Total Well Depth: 18.99 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

	Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
3						
4						
5						
6						
7						
8						
9						

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P					

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

Measurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # P3
Project Number: B762-0004-1	Well yield:	Date: 8/22/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS Well Diameter: 2"
Initial Depth to Water: 13.80 feet	Total Well Depth: 24.80 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

	Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
3						
4						
5						
6						
7						
8						
9						

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P					

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

Measurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # P4
Project Number: B762-0004-1	Well yield:	Date: 8/22/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS Well Diameter: 2"
Initial Depth to Water: 12.65 feet	Total Well Depth: 24.22 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

	Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
3						
4						
5						
6						
7						
8						
9						

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P					

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

Measurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 5
Project Number: B762-0004-1	Well yield:	Date: 8/22/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS Well Diameter: 2"
Initial Depth to Water: 15.10 feet	Total Well Depth: 27.70 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

	Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
	1000	2L	21.7	5.43	770	
3						
4						
5						
6						
7						
8						
9						

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
PC039171-01	8/26/25	1000	4	NO	RS

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

Measurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 6
Project Number: B762-0004-1	Well yield:	Date: 8/22/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS
		Well Diameter: 2"
Initial Depth to Water: 13.70 feet	Total Well Depth: 22.60 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

	Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
	0940	2L	20.7	6.41	577	
3						
4						
5						
6						
7						
8						
9						

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P C038171-02	8/26/25	0940	4	NO	RS

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

Measurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 7
Project Number: B762-0004-1	Well yield:	Date: 8/22/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS Well Diameter: 2"
Initial Depth to Water: 10.50 feet	Total Well Depth: 26.40 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

	Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
	0920	2L	21.8	4.86	197.0	
3						
4						
5						
6						
7						
8						
9						

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
PC058171-03	8/26/25	0920	4	No	RS

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

easurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 8
Project Number: B762-0004-1	Well yield:	Date: 8/22/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS Well Diameter: 2"
Initial Depth to Water: 17.4 feet	Total Well Depth: 25.05 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

	Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
	0900	2L	23.6	5.00	245.0	
3						
4						
5						
6						
7						
8						
9						

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P C038171-04	8/26/25	0900	4	NO	RS

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

Measurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 9
Project Number: B762-0004-1	Well yield:	Date: ~~8/28/~~ 8/22/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS Well Diameter: 2"
Initial Depth to Water: 7.80 feet	Total Well Depth: 22.20 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

	Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
	0900	2L	19.1	5.16	144	
3						
4						
5						
6						
7						
8						
9						

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P C038172-01	~~8/28~~ 8/28/25	0900	4	NO	RS

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

GROUND WATER MONITORING WELL SAMPLING FORM

Measurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 10
Project Number: B762-0004-1	Well yield:	Date: 8/22/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS Well Diameter: 2"
Initial Depth to Water: 9.50 feet	Total Well Depth: 20.00 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

	Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
	0930	2L	23.2	6.35	382	
3						
4						
5						
6						
7						
8						
9						

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P C038172-02	8/28/25	0930	4	NO	RS

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

GROUND WATER MONITORING WELL SAMPLING FORM

Measurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 11
Project Number: B762-0004-1	Well yield:	Date: 8/22/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS
		Well Diameter: 2"
Initial Depth to Water: 70.60 feet	Total Well Depth: 79.30 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

	Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
	1000	2L	21.5	3.09	2824	
3						
4						
5						
6						
7						
8						
9						

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
PC058172-05	8/28/25	1000	4	NO	RS

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

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GROUND WATER MONITORING WELL SAMPLING FORM

Measurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 1
Project Number: B762-0004-1	Well yield:	Date: 11/20/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS Well Diameter: 2"
Initial Depth to Water: 1.90 feet	Total Well Depth: 13.82 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

	Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
4						
5						
6						
7						
8						
9						

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P					

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

Measurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # P2
Project Number: B762-0004-1	Well yield:	Date: 11/20/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS
		Well Diameter: 2"
Initial Depth to Water: 10.40 feet	Total Well Depth: 18.99 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
4					
5					
6					
7					
8					
9					

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P					

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

easurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 3
Project Number: B762-0004-1	Well yield:	Date: 11/20/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS Well Diameter: 2"
Initial Depth to Water: 13.60 feet	Total Well Depth: 24.80 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
4					
5					
6					
7					
8					
9					

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P					

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

easurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 4
Project Number: B762-0004-1	Well yield:	Date: 11/20/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS
		Well Diameter: 2"
Initial Depth to Water: 12.50 feet	Total Well Depth: 24.22 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
4					
5					
6					
7					
8					
9					

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P					

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

Measurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 5
Project Number: B762-0004-1	Well yield:	Date: 11/20/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS
		Well Diameter: 2"
Initial Depth to Water: 15.25 feet	Total Well Depth: 27.70 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
4					
5					
6					
7					
8					
9					

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P					

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

Measurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 6
Project Number: B762-0004-1	Well yield:	Date: 11/20/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS Well Diameter: 2"
Initial Depth to Water: 11.55 feet	Total Well Depth: 22.60 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

	Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
3						
4						
5						
6						
7						
8						
9						

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P					

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

easurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 7
Project Number: B762-0004-1	Well yield:	Date: 11/20/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS
		Well Diameter: 2"
Initial Depth to Water: 12.69 feet	Total Well Depth: 26.40 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
4					
5					
6					
7					
8					
9					

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P					

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

Measurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 8
Project Number: B762-0004-1	Well yield:	Date: 11/20/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS Well Diameter: 2"
Initial Depth to Water: 17.30 feet	Total Well Depth: 25.05 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
4					
5					
6					
7					
8					
9					

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P					

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

easurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 9
Project Number: B762-0004-1	Well yield:	Date: 11/20/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS Well Diameter: 2"
Initial Depth to Water: 6.90 feet	Total Well Depth: 22.20 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
4					
5					
6					
7					
8					
9					

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P					

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

easurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 10
Project Number: B762-0004-1	Well yield:	Date: 11/20/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, Per 2010 SOP	Sampler(s): RS
		Well Diameter: 2"
Initial Depth to Water: 7.00 feet	Total Well Depth: 20.00 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
4					
5					
6					
7					
8					
9					

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P					

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

EBMUD

GROUND WATER MONITORING WELL SAMPLING FORM

Measurement & Purging Information: (day 1) CASS - South Shore

Project Name: Camanche SS	CPM: Deirdre Mena (510) 287-1559	Well ID: MW # 11
Project Number: B762-0004-1	Well yield:	Date: 11/20/25
Site Address: 4900 Stony Creek Road Ione, CA 95640	Sampling Method: Passive Diffusion, per 2010 SOP	Sampler(s): RS Well Diameter: 2"
Initial Depth to Water: 70.20 feet	Total Well Depth: 79.30 feet	Water Column Height: feet
Volume/ft:	1 Casing Volume:	3 Casing Volumes:
Purging Device:	Did Well Dewater?:	Total Gallons Purged:
Start Purge Time:	Stop Purge Time:	Total Time:

1 Casing Volume = Water column height, feet x Volume/ ft.

Well Diam.	Volume/ft (gallons)
2"	0.16

purge at least 3 well casing volume or until field parameters are within 10% on 3 successive measurements

Time	Casing Volume	Temp. (°C)	pH	Cond. (µS)	Comments
4					
5					
6					
7					
8					
9					

Sampling information: (day 2)

Prelog sample ID	Date	Time	Number of Containers filled	Field Preserved?	Sampler:
P					

Field Notes: (please note any field issues: missing locks, missing bolts, broken caps, flooded conditions, etc.)

date/time/ID:

Appendix C – Analytical Laboratory Reports

East Bay Municipal Utility District
2020 Wake Ave, Oakland, CA 94623 T: 510-287-1432

Laboratory Services Division
ELAP#1060

Analytical Results Report

16 September 2025

Justin Nickell

MS PAR

Re: Camanche South Shore - Wastewater

COC# C038171

Report Generated: 09/16/2025 16:10

Login Performance Summary

• 0 Lost Analyses

• 0 Hold Time Exceedances

• Analytical analyses did meet the turnaround time

Report Notes

CASS Semiannual Groundwater Monitoring

For questions concerning this report, please contact:

Reported By:

Kristi Schwab

Senior Chemist

Approved By:

Yuyun Shang

Lab Manager

Samples for C038171

Samples Included in the Report

Sample Number	Sample Type	Sampled Date	Location Name	Sample Name
C038171-01	GRAB	Aug 26 2025 10:00	WW CAMANCHE SS - MW 5	-
C038171-02	GRAB	Aug 26 2025 09:40	WW CAMANCHE SS - MW 6	-
C038171-03	GRAB	Aug 26 2025 09:20	WW CAMANCHE SS - MW 7	-
C038171-04	GRAB	Aug 26 2025 09:00	WW CAMANCHE SS - MW 8	-

Samples Results for C038171

Sample ID: C038171-01
Site: WW CAMANCHE SS — Camanche South Shore Recreation Area, wastewater system
Locator: MW 5 — Groundwater monitoring well 5, North of Catfish Pond
Client: Camanche South Shore - Wastewater
Sample Type: GRAB
Date Collected: Aug 26 2025 10:00 **Sample Collector:** R. Stange
Date Received: Aug 26 2025 14:07 **Sample Receiver:** L Brougham
Sample Comments:

Analyte	Qualifier	Result	MDL	RL	Units	DF	Batch	Prepared	Analyzed
Field data entry into LIMS									
TARGET ANALYTES									
CL2R		**<0.08**			mg/L				08/26/2025 10:00
Field data entry into LIMS									
TARGET ANALYTES									
Conductivity		**770**			umhos/cm				08/26/2025 10:00
Field data entry into LIMS									
TARGET ANALYTES									
Depth		**15.10**			Feet				08/26/2025 10:00
Field data entry into LIMS									
TARGET ANALYTES									
pH		**5.43**			pH Units				08/26/2025 10:00
Field data entry into LIMS									
TARGET ANALYTES									
Temperature		**21.7**			C				08/26/2025 10:00
Total Coliform by Multiple Tube Fermentation by SM 9221 B,C-2014									
TARGET ANALYTES									
Total Coliform	<	1.8		1.8	MPN/100 mL	1.0	B250826-008		08/26/2025 14:42
Total Dissolved Solids by SM 2540 C-2015									
TARGET ANALYTES									
Total Dissolved Solids		**650**	14	69	mg/L	1.2	B250828-003		08/28/2025 08:26
Anions by EPA 300.1									
TARGET ANALYTES									
Chloride		**200**	5.0	10	mg/L	50	B250826-003		08/26/2025 16:36
Nitrate as N	**E1**	**0.87**	0.24	1.5	mg/L	50	B250826-003		08/26/2025 16:36
SURROGATES									
Dichloroacetate (%)		104			%	50	B250826-003		08/26/2025 16:36
Metals by EPA 200.7									
TARGET ANALYTES									
Sodium		**63800**	3.04	55.0	ug/L	1.1	B250903-001	08/28/2025 10:45	09/03/2025 11:24
INTERNAL STANDARD									
Yttrium (%)		98			%	1.1	B250903-001	08/28/2025 10:45	09/03/2025 11:24
Yttrium Radial (%)		98			%	1.1	B250903-001	08/28/2025 10:45	09/03/2025 11:24

Samples Results for C038171

Sample ID: C038171-02
Site: WW CAMANCHE SS — Camanche South Shore Recreation Area, wastewater system
Locator: MW 6 — Groundwater monitoring well 6, East of WW Pond 3
Client: Camanche South Shore - Wastewater
Sample Type: GRAB
Date Collected: Aug 26 2025 09:40 **Sample Collector:** R. Stange
Date Received: Aug 26 2025 14:07 **Sample Receiver:** L Brougham
Sample Comments:

Analyte	Qualifier	Result	MDL	RL	Units	DF	Batch	Prepared	Analyzed
Field data entry into LIMS									
TARGET ANALYTES									
CL2R		**<0.08**			mg/L				08/26/2025 09:40
Field data entry into LIMS									
TARGET ANALYTES									
Conductivity		**577**			umhos/cm				08/26/2025 09:40
Field data entry into LIMS									
TARGET ANALYTES									
Depth		**13.30**			Feet				08/26/2025 09:40
Field data entry into LIMS									
TARGET ANALYTES									
pH		**6.41**			pH Units				08/26/2025 09:40
Field data entry into LIMS									
TARGET ANALYTES									
Temperature		**20.7**			C				08/26/2025 09:40
Total Coliform by Multiple Tube Fermentation by SM 9221 B,C-2014									
TARGET ANALYTES									
Total Coliform	<	1.8		1.8	MPN/100 mL	1.0	B250826-008		08/26/2025 14:53
Total Dissolved Solids by SM 2540 C-2015									
TARGET ANALYTES									
Total Dissolved Solids		**290**	11	55	mg/L	1.0	B250828-003		08/28/2025 08:26
Anions by EPA 300.1									
TARGET ANALYTES									
Chloride		**52**	2.5	5.0	mg/L	25	B250826-003		08/26/2025 17:14
Nitrate as N	U	0.0048	0.0048	0.030	mg/L	1.0	B250827-001		08/27/2025 12:57
SURROGATES									
Dichloroacetate (%)		104			%	25	B250826-003		08/26/2025 17:14
Dichloroacetate (%)		102			%	1.0	B250827-001		08/27/2025 12:57
Metals by EPA 200.7									
TARGET ANALYTES									
Sodium		**52200**	3.04	55.0	ug/L	1.1	B250903-001	08/28/2025 10:45	09/03/2025 11:27
INTERNAL STANDARD									
Yttrium (%)		99			%	1.1	B250903-001	08/28/2025 10:45	09/03/2025 11:27
Yttrium Radial (%)		100			%	1.1	B250903-001	08/28/2025 10:45	09/03/2025 11:27

Samples Results for C038171

Sample ID: C038171-03
Site: WW CAMANCHE SS — Camanche South Shore Recreation Area, wastewater system
Locator: MW 7 — Groundwater monitoring well 7, North-west of Trout Pond
Client: Camanche South Shore - Wastewater
Sample Type: GRAB
Date Collected: Aug 26 2025 09:20 **Sample Collector:** R. Stange
Date Received: Aug 26 2025 14:07 **Sample Receiver:** L Brougham
Sample Comments:

Analyte	Qualifier	Result	MDL	RL	Units	DF	Batch	Prepared	Analyzed
Field data entry into LIMS									
TARGET ANALYTES									
CL2R		**<0.08**			mg/L				08/26/2025 09:20
Field data entry into LIMS									
TARGET ANALYTES									
Conductivity		**197**			umhos/cm				08/26/2025 09:20
Field data entry into LIMS									
TARGET ANALYTES									
Depth		**10.50**			Feet				08/26/2025 09:20
Field data entry into LIMS									
TARGET ANALYTES									
pH		**4.86**			pH Units				08/26/2025 09:20
Field data entry into LIMS									
TARGET ANALYTES									
Temperature		**21.8**			C				08/26/2025 09:20
Total Coliform by Multiple Tube Fermentation by SM 9221 B,C-2014									
TARGET ANALYTES									
Total Coliform	<	1.8		1.8	MPN/100 mL	1.0	B250826-008		08/26/2025 15:03
Total Dissolved Solids by SM 2540 C-2015									
TARGET ANALYTES									
Total Dissolved Solids		**180**	11	55	mg/L	1.0	B250828-003		08/28/2025 08:26
Anions by EPA 300.1									
TARGET ANALYTES									
Chloride		**27**	1.0	2.0	mg/L	10	B250826-003		08/26/2025 17:52
Nitrate as N	**E1**	**0.29**	0.048	0.30	mg/L	10	B250826-003		08/26/2025 17:52
SURROGATES									
Dichloroacetate (%)		102			%	10	B250826-003		08/26/2025 17:52
Metals by EPA 200.7									
TARGET ANALYTES									
Sodium		**17100**	3.04	55.0	ug/L	1.1	B250903-001	08/28/2025 10:45	09/03/2025 11:37
INTERNAL STANDARD									
Yttrium (%)		100			%	1.1	B250903-001	08/28/2025 10:45	09/03/2025 11:37
Yttrium Radial (%)		100			%	1.1	B250903-001	08/28/2025 10:45	09/03/2025 11:37

Samples Results for C038171

Sample ID: C038171-04
Site: WW CAMANCHE SS — Camanche South Shore Recreation Area, wastewater system
Locator: MW 8 — Groundwater monitoring well 8, South of WW Pond 3
Client: Camanche South Shore - Wastewater
Sample Type: GRAB
Date Collected: Aug 26 2025 09:00 **Sample Collector:** R. Stange
Date Received: Aug 26 2025 14:07 **Sample Receiver:** L Brougham
Sample Comments:

Analyte	Qualifier	Result	MDL	RL	Units	DF	Batch	Prepared	Analyzed
Field data entry into LIMS									
TARGET ANALYTES									
CL2R		**<0.08**			mg/L				08/26/2025 09:00
Field data entry into LIMS									
TARGET ANALYTES									
Conductivity		**245**			umhos/cm				08/26/2025 09:00
Field data entry into LIMS									
TARGET ANALYTES									
Depth		**17.4**			Feet				08/26/2025 09:00
Field data entry into LIMS									
TARGET ANALYTES									
pH		**5.00**			pH Units				08/26/2025 09:00
Field data entry into LIMS									
TARGET ANALYTES									
Temperature		**23.6**			C				08/26/2025 09:00
Total Coliform by Multiple Tube Fermentation by SM 9221 B,C-2014									
TARGET ANALYTES									
Total Coliform	<	1.8		1.8	MPN/100 mL	1.0	B250826-008		08/26/2025 15:03
Total Dissolved Solids by SM 2540 C-2015									
TARGET ANALYTES									
Total Dissolved Solids		**190**	11	55	mg/L	1.0	B250828-003		08/28/2025 08:26
Anions by EPA 300.1									
TARGET ANALYTES									
Chloride		**54**	1.0	2.0	mg/L	10	B250826-003		08/26/2025 18:30
Nitrate as N		**1.2**	0.048	0.30	mg/L	10	B250826-003		08/26/2025 18:30
SURROGATES									
Dichloroacetate (%)		103			%	10	B250826-003		08/26/2025 18:30
Metals by EPA 200.7									
TARGET ANALYTES									
Sodium		**25400**	3.04	55.0	ug/L	1.1	B250903-001	08/28/2025 10:45	09/03/2025 11:40
INTERNAL STANDARD									
Yttrium (%)		99			%	1.1	B250903-001	08/28/2025 10:45	09/03/2025 11:40
Yttrium Radial (%)		100			%	1.1	B250903-001	08/28/2025 10:45	09/03/2025 11:40

Quality Control for C038171

Analyte	Qualifier	Result	MDL	RL	Units	Spike Level	Source Result	% REC	% REC Limits	RPD	RPD Limits
Total Fecal E. coli Multiple Tube Fermentation CC by SM 9221 B,C,E,F-2006, B250826-008											
B250826-008 analyzed on 08/26/2025 10:31											
Total Coliform		**Pass**									
Total Fecal E. coli Multiple Tube Fermentation NCC by SM 9221 B,C,E,F-2006, B250826-008											
B250826-008 analyzed on 08/26/2025 10:31											
Total Coliform		**Pass**									
Total Fecal E. coli Multiple Tube Fermentation PCC by SM 9221 B,C,E,F-2006, B250826-008											
B250826-008 analyzed on 08/26/2025 10:31											
Total Coliform		**Pass**									
Total Coliform by Multiple Tube Fermentation DUP by SM 9221 B,C-2006, B250826-008											
B250826-008 analyzed on 08/26/2025 14:53; Source = C038171-02											
Total Coliform	<	1.8		1.8	MPN/100 mL		1.8			0.000	0.856
Total Dissolved Solids DUP by SM 2540 C-2015, B250828-003											
B250828-003 analyzed on 08/28/2025 08:26; Source = C038171-03											
Total Dissolved Solids		**170**	11	55	mg/L		180			2.3	10
Total Dissolved Solids LCS by SM 2540 C-2015, B250828-003											
B250828-003 analyzed on 08/28/2025 08:26											
Total Dissolved Solids		230	22	110	mg/L	240		94	85 - 115		
Total Dissolved Solids MB by SM 2540 C-2015, B250828-003											
B250828-003 analyzed on 08/28/2025 08:26											
Total Dissolved Solids	U	11	11	55	mg/L						
Anions LCS by EPA 300.1, B250826-003											
B250826-003 analyzed on 08/26/2025 11:10											
Chloride		1.4	0.10	0.2	mg/L	1.5		96	85 - 115		
Nitrate as N		0.084	0.0048	0.03	mg/L	0.09		93	85 - 115		
Dichloroacetate (%)		102			%						
Anions LOQ by EPA 300.1, B250826-003											
B250826-003 analyzed on 08/26/2025 10:32											
Chloride		0.21	0.10	0.2	mg/L	0.20		105	50 - 150		
Nitrate as N		0.030	0.0048	0.03	mg/L	0.03		101	50 - 150		
Dichloroacetate (%)		102			%						
Anions MB by EPA 300.1, B250826-003											
B250826-003 analyzed on 08/26/2025 09:54											
Chloride	U	0.10	0.10	0.2	mg/L						
Nitrate as N	U	0.0048	0.0048	0.03	mg/L						

Quality Control for C038171

Analyte	Qualifier	Result	MDL	RL	Units	Spike Level	Source Result	% REC	% REC Limits	RPD	RPD Limits
Dichloroacetate (%)		104			%						
Anions DUP by EPA 300.1, B250826-003											
B250826-003 analyzed on 08/26/2025 15:20; Source = C038348-01											
Nitrate as N		**4.1**	0.12	0.75	mg/L		4.1			0.0	10
Dichloroacetate (%)		105			%		105				
Anions DUP by EPA 300.1, B250826-003											
B250826-003 analyzed on 08/26/2025 20:23; Source = C038336-03											
Nitrate as N		**0.22**	0.0048	0.030	mg/L		0.22			0.5	10
Dichloroacetate (%)		110			%		109				
Anions MS by EPA 300.1, B250826-003											
B250826-003 analyzed on 08/26/2025 15:58; Source = C038348-01											
Nitrate as N		6.3	0.12	0.75	mg/L	2.2	4.1	98	75 - 125		
Dichloroacetate (%)		103			%		105				
Anions MS by EPA 300.1, B250826-003											
B250826-003 analyzed on 08/26/2025 21:01; Source = C038336-03											
Nitrate as N		0.32	0.0048	0.030	mg/L	0.09	0.22	105	75 - 125		
Dichloroacetate (%)		109			%		109				
Anions LCS by EPA 300.1, B250827-001											
B250827-001 analyzed on 08/27/2025 12:19											
Chloride		1.4	0.10	0.2	mg/L	1.5		95	85 - 115		
Nitrate as N		0.080	0.0048	0.03	mg/L	0.09		89	85 - 115		
Dichloroacetate (%)		98			%						
Anions LOQ by EPA 300.1, B250827-001											
B250827-001 analyzed on 08/27/2025 11:42											
Chloride		0.20	0.10	0.2	mg/L	0.20		102	50 - 150		
Nitrate as N	E1	0.028	0.0048	0.03	mg/L	0.03		95	50 - 150		
Dichloroacetate (%)		98			%						
Anions MB by EPA 300.1, B250827-001											
B250827-001 analyzed on 08/27/2025 11:04											
Chloride	U	0.10	0.10	0.2	mg/L						
Nitrate as N	U	0.0048	0.0048	0.03	mg/L						
Dichloroacetate (%)		93			%						
Anions DUP by EPA 300.1, B250827-001											
B250827-001 analyzed on 08/27/2025 14:51; Source = C038395-01											
Nitrate as N		**3.3**	0.12	0.75	mg/L		3.3			0.1	10
Dichloroacetate (%)		102			%		101				

Quality Control for C038171

Analyte	Qualifier	Result	MDL	RL	Units	Spike Level	Source Result	% REC	% REC Limits	RPD	RPD Limits
Anions MS by EPA 300.1, B250827-001											
B250827-001 analyzed on 08/27/2025 15:29; Source = C038395-01											
Nitrate as N		5.4	0.12	0.75	mg/L	2.2	3.3	93	75 - 125		
Dichloroacetate (%)		98			%		101				
Metals LCS by EPA 200.7, B250903-001											
B250903-001 analyzed on 09/03/2025 11:13; B250828-010 prepared on 08/28/2025 10:45											
Sodium		9960	3.15	57.0	ug/L	10000		100	85 - 115		
Yttrium (%)		99			%						
Yttrium Radial (%)		99			%						
Metals LCSD by EPA 200.7, B250903-001											
B250903-001 analyzed on 09/03/2025 11:16; B250828-010 prepared on 08/28/2025 10:45											
Sodium		9900	3.15	57.0	ug/L	10000		99	85 - 115	0.5	10
Yttrium (%)		99			%						
Yttrium Radial (%)		99			%						
Metals MB by EPA 200.7, B250903-001											
B250903-001 analyzed on 09/03/2025 11:05; B250828-010 prepared on 08/28/2025 10:45											
Sodium	U	3.04	3.04	55.0	ug/L						
Yttrium (%)		100			%						
Yttrium Radial (%)		100			%						
Metals MS by EPA 200.7, B250903-001											
B250903-001 analyzed on 09/03/2025 11:48; B250828-010 prepared on 08/28/2025 10:45; Source = C037793-01											
Sodium		235000	3.15	57.0	ug/L	10000	226000	90	70 - 130		
Yttrium (%)		95			%		96				
Yttrium Radial (%)		98			%		97				
Metals MSD by EPA 200.7, B250903-001											
B250903-001 analyzed on 09/03/2025 11:51; B250828-010 prepared on 08/28/2025 10:45; Source = C037793-01											
Sodium		234000	3.15	57.0	ug/L	10000	226000	82	70 - 130	0.4	20
Yttrium (%)		96			%		96				
Yttrium Radial (%)		98			%		97				

Qualifiers and Definitions

<	Less than
E1	Concentration estimated. Analyte detected below reporting limit (RL) but above MDL. For SIP, E1=DNQ, Estimated Concentration.
U	Analyte not detected.

Qualifiers for subcontract work – see parameter comment for description
Corrections for dilutions for matrix effects applied to the MDL and RL.

QC Types and Definitions

CC	Control Culture
DUP	Duplicate Sample
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOQ	Limit of Quantitation
MB	Method Blank
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NCC	Negative Culture Control
PCC	Positive Culture Control

East Bay Municipal Utility District Laboratory Services Division Chain of Custody Record

EBMUD

COC #: C038171	Project Title: Camanche South Shore - Wastewater TAT: Standard	Client PM: Justin Nickell Lab PM: Kristi Schwab Job #:	Expect Date: 08/26/2025 Sampled By: R Stamer ☒ Samples transported on ice

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required
8/26/25	1000	WW CAMANCHE SS - MW 5	C038171-01	GRAB	Aqueous			+SAMP KIT
						-01B ✓	BACTL	Total Coliform MTF-AQ JY0623✓
						-01C ✓	PLSTS	EPA 300.1 (Cl,NO3)
						-01H ✓	PLSTM	TDS
						-01I ✓	PLSTM	EPA 200.7-WW (Na)

Field Test Parameters:

CL2R = LO.08		mg/L
Conductivity = 720		umhos/cm
Depth = 15.10		Feet
pH = 5.43		pH Units
Temperature = 21.7		C

Field Comments:

Field Instructions:

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required
8/26/25	0940	WW CAMANCHE SS - MW 6	C038171-02	GRAB	Aqueous			
						-02B ✓	BACTL	Total Coliform MTF-AQ JY0623✓
						-02C ✓	PLSTS	EPA 300.1 (Cl,NO3)
						-02H ✓	PLSTM	TDS 0.1°C #22 UEB 08/26/2025
						-02I ✓	PLSTM	EPA 200.7-WW (Na)

Field Test Parameters:

CL2R = LO.08		mg/L
Conductivity = 577		umhos/cm
Depth = 13.30		Feet
pH = 6.41		pH Units
Temperature = 20.7		C

Field Comments:

Field Instructions:

Page 1 of 3 for C038171

East Bay Municipal Utility District Laboratory Services Division Chain of Custody Record

COC #: C038171	Project Title: Camanche South Shore - Wastewater TAT: Standard	Client PM: Justin Nickell Lab PM: Kristi Schwab Job #:	Expect Date: 08/26/2025 Sampled By: R. Stange ☒ Samples transported on ice

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required
8/26/25	0920	WW CAMANCHE SS - MW 7	C038171-03	GRAB	Aqueous	-03B ✓	BACTL	Total Coliform MTF-AQ JY 8/23V
						-03C ✓	PLSTS	EPA 300.1 (Cl,NO3)
						-03H ✓	PLSTM	TDS
						-03I ✓	PLSTM	EPA 200.7-WW (Na)

Field Test Parameters:

CL2R = <0.08		mg/L
Conductivity = 197.0		umhos/cm
Depth = 10.50		Feet
pH = 4.86		pH Units
Temperature = 21.8		C

Field Comments:

Field Instructions:

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required
8/26/25	0900	WW CAMANCHE SS - MW 8	C038171-04	GRAB	Aqueous	-04B ✓	BACTL	Total Coliform MTF-AQ JY 8/23V
						-04C ✓	PLSTS	EPA 300.1 (Cl,NO3)
						-04H ✓	PLSTM	TDS
						-04I ✓	PLSTM	EPA 200.7-WW (Na)

Field Test Parameters:

CL2R = <0.08		mg/L
Conductivity = 245.0		umhos/cm
Depth = 17.4		Feet
pH = 5.00		pH Units
Temperature = 23.6		C

Field Comments:

Field Instructions:

Page 2 of 3 for C038171

East Bay Municipal Utility District Laboratory Services Division Chain of Custody Record

COC #: C038171	Project Title: Camanche South Shore - Wastewater TAT: Standard	Client PM: Justin Nickell Lab PM: Kristi Schwab Job #:	Expect Date: 08/26/2025 Sampled By: R. Stange ☒ Samples transported on ice

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required

Total Containers for: C038171	16

	Signature	Print Name	Time	Date
Relinquished by:		Robert Stange	1100	8/26/25
Received by:	KRahi	KHALID RAHI	11:00	8/26/25
Relinquished by:	KRahi	KHALID RAHI	13:41	8/26/25
Received by:				
Relinquished by:				
Received by:	James Brougham	LBrougham	1407	08/26/2025

WEB 08/26/2025

Container Legend:

BACTL = Plastic, sterile, Na2S2O3, Clear, 290 mL

PLSTM = Plastic, WM, 500 mL

PLSTS = Plastic, NM, 125 mL

Page 3 of 3 for C038171

East Bay Municipal Utility District Laboratory Services Division Chain of Custody Record

COC #: C038171	Project Title: Camanche South Shore - Wastewater TAT: Standard	Client PM: Justin Nickell Lab PM: Kristi Schwab Job #:	Received Date/Time: 08/26/2025 14:07 Received By: Lauren Brougham Sampled By: R. Stange Due Date: 09/24/2025

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required
08/26/2025	10:00	WW CAMANCHE SS - MW 5	C038171-01	GRAB	Aqueous			+SAMP KIT
						-01B	BACTL	Total Coliform MTF-AQ
						-01C	PLSTS	EPA 300.1 (Cl,NO3)
						-01H	PLSTM	TDS
						-01I	PLSTM	EPA 200.7-WW (Na)
								Field Test Parameters:
								CL2R = <0.08 mg/L
								Conductivity = 770 umhos/cm
								Depth = 15.10 Feet
								pH = 5.43 pH Units
								Temperature = 21.7 C
Field Comments:								
Field Instructions:								
Sample External Comments:								
08/26/2025	09:40	WW CAMANCHE SS - MW 6	C038171-02	GRAB	Aqueous			
						-02B	BACTL	Total Coliform MTF-AQ
						-02C	PLSTS	EPA 300.1 (Cl,NO3)
						-02H	PLSTM	TDS
						-02I	PLSTM	EPA 200.7-WW (Na)
								Field Test Parameters:
								CL2R = <0.08 mg/L
								Conductivity = 577 umhos/cm
								Depth = 13.30 Feet
								pH = 6.41 pH Units
								Temperature = 20.7 C
Field Comments:								
Field Instructions:								
Sample External Comments:								

Page 1 of 6 for C038171

East Bay Municipal Utility District Laboratory Services Division Chain of Custody Record

COC #: C038171	Project Title: Camanche South Shore - Wastewater TAT: Standard	Client PM: Justin Nickell Lab PM: Kristi Schwab Job #:	Received Date/Time: 08/26/2025 14:07 Received By: Lauren Brougham Sampled By: R. Stange Due Date: 09/24/2025

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required
08/26/2025	09:20	WW CAMANCHE SS - MW 7	C038171-03	GRAB	Aqueous			
						-03B	BACTL	Total Coliform MTF-AQ
						-03C	PLSTS	EPA 300.1 (Cl,NO3)
						-03H	PLSTM	TDS
						-03I	PLSTM	EPA 200.7-WW (Na)

Field Test Parameters:		
CL2R =	<0.08	mg/L
Conductivity =	197	umhos/cm
Depth =	10.50	Feet
pH =	4.86	pH Units
Temperature =	21.8	C

Field Comments:
Field Instructions:
Sample External Comments:

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required
08/26/2025	09:00	WW CAMANCHE SS - MW 8	C038171-04	GRAB	Aqueous			
						-04B	BACTL	Total Coliform MTF-AQ
						-04C	PLSTS	EPA 300.1 (Cl,NO3)
						-04H	PLSTM	TDS
						-04I	PLSTM	EPA 200.7-WW (Na)

Field Test Parameters:		
CL2R =	<0.08	mg/L
Conductivity =	245	umhos/cm
Depth =	17.4	Feet
pH =	5.00	pH Units
Temperature =	23.6	C

Field Comments:
Field Instructions:
Sample External Comments:

East Bay Municipal Utility District Laboratory Services Division Chain of Custody Record

EBMUD	COC #: C038171	Project Title: Camanche South Shore - Wastewater TAT: Standard	Client PM: Justin Nickell Lab PM: Kristi Schwab Job #:	Received Date/Time: 08/26/2025 14:07 Received By: Lauren Brougham Sampled By: R. Stange Due Date: 09/24/2025

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required

Total Containers for: C038171	16

C038171 Sample Acceptance Report

Received: 08/26/2025 14:07
Received By: Lauren Brougham

Chain-of-Custody		Comments
Chilled During Transport?	Yes	
Missing or incorrect information	No	
Mode of receipt	Person-to-Person	
Shipping Slip?	No	

Containers		Comments
BACT lot number(s)	JY023V	
Container and label are legible and match COC?	Yes	
Correct container used with field preservation?	Yes	
Received within holding times?	Yes	
Sufficient volume, undamaged, or uncontaminated?	Yes	

Intent to chill

Cooler: 1		Comments
Corrected Temp (° C)	0.4	
IR Thermometer Number	IR #22	
Representative temperature taken from	-02H	
Uncorrected Temp (° C)	0.1	
Visible ice formed inside sample container?	No	

Acceptance		Comments
PM notified?	N/A	
Samples meet acceptance requirements?	Yes	

Sample Acceptance Preservation Report

COC: C038171

Report Generated: 08/26/2025 14:13

Inventory Item	Inventory ID	Open Date	Prep Date	Expiration Date
1+1 Sulfuric Acid	ST250529-001	N/A	05/29/2025	05/29/2026
1+9 Phosphoric plus Sulfamic Acid	ST250626-002	N/A	07/01/2025	07/01/2026
Ammonium Hydroxide	ST240416-017	N/A	N/A	11/06/2026
Ammonium Sulfate Buffer	ST250428-003	N/A	04/28/2025	10/29/2025
DPD Total Chlorine Reagent	ST250129-022	01/29/2025	N/A	12/31/2029
Ethylenediamine 12.5 mg/mL EDA	ST250825-003	N/A	08/25/2025	09/25/2025
H2SO4 15 mL 1:1 LDPE dropper	ST250218-019	02/18/2025	N/A	07/31/2028
Hydrochloric Acid 1+1	ST250221-012	02/21/2025	N/A	05/31/2027
NaOH 15 mL 1:1 LDPE dropper	ST250218-020	02/21/2025	N/A	06/30/2026
Nitric Acid Trace Metals Grade	ST250424-020	05/07/2025	N/A	11/13/2026
pH Strip 0-14	ST221220-011	05/23/2023	N/A	07/31/2027
pH Strip 0-6	ST241118-010	11/18/2024	N/A	06/30/2028
pH Strip 7-14	ST230126-011	06/27/2023	N/A	10/31/2026
Sodium Thiosulfate, Anhydrous	ST221115-035	11/23/2022	N/A	02/28/2027
Zinc Acetate 2N	ST250326-020	08/01/2025	N/A	02/01/2026

Container Number	Container Name	Tests	Preservation Requirement	Result	Initial/ Date
C038171-01B	BACTL ✓	Total Coliform MTF-AQ	Check Container	PASS LEB	08/26/2025
C038171-01I	PLSTM ✓	EPA 200.7-WW	HNO3 to pH <2. Preservation Time = 1420	↓	↓
C038171-02B	BACTL ✓	Total Coliform MTF-AQ	Check Container		
C038171-02I	PLSTM ✓	EPA 200.7-WW	HNO3 to pH <2. Preservation Time = 1420		
C038171-03B	BACTL ✓	Total Coliform MTF-AQ	Check Container	PASS LEB	08/26/2025

Page 5 of 6 for C038171

Sample Acceptance Preservation Report

COC: C038171

Report Generated: 08/26/2025 14:13

C038171-03I	PLSTM ✓	EPA 200.7-WW	HNO3 to pH <2. Preservation Time = 1420	PASS LEB	08/26/2025
C038171-04B	BACTL ✓	Total Coliform MTF-AQ	Check Container	↓	↓
C038171-04I	PLSTM ✓	EPA 200.7-WW	HNO3 to pH <2. Preservation Time = 1420	PASS LEB	08/26/2025

East Bay Municipal Utility District
2020 Wake Ave, Oakland, CA 94623 T: 510-287-1432

Laboratory Services Division
ELAP#1060

Analytical Results Report

30 September 2025

Justin Nickell

MS PAR

Re: Camanche South Shore - Wastewater

COC# C038172

Report Generated: 09/30/2025 09:38

Login Performance Summary

• 0 Lost Analyses

• 0 Hold Time Exceedances

• Analytical analyses did not meet the turnaround time

Report Notes

CASS Semiannual Groundwater Monitoring

For questions concerning this report, please contact:

Reported By:

Kristi Schwab

Senior Chemist

Approved By:

Yuyun Shang

Lab Manager

Samples for C038172

Samples Included in the Report

Sample Number	Sample Type	Sampled Date	Location Name	Sample Name
C038172-01	GRAB	Aug 28 2025 09:00	WW CAMANCHE SS - MW 9	-
C038172-02	GRAB	Aug 28 2025 09:30	WW CAMANCHE SS - MW 10	-
C038172-03	GRAB	Aug 28 2025 10:00	WW CAMANCHE SS - MW 11	-

Samples Results for C038172

Sample ID: C038172-01
Site: WW CAMANCHE SS — Camanche South Shore Recreation Area, wastewater system
Locator: MW 9 — Groundwater monitoring well 9, South-west of WW Pond 3
Client: Camanche South Shore - Wastewater
Sample Type: GRAB
Date Collected: Aug 28 2025 09:00 **Sample Collector:** R. Stange
Date Received: Aug 28 2025 14:02 **Sample Receiver:** L Brougham
Sample Comments:

Analyte	Qualifier	Result	MDL	RL	Units	DF	Batch	Prepared	Analyzed
Field data entry into LIMS									
TARGET ANALYTES									
CL2R		**<0.08**			mg/L				08/28/2025 09:00
Field data entry into LIMS									
TARGET ANALYTES									
Conductivity		**144**			umhos/cm				08/28/2025 09:00
Field data entry into LIMS									
TARGET ANALYTES									
Depth		**7.80**			Feet				08/28/2025 09:00
Field data entry into LIMS									
TARGET ANALYTES									
pH		**5.16**			pH Units				08/28/2025 09:00
Field data entry into LIMS									
TARGET ANALYTES									
Temperature		**19.1**			C				08/28/2025 09:00
Total Coliform by Multiple Tube Fermentation by SM 9221 B,C-2014									
TARGET ANALYTES									
Total Coliform		**2.0**		1.8	MPN/100 mL	1.0	B250828-028		08/28/2025 15:12
Total Dissolved Solids by SM 2540 C-2015									
TARGET ANALYTES									
Total Dissolved Solids		**140**	11	55	mg/L	1.0	B250829-002		08/29/2025 08:29
Anions by EPA 300.1									
TARGET ANALYTES									
Chloride		**24**	0.50	1.0	mg/L	5.0	B250828-001		08/28/2025 20:35
Nitrate as N	U	0.0048	0.0048	0.030	mg/L	1.0	B250829-001		08/29/2025 14:24
SURROGATES									
Dichloroacetate (%)		99			%	5.0	B250828-001		08/28/2025 20:35
Dichloroacetate (%)		104			%	1.0	B250829-001		08/29/2025 14:24
Metals by EPA 200.7									
TARGET ANALYTES									
Sodium		**18500**	3.04	55.0	ug/L	1.1	B250924-001	09/23/2025 10:14	09/25/2025 11:38
INTERNAL STANDARD									
Yttrium (%)		101			%	1.1	B250924-001	09/23/2025 10:14	09/25/2025 11:38
Yttrium Radial (%)		101			%	1.1	B250924-001	09/23/2025 10:14	09/25/2025 11:38

Samples Results for C038172

Sample ID: C038172-02
Site: WW CAMANCHE SS — Camanche South Shore Recreation Area, wastewater system
Locator: MW 10 — Groundwater monitoring well 10, West of Beaver Pond
Client: Camanche South Shore - Wastewater
Sample Type: GRAB
Date Collected: Aug 28 2025 09:30 **Sample Collector:** R. Stange
Date Received: Aug 28 2025 14:02 **Sample Receiver:** L Brougham
Sample Comments:

Analyte	Qualifier	Result	MDL	RL	Units	DF	Batch	Prepared	Analyzed
Field data entry into LIMS									
TARGET ANALYTES									
CL2R		**<0.08**			mg/L				08/28/2025 09:30
Field data entry into LIMS									
TARGET ANALYTES									
Conductivity		**382**			umhos/cm				08/28/2025 09:30
Field data entry into LIMS									
TARGET ANALYTES									
Depth		**9.50**			Feet				08/28/2025 09:30
Field data entry into LIMS									
TARGET ANALYTES									
pH		**6.35**			pH Units				08/28/2025 09:30
Field data entry into LIMS									
TARGET ANALYTES									
Temperature		**23.2**			C				08/28/2025 09:30
Total Coliform by Multiple Tube Fermentation by SM 9221 B,C-2014									
TARGET ANALYTES									
Total Coliform		**70**		1.8	MPN/100 mL	1.0	B250828-028		08/28/2025 15:12
Total Dissolved Solids by SM 2540 C-2015									
TARGET ANALYTES									
Total Dissolved Solids		**240**	11	55	mg/L	1.0	B250829-002		08/29/2025 08:29
Anions by EPA 300.1									
TARGET ANALYTES									
Chloride		**3.4**	0.20	0.40	mg/L	2.0	B250829-001		08/29/2025 15:02
Nitrate as N	U	0.0048	0.0048	0.030	mg/L	1.0	B250828-001		08/28/2025 21:13
SURROGATES									
Dichloroacetate (%)		104			%	1.0	B250828-001		08/28/2025 21:13
Dichloroacetate (%)		104			%	2.0	B250829-001		08/29/2025 15:02
Metals by EPA 200.7									
TARGET ANALYTES									
Sodium		**16600**	3.04	55.0	ug/L	1.1	B250924-001	09/23/2025 10:14	09/25/2025 11:41
INTERNAL STANDARD									
Yttrium (%)		100			%	1.1	B250924-001	09/23/2025 10:14	09/25/2025 11:41
Yttrium Radial (%)		100			%	1.1	B250924-001	09/23/2025 10:14	09/25/2025 11:41

Samples Results for C038172

Sample ID: C038172-03
Site: WW CAMANCHE SS — Camanche South Shore Recreation Area, wastewater system
Locator: MW 11 — Groundwater monitoring well 11, approximately 750 feet North of MW 5
Client: Camanche South Shore - Wastewater
Sample Type: GRAB
Date Collected: Aug 28 2025 10:00 **Sample Collector:** R. Stange
Date Received: Aug 28 2025 14:02 **Sample Receiver:** L Brougham
Sample Comments:

Analyte	Qualifier	Result	MDL	RL	Units	DF	Batch	Prepared	Analyzed
Field data entry into LIMS									
TARGET ANALYTES									
CL2R		**<0.08**			mg/L				08/28/2025 10:00
Field data entry into LIMS									
TARGET ANALYTES									
Conductivity		**2824**			umhos/cm				08/28/2025 10:00
Field data entry into LIMS									
TARGET ANALYTES									
Depth		**70.60**			Feet				08/28/2025 10:00
Field data entry into LIMS									
TARGET ANALYTES									
pH		**3.09**			pH Units				08/28/2025 10:00
Field data entry into LIMS									
TARGET ANALYTES									
Temperature		**21.5**			C				08/28/2025 10:00
Total Coliform by Multiple Tube Fermentation by SM 9221 B,C-2014									
TARGET ANALYTES									
Total Coliform	<	1.8		1.8	MPN/100 mL	1.0	B250828-028		08/28/2025 15:21
Total Dissolved Solids by SM 2540 C-2015									
TARGET ANALYTES									
Total Dissolved Solids		**3500**	55	280	mg/L	5.0	B250829-002		08/29/2025 08:29
Anions by EPA 300.1									
TARGET ANALYTES									
Chloride		**13**	0.20	0.40	mg/L	2.0	B250828-001		08/28/2025 21:51
Nitrate as N	**E1**	**0.011**	0.0096	0.060	mg/L	2.0	B250828-001		08/28/2025 21:51
SURROGATES									
Dichloroacetate (%)		90			%	2.0	B250828-001		08/28/2025 21:51
Metals by EPA 200.7									
TARGET ANALYTES									
Sodium		**28400**	11.5	208	ug/L	4.2	B250924-001	09/23/2025 10:14	09/25/2025 13:03
INTERNAL STANDARD									
Yttrium (%)		106			%	4.2	B250924-001	09/23/2025 10:14	09/25/2025 13:03
Yttrium Radial (%)		108			%	4.2	B250924-001	09/23/2025 10:14	09/25/2025 13:03

Quality Control for C038172

Analyte	Qualifier	Result	MDL	RL	Units	Spike Level	Source Result	% REC	% REC Limits	RPD	RPD Limits
Total Fecal E. coli Multiple Tube Fermentation CC by SM 9221 B,C,E,F-2006, B250828-028											
B250828-028 analyzed on 08/28/2025 15:05											
Total Coliform		**Pass**									
Total Fecal E. coli Multiple Tube Fermentation NCC by SM 9221 B,C,E,F-2006, B250828-028											
B250828-028 analyzed on 08/28/2025 15:05											
Total Coliform		**Pass**									
Total Fecal E. coli Multiple Tube Fermentation PCC by SM 9221 B,C,E,F-2006, B250828-028											
B250828-028 analyzed on 08/28/2025 15:05											
Total Coliform		**Pass**									
Total Coliform by Multiple Tube Fermentation DUP by SM 9221 B,C-2006, B250828-028											
B250828-028 analyzed on 08/28/2025 15:21; Source = C038172-03											
Total Coliform	<	1.8		1.8	MPN/100 mL		1.8			0.000	0.856
Total Dissolved Solids DUP by SM 2540 C-2015, B250829-002											
B250829-002 analyzed on 08/29/2025 08:29; Source = C038172-01											
Total Dissolved Solids		**140**	11	55	mg/L		140			0.00	10
Total Dissolved Solids LCS by SM 2540 C-2015, B250829-002											
B250829-002 analyzed on 08/29/2025 08:29											
Total Dissolved Solids		230	22	110	mg/L	240		93	85 - 115		
Total Dissolved Solids MB by SM 2540 C-2015, B250829-002											
B250829-002 analyzed on 08/29/2025 08:29											
Total Dissolved Solids	U	11	11	55	mg/L						
Anions LCS by EPA 300.1, B250828-001											
B250828-001 analyzed on 08/28/2025 11:37											
Chloride		1.4	0.10	0.2	mg/L	1.5		95	85 - 115		
Nitrate as N		0.081	0.0048	0.03	mg/L	0.09		90	85 - 115		
Dichloroacetate (%)		98			%						
Anions LOQ by EPA 300.1, B250828-001											
B250828-001 analyzed on 08/28/2025 12:23											
Chloride		0.20	0.10	0.2	mg/L	0.20		101	50 - 150		
Nitrate as N	E1	0.028	0.0048	0.03	mg/L	0.03		94	50 - 150		
Dichloroacetate (%)		96			%						
Anions MB by EPA 300.1, B250828-001											
B250828-001 analyzed on 08/28/2025 09:18											
Chloride	U	0.10	0.10	0.2	mg/L						
Nitrate as N	U	0.0048	0.0048	0.03	mg/L						

Quality Control for C038172

Analyte	Qualifier	Result	MDL	RL	Units	Spike Level	Source Result	% REC	% REC Limits	RPD	RPD Limits
Dichloroacetate (%)		93			%						
Anions MB by EPA 300.1, B250828-001											
B250828-001 analyzed on 08/28/2025 09:57											
Dichloroacetate (%)		92			%						
Anions DUP by EPA 300.1, B250828-001											
B250828-001 analyzed on 08/28/2025 16:10; Source = C038414-01											
Nitrate as N		**5.5**	0.12	0.75	mg/L		5.5			0.5	10
Dichloroacetate (%)		100			%		101				
Anions DUP by EPA 300.1, B250828-001											
B250828-001 analyzed on 08/28/2025 23:07; Source = C038405-13											
Nitrate as N	**E1**	**0.024**	0.0048	0.030	mg/L		0.024			0.4	10
Dichloroacetate (%)		106			%		106				
Anions MS by EPA 300.1, B250828-001											
B250828-001 analyzed on 08/28/2025 16:48; Source = C038414-01											
Nitrate as N		7.7	0.12	0.75	mg/L	2.2	5.5	98	75 - 125		
Dichloroacetate (%)		99			%		101				
Anions MS by EPA 300.1, B250828-001											
B250828-001 analyzed on 08/28/2025 23:45; Source = C038405-13											
Nitrate as N		0.11	0.0048	0.030	mg/L	0.09	0.024	93	75 - 125		
Dichloroacetate (%)		106			%		106				
Anions LCS by EPA 300.1, B250829-001											
B250829-001 analyzed on 08/29/2025 13:46											
Chloride		1.4	0.10	0.2	mg/L	1.5		96	85 - 115		
Nitrate as N		0.081	0.0048	0.03	mg/L	0.09		90	85 - 115		
Dichloroacetate (%)		99			%						
Anions LOQ by EPA 300.1, B250829-001											
B250829-001 analyzed on 08/29/2025 13:09											
Chloride		0.21	0.10	0.2	mg/L	0.20		104	50 - 150		
Nitrate as N	E1	0.029	0.0048	0.03	mg/L	0.03		96	50 - 150		
Dichloroacetate (%)		100			%						
Anions MB by EPA 300.1, B250829-001											
B250829-001 analyzed on 08/29/2025 12:31											
Chloride	U	0.10	0.10	0.2	mg/L						
Nitrate as N	U	0.0048	0.0048	0.03	mg/L						
Dichloroacetate (%)		103			%						

Quality Control for C038172

Analyte	Qualifier	Result	MDL	RL	Units	Spike Level	Source Result	% REC	% REC Limits	RPD	RPD Limits
Anions DUP by EPA 300.1, B250829-001											
B250829-001 analyzed on 08/29/2025 16:56; Source = C038428-01											
Nitrate as N		**3.1**	0.12	0.75	mg/L		3.1			0.3	10
Dichloroacetate (%)		104			%		102				
Anions MS by EPA 300.1, B250829-001											
B250829-001 analyzed on 08/29/2025 17:34; Source = C038428-01											
Nitrate as N		5.2	0.12	0.75	mg/L	2.2	3.1	97	75 - 125		
Dichloroacetate (%)		101			%		102				
Metals LCS by EPA 200.7, B250924-001											
B250924-001 analyzed on 09/25/2025 11:15; B250923-007 prepared on 09/23/2025 10:14											
Sodium		10200	3.15	57.0	ug/L	10000		102	85 - 115		
Yttrium (%)		99			%						
Yttrium Radial (%)		100			%						
Metals LCSD by EPA 200.7, B250924-001											
B250924-001 analyzed on 09/25/2025 11:18; B250923-007 prepared on 09/23/2025 10:14											
Sodium		10200	3.15	57.0	ug/L	10000		102	85 - 115	0.0	10
Yttrium (%)		99			%						
Yttrium Radial (%)		100			%						
Metals MB by EPA 200.7, B250924-001											
B250924-001 analyzed on 09/25/2025 11:07; B250923-007 prepared on 09/23/2025 10:14											
Sodium	U	3.04	3.04	55.0	ug/L						
Yttrium (%)		100			%						
Yttrium Radial (%)		100			%						
Metals MS by EPA 200.7, B250924-001											
B250924-001 analyzed on 09/25/2025 11:49; B250923-007 prepared on 09/23/2025 10:14; Source = C038541-01											
Sodium		256000	3.15	57.0	ug/L	10000	245000	107	70 - 130		
Yttrium (%)		96			%		96				
Yttrium Radial (%)		98			%		98				
Metals MS by EPA 200.7, B250924-001											
B250924-001 analyzed on 09/25/2025 12:14; B250923-007 prepared on 09/23/2025 10:14; Source = C038689-02											
Sodium		40300	3.15	57.0	ug/L	10000	30500	98	70 - 130		
Yttrium (%)		99			%		99				
Yttrium Radial (%)		100			%		100				
Metals MSD by EPA 200.7, B250924-001											
B250924-001 analyzed on 09/25/2025 11:52; B250923-007 prepared on 09/23/2025 10:14; Source = C038541-01											
Sodium		255000	3.15	57.0	ug/L	10000	245000	105	70 - 130	0.1	20
Yttrium (%)		96			%		96				
Yttrium Radial (%)		98			%		98				

Quality Control for C038172

Analyte	Qualifier	Result	MDL	RL	Units	Spike Level	Source Result	% REC	% REC Limits	RPD	RPD Limits
Metals MSD by EPA 200.7, B250924-001											
B250924-001 analyzed on 09/25/2025 12:16; B250923-007 prepared on 09/23/2025 10:14; Source = C038689-02											
Sodium		40500	3.15	57.0	ug/L	10000	30500	100	70 - 130	0.5	20
Yttrium (%)		99			%		99				
Yttrium Radial (%)		100			%		100				

Qualifiers and Definitions

<	Less than
E1	Concentration estimated. Analyte detected below reporting limit (RL) but above MDL. For SIP, E1=DNQ, Estimated Concentration.
U	Analyte not detected.

Qualifiers for subcontract work – see parameter comment for description
Corrections for dilutions for matrix effects applied to the MDL and RL.

QC Types and Definitions

CC	Control Culture
DUP	Duplicate Sample
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOQ	Limit of Quantitation
MB	Method Blank
MS	Matrix Spike
MSD	Matrix Spike Duplicate
NCC	Negative Culture Control
PCC	Positive Culture Control

East Bay Municipal Utility District Laboratory Services Division Chain of Custody Record

COC #: C038172	Project Title: Camanche South Shore - Wastewater TAT: Standard	Client PM: Justin Nickell Lab PM: Kristi Schwab Job #:	Expect Date: 08/28/2025 Sampled By: R.Stanke ☑ Samples transported on ice

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required
8/28/25	0900	WW CAMANCHE SS - MW 9	C038172-01	GRAB	Aqueous			+SAMP KIT
						-01B	BACTL	Total Coliform MTF-AQ JV 8/23/25
						-01C	PLSTS	EPA 300.1 (Cl,NO3)
						-01H	PLSTM	TDS
						-01I	PLSTM	EPA 200.7-WW (Na) 0.1°C #18 LEB 08/28/2025

Field Test Parameters:

CL2R =	<0.08		mg/L
Conductivity =	144		umhos/cm
Depth =	~~X~~ 7.80	MS 8/25/25	Feet
pH =	5.16		pH Units
Temperature =	19.1		C

Field Comments:

Field Instructions:

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required
8/28/25	0930	WW CAMANCHE SS - MW 10	C038172-02	GRAB	Aqueous			
						-02B	BACTL	Total Coliform MTF-AQ JV 8/23/25
						-02C	PLSTS	EPA 300.1 (Cl,NO3)
						-02H	PLSTM	TDS
						-02I	PLSTM	EPA 200.7-WW (Na)

Field Test Parameters:

CL2R =	<0.08		mg/L
Conductivity =	382		umhos/cm
Depth =	9.50		Feet
pH =	6.35		pH Units
Temperature =	23.2		C

Field Comments:

Field Instructions:

Page 1 of 2 for C038172

East Bay Municipal Utility District Laboratory Services Division Chain of Custody Record

EBMUD

COC #: C038172	Project Title: Camanche South Shore - Wastewater TAT: Standard	Client PM: Justin Nickell Lab PM: Kristi Schwab Job #:	Expect Date: 08/28/2025 Sampled By: R.Stange ☒ Samples transported on ice

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required
8/28/25	1000	WW CAMANCHE SS - MW 11	C038172-03	GRAB	Aqueous	-03B	BACTL	Total Coliform MTF-AQ JYQ23V
						-03C	PLSTS	EPA 300.1 (Cl,NO3)
						-03H	PLSTM	TDS
						-03I	PLSTM	EPA 200.7-WW (Na)

Field Test Parameters:

CL2R = 20.08		mg/L
Conductivity = 2824		umhos/cm
Depth = 70.60		Feet
pH = 3.09		pH Units
Temperature = 21.5		C

Field Comments:

Field Instructions:

Total Containers for: C038172 | 12

	Signature	Print Name	Time	Date
Relinquished by:		Robert Stange	1100	8/28/25
Received by:	Khalid	Khalid Rahi	11:00	8/28/25
Relinquished by:	Khalid	Khalid Rahi	13:30	8/28/25
Received by:				
Relinquished by:				
Received by:	Lauren Brougham	L. Brougham	1402	08/28/2025

WEB 08/28/2025

Container Legend:

BACTL = Plastic, sterile, Na2S2O3, Clear, 290 mL

PLSTM = Plastic, WM, 500 mL

PLSTS = Plastic, NM, 125 mL

Page 2 of 2 for C038172

East Bay Municipal Utility District Laboratory Services Division Chain of Custody Record

EBMUD

COC #: C038172

Project Title: Camanche South Shore - Wastewater

TAT: Standard

Client PM: Justin Nickell
Lab PM: Kristi Schwab

Job #:

Received Date/Time: 08/28/2025 14:02
Received By: Lauren Brougham

Sampled By: R. Stange
Due Date: 09/26/2025

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required
08/28/2025	09:00	WW CAMANCHE SS - MW 9	C038172-01	GRAB	Aqueous			+SAMP KIT
						-01B	BACTL	Total Coliform MTF-AQ
						-01C	PLSTS	EPA 300.1 (Cl,NO3)
						-01H	PLSTM	TDS
						-01I	PLSTM	EPA 200.7-WW (Na)

Field Test Parameters:

CL2R =	<0.08	mg/L
Conductivity =	144	umhos/cm
Depth =	7.80	Feet
pH =	5.16	pH Units
Temperature =	19.1	C

Field Comments:
Field Instructions:
Sample External Comments:

08/28/2025	09:30	WW CAMANCHE SS - MW 10	C038172-02	GRAB	Aqueous			
						-02B	BACTL	Total Coliform MTF-AQ
						-02C	PLSTS	EPA 300.1 (Cl,NO3)
						-02H	PLSTM	TDS
						-02I	PLSTM	EPA 200.7-WW (Na)

Field Test Parameters:

CL2R =	<0.08	mg/L
Conductivity =	382	umhos/cm
Depth =	9.50	Feet
pH =	6.35	pH Units
Temperature =	23.2	C

Field Comments:
Field Instructions:
Sample External Comments:

Page 1 of 5 for C038172

East Bay Municipal Utility District Laboratory Services Division Chain of Custody Record

COC #: C038172	Project Title: Camanche South Shore - Wastewater TAT: Standard	Client PM: Justin Nickell Lab PM: Kristi Schwab Job #:	Received Date/Time: 08/28/2025 14:02 Received By: Lauren Brougham Sampled By: R. Stange Due Date: 09/26/2025

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required
08/28/2025	10:00	WW CAMANCHE SS - MW 11	C038172-03	GRAB	Aqueous			
						-03B	BACTL	Total Coliform MTF-AQ
						-03C	PLSTS	EPA 300.1 (Cl,NO3)
						-03H	PLSTM	TDS
						-03I	PLSTM	EPA 200.7-WW (Na)

Field Test Parameters:		
CL2R =	<0.08	mg/L
Conductivity =	2824	umhos/cm
Depth =	70.60	Feet
pH =	3.09	pH Units
Temperature =	21.5	C

Field Comments:

Field Instructions:

Sample External Comments:

Total Containers for: C038172	12

C038172 Sample Acceptance Report

Received: 08/28/2025 14:02
Received By: Lauren Brougham

Chain-of-Custody		Comments
Chilled During Transport?	Yes	
Missing or incorrect information	No	
Mode of receipt	Person-to-Person	
Shipping Slip?	No	

Containers		Comments
BACT lot number(s)	JY023V	
Container and label are legible and match COC?	Yes	
Correct container used with field preservation?	Yes	
Received within holding times?	Yes	
Sufficient volume, undamaged, or uncontaminated?	Yes	

Intent to chill

Cooler: 1		Comments
Corrected Temp (° C)	0.4	
IR Thermometer Number	IR #18	
Representative temperature taken from	-01I	
Uncorrected Temp (° C)	0.1	
Visible ice formed inside sample container?	No	

Acceptance		Comments
PM notified?	N/A	
Samples meet acceptance requirements?	Yes	

Sample Acceptance Preservation Report

COC: C038172

Report Generated: 08/28/2025 14:07

Inventory Item	Inventory ID	Open Date	Prep Date	Expiration Date
1+1 Sulfuric Acid	ST250529-001	N/A	05/29/2025	05/29/2026
1+9 Phosphoric plus Sulfamic Acid	ST250827-001	N/A	08/27/2025	08/27/2026
Ammonium Hydroxide	ST240416-017	N/A	N/A	11/06/2026
Ammonium Sulfate Buffer	ST250428-003	N/A	04/28/2025	10/29/2025
DPD Total Chlorine Reagent	ST250129-022	01/29/2025	N/A	12/31/2029
Ethylenediamine 12.5 mg/mL EDA	ST250825-003	N/A	08/25/2025	09/25/2025
H2SO4 15 mL 1:1 LDPE dropper	ST250218-019	02/[illegible]/2025	N/A	07/31/2028
Hydrochloric Acid 1+1	ST250221-012	02/21/2025	N/A	05/31/2027
NaOH 15 mL 1:1 LDPE dropper	ST250218-020	02/21/2025	N/A	06/30/2026
Nitric Acid Trace Metals Grade	ST250424-020	05/07/2025	N/A	11/13/2026
pH Strip 0-14	ST221220-011	05/23/2023	N/A	07/31/2027
pH Strip 0-6	ST241118-010	11/18/2024	N/A	06/30/2028
pH Strip 7-14	ST230126-011	06/27/2023	N/A	10/31/2026
Sodium Thiosulfate, Anhydrous	ST221115-035	11/23/2022	N/A	02/28/2027
Zinc Acetate 2N	ST250326-020	08/01/2025	N/A	02/01/2026

Container Number	Container Name	Tests	Preservation Requirement	Result	Initial/ Date
C038172-01B	BACTL	Total Coliform MTF-AQ	Check Container	PASS LEB	08/28/2025
C038172-01I	PLSTM	EPA 200.7-WW	HNO3 to pH <2. Preservation Time = 1416	↓	↓
C038172-02B	BACTL	Total Coliform MTF-AQ	Check Container		
C038172-02I	PLSTM	EPA 200.7-WW	HNO3 to pH <2. Preservation Time = 1410	↓	↓
C038172-03B	BACTL	Total Coliform MTF-AQ	Check Container	PASS LEB	08/28/2025

Sample Acceptance Preservation Report

COC: C038172

Report Generated: 08/28/2025 14:07

C038172-03I	PLSTM	EPA 200.7-WW	HNO3 to pH <2, Preservation Time = 1410	PASS LEB 08/26/2025	

East Bay Municipal Utility District
2020 Wake Ave, Oakland, CA 94623 T: 510-287-1432

Laboratory Services Division
ELAP#1060

Analytical Results Report

19 September 2025

Justin Nickell

MS PAR

Re: Camanche South Shore - Wastewater

COC# C038385

Report Generated: 09/19/2025 15:22

Login Performance Summary

- 0 Lost Analyses
- 0 Hold Time Exceedances
- Analytical analyses did meet the turnaround time

Report Notes

For questions concerning this report, please contact:

Reported By:

Kristi Schwab

Senior Chemist

Approved By:

Yuyun Shang

Lab Manager

Samples for C038385

Samples Included in the Report

Sample Number	Sample Type	Sampled Date	Location Name	Sample Name
C038385-01	GRAB	Aug 27 2025 10:30	CAMANCHE SOUTH SHORE - TROUT POND	-
C038385-02	GRAB	Aug 27 2025 10:35	CAMANCHE SOUTH SHORE - BEAVER POND	-

Samples Results for C038385

Sample ID: C038385-01
Site: CAMANCHE SOUTH SHORE Camanche South Shore Recreation Area, Lake Camanche, Calaveras County
Locator: TROUT POND Trout Pond, freshwater pond south-east of wastewater ponds
Client: Camanche South Shore - Wastewater
Sample Type: GRAB
Date Collected: Aug 27 2025 10:30 **Sample Collector:** J. Flores
Date Received: Aug 27 2025 14:15 **Sample Receiver:** R Molina
Sample Comments: Field Comments: E = 1' 0"

Analyte	Qualifier	Result	MDL	RL	Units	DF	Batch	Prepared	Analyzed
Total Dissolved Solids by SM 2540 C-2015									
TARGET ANALYTES									
Total Dissolved Solids		**49**	6.1	30	mg/L	0.56	B250828-003		08/28/2025 08:26
Alkalinity by SM 2320 B-2011									
Test External Comments:	Alkalinity: Total endpoint = pH 4.5								
TARGET ANALYTES									
Alkalinity: Total as CaCO3	**E1**	**29**	5	30	mg/L	1.0	B250829-003		08/29/2025 10:52
Anions by EPA 300.1									
TARGET ANALYTES									
Chloride		**2.0**	0.10	0.20	mg/L	1.0	B250827-001		08/27/2025 17:22
Nitrate as N	U	0.0048	0.0048	0.030	mg/L	1.0	B250827-001		08/27/2025 17:22
SURROGATES									
Dichloroacetate (%)		100			%	1.0	B250827-001		08/27/2025 17:22

Samples Results for C038385

Sample ID: C038385-02
Site: CAMANCHE SOUTH SHORE Camanche South Shore Recreation Area, Lake Camanche, Calaveras County
Locator: BEAVER POND Beaver Pond (also called Tractor Pond), freshwater pond west of wastewater ponds
Client: Camanche South Shore - Wastewater
Sample Type: GRAB
Date Collected: Aug 27 2025 10:35 **Sample Collector:** J. Flores
Date Received: Aug 27 2025 14:15 **Sample Receiver:** R Molina
Sample Comments: Field Comments: E = 1' 0"

Analyte	Qualifier	Result	MDL	RL	Units	DF	Batch	Prepared	Analyzed
Total Dissolved Solids by SM 2540 C-2015									
TARGET ANALYTES									
Total Dissolved Solids		**52**	6.1	30	mg/L	0.56	B250828-003		08/28/2025 08:26
Alkalinity by SM 2320 B-2011									
Test External Comments: Alkalinity: Total endpoint = pH 4.5									
TARGET ANALYTES									
Alkalinity: Total as CaCO3	**E1**	**30**	5	30	mg/L	1.0	B250829-003		08/29/2025 12:01
Anions by EPA 300.1									
TARGET ANALYTES									
Chloride		**1.8**	0.10	0.20	mg/L	1.0	B250827-001		08/27/2025 18:00
Nitrate as N	U	0.0048	0.0048	0.030	mg/L	1.0	B250827-001		08/27/2025 18:00
SURROGATES									
Dichloroacetate (%)		99			%	1.0	B250827-001		08/27/2025 18:00

Quality Control for C038385

Analyte	Qualifier	Result	MDL	RL	Units	Spike Level	Source Result	% REC	% REC Limits	RPD	RPD Limits
Total Dissolved Solids DUP by SM 2540 C-2015, B250828-003											
B250828-003 analyzed on 08/28/2025 08:26; Source = C038171-03											
Total Dissolved Solids		**170**	11	55	mg/L		180			2.3	10
Total Dissolved Solids LCS by SM 2540 C-2015, B250828-003											
B250828-003 analyzed on 08/28/2025 08:26											
Total Dissolved Solids		230	22	110	mg/L	240		94	85 - 115		
Total Dissolved Solids MB by SM 2540 C-2015, B250828-003											
B250828-003 analyzed on 08/28/2025 08:26											
Total Dissolved Solids	U	11	11	55	mg/L						
Alkalinity DUP by SM 2320 B-2011, B250829-003											
B250829-003 analyzed on 08/29/2025 12:04; Source = C038385-02											
Alkalinity: Total as CaCO3	**E1**	**28**	5	30	mg/L		30			5.6	15
Alkalinity LCS by SM 2320 B-2011, B250829-003											
B250829-003 analyzed on 08/29/2025 10:38											
Alkalinity: Total as CaCO3		390	5	30	mg/L	400		98	90 - 110		
Alkalinity MB by SM 2320 B-2011, B250829-003											
B250829-003 analyzed on 08/29/2025 10:20											
Alkalinity: Total as CaCO3	U	5	5	30	mg/L						
Alkalinity MS by SM 2320 B-2011, B250829-003											
B250829-003 analyzed on 08/29/2025 12:07; Source = C038385-02											
Alkalinity: Total as CaCO3		420	5	30	mg/L	400	30	98	80 - 115		
Alkalinity QCS by SM 2320 B-2011, B250829-003											
B250829-003 analyzed on 08/29/2025 10:46											
Alkalinity: Total as CaCO3		180	5	30	mg/L	180		101	91 - 111		
Anions LCS by EPA 300.1, B250827-001											
B250827-001 analyzed on 08/27/2025 12:19											
Chloride		1.4	0.10	0.2	mg/L	1.5		95	85 - 115		
Nitrate as N		0.080	0.0048	0.03	mg/L	0.09		89	85 - 115		
Dichloroacetate (%)		98			%						
Anions LOQ by EPA 300.1, B250827-001											
B250827-001 analyzed on 08/27/2025 11:42											
Chloride		0.20	0.10	0.2	mg/L	0.20		102	50 - 150		
Nitrate as N	E1	0.028	0.0048	0.03	mg/L	0.03		95	50 - 150		
Dichloroacetate (%)		98			%						

Quality Control for C038385

Analyte	Qualifier	Result	MDL	RL	Units	Spike Level	Source Result	% REC	% REC Limits	RPD	RPD Limits
Anions MB by EPA 300.1, B250827-001											
B250827-001 analyzed on 08/27/2025 11:04											
Chloride	U	0.10	0.10	0.2	mg/L						
Nitrate as N	U	0.0048	0.0048	0.03	mg/L						
Dichloroacetate (%)		93			%						
Anions DUP by EPA 300.1, B250827-001											
B250827-001 analyzed on 08/27/2025 14:51; Source = C038395-01											
Nitrate as N		**3.3**	0.12	0.75	mg/L		3.3			0.1	10
Dichloroacetate (%)		102			%		101				
Anions MS by EPA 300.1, B250827-001											
B250827-001 analyzed on 08/27/2025 15:29; Source = C038395-01											
Nitrate as N		5.4	0.12	0.75	mg/L	2.2	3.3	93	75 - 125		
Dichloroacetate (%)		98			%		101				

Qualifiers and Definitions

E1	Concentration estimated. Analyte detected below reporting limit (RL) but above MDL. For SIP, E1=DNQ, Estimated Concentration.
U	Analyte not detected.

Qualifiers for subcontract work – see parameter comment for description
Corrections for dilutions for matrix effects applied to the MDL and RL.

QC Types and Definitions

DUP	Duplicate Sample
LCS	Laboratory Control Sample
LOQ	Limit of Quantitation
MB	Method Blank
MS	Matrix Spike
QCS	Quality Control Sample

East Bay Municipal Utility District Laboratory Services Division Chain of Custody Record

COC #: C038385	Project Title: Camanche South Shore - Wastewater TAT: Standard	Client PM: Justin Nickell Lab PM: Kristi Schwab Job #:	Expect Date: 08/27/2025 Sampled By: J. Flores ☒ Samples transported on ice

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required
8/27/25	1030	CAMANCHE SOUTH SHORE - TROUT POND	C038385-01	GRAB	Aqueous			+SAMP KIT
						-01A	PLSTL	TDS 0.7°C#18 Rvm 08/27/2025
						-01B	PLSTS	EPA 300.1 (Cl,NO3)
						-01D	C500Z	Alkalinity
Field Comments: E = Unable to locate 1'-0"								
Field Instructions:								
8/27/25	1035	CAMANCHE SOUTH SHORE - BEAVER POND	C038385-02	GRAB	Aqueous	-02A	PLSTL	TDS
						-02B	PLSTS	EPA 300.1 (Cl,NO3)
						-02D	C500Z	Alkalinity
Field Comments: E = Unable to locate 1'-04								
Field Instructions:								

Total Containers for: C038385	6

	Signature	Print Name	Time	Date
Relinquished by:		Joel Flores	11:00	8/27/25
Received by:		Khalid Rahi	11:00	8/27/25
Relinquished by:		Khalid Rahi	13:45	8/27/25
Received by:				
Relinquished by:				
Received by:	Robert Melling	Robert Melling	14:15	08/27/2025

Container Legend:

C500Z = Glass, NM, septa top, Clear, 500 mL

PLSTL = Plastic, WM, 1000 mL

PLSTS = Plastic, NM, 125 mL

Page 1 of 1 for C038385

Laboratory Services Division
ELAP#1060

East Bay Municipal Utility District
2020 Wake Ave, Oakland, CA 94623 T: 510-287-1432

Molina, Robert

From: Flores, Joel
Sent: Wednesday, August 27, 2025 2:46 PM
To: Molina, Robert
Subject: RE: Elevation at Trout and Beaver ponds

Hello Robert, I did indeed make those last minute. 1'-0" is the level at both ponds. My apologies. Thx joel

From: Molina, Robert <robert.molina@ebmud.com>
Sent: Wednesday, August 27, 2025 2:13 PM
To: Flores, Joel <joel.flores@ebmud.com>
Subject: Elevation at Trout and Beaver ponds

Hi Joel,

Could you please let me know what is recorded for elevation below? Also, please be reminded that line-through corrections should be accompanied by your initials and the date the correction was made. Please confirm you made the corrections, or if someone else made the corrections, please reply to all and include them so they can confirm. Thank you!

East Bay Municipal Utility District Laboratory Services Division Chain of Custody Record

EBMUD

COC #: C038385
Project Title: Camanche South Shore - Wastewater
TAT: Standard
Client PM: Justin Nickell
Lab PM: Kristi Schwab
Job #:
Expect Date: 08/27/2025
Sampled By: J. Flores
☒ Samples transported on ice

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required
8/27/25	1030	CAMANCHE SOUTH SHORE - TROUT POND	C038385-01	GRAB	Aqueous			+SAMP KIT
						-01A	PLSTL	TDS
						-01B	PLSTS	EPA 300.1 (Cl,NO3)
						-01D	C500Z	Alkalinity
Field Comments: E = Unable to locate 1'-0"								
Field Instructions:								
8/27/25	1035	CAMANCHE SOUTH SHORE - BEAVER POND	C038385-02	GRAB	Aqueous	-02A	PLSTL	TDS
						-02B	PLSTS	EPA 300.1 (Cl,NO3)
						-02D	C500Z	Alkalinity
Field Comments: E = Unable to locate 1'-0"								
Field Instructions:								

Total Containers for: C038385: 6

	Signature	Print Name	Time	Date
Relinquished by:		Joel Flor	11:00	8/27/25
Received by:		Khalid Rahi	11:00	8/27/25
Relinquished by:		Khalid Rahi	13:45	8/27/25
Received by:				
Relinquished by:				

Container Legend:
C500Z = Glass, NM, septa top, Clear, 500 mL
PLSTL = Plastic, WM, 1000 mL
PLSTS = Plastic, NM, 125 mL

Robert Molina | Chemist
East Bay Municipal Utility District

East Bay Municipal Utility District Laboratory Services Division Chain of Custody Record

COC #: C038385	Project Title: Camanche South Shore - Wastewater TAT: Standard	Client PM: Justin Nickell Lab PM: Kristi Schwab Job #:	Received Date/Time: 08/27/2025 14:15 Received By: Robert Molina Sampled By: J. Flores Due Date: 09/25/2025

Date	Time	Site/Locator	Sample ID	Type	Matrix	ID	Type	Tests Required
08/27/2025	10:30	CAMANCHE SOUTH SHORE - TROUT POND	C038385-01	GRAB	Aqueous			+SAMP KIT
						-01A	PLSTL	TDS
						-01B	PLSTS	EPA 300.1 (Cl,NO3)
						-01D	C500Z	Alkalinity
Field Comments: E = 1' 0"								
Field Instructions:								
Sample External Comments:								
08/27/2025	10:35	CAMANCHE SOUTH SHORE - BEAVER POND	C038385-02	GRAB	Aqueous	-02A	PLSTL	TDS
						-02B	PLSTS	EPA 300.1 (Cl,NO3)
						-02D	C500Z	Alkalinity
Field Comments: E = 1' 0"								
Field Instructions:								
Sample External Comments:								

Total Containers for: C038385	6

Page 1 of 4 for C038385

C038385 Sample Acceptance Report

Received: 08/27/2025 14:15
Received By: Robert Molina

Chain-of-Custody		Comments
Chilled During Transport?	Yes	
Missing or incorrect information	Yes	Line-through correction missing date and initials
Mode of receipt	Person-to-Person	
Shipping Slip?	No	

Containers		Comments
BACT lot number(s)	Add lot no	
Container and label are legible and match COC?	Yes	
Correct container used with field preservation?	Yes	
Received within holding times?	Yes	
Sufficient volume, undamaged, or uncontaminated?	Yes	

Sample: C038385-01		Comments
Bubbles in ZHS/VOA containers	No	

Sample: C038385-02		Comments
Bubbles in ZHS/VOA containers	No	

Intent to chill

Cooler: 1		Comments
Corrected Temp (° C)	1	
IR Thermometer Number	IR #18	
Representative temperature taken from	-01	
Uncorrected Temp (° C)	0.7	
Visible ice formed inside sample container?	No	

C038385 Sample Acceptance Report

Received: 08/27/2025 14:15
Received By: Robert Molina

Acceptance		Comments
PM notified?	N/A	
Samples meet acceptance requirements?	Yes	

Sample Acceptance Preservation Report

COC: C038385

Report Generated: 08/27/2025 14:20

No preservation upon sample receipt required for this sampling event

Appendix D – Mann-Kendall Analysis (Tier 1b)

For analytes consistently found at detectable levels, the Tier 1b analysis entails an intrawell analysis of current and historical data for a compliance well to determine whether analyte concentrations show a significant increasing or decreasing trend over time.

The intrawell analysis is performed using the Mann-Kendall test, which is a nonparametric, hypothesis testing procedure used to identify trends in time-series data. The null hypothesis generally evaluated with the Mann-Kendall test is that the evaluated data does not tend to increase or decrease (a monotonic change) with time.

A statistical program is used to perform the Mann-Kendall test, which entails calculating a Mann-Kendall "S" statistic from data pairs (analyte concentrations and sample dates). A positive value of "S" indicates an increasing trend, while a negative value of "S" indicates a decreasing trend. A two-tailed p-value is also calculated as part of the test and can be compared with a desired significance level (α) to determine the significance of the test results. A significance level of 0.05 has been chosen for this evaluation, equating to a confidence level of 95 percent.

The null hypothesis may be stated as follows:

"At a 95 percent confidence level, <u>there is no trend</u> in [analyte] concentrations in Well [well number]."

The alternative hypothesis is:

"At a 95 percent confidence level, <u>there is a trend</u> in the [analyte] concentrations in Well [well number] over time."

Mann-Kendall test results with a p-value below 0.05 will thus be considered significant, and the alternative hypothesis accepted. For these results, the "S" value will then be reviewed to determine the direction of the trend.

The analysis entails evaluation of data for the current monitoring event and previous 11 monitoring events (as available). A minimum of eight data points is needed for a meaningful result of the Mann-Kendall test. However, use of additional data for this test would: (1) potentially mask recent trends in the data, and (2) not reflect current groundwater conditions. Since not all monitoring events have data for each analyte, twelve monitoring events are used to ensure that at least eight data points are included in the analysis.

MW-11 (BACKGROUND MONITORING WELL)

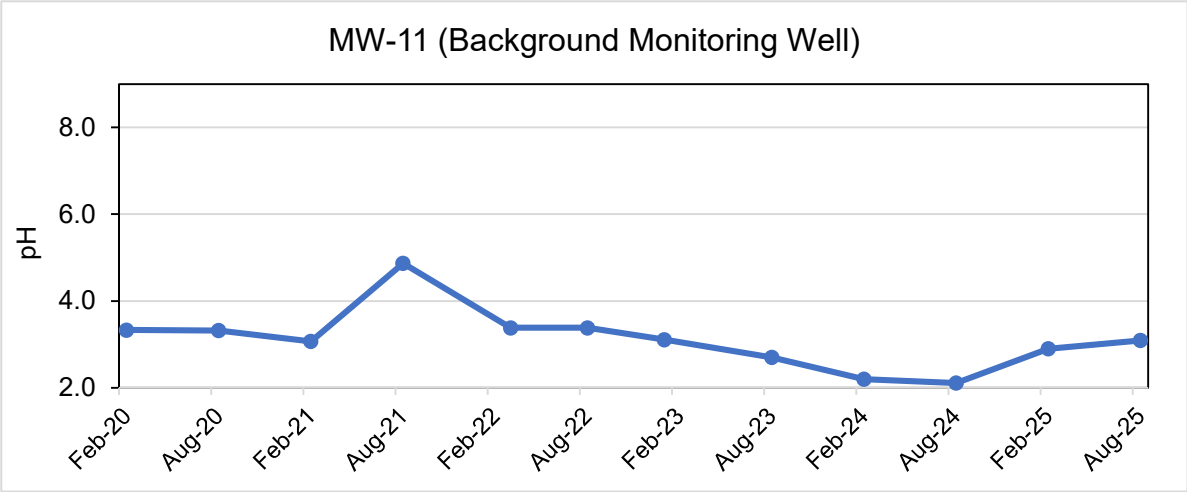
MW-11 Summary Statistics

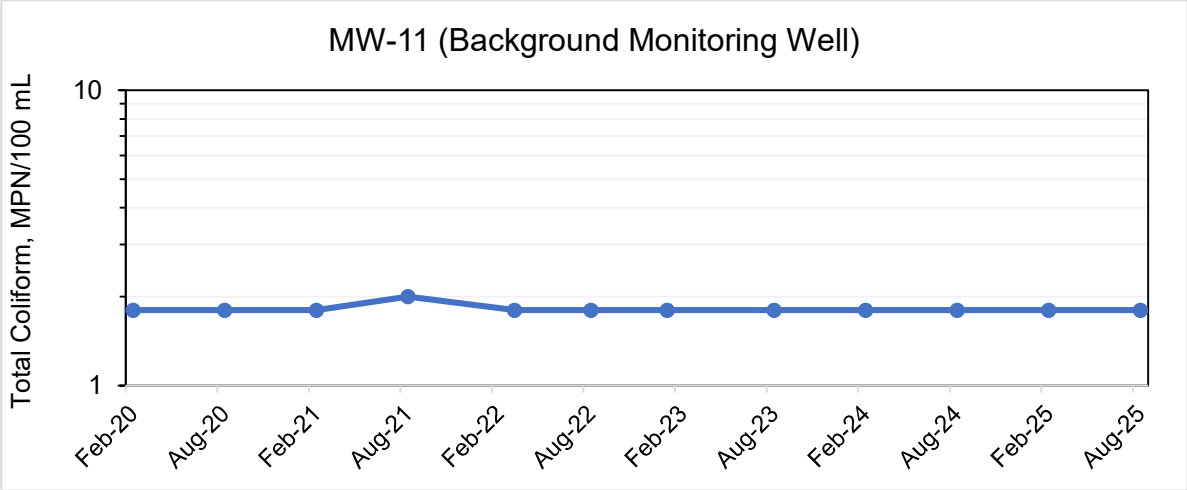
Variable	Observations	Min	Max	Mean	Std. deviation
Semi-Annual Analytes					
pH	12	2.11	4.87	3.12	0.70
Total Coliform, MPN/100 mL	12	<1.8	2	ND	-
Chloride, mg/L	12	9.6	21	15.1	3.21
Sodium, mg/L	12	25	82.9	46.4	19.7
TDS, mg/L	12	820	11,000	4,093	3,142
Nitrate as N, mg/L	12	J 0.011	0.23	ND	-
Annual Analytes					
Iron, mg/L	12	15.9	1,450	439	529
Manganese, µg/L	12	593	30,000	8,459	9,654

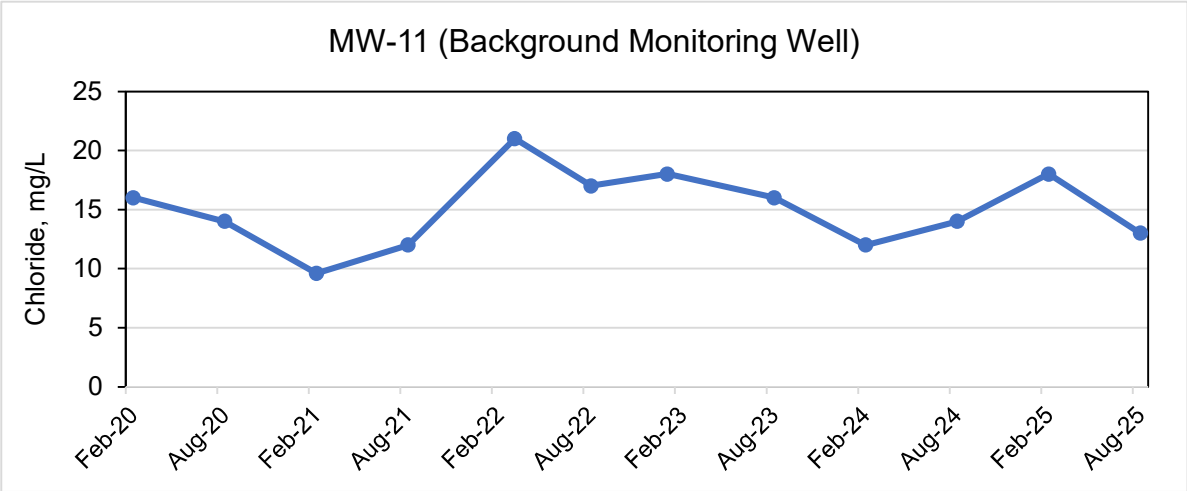
MW-11 Mann-Kendall and Sen's Slope Test Results

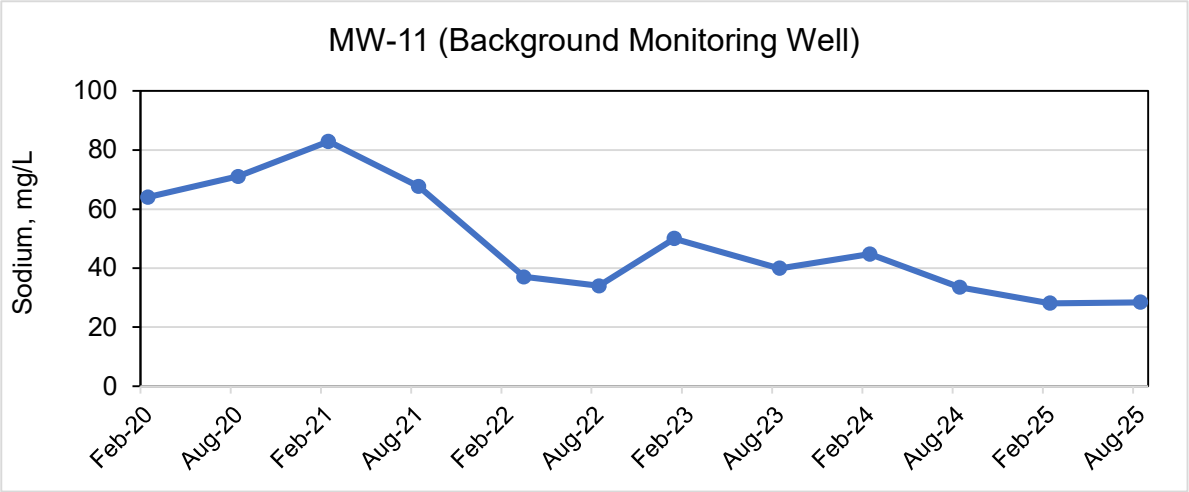
Analyte	p-value[a]	Trend	z-Stat	Sen's Slope	Trend direction
Semi-Annual Analytes					
pH	0.054	no	-1.925	-0.085	
Total Coliform	-	-	-	-	N/A
Chloride	0.945	no	0.069	0.000	
Sodium	**0.016**	yes	-2.400	-4.11	Downward
TDS	0.732	no	0.343	93.8	
Nitrate as N	-	-	-	-	N/A
Annual Analytes					
Iron	**0.003**	yes	2.949	75.45	Upward
Manganese	0.086	no	1.714	914.0	

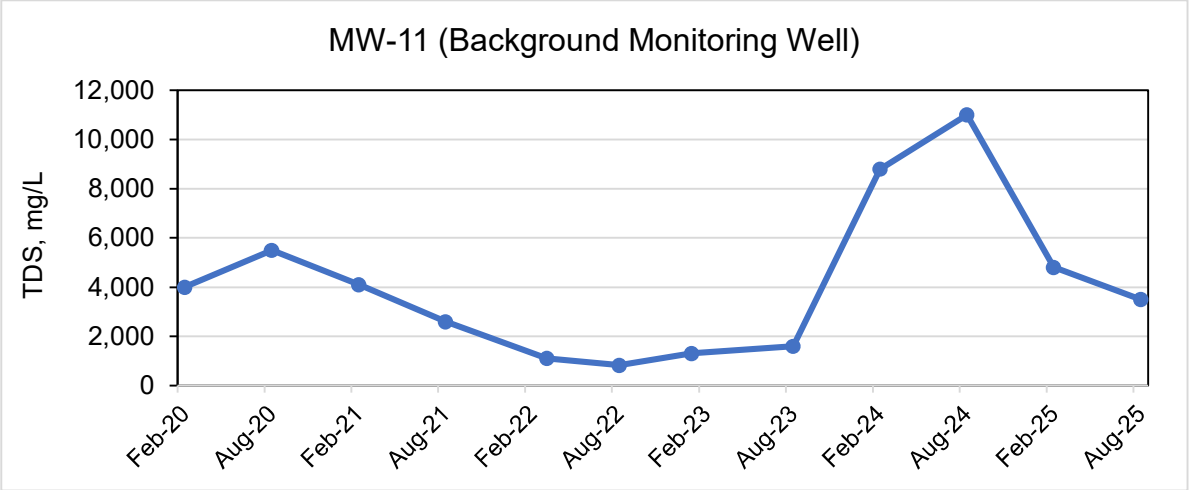
[a] p-values below 0.05 are bold to indicate that a trend in the series may be present.

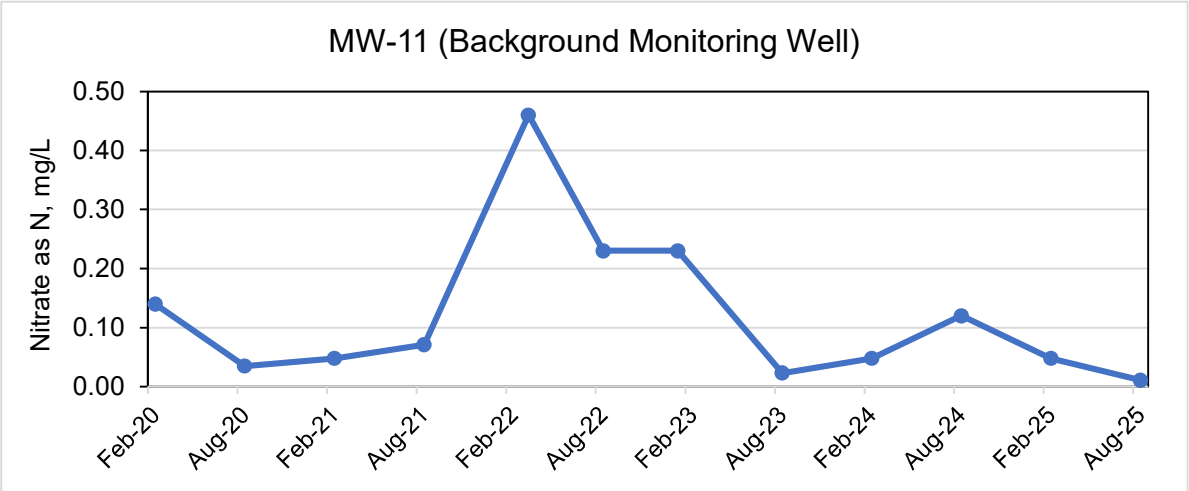

MW-11 (Background Monitoring Well)
pH
8.0
6.0
4.0
2.0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25

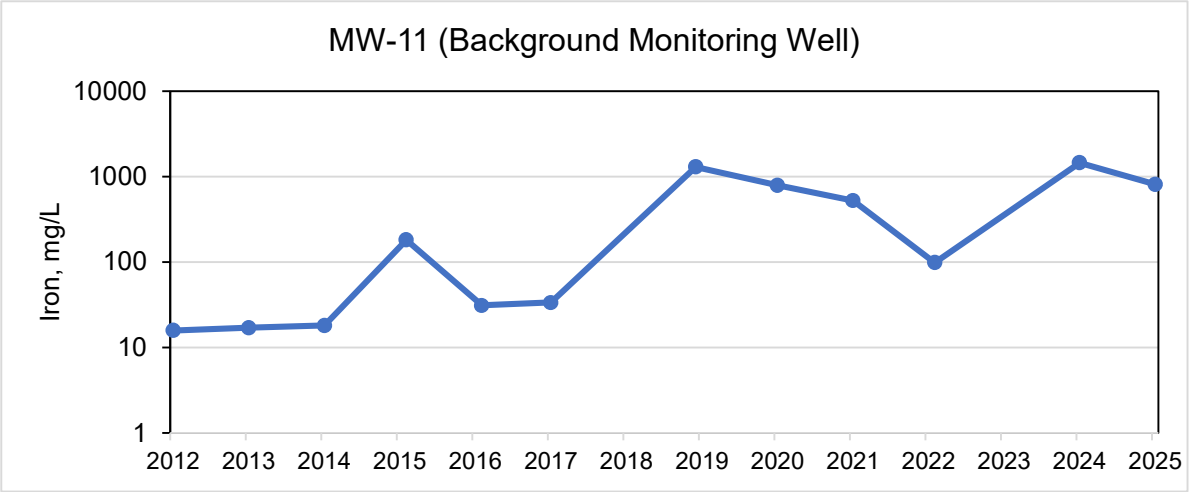

MW-11 (Background Monitoring Well)
Total Coliform, MPN/100 mL
10
1
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25

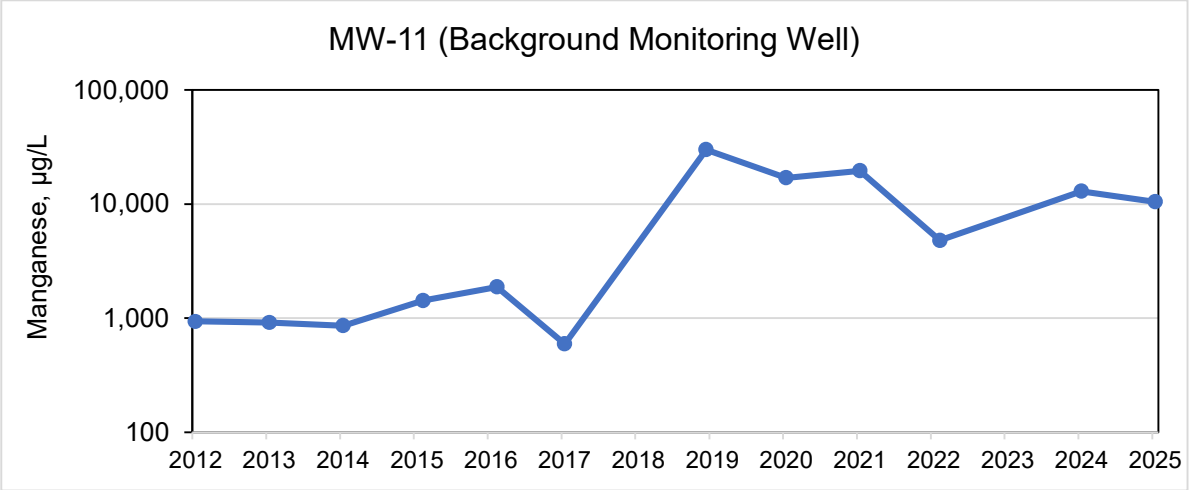

MW-11 (Background Monitoring Well)
Chloride, mg/L
25
20
15
10
5
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-11 (Background Monitoring Well)
Sodium, mg/L
100
80
60
40
20
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-11 (Background Monitoring Well)
TDS, mg/L
12,000
10,000
8,000
6,000
4,000
2,000
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-11 (Background Monitoring Well)
Nitrate as N, mg/L
0.50
0.40
0.30
0.20
0.10
0.00
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-11 (Background Monitoring Well)
Iron, mg/L
10000
1000
100
10
1
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025


MW-11 (Background Monitoring Well)
Manganese, µg/L
100,000
10,000
1,000
100
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025

MW-5 (COMPLIANCE MONITORING WELL)

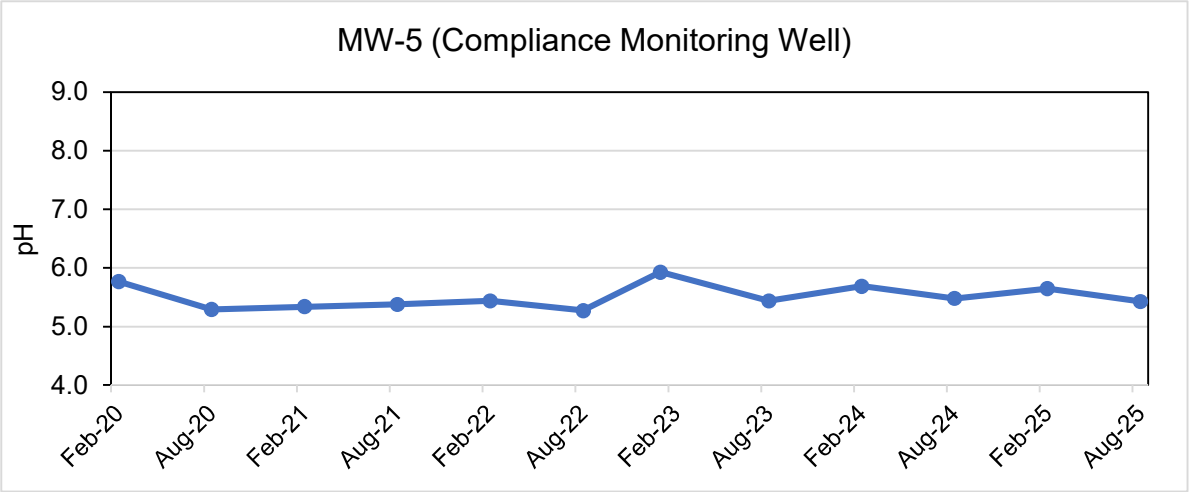
MW-5 Summary Statistics

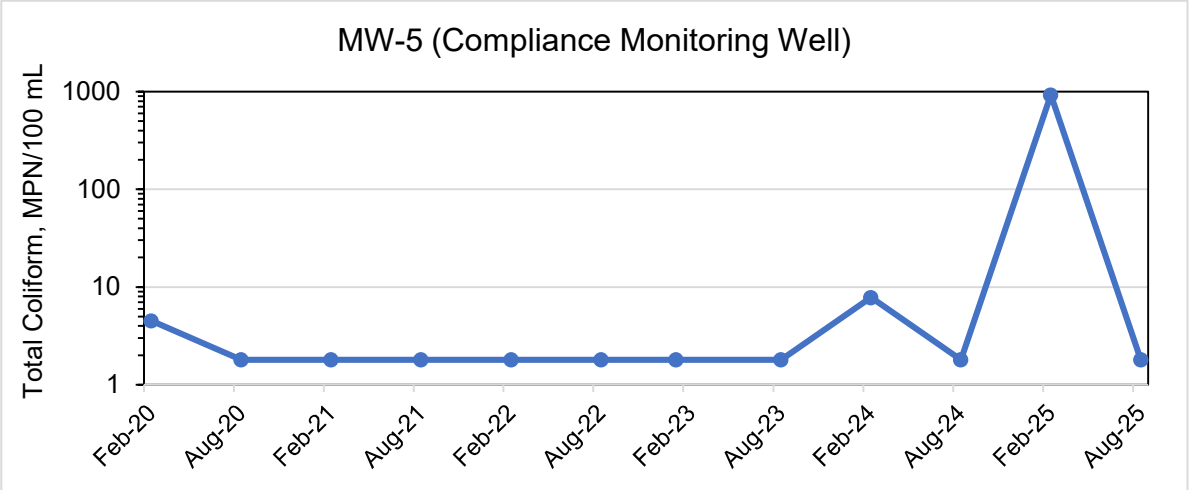
Variable	Observations	Min	Max	Mean	Std. deviation
Semi-Annual Analytes					
pH	12	5.27	5.93	5.51	0.21
Total Coliform, MPN/100 mL	12	<1.8	920	ND	-
Chloride, mg/L	12	200	310	236	28
Sodium, mg/L	12	62.6	360	94.8	83.7
TDS, mg/L	12	560	960	662	106
Nitrate as N, mg/L	12	<0.12	2.0	1.03	0.73
Annual Analytes					
Iron, mg/L	12	0.47	4.19	2.19	1.30
Manganese, µg/L	12	77.3	1,300	263	350

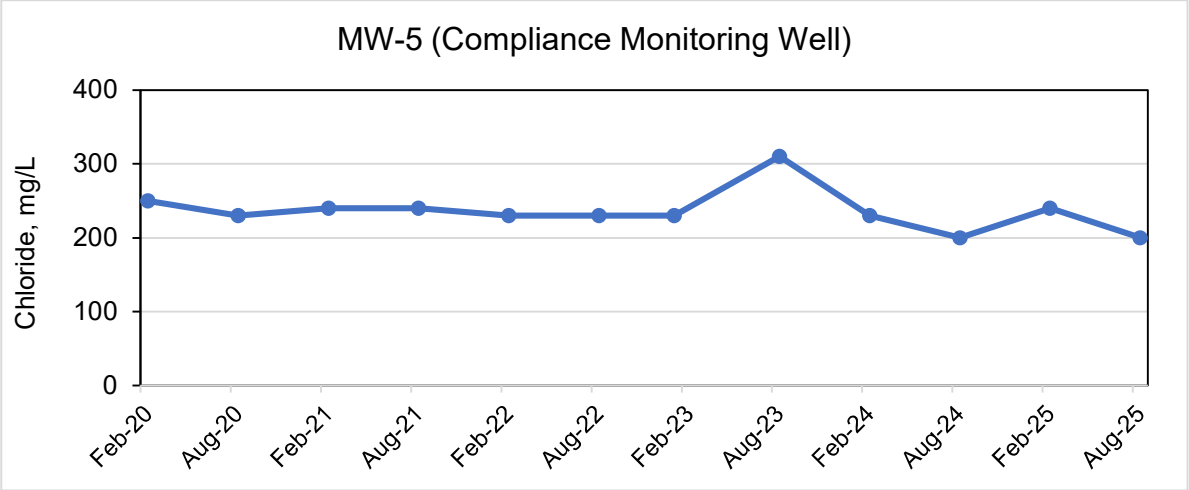
MW-5 Mann-Kendall and Sen's Slope Test Results

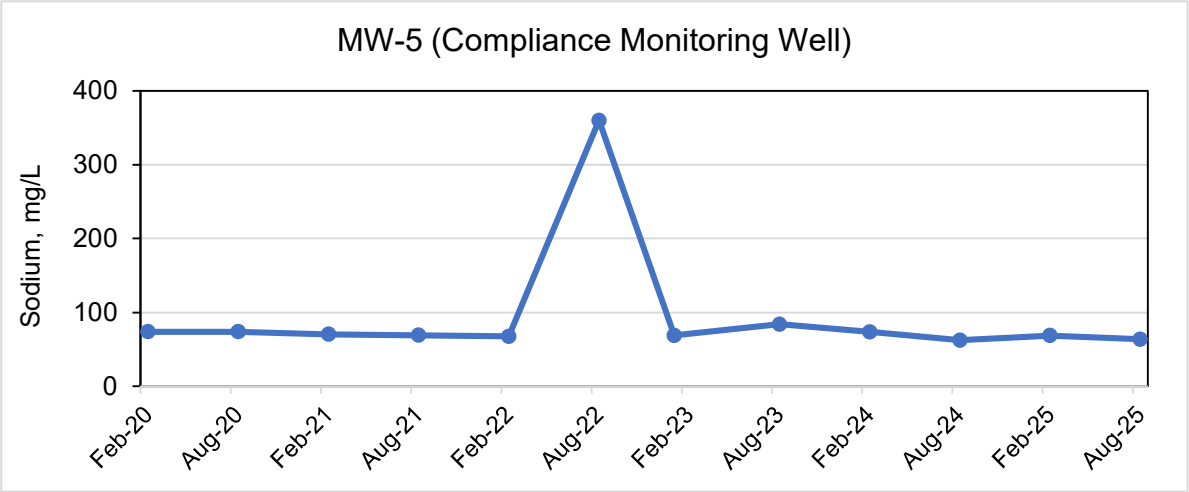
Analyte	p-value[a]	Trend	z-stat	Sen's Slope	Trend direction
Semi-Annual Analytes					
pH	0.409	no	0.825	0.018	
Total Coliform	-	-	-	-	N/A
Chloride	0.129	no	-1.518	-2.50	
Sodium	0.074	no	-1.787	-0.88	
TDS	0.833	no	0.211	0.000	
Nitrate as N	0.009	yes	-2.612	-0.176	Downward
Annual Analytes					
Iron	0.631	no	0.480	0.06	
Manganese	0.054	no	1.925	26.3	

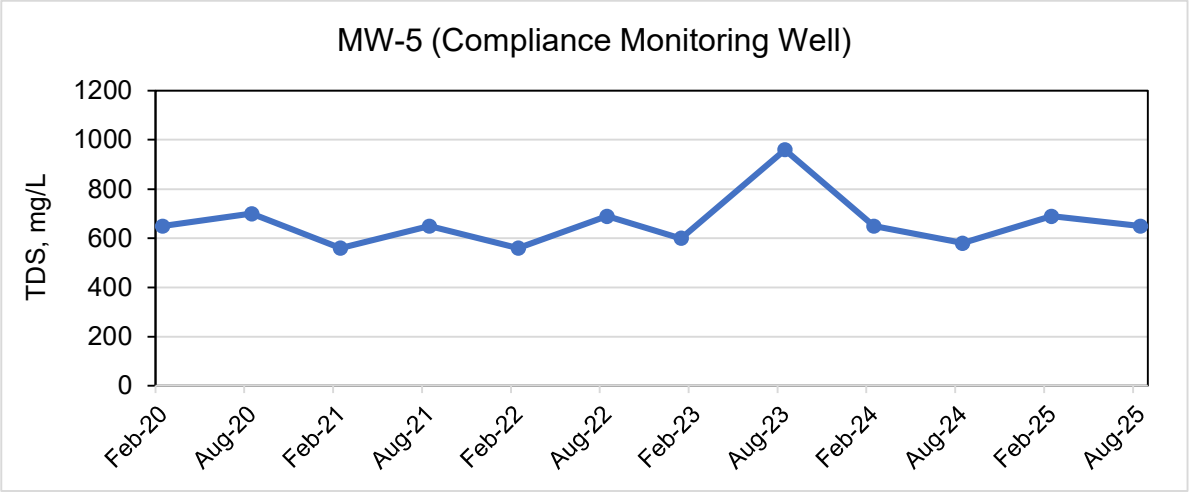
[a] p-values below 0.05 are bold to indicate that a trend in the series may be present.

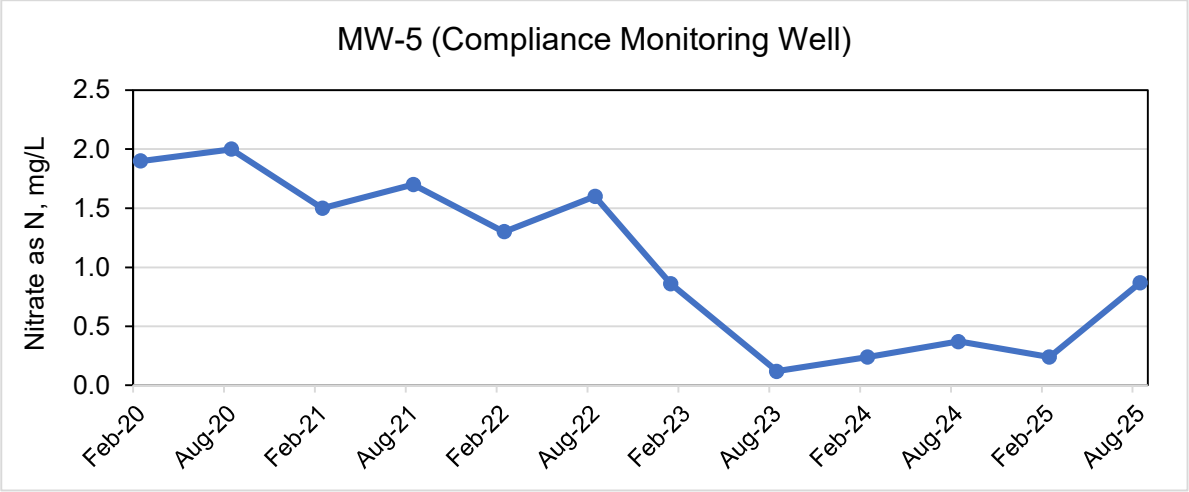

MW-5 (Compliance Monitoring Well)
pH
9.0
8.0
7.0
6.0
5.0
4.0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-5 (Compliance Monitoring Well)
Total Coliform, MPN/100 mL
1000
100
10
1
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-5 (Compliance Monitoring Well)
Chloride, mg/L
400
300
200
100
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-5 (Compliance Monitoring Well)
Sodium, mg/L
400
300
200
100
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-5 (Compliance Monitoring Well)
TDS, mg/L
1200
1000
800
600
400
200
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-5 (Compliance Monitoring Well)
Nitrate as N, mg/L
2.5
2.0
1.5
1.0
0.5
0.0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
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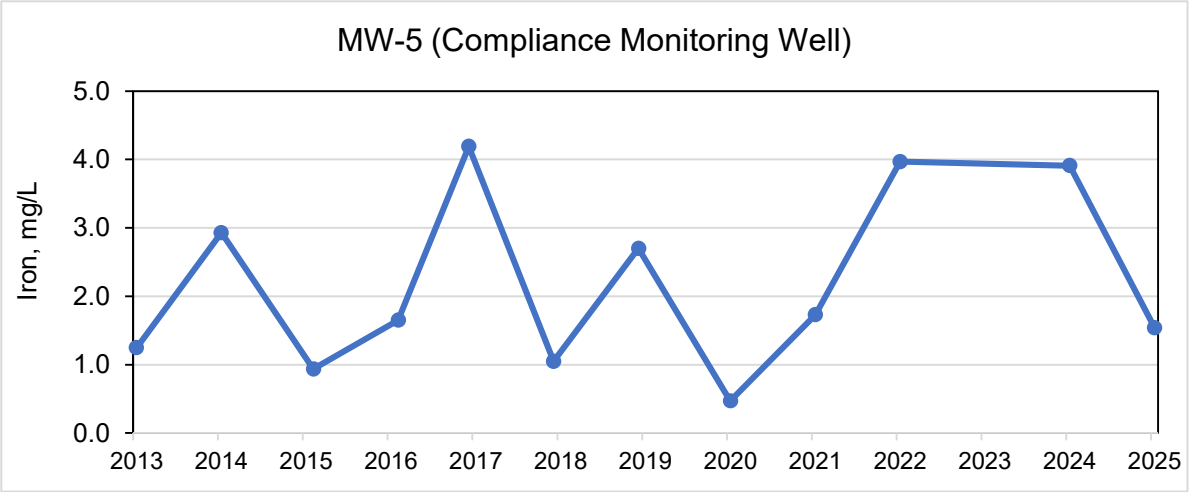
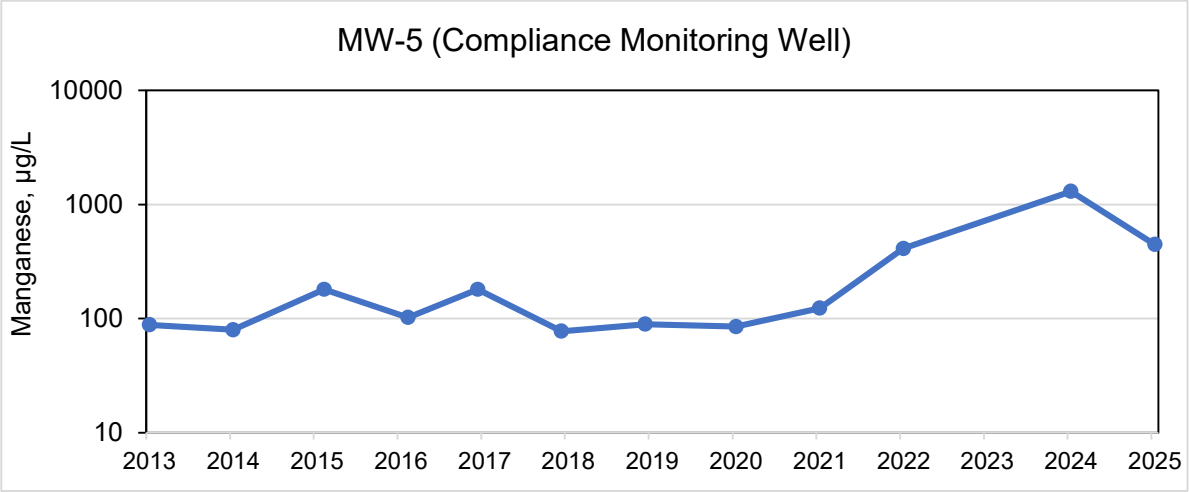
Feb-24
Aug-24
Feb-25
Aug-25


MW-5 (Compliance Monitoring Well)
Iron, mg/L
5.0
4.0
3.0
2.0
1.0
0.0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025


MW-5 (Compliance Monitoring Well)
Manganese, µg/L
10000
1000
100
10
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025

MW-6 (COMPLIANCE MONITORING WELL)

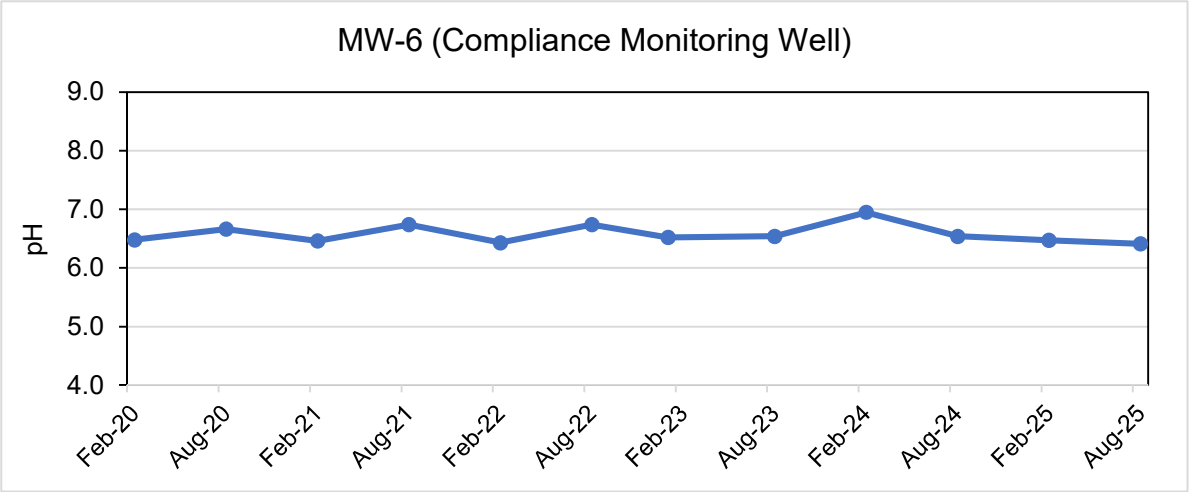
MW-6 Summary Statistics

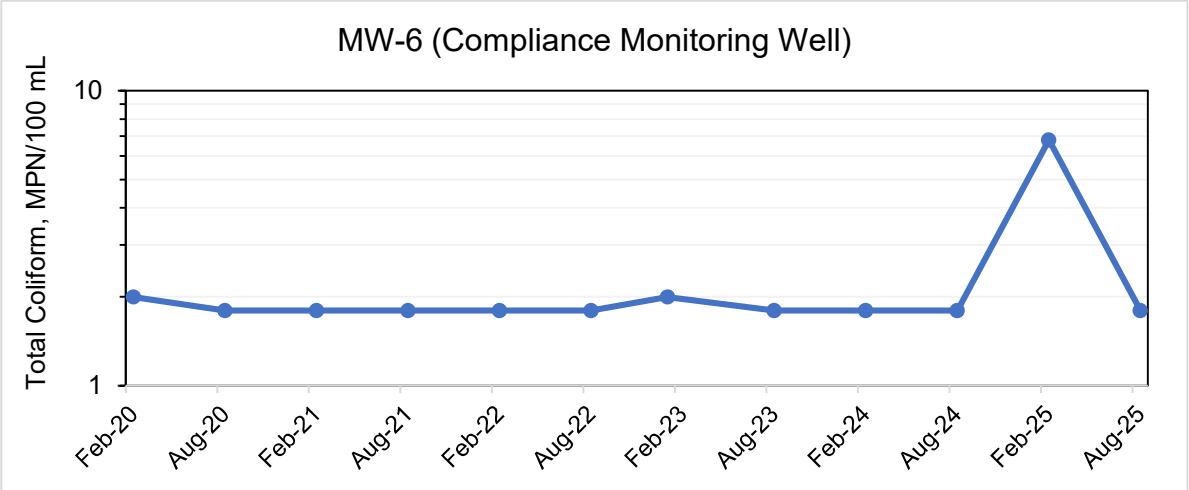
Variable	Observations	Min	Max	Mean	Std. deviation
Semi-Annual Analytes					
pH	12	6.41	6.95	6.58	0.16
Total Coliform, MPN/100 mL	12	<1.8	6.8	ND	-
Chloride, mg/L	12	43	260	115	81
Sodium, mg/L	12	36.1	210	113	66
TDS, mg/L	12	240	980	535	319
Nitrate as N, mg/L	12	<0.0048	0.76	ND	-
Annual Analytes					
Iron, mg/L	12	7.57	35.4	19.8	9.9
Manganese, µg/L	12	559	2,300	1,243	540

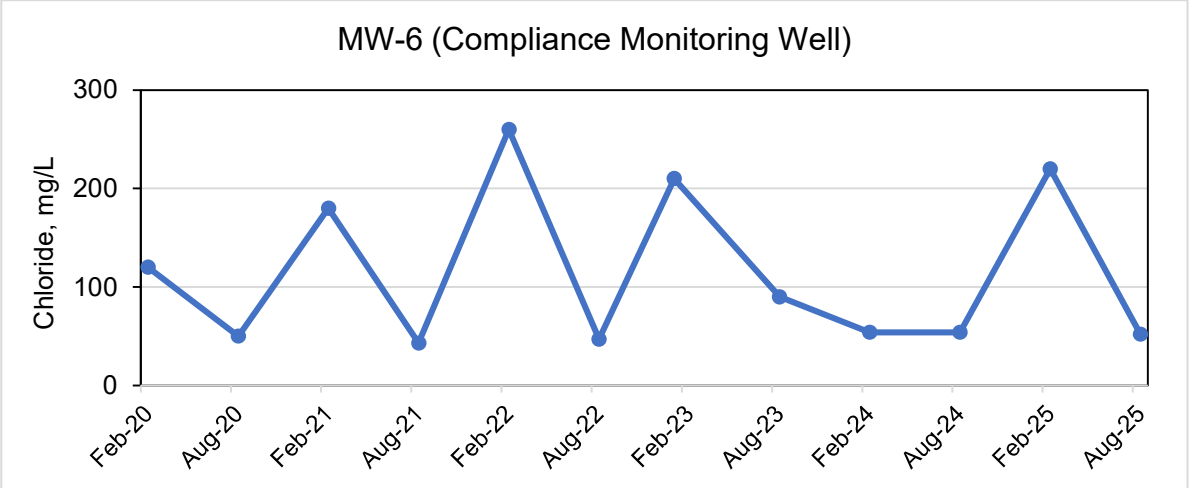
MW-6 Mann-Kendall and Sen's Slope Test Results

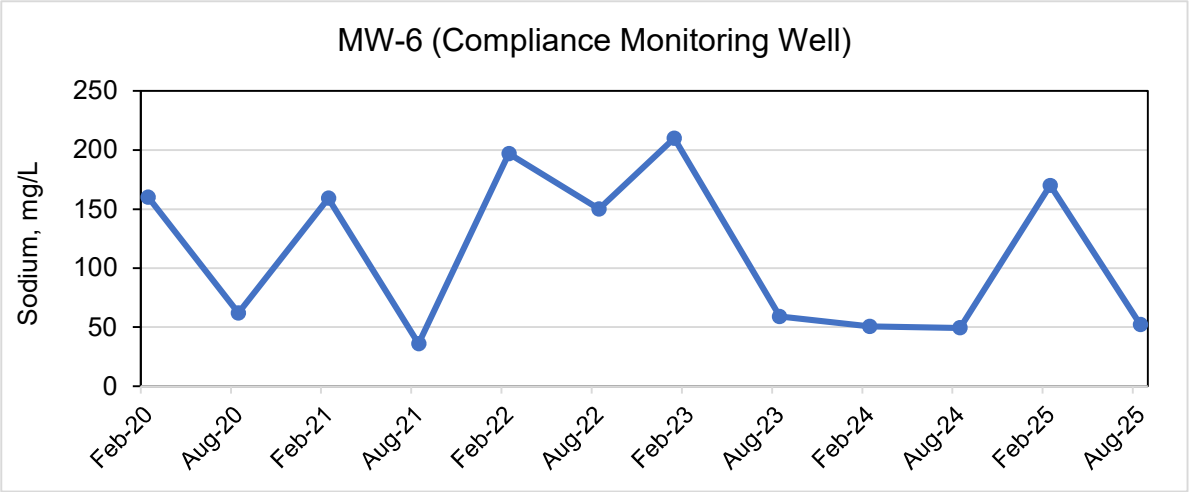
Analyte	p-value[a]	Trend	z-stat	Sen's Slope	Trend direction
Semi-Annual Analytes					
pH	0.730	no	-0.344	-0.004	
Total Coliform	-	-	-	-	N/A
Chloride	1.000	no	0.000	0.100	
Sodium	0.451	no	-0.754	-1.66	
TDS	1.000	no	0.000	0.000	
Nitrate as N	-	-	-	-	N/A
Annual Analytes					
Iron	0.837	no	-0.206	-0.53	
Manganese	0.945	no	0.069	1.9	

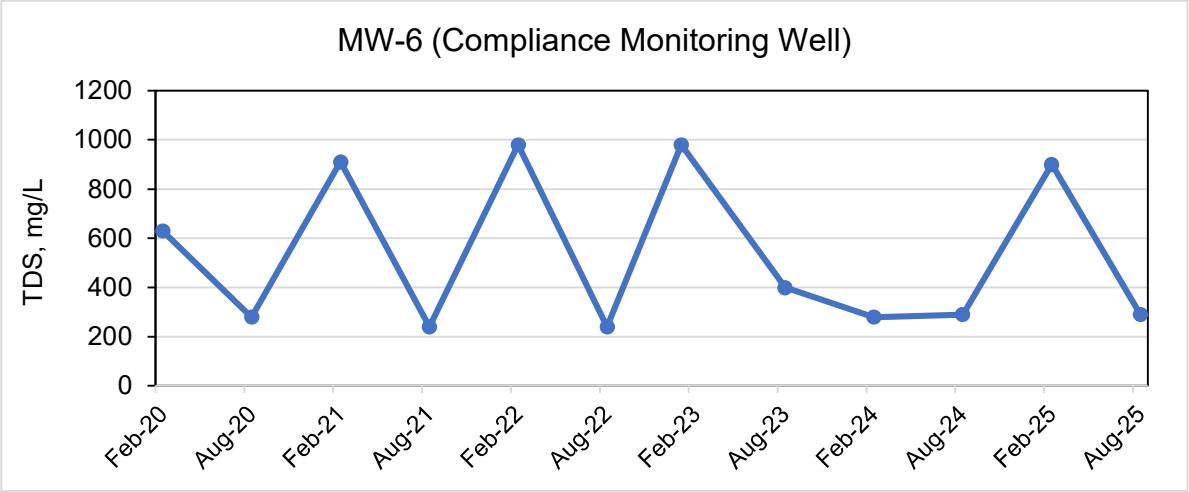
[a] p-values below 0.05 are bold to indicate that a trend in the series may be present.

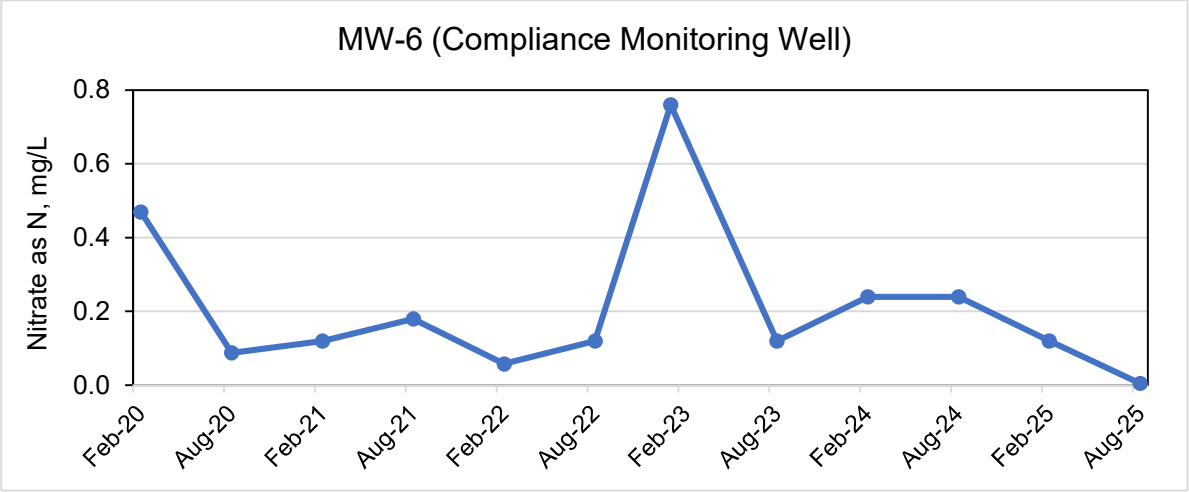

MW-6 (Compliance Monitoring Well)
pH
9.0
8.0
7.0
6.0
5.0
4.0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25

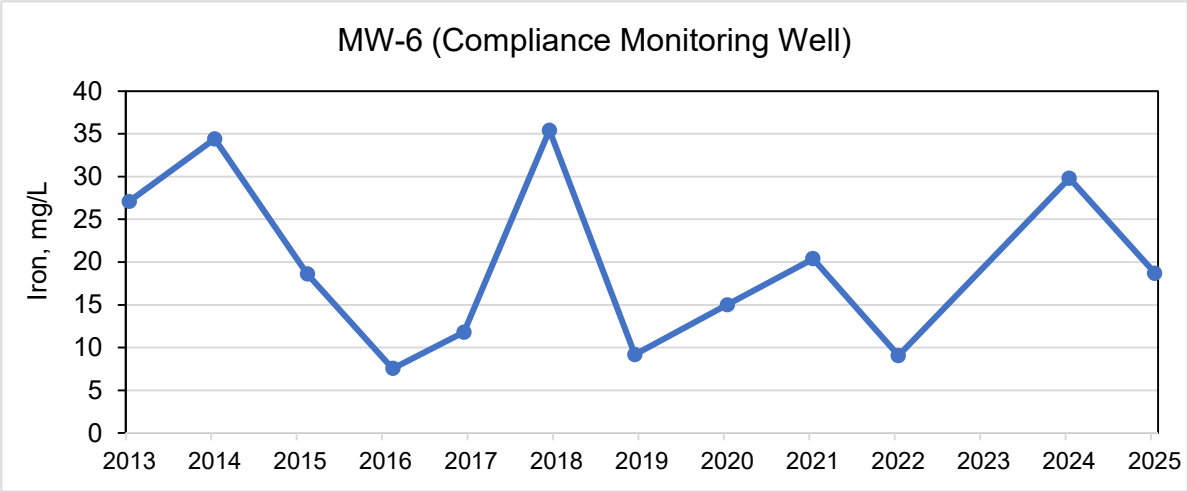

MW-6 (Compliance Monitoring Well)
Total Coliform, MPN/100 mL
10
1
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25

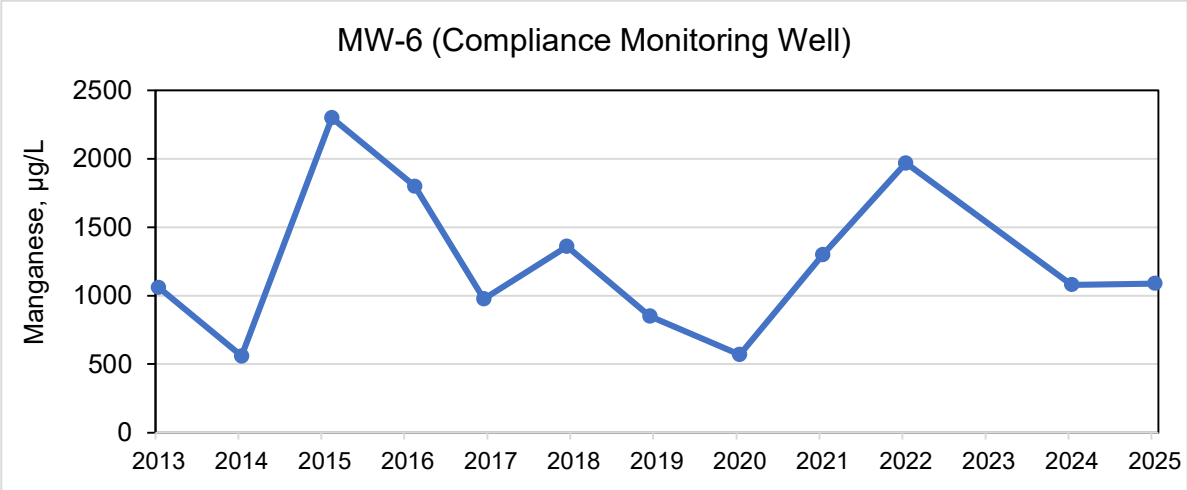

MW-6 (Compliance Monitoring Well)
Chloride, mg/L
300
200
100
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-6 (Compliance Monitoring Well)
Sodium, mg/L
250
200
150
100
50
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-6 (Compliance Monitoring Well)
TDS, mg/L
1200
1000
800
600
400
200
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-6 (Compliance Monitoring Well)
Nitrate as N, mg/L
0.8
0.6
0.4
0.2
0.0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-6 (Compliance Monitoring Well)
Iron, mg/L
40
35
30
25
20
15
10
5
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025


MW-6 (Compliance Monitoring Well)
Manganese, µg/L
2500
2000
1500
1000
500
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025

MW-7 (COMPLIANCE MONITORING WELL)

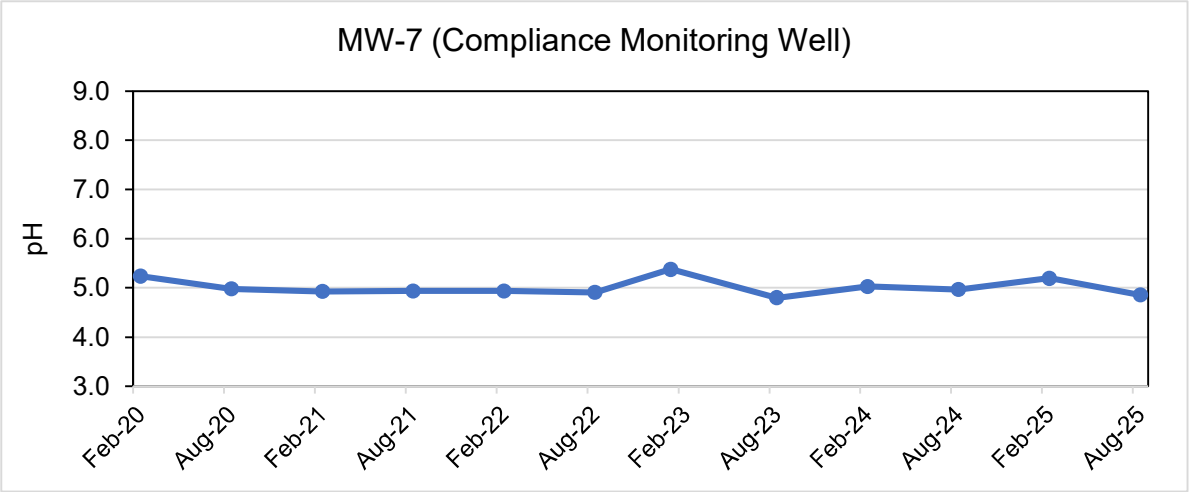
MW-7 Summary Statistics

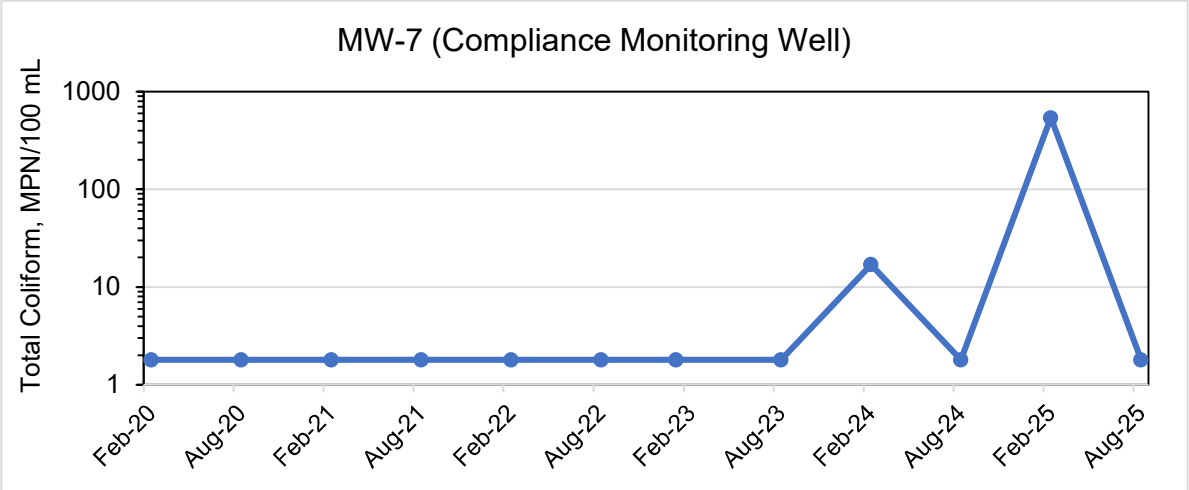
Variable	Observations	Min	Max	Mean	Std. deviation
Semi-Annual Analytes					
pH	12	4.8	5.38	5.02	0.17
Total Coliform, MPN/100 mL	12	<1.8	540	ND	-
Chloride, mg/L	12	16	35	24.2	7.04
Sodium, mg/L	12	16.5	82	23.6	18.5
TDS, mg/L	12	150	190	173	11
Nitrate as N, mg/L	12	0.29	0.87	0.56	0.17
Annual Analytes					
Iron, mg/L	12	0.072	1.4	0.39	0.37
Manganese, µg/L	12	136	1,500	620	333

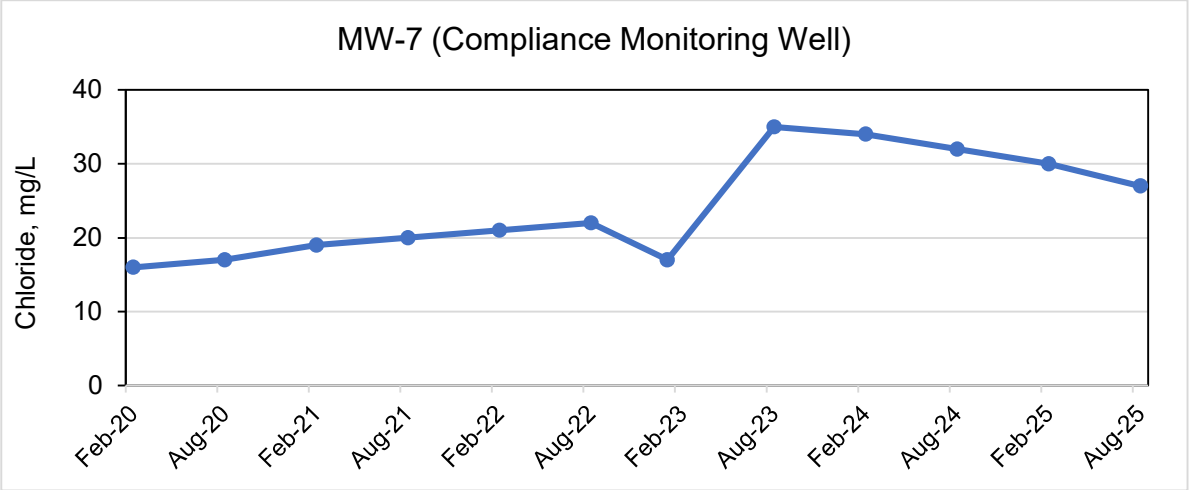
MW-7 Mann-Kendall and Sen's Slope Test Results

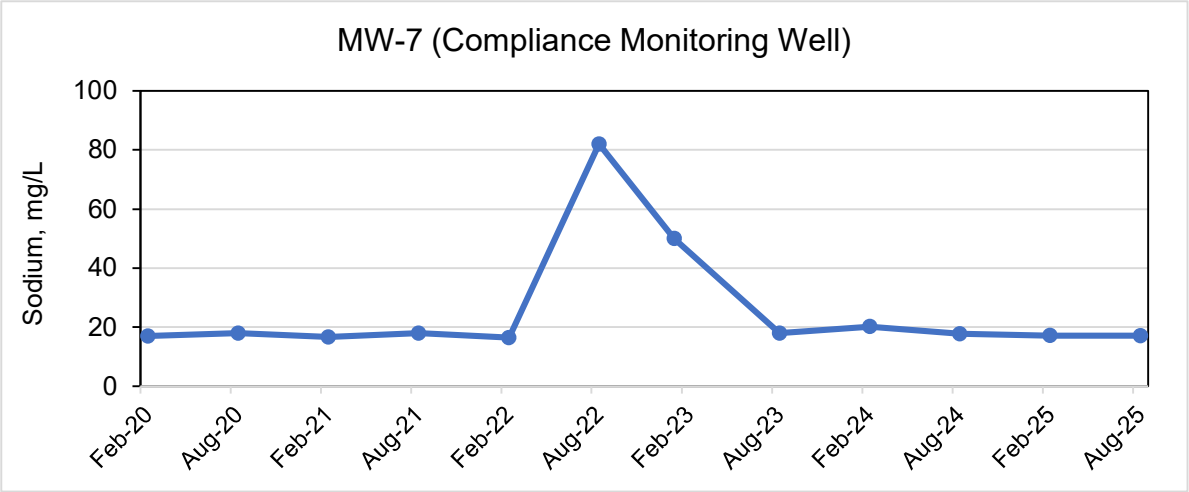
Analyte	p-value[a]	Trend	z-stat	Sen's Slope	Trend direction
Semi-Annual Analytes					
pH	0.582	no	-0.550	-0.0081	
Total Coliform	-	-	-	-	N/A
Chloride	**0.013**	yes	2.474	1.333	Upward
Sodium	1.000	no	0.000	0.000	
TDS	0.093	no	1.680	1.25	
Nitrate as N	**0.003**	yes	-2.95	-0.033	Downward
Annual Analytes					
Iron	0.451	no	-0.754	-0.01	
Manganese	0.150	no	1.440	26.2	

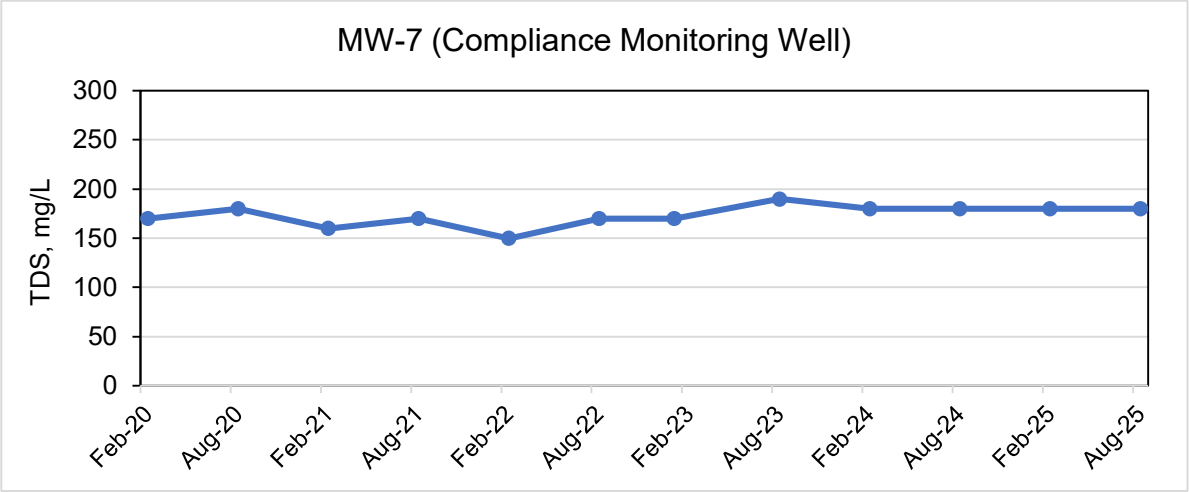
[a] p-values below 0.05 are bold to indicate that a trend in the series may be present.

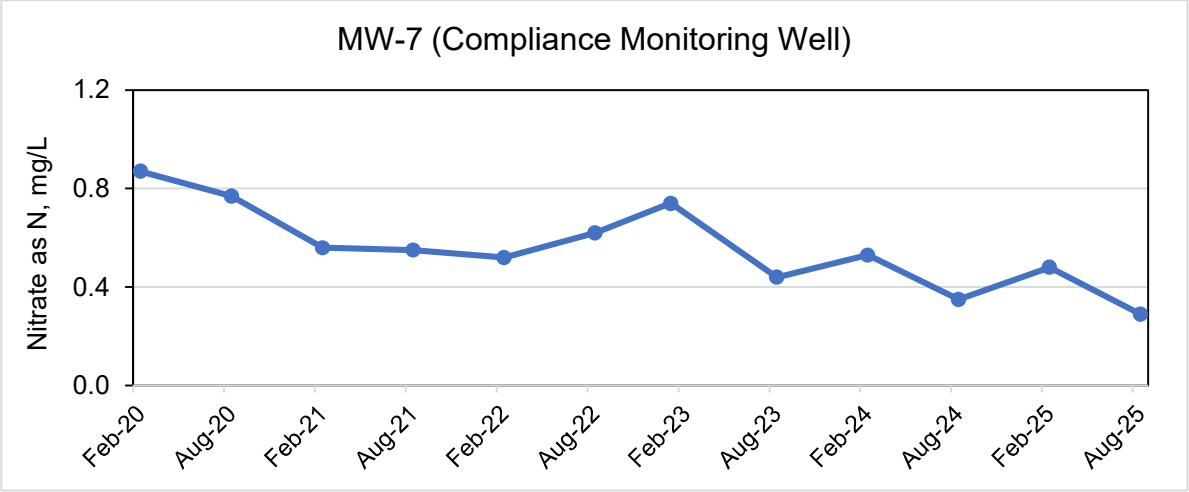

MW-7 (Compliance Monitoring Well)
pH
9.0
8.0
7.0
6.0
5.0
4.0
3.0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25

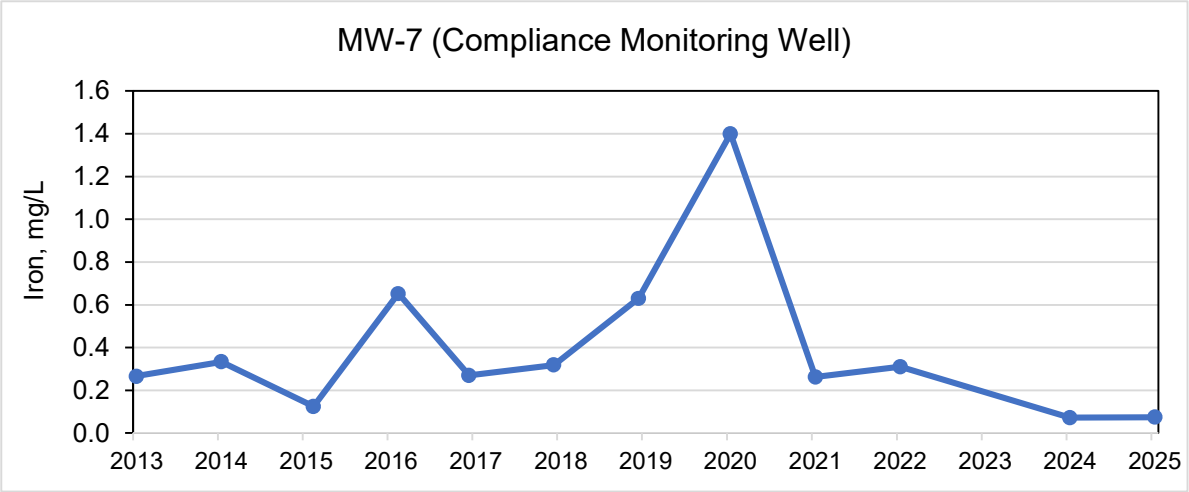

MW-7 (Compliance Monitoring Well)
Total Coliform, MPN/100 mL
1000
100
10
1
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25

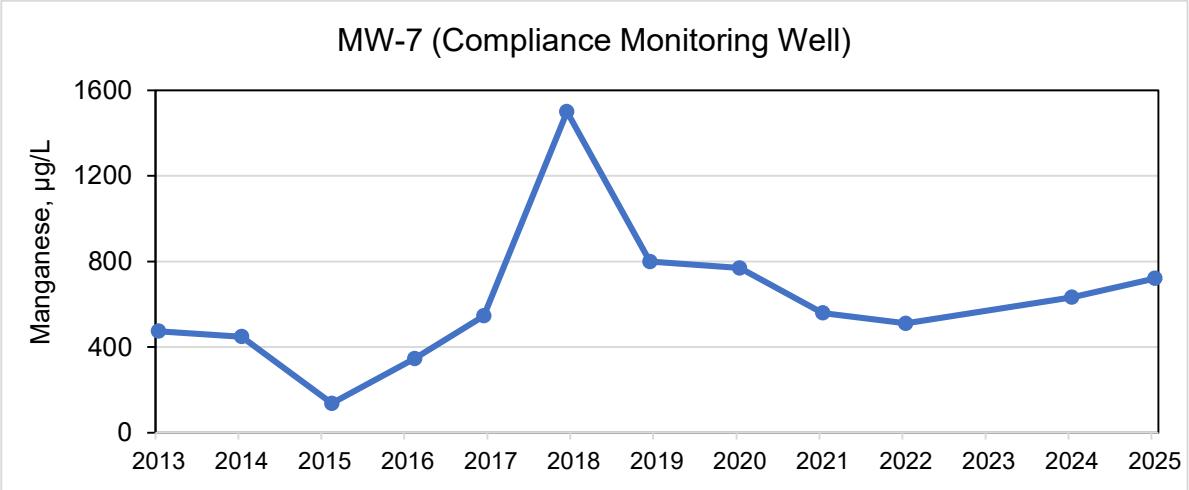

MW-7 (Compliance Monitoring Well)
Chloride, mg/L
40
30
20
10
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-7 (Compliance Monitoring Well)
Sodium, mg/L
100
80
60
40
20
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-7 (Compliance Monitoring Well)
TDS, mg/L
300
250
200
150
100
50
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-7 (Compliance Monitoring Well)
Nitrate as N, mg/L
1.2
0.8
0.4
0.0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-7 (Compliance Monitoring Well)
Iron, mg/L
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025


MW-7 (Compliance Monitoring Well)
Manganese, µg/L
1600
1200
800
400
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025

MW-8 (COMPLIANCE MONITORING WELL)

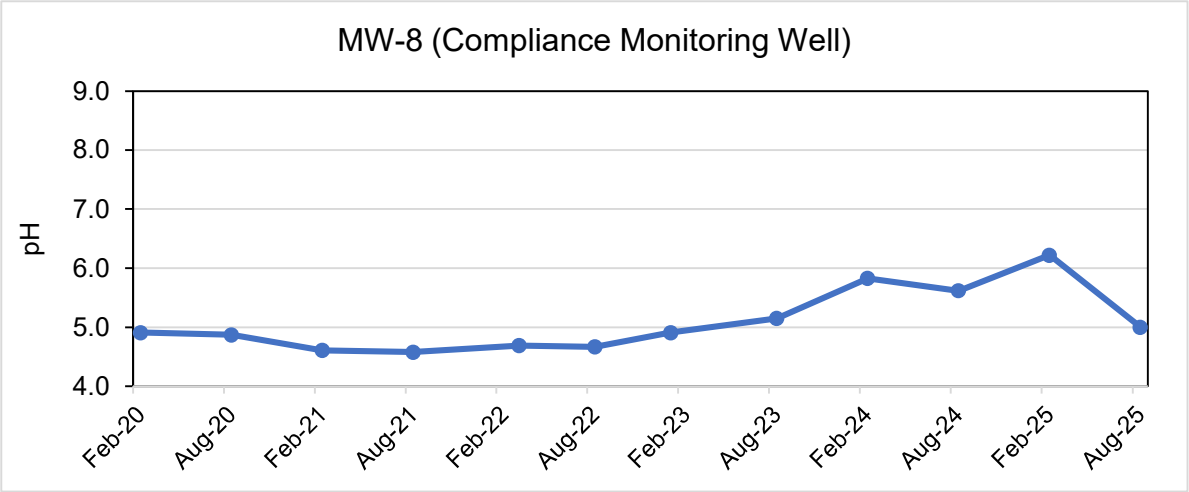
MW-8 Summary Statistics

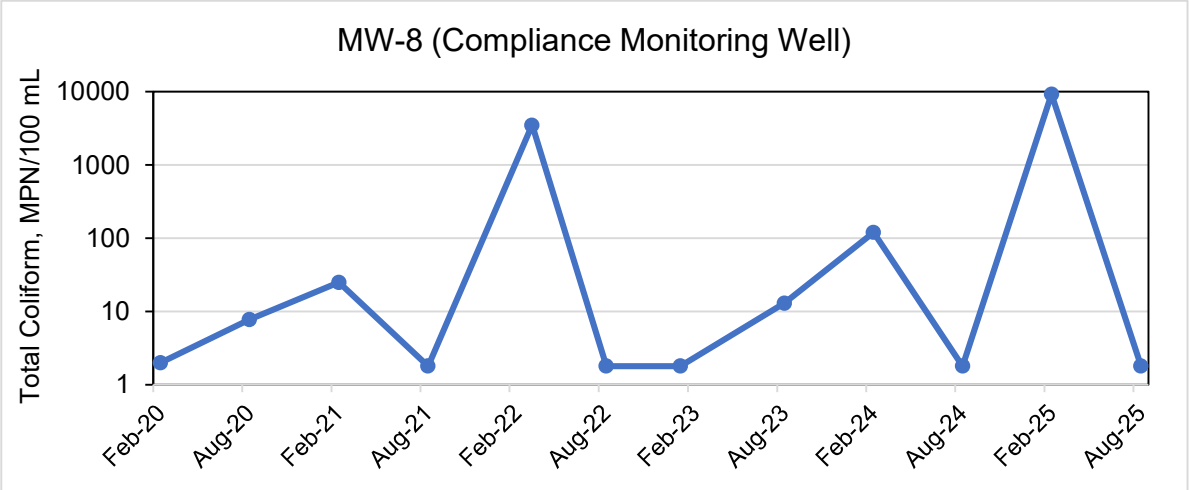
Variable	Observations	Min	Max	Mean	Std. deviation
Semi-Annual Analytes					
pH	12	4.58	6.22	5.09	0.53
Total Coliform, MPN/100 mL	12	<1.8	9,200	1,073	2,749
Chloride, mg/L	12	21	65	47.9	11.3
Sodium, mg/L	12	20	94	31.7	21.1
TDS, mg/L	12	190	250	218	15
Nitrate as N, mg/L	12	<0.048	3.2	1.98	1.28
Annual Analytes					
Iron, mg/L	12	0.97	18	5.4	4.8
Manganese, µg/L	12	260	1,220	506	286

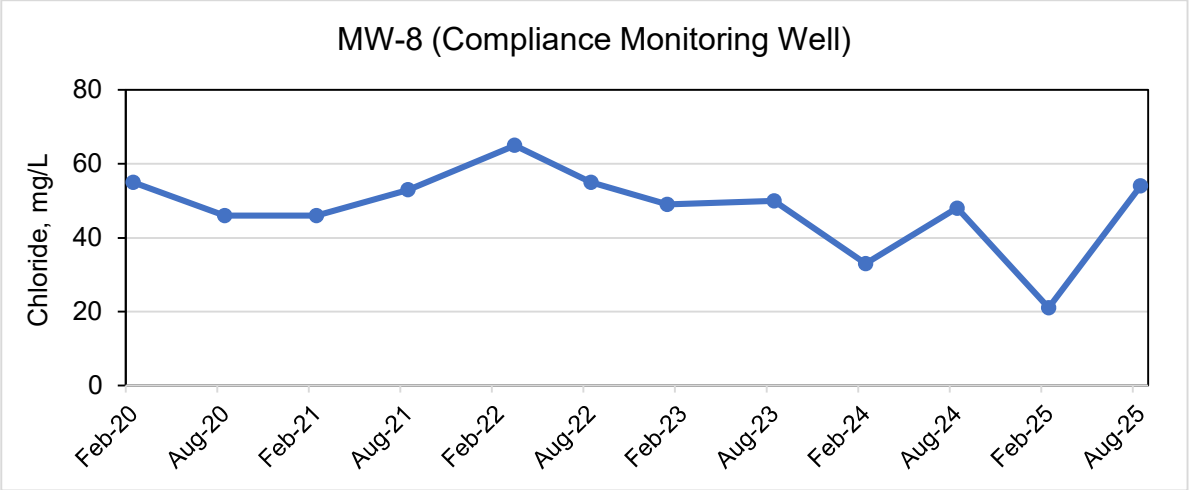
MW-8 Mann-Kendall and Sen's Slope Test Results

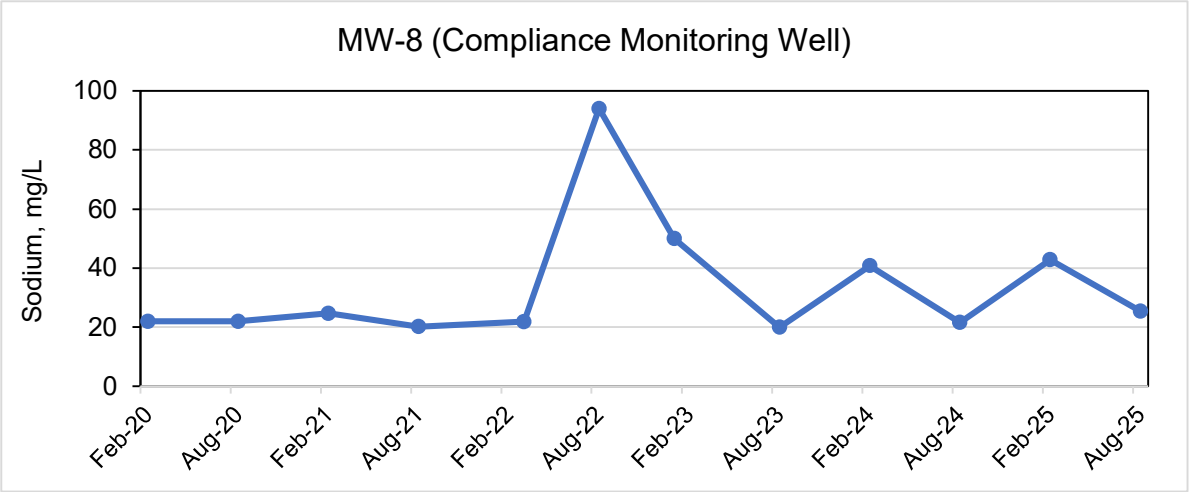
Analyte	p-value[a]	Trend	z-stat	Sen's Slope	Trend direction
Semi-Annual Analytes					
pH	**0.028**	yes	2.199	0.101	Upward
Total Coliform	0.943	no	0.071	0.000	
Chloride	0.370	no	-0.896	-0.764	
Sodium	0.409	no	0.825	0.420	
TDS	0.053	no	-1.938	-2.50	
Nitrate as N	**0.016**	yes	-2.41	-0.305	Downward
Annual Analytes					
Iron, mg/L	0.732	no	-0.343	-0.13	
Manganese, µg/L	0.193	no	-1.303	-28.3	

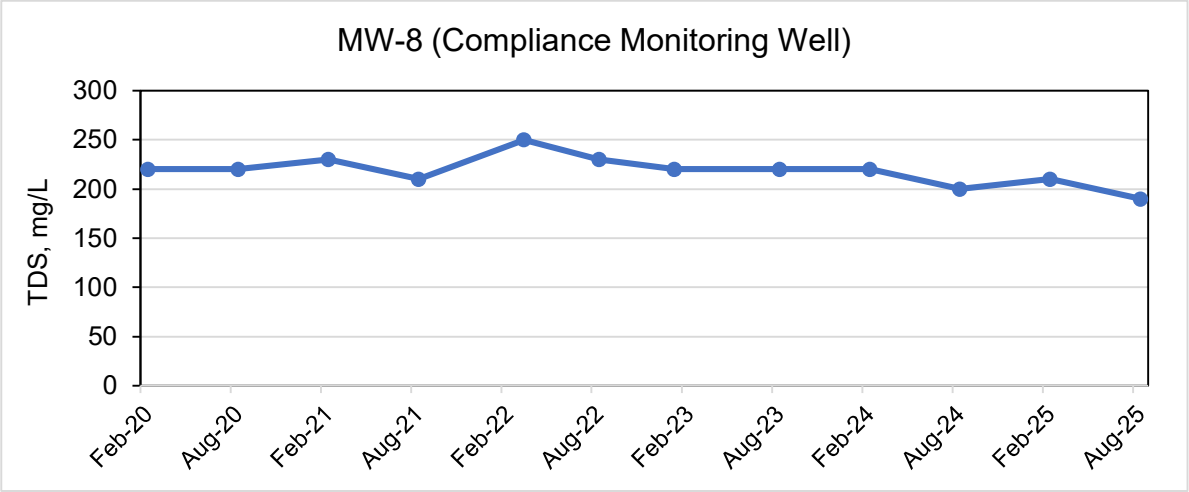
[a] p-values below 0.05 are bold to indicate that a trend in the series may be present.

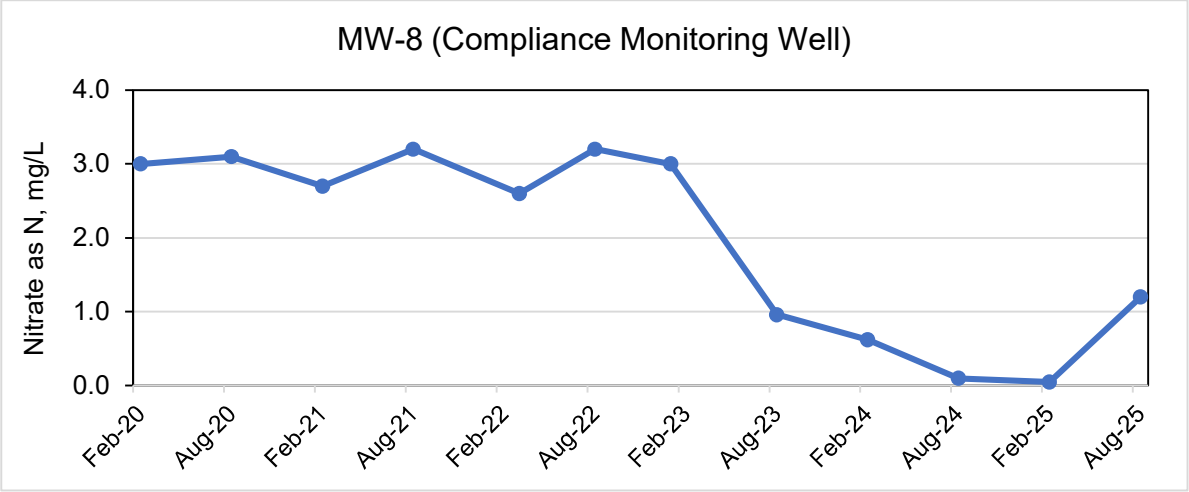

MW-8 (Compliance Monitoring Well)
pH
9.0
8.0
7.0
6.0
5.0
4.0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25

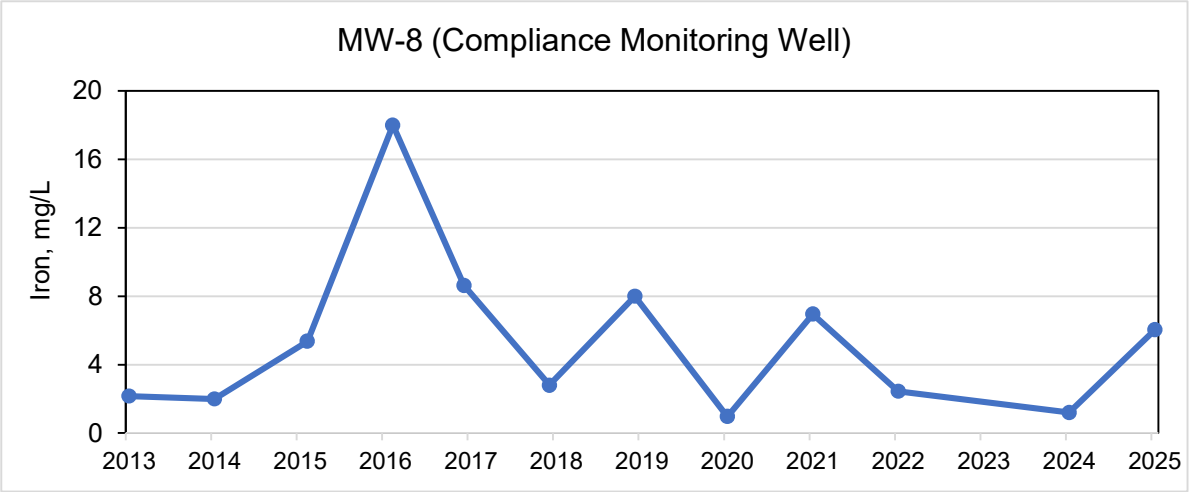

MW-8 (Compliance Monitoring Well)
Total Coliform, MPN/100 mL
10000
1000
100
10
1
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25

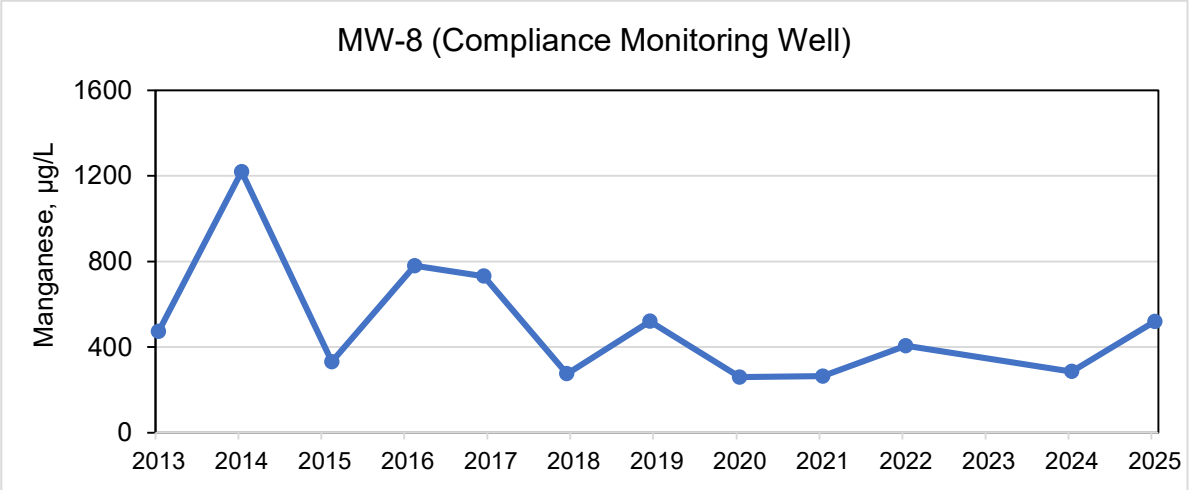

MW-8 (Compliance Monitoring Well)
Chloride, mg/L
80
60
40
20
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-8 (Compliance Monitoring Well)
Sodium, mg/L
100
80
60
40
20
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-8 (Compliance Monitoring Well)
TDS, mg/L
300
250
200
150
100
50
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-8 (Compliance Monitoring Well)
Nitrate as N, mg/L
4.0
3.0
2.0
1.0
0.0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-8 (Compliance Monitoring Well)
Iron, mg/L
20
16
12
8
4
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025


MW-8 (Compliance Monitoring Well)
Manganese, µg/L
1600
1200
800
400
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025

MW-9 (COMPLIANCE MONITORING WELL)

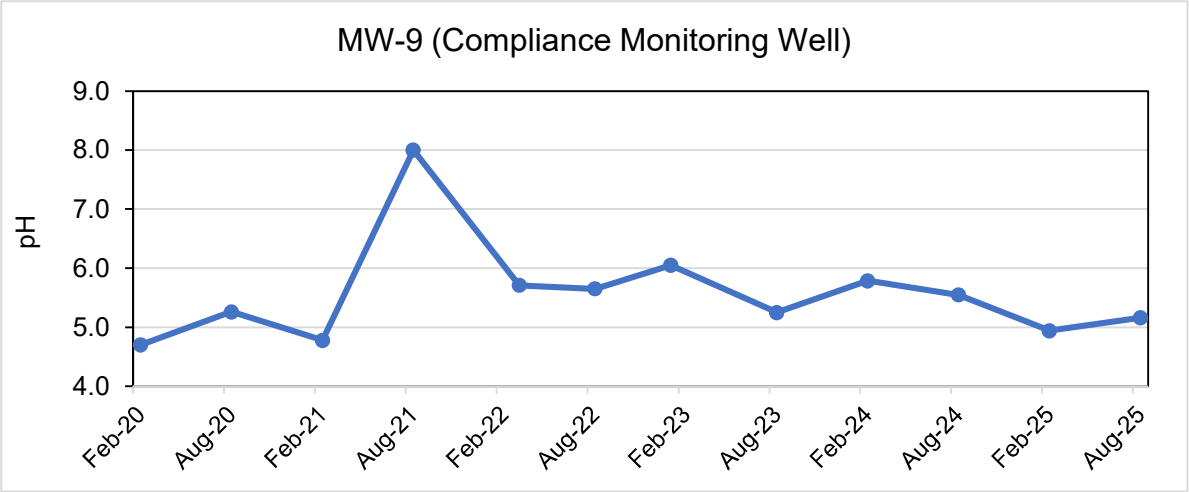
MW-9 Summary Statistics

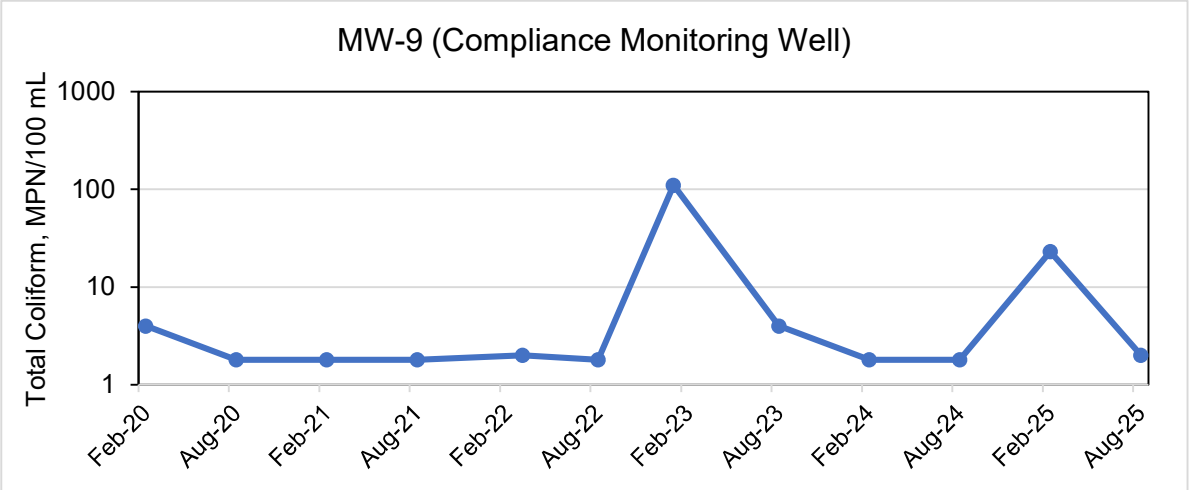
Variable	Observations	Min	Max	Mean	Std. deviation
Semi-Annual Analytes					
pH	12	4.7	8.0	5.57	0.87
Total Coliform, MPN/100 mL	12	<1.8	110	ND	-
Chloride, mg/L	12	6.6	68	25.5	19.4
Sodium, mg/L	12	10	53.6	20.1	11.7
TDS, mg/L	12	88	250	152	42
Nitrate as N, mg/L	12	<0.0048	0.056	ND	-
Annual Analytes					
Iron, mg/L	12	1.16	19	6.1	5.4
Manganese, µg/L	12	48.7	598	174	167

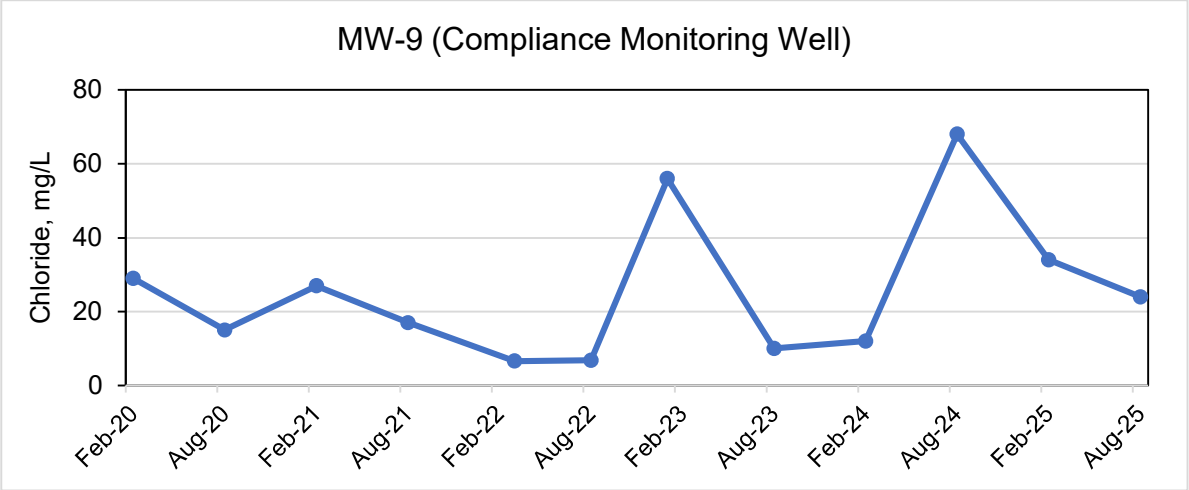
MW-9 Mann-Kendall and Sen's Slope Test Results

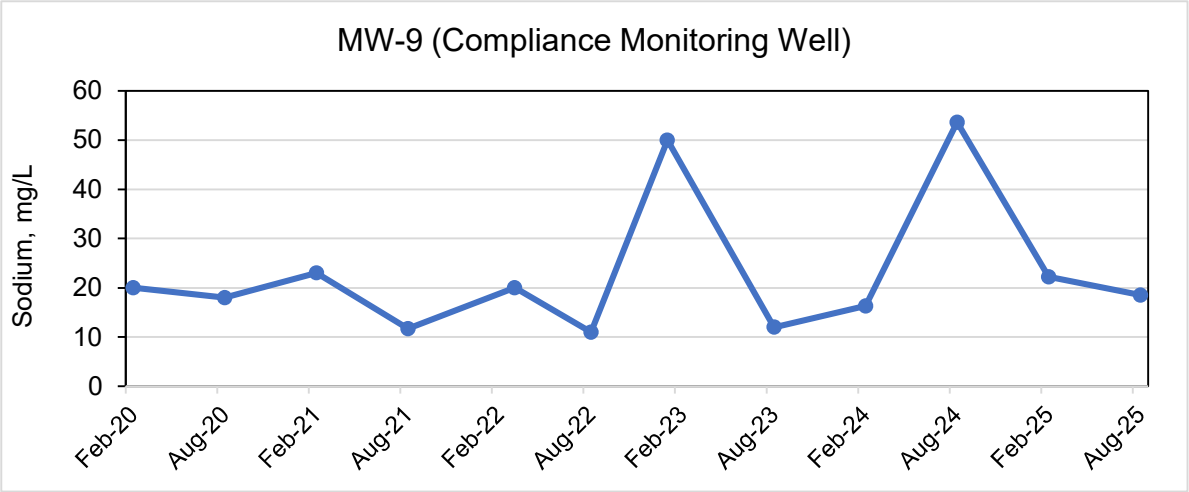
Analyte	p-value[a]	Trend	z-stat	Sen's Slope	Trend direction
Semi-Annual Analytes					
pH	1.000	no	0.000	0.009	
Total Coliform	-	-	-	-	N/A
Chloride	0.631	no	0.480	0.888	
Sodium	0.537	no	0.617	0.500	
TDS	0.890	no	0.138	0.625	
Nitrate as N	-	-	-	-	N/A
Annual Analytes					
Iron, mg/L	0.271	no	-1.100	-0.31	
Manganese, µg/L	0.064	no	1.851	14.0	

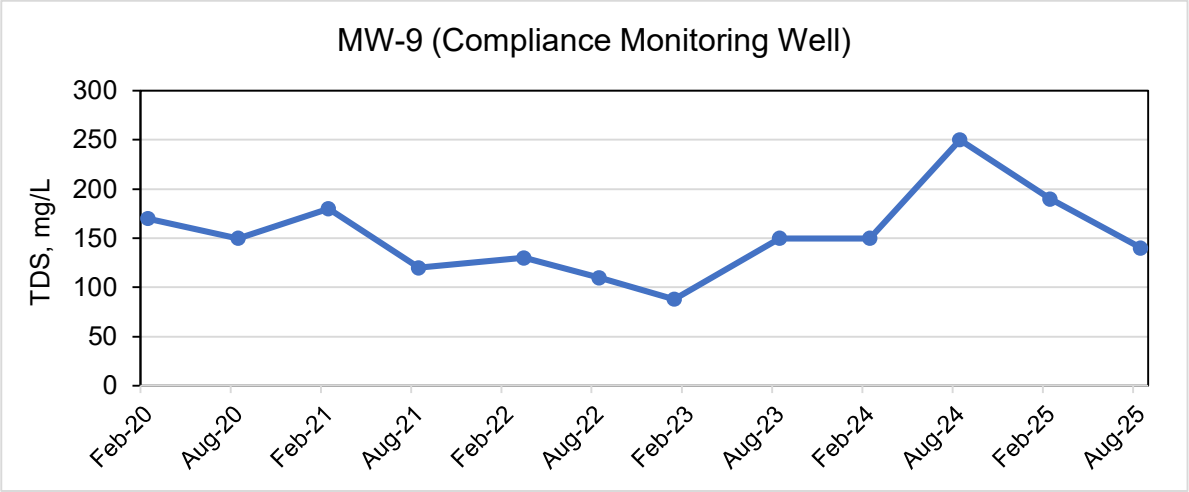
[a] p-values below 0.05 are bold to indicate that a trend in the series may be present.

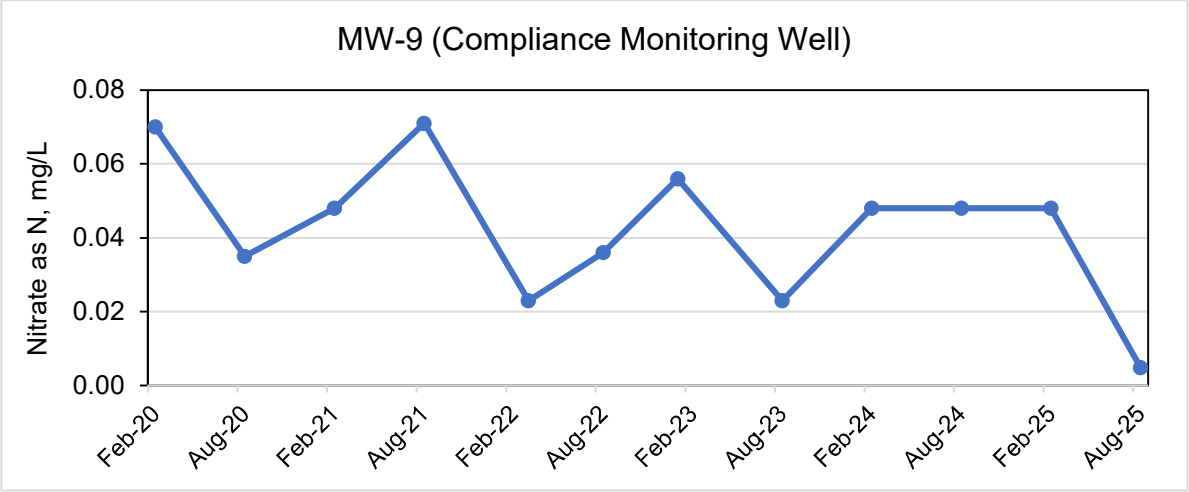

MW-9 (Compliance Monitoring Well)
pH
9.0
8.0
7.0
6.0
5.0
4.0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25

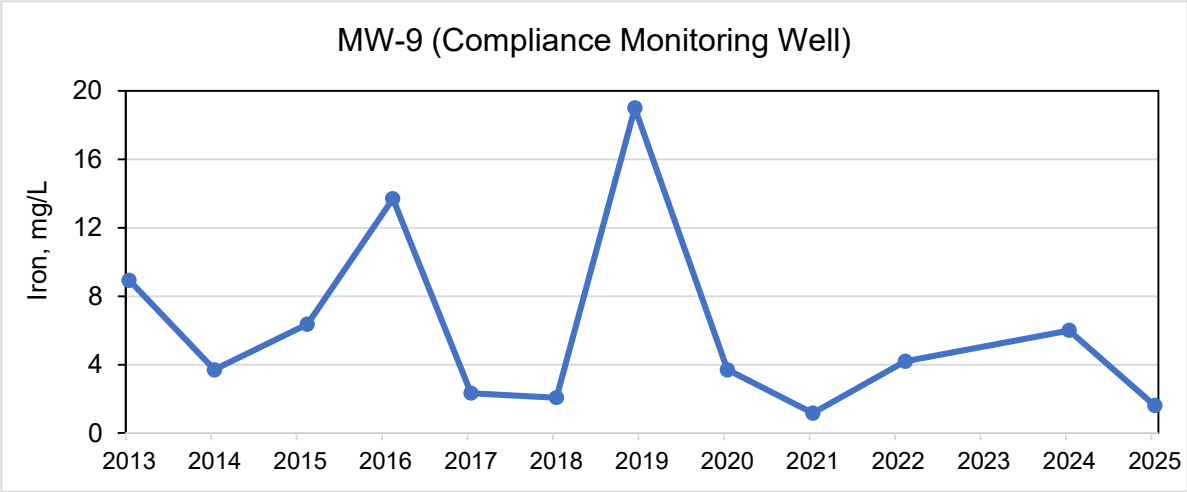

MW-9 (Compliance Monitoring Well)
Total Coliform, MPN/100 mL
1000
100
10
1
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25

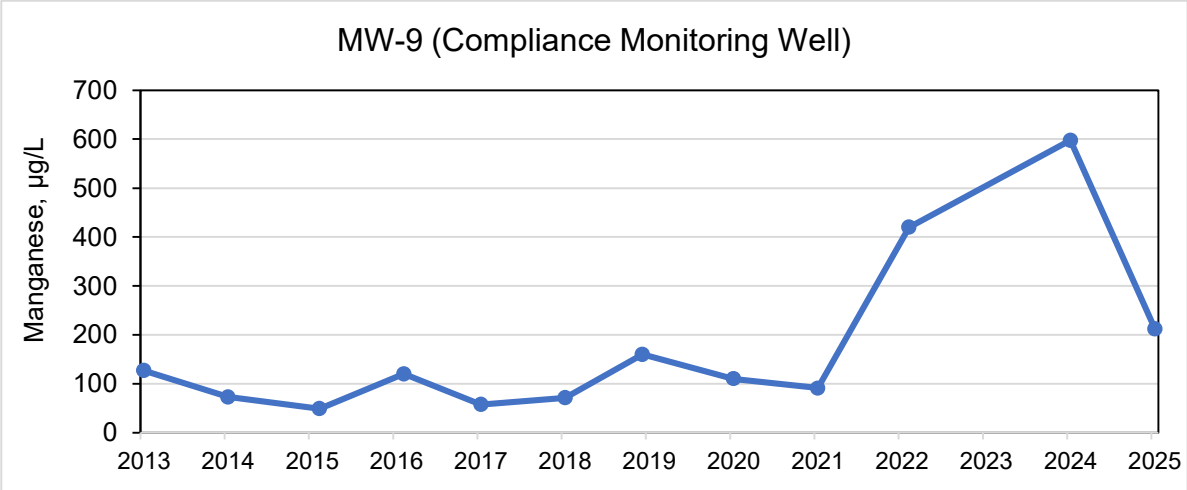

MW-9 (Compliance Monitoring Well)
Chloride, mg/L
80
60
40
20
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-9 (Compliance Monitoring Well)
Sodium, mg/L
60
50
40
30
20
10
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-9 (Compliance Monitoring Well)
TDS, mg/L
300
250
200
150
100
50
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-9 (Compliance Monitoring Well)
Nitrate as N, mg/L
0.08
0.06
0.04
0.02
0.00
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-9 (Compliance Monitoring Well)
Iron, mg/L
20
16
12
8
4
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025


MW-9 (Compliance Monitoring Well)
Manganese, µg/L
700
600
500
400
300
200
100
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025

MW-10 (COMPLIANCE MONITORING WELL)

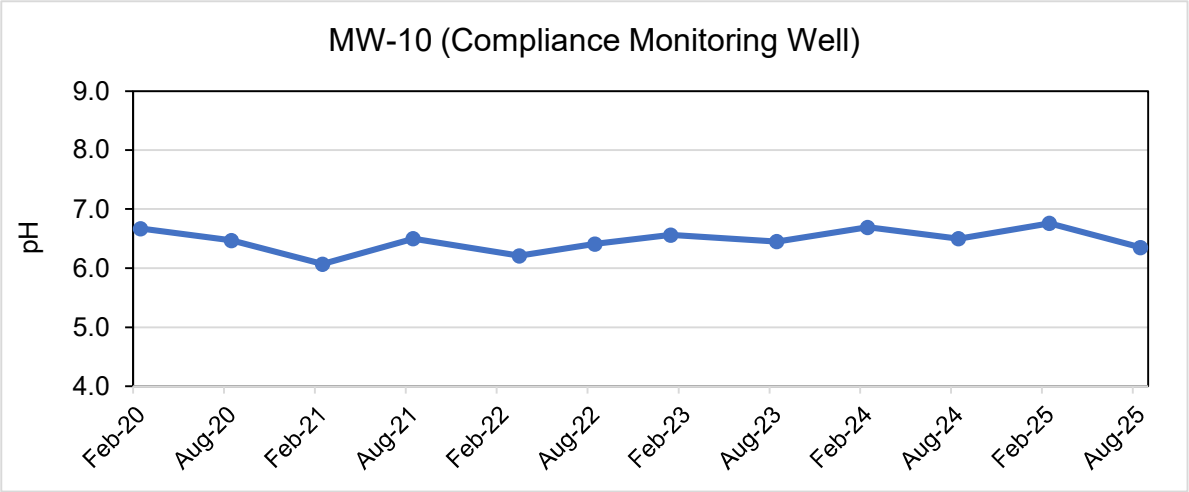
MW-10 Summary Statistics

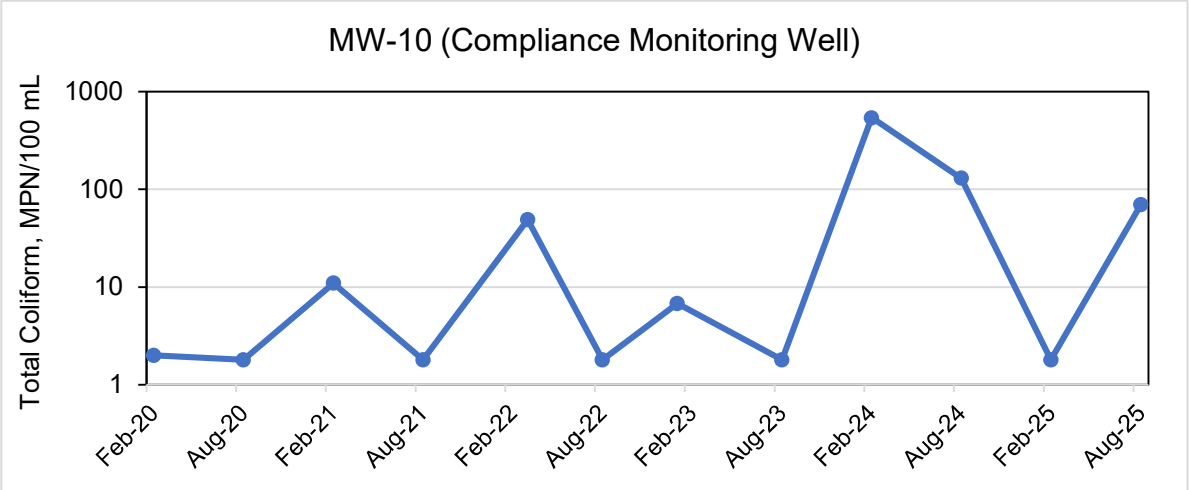
Variable	Observations	Min	Max	Mean	Std. deviation
Semi-Annual Analytes					
pH	12	6.07	6.76	6.47	0.20
Total Coliform, MPN/100 mL	12	<1.8	540	68	154
Chloride, mg/L	12	3.4	10	5.03	1.89
Sodium, mg/L	12	8.6	25	12.5	5.0
TDS, mg/L	12	130	390	181	71
Nitrate as N, mg/L	12	<0.0048	0.078	ND	-
Annual Analytes					
Iron, mg/L	12	18.8	140	47.7	37.7
Manganese, µg/L	12	330	17,200	5,520	4,442

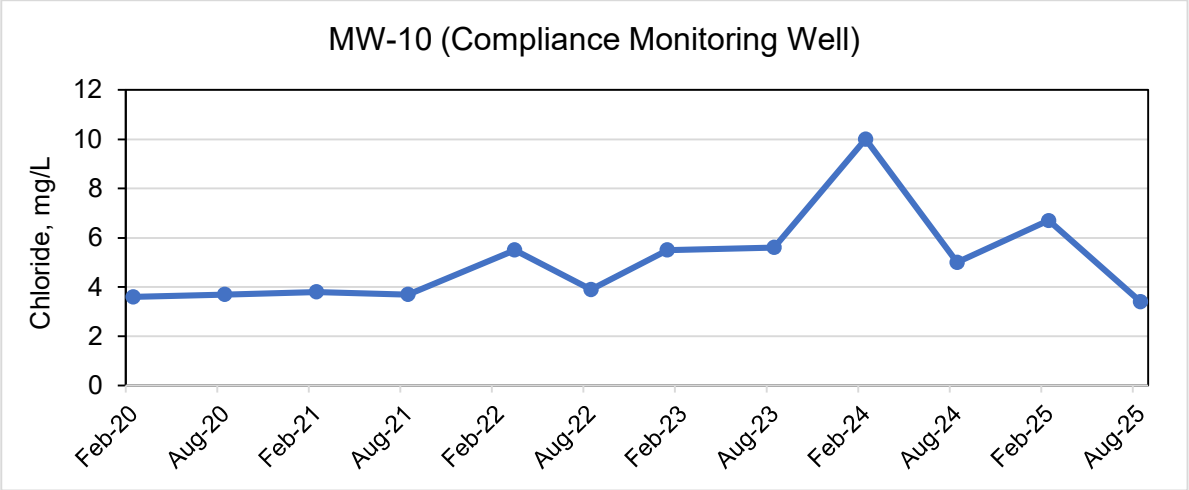
MW-10 Mann-Kendall and Sen's Slope Test Results

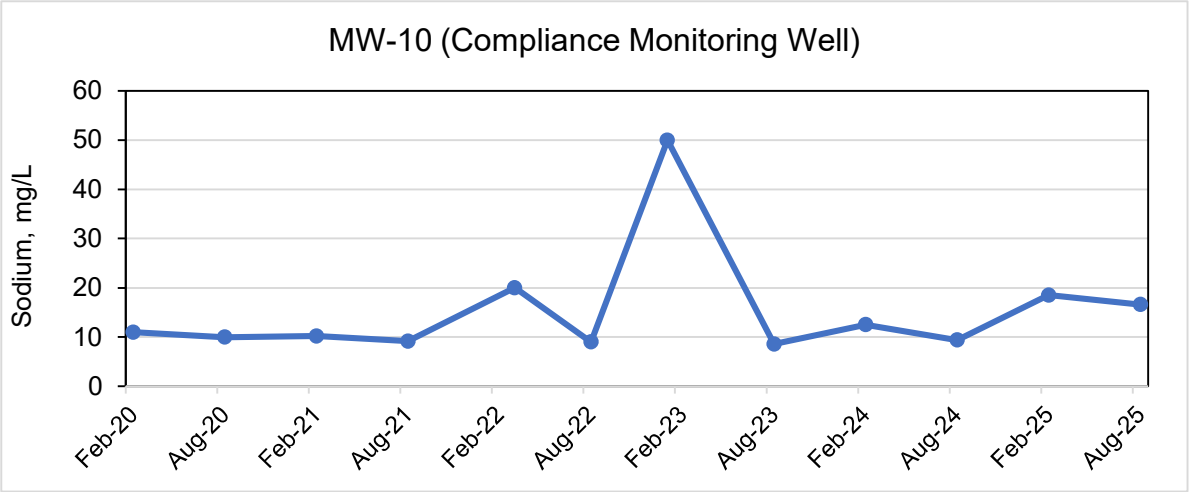
Analyte	p-value[a]	Trend	z-stat	Sen's Slope	Trend direction
Semi-Annual Analytes					
pH	0.492	no	0.687	0.019	
Total Coliform	0.353	no	0.929	1.573	
Chloride	0.063	no	1.860	0.186	
Sodium	0.680	no	0.412	0.19	
TDS	**0.025**	yes	2.239	5.00	Upward
Nitrate as N	-	-	-	-	N/A
Annual Analytes					
Iron, mg/L	0.631	no	0.480	1.09	
Manganese, µg/L	0.631	no	0.480	231.4	

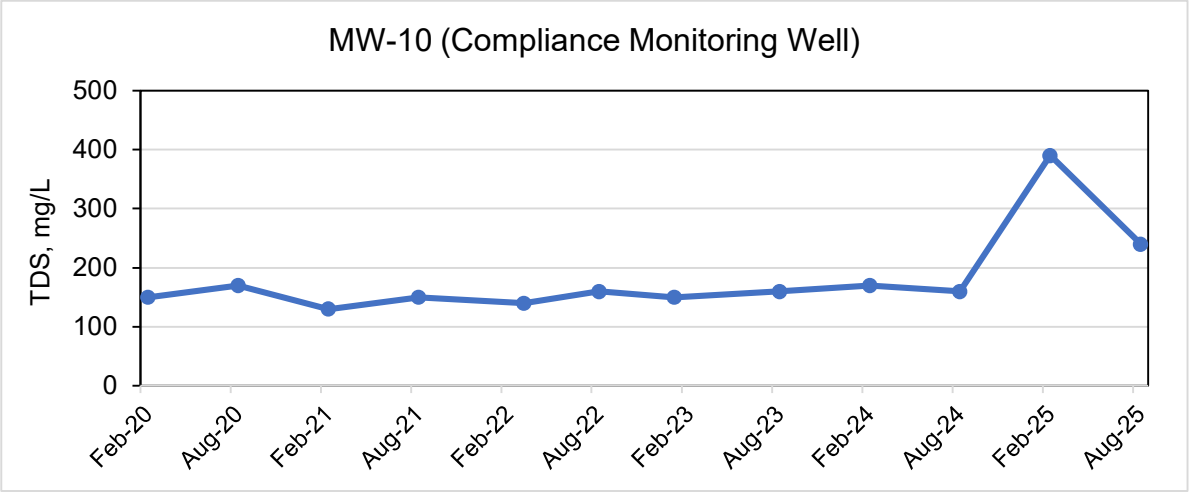
[a] p-values below 0.05 are bold to indicate that a trend in the series may be present.

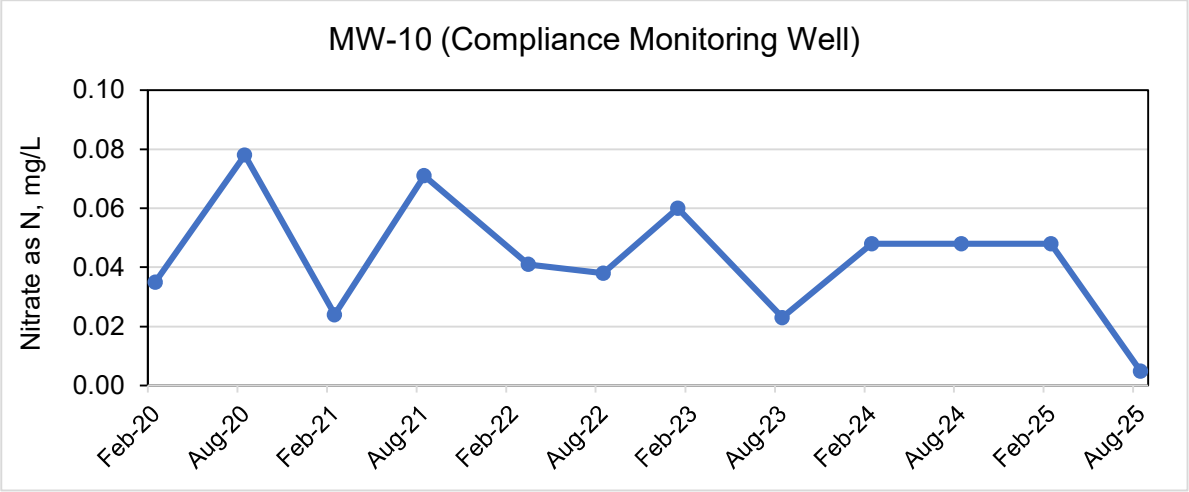

MW-10 (Compliance Monitoring Well)
pH
9.0
8.0
7.0
6.0
5.0
4.0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25

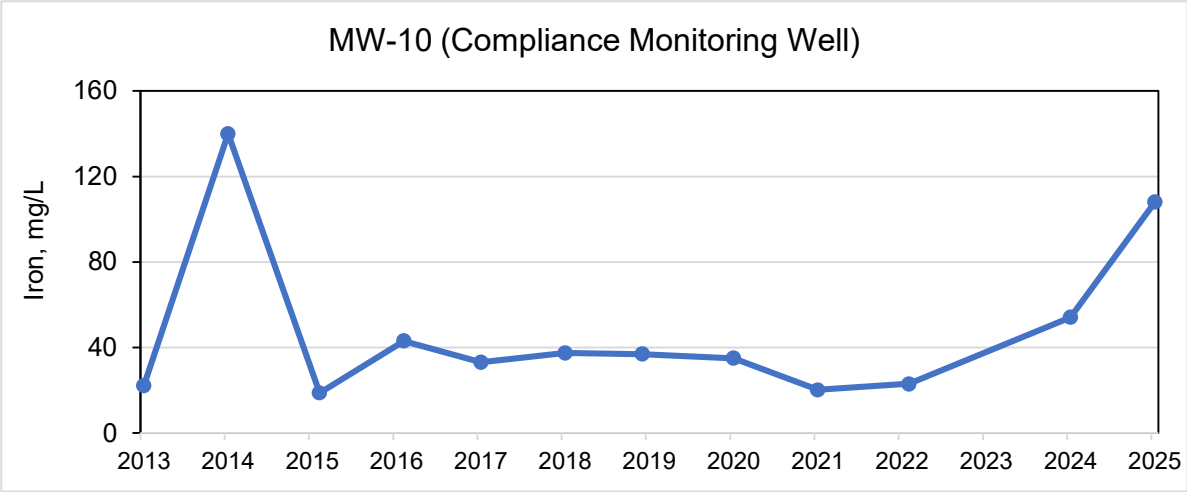

MW-10 (Compliance Monitoring Well)
Total Coliform, MPN/100 mL
1000
100
10
1
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25

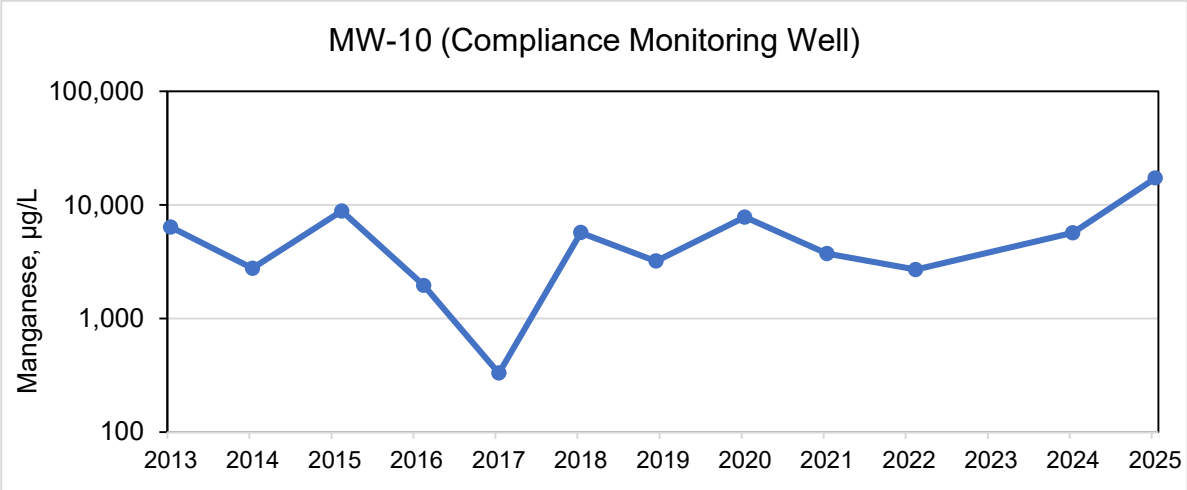

MW-10 (Compliance Monitoring Well)
Chloride, mg/L
12
10
8
6
4
2
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-10 (Compliance Monitoring Well)
Sodium, mg/L
60
50
40
30
20
10
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-10 (Compliance Monitoring Well)
TDS, mg/L
500
400
300
200
100
0
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-10 (Compliance Monitoring Well)
Nitrate as N, mg/L
0.10
0.08
0.06
0.04
0.02
0.00
Feb-20
Aug-20
Feb-21
Aug-21
Feb-22
Aug-22
Feb-23
Aug-23
Feb-24
Aug-24
Feb-25
Aug-25


MW-10 (Compliance Monitoring Well)
Iron, mg/L
160
120
80
40
0
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025


MW-10 (Compliance Monitoring Well)
Manganese, µg/L
100,000
10,000
1,000
100
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025

Appendix E – Wilcoxon Rank-Sum Analysis (Tier 2)

The Tier 2 analysis entails an interwell analysis of current and historical compliance well data for an analyte relative to the corresponding background well (MW-1) data for that analyte. Specifically, a Wilcoxon Rank-Sum (WRS) test is used. The WRS test is a nonparametric, hypothesis-testing procedure that is used to evaluate differences in the central value between two independent data sets. The test requires no assumptions about the distribution of the data, such as normality.

The test statistic is computed first by arranging the values for both data sets in ascending order and assigning ranks starting with the lowest value. The test statistic is the sum of the ranks of the smaller-sized sample. If the test was being applied manually, the null hypothesis would then be evaluated by comparing the test statistic with a table of test statistics calculated for the significance level desired.[1]

A significance level (α) of 0.05 was chosen for this evaluation. The significance level represents the probability, or risk, that the null hypothesis will be rejected when it is true. In the present evaluation, the significance level is the risk of concluding that the concentrations measured in a compliance well exceed background concentrations when they do not. The significance level does not come from the data, but is chosen according to the requirements of the project, and represents the level of certainty that is required before rejecting the null hypothesis. The level of certainty, or confidence, is calculated as 1-α. For this evaluation, the confidence level is:

$$1 - \alpha = 1 - 0.05 = 0.95 = 95 \text{ percent}$$

This 95 percent confidence level is thus consistent with that used for the Mann-Kendall analysis.

The null hypothesis for the WRS test that would be performed may be stated as follows:

"The median concentration of [analyte] in [well number] does not differ from the median background concentration at a 95 percent confidence level".

The alternative hypothesis is:

"The median concentration of (analyte) in (well) is greater than or less than the median background concentration at a 95 percent confidence level".

In comparing summary statistics between the various monitoring wells, the use of the median is preferred as a measure of central tendency over the use of the statistical mean, or average. The median is a "resistant" statistic in that it depends only on the rank order of the data values and not on their magnitude. For that reason, it is much less sensitive to large outlying data points than is the mean. The median is most commonly used with datasets that do not conform to standard distribution models, or that have asymmetrical distributions.[1,2]

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[1] Helsel, D.R. and R.M. Hirsch. 1992. "Statistical Methods in Water Resources". New York, Elsevier.

[2] Sokal R.R. and F.J. Rohlf. 1982. "*Biometry*". New York. W.H. Freeman.

Wilcoxon Rank-Sum Analysis (Mann-Whitney Test)

Series/Test Relative to MW-11

Variable	p-value[a]					
	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10
Semi-Annual Analytes						
pH	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**
Total Coliform	-	-	-	**0.0078**	-	**0.0078**
Chloride	**<0.0001**	**<0.0001**	**0.000**	**<0.0001**	0.3253	**<0.0001**
Sodium	**0.002**	**0.008**	**0.0002**	**0.0087**	**<0.0001**	**<0.0001**
TDS	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**
Nitrate as N	**<0.0001**	-	**<0.0001**	**0.0001**	-	-
Annual Analytes						
Iron	**<0.0001**	**0.006**	**<0.0001**	**<0.0001**	**<0.0001**	0.291
Manganese	**<0.0001**	0.089	**<0.0001**	**<0.0001**	**<0.0001**	0.887

[a] Bold values indicate statistically different data sets (p-values below 0.05), for which a comparison of medians is needed.

Mann-Whitney test / Two-tailed test: pH

	MW-11 & MW-5 [a]	MW-11 & MW-6 [a]	MW-11 & MW-7	MW-11 & MW-8	MW-11 & MW-9	MW-11 & MW-10 [a]
U	0	0	2	5	2	0
U (standardized)	-4.130	-4.131	0.000	0.000	0.000	-4.130
Expected value	72.000	72.000	72.000	72.000	72.000	72.000
Variance (U)	299.739	299.609	299.739	299.609	299.870	299.739
p-value (Two-tailed)	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**
alpha	0.05	0.05	0.05	0.05	0.05	0.05

The p-value is computed using an exact method.
[a] The exact p-value could not be computed. An approximation has been used to compute the p-value.

Test interpretation:
H0: The difference of location between the samples is equal to 0.
Ha: The difference of location between the samples is different from 0.
If the computed p-value is **lower than** the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.

If the computed p-value is greater than the significance level alpha=0.05, one cannot reject the null hypothesis H0.

Mann-Whitney test / Two-tailed test: Total Coliform

	MW-11 & MW-5	MW-11 & MW-6	MW-11 & MW-7	MW-11 & MW-8	MW-11 & MW-9	MW-11 & MW-10
U	-	-	-	33.000	-	33.000
U (standardized)	-	-	-	0.000	-	0.000
Expected value	-	-	-	72.000	-	72.000
Variance (U)	-	-	-	211.174	-	211.174
p-value (Two-tailed)	-	-	-	**0.0078**	-	**0.0078**
alpha	-	-	-	0.05	-	0.05

The p-value is computed using an exact method.

Test interpretation:
H0: The difference of location between the samples is equal to 0.
Ha: The difference of location between the samples is different from 0.
If the computed p-value is **lower than** the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.

If the computed p-value is greater than the significance level alpha=0.05, one cannot reject the null hypothesis H0.

Mann-Whitney test / Two-tailed test: Chloride

	MW-11 & MW-5 [a]	MW-11 & MW-6 [a]	MW-11 & MW-7	MW-11 & MW-8 [a]	MW-11 & MW-9	MW-11 & MW-10 [a]
U	0	0	14.500	0.5	54.5	143
U (standardized)	-4.154	-4.133	0.000	0.000	0.000	0.000
Expected value	72.000	72.000	72.000	72.000	72.000	72.000
Variance (U)	296.217	299.348	298.435	299.087	298.957	299.217
p-value (Two-tailed)	**<0.0001**	**<0.0001**	**0.000**	**<0.0001**	0.3253	**<0.0001**
alpha	0.05	0.05	0.05	0.05	0.05	0.05

The p-value is computed using an exact method.
[a] The exact p-value could not be computed. An approximation has been used to compute the p-value.

Test interpretation:
H0: The difference of location between the samples is equal to 0.
Ha: The difference of location between the samples is different from 0.
If the computed p-value is **lower than** the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.

If the computed p-value is greater than the significance level alpha=0.05, one cannot reject the null hypothesis H0.

Mann-Whitney test / Two-tailed test: Sodium

	MW-11 & MW-5	MW-11 & MW-6	MW-11 & MW-7	MW-11 & MW-8	MW-11 & MW-9	MW-11 & MW-10
U	21.5	27	132.5	116.5	135.5	143.5
U (standardized)	0.000	0.000	0.000	0.000	0.000	0.000
Expected value	72.000	72.000	72.000	72.000	72.000	72.000
Variance (U)	299.739	300.000	299.348	299.739	299.870	299.739
p-value (Two-tailed)	**0.002**	**0.008**	**0.0002**	**0.0087**	**<0.0001**	**<0.0001**
alpha	0.05	0.05	0.05	0.05	0.05	0.05

The p-value is computed using an exact method.

Test interpretation:
H0: The difference of location between the samples is equal to 0.
Ha: The difference of location between the samples is different from 0.
If the computed p-value is **lower than** the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.

If the computed p-value is greater than the significance level alpha=0.05, one cannot reject the null hypothesis H0.

Mann-Whitney test / Two-tailed test: TDS

	MW-11 & MW-5	MW-11 & MW-6	MW-11 & MW-7 [a]	MW-11 & MW-8 [a]	MW-11 & MW-9 [a]	MW-11 & MW-10 [a]
U	143	140	144	144	144	144
U (standardized)	0.000	0.000	4.155	4.148	4.132	4.136
Expected value	72.000	72.000	72.000	72.000	72.000	72.000
Variance (U)	298.435	299.478	296.087	297.130	299.478	298.826
p-value (Two-tailed)	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**	**<0.0001**
alpha	0.05	0.05	0.05	0.05	0.05	0.05

The p-value is computed using an exact method.
[a] The exact p-value could not be computed. An approximation has been used to compute the p-value.

Test interpretation:
H0: The difference of location between the samples is equal to 0.
Ha: The difference of location between the samples is different from 0.
If the computed p-value is **lower than** the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.

If the computed p-value is greater than the significance level alpha=0.05, one cannot reject the null hypothesis H0.

Mann-Whitney test / Two-tailed test: Nitrate as N

	MW-11 & MW-5	MW-11 & MW-6	MW-11 & MW-7 [a]	MW-11 & MW-8	MW-11 & MW-9	MW-11 & MW-10
U	6.5	-	0	10.5	-	-
U (standardized)	0.000	-	-4.133	0.000	-	-
Expected value	72.000	-	72.000	72.000	-	-
Variance (U)	299.087	-	299.348	298.304	-	-
p-value (Two-tailed)	**<0.0001**	-	**<0.0001**	**0.0001**	-	-
alpha	0.05	-	0.05	0.05	-	-

The p-value is computed using an exact method.
[a] The exact p-value could not be computed. An approximation has been used to compute the p-value.

Test interpretation:
H0: The difference of location between the samples is equal to 0.
Ha: The difference of location between the samples is different from 0.
If the computed p-value is **lower than** the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.

If the computed p-value is greater than the significance level alpha=0.05, one cannot reject the null hypothesis H0.

Mann-Whitney test / Two-tailed test: Iron

	MW-11 & MW-5	MW-11 & MW-6	MW-11 & MW-7	MW-11 & MW-8	MW-11 & MW-9	MW-11 & MW-10
U	144	119.000	144	142	141	91
U (standardized)	0.000	0.000	0.000	0.000	0.000	0.000
Expected value	72.000	72.000	72.000	72.000	72.000	72.000
Variance (U)	300.000	300.000	300.000	300.000	299.870	300.000
p-value (Two-tailed)	**<0.0001**	**0.006**	**<0.0001**	**<0.0001**	**<0.0001**	0.291
alpha	0.05	0.05	0.05	0.05	0.05	0.05

The p-value is computed using an exact method.

Test interpretation:
H0: The difference of location between the samples is equal to 0.
Ha: The difference of location between the samples is different from 0.
If the computed p-value is **lower than** the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.

If the computed p-value is greater than the significance level alpha=0.05, one cannot reject the null hypothesis H0.

Mann-Whitney test / Two-tailed test: Manganese

	MW-11 & MW-5	MW-11 & MW-6	MW-11 & MW-7	MW-11 & MW-8	MW-11 & MW-9	MW-11 & MW-10
U	140	102.000	135	138	143	69
U (standardized)	0.000	0.000	0.000	0.000	0.000	0.000
Expected value	72.000	72.000	72.000	72.000	72.000	72.000
Variance (U)	299.870	300.000	300.000	300.000	300.000	300.000
p-value (Two-tailed)	**<0.0001**	0.089	**<0.0001**	**<0.0001**	**<0.0001**	0.887
alpha	0.05	0.05	0.05	0.05	0.05	0.05

The p-value is computed using an exact method.

Test interpretation:
H0: The difference of location between the samples is equal to 0.
Ha: The difference of location between the samples is different from 0.
If the computed p-value is **lower than** the significance level alpha=0.05, one should reject the null hypothesis H0, and accept the alternative hypothesis Ha.

If the computed p-value is greater than the significance level alpha=0.05, one cannot reject the null hypothesis H0.