EAST BAY MUNICIPAL UTILITY DISTRICT

March 1, 2018

Ms. Alyx Karpowicz
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Re: East Bay Municipal Utility District Bayside Groundwater Project, 2017 Annual Report, Order No. R2-2007-0038

Dear Ms. Karpowicz:

In accordance with the Waste Discharge Requirements of Order No. R2-2007-0038, the East Bay Municipal Utility District (EBMUD) is submitting the enclosed 2017 annual self-monitoring report (SMR) for the Bayside Groundwater Project. There were no exceedances of the permit's water quality limits.

Table 1 includes construction details for the project's groundwater monitoring wells. Table 2 summarizes historical injected and recovered water volumes. Injection of treated drinking water in the Bayside Well occurred during February 2017 totaling approximately 1.31 million gallons; however no extraction events took place in 2017.

The Self-Monitoring and Reporting Program (SMP) of Order No. R2-2007-0038 requires EBMUD to implement a phased approach for groundwater quality monitoring. Table 3 of the SMP tabulates groundwater quality monitoring well groups for phased monitoring. There are a total of four groups. Group 3 monitoring, consisting of the Bayside Well, MW-2S, MW-2D[1], MW-4, MW-5D, MW-6, and MW-7, was implemented beginning in 2014.

Table 3 summarizes groundwater level elevations and depths; Table 4 presents the vertical hydraulic gradients at MW-5S, MW-5I, and MW-5D; and Tables 5 and 6 contain current and historical groundwater quality results. Figure 1 is a well location map; Figures 2 and 3 present the groundwater elevation contours on July 1 1, 2017 and December 1, 2017, respectively; and Figure 4 shows TDS concentration contours. Attachment B contains figures showing the monitoring wells' groundwater elevation trends in 2017.

There were no exceedances of the permit's limits for TTHMs and HAAs.

[1] EBMUD uses slightly different well names than those used in the Permit. For example, "MW-2I" is used instead of "MW-2D" and "MW-9D" instead of "MW-9." EBMUD's well naming convention is used in this Report.

CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

If you have any questions, please contact me at (510) 287-0412 or David Behnken, Environmental Health and Safety Specialist II, at (510) 287-0327.

Sincerely,

Chandra Johannesson
Manager of Environmental Compliance

WEST YOST
ASSOCIATES
Consulting Engineers

February 28, 2018

Project No.: 484-13-14-02.002
SENT VIA: EMAIL

Mr. David Behnken
Environmental Health & Safety Specialist II
East Bay Municipal Utility District
375 11th Street
Oakland, CA 94607

SUBJECT: EBMUD Bayside Groundwater Project, 2017 Annual Report, Waste Discharge Requirements Order No. R2-2007-0038

Dear Mr. Behnken:

West Yost Associates (West Yost) has prepared this 2017 Annual Report (Report) on behalf of the East Bay Municipal Utility District (EBMUD) for the Bayside Groundwater Project (Project) in Alameda County. West Yost has prepared this Report in accordance with the Self-Monitoring and Reporting Program (SMRP) of Waste Discharge Requirements (Permit) Order No. R2-2007-0038, which was adopted by the San Francisco Regional Water Quality Control Board (Regional Board) on May 9, 2007 (Regional Board, 2007).

The Project consists of the Bayside Well and a number of monitoring wells constructed near and in the vicinity of the Bayside Well. Depth to groundwater was monitored in the Bayside Well and associated monitoring wells during 2017. Groundwater samples were collected December 5, 19, and 20, 2017, for analytical testing. Groundwater elevations and analytical results are provided in this Report, along with results from previous years, in accordance with the SMRP, for evaluation of long-term trends.

This Report addresses the following topics:

- Project Overview
- Regulatory Requirements
- Injection and Recovery Activities
- Monitoring and Sampling Activities
- Groundwater Elevations and Flow Directions
- Groundwater Quality Results
- Conclusions

PROJECT OVERVIEW

The Project is located in a predominantly industrial area within unincorporated portions of the City of San Lorenzo and the City of San Leandro. The Bayside Well is located at 2600 Grant Avenue in San Lorenzo. The Project area is bounded by residential communities to the north and east, and the San Francisco Bay about a half-mile to the west.

The Bayside Well is an Aquifer Storage and Recovery (ASR) well designed, constructed, and operated for injection of treated drinking water from EBMUD's distribution system into the South East Bay Plain Groundwater Basin for aquifer storage during wet years and, later, for recovery as a source of supplemental drinking water supply for EBMUD during dry years. Injection of treated drinking water took place in February 2017, though no extraction of water occurred during 2017. EBMUD is not planning to inject or extract water during 2018.

The Bayside Well was constructed with 18-inch diameter stainless steel casing and is screened from 520 feet below ground surface (bgs) to 650 feet bgs. The monitoring well network consists of 17 monitoring wells constructed to various depths (Figure 1). Well construction details are summarized in Table 1. Additional background information on the Project is provided in the Permit.

REGULATORY REQUIREMENTS

The SMRP requires groundwater level monitoring in 13 of the 17 Project monitoring wells. The 13 Project wells monitored during this reporting period were MW-1, MW-2S, MW-2I, MW-3, MW-4, MW-5S, MW-5I, MW-5D, MW-6, MW-7, MW-9D, MW-10I, and MW-10D.[1] After the first year of monitoring in 2009, groundwater levels are required to be monitoring on an hourly basis in 11 of the 13 wells listed above. The exceptions to this monitoring frequency are MW-4 and MW-6, where groundwater level monitoring is required to be performed quarterly only.

To address the primary groundwater quality concern of introducing disinfection by-products (DBPs) into the groundwater basin, the SMRP requires EBMUD to implement a phased approach for sampling and monitoring groundwater quality in subsets of the Project monitoring wells. Each phase is successive and depends on certain SMRP triggers, generally related to the location of the injected water front (i.e. leading edge of the injected water). The SMRP specifies the following phased approach consisting of four groups of monitoring wells:

- Initial monitoring in Group 1 wells (Bayside Well, MW-2S, MW-2I, MW-4, and MW-10D[2]) is required to start three months prior to the start of Project operations and to continue on an annual basis until Group 2 monitoring is triggered.

[1] EBMUD uses slightly different well names than those used in the Permit. For example, "MW-2I" is used instead of "MW-2D" and "MW-9D" instead of "MW-9." EBMUD's well naming convention is used in this Report.

[2] Group 1 monitoring included limited monitoring at MW-10D. Specifically, the SMRP requires monitoring of MW-10D only once in the beginning of the Group 1 monitoring phase.

- Monitoring of Group 2 wells (Group 1 wells plus MW-6, but excluding MW-10D) would begin once the injected water front reaches MW-4 and would continue on an annual basis until Group 3 monitoring is triggered.
- Monitoring of Group 3 wells (Group 2 wells plus MW-5D and MW-7) would begin once the injected water front reaches MW-6 and would continue on an annual basis until Group 4 monitoring is triggered.
- Monitoring of Group 4 wells (Group 3 wells plus MW-10D) would begin with the detection of injected water at MW-5D or MW-7, or 15 years after initiating Project operations, whichever is earlier.

Water quality parameters are required to be measured annually per the parameters and test methods listed in Table 4 of the SMRP. These parameters include general water quality parameters, standard minerals, and DBPs. The Permit specifies DBPs water quality limits for total trihalomethanes (THMs) at 80 µg/L, and haloacetic acids (HAAs) at 60µg/L. The individual analytes are discussed below in the Water Quality Results section below.

The SMRP requires the submission of data from the Project's monitoring well network to the Regional Board in an annual report. Annual reports, due by March 1 of the following year, are required to include the following items, per Part A.4 of the SMRP:

- A table of water injection and groundwater recovery data, including the cumulative total volume injected and recovered since Project inception.
- Maps of well locations, groundwater elevation contours, extent of the injected water front, and extent of dissolved water quality parameters (isoconcentration maps).
- A table of location and construction details for the wells.
- A table of current groundwater depths, elevations, and horizontal and vertical gradients.
- A table of current and historical (past five years) water quality results for the wells.
- A discussion of field and laboratory results that includes conclusions, recommendations, and data anomalies.

INJECTION AND RECOVERY ACTIVITIES

Injection of treated drinking water in the Bayside Well took place over a 6-day period, between February 10 and 15, 2017. A total of 1.31 million gallons of treated drinking water was injected at rates ranging between 160 to 250 gallons per minute. The 2017 injection flow rate was below the permit specification of an annual rate equivalent to 1 million gallons per day. No extraction from the Bayside Well occurred in 2017. Both the injection and recovery rates were in compliance with the permitted maximum rate limits. The cumulative volumes of injected and recovered water since the Project inception in 2009 are shown in Table 2.

MONITORING AND SAMPLING ACTIVITIES

The SMRP requires groundwater level monitoring on an hourly basis in the applicable monitoring wells with the exception of MW-4 and MW-6, for which quarterly groundwater level monitoring is required. In early 2014, EBMUD installed new dedicated pressure transducers in the wells to collect hourly groundwater level data. Hourly groundwater level data were collected from January through December 2017.

As noted in the previous annual reports, monitoring well MW-7 was damaged by a PG&E contractor in 2012. MW-7 was repaired in May 2015; however, groundwater level monitoring was not conducted at MW-7 in 2015 because EBMUD did not want to use the well before PG&E finished the well surface completion repair work. Groundwater level monitoring at MW-7 commenced again in 2017.

The SMRP also requires groundwater quality monitoring following a phased approach. In 2013, EBMUD initiated monitoring of Group 2 wells, which added MW-6 to the annual monitoring well network. In 2015, EBMUD initiated monitoring of Group 3 wells, which added MW-5D and MW-7 to the annual monitoring well network, in response to the detection of chlorine residual and the HAA dibromoacetic acid at MW-6, as detailed in the 2013 Annual Report.

EBMUD's contractor collected the 2017 groundwater samples from the required monitoring wells, with the exception of MW-7. The required annual water quality sampling was performed on December 5, 19, and 20, 2017. MW-7 was not accessible by the contractor during the 2017 groundwater monitoring event. EBMUD will insure accessibility of MW-7 during the following groundwater sampling event scheduled for December 2018.

Submersible pumps fitted with new tubing were used to purge and sample groundwater monitoring wells MW-2S, MW-2I, MW-4, MW-5D, and MW-6. The Bayside Well was purged using the dedicated downhole turbine pump with the sample collected from a spigot at the wellhead. Purge water was disposed of on permeable ground adjacent to monitoring wells. Purge water from the Bayside Well was pumped to an onsite holding tank and eventually discharged to Oro Loma Sanitary District under Wastewater Discharge Permit SDP-2013259. No surface water discharges occurred during the 2017 reporting period.

Groundwater monitoring and sampling were completed using the following procedures:

1. Measured static water level within each well, and calculated three well casing volumes required for purging in accordance with USEPA groundwater sampling protocols.
2. Purged the well until three well casing volumes were removed.
3. Measured field water quality parameters (pH, specific conductance, and temperature) periodically during purging.
4. Collected samples in containers with appropriate preservatives in accordance with USEPA sampling protocols for individual constituents.
5. Measured residual chlorine immediately after sample collection.
6. Transported samples to EBMUD's state-certified laboratory in a cooler under chain of custody for analytical testing.

Attachment A provides well purge logs, including the static water level, purge volumes, and field parameter measurements.

GROUNDWATER ELEVATIONS AND FLOW DIRECTIONS

Static depth to groundwater levels measured prior to well purging and sampling in 2017 are summarized in Table 3, along with calculated groundwater elevations. The calculated groundwater elevations are based on the reference elevations noted in Table 1. The historical static water levels and groundwater elevations are also provided n Table 3.

Groundwater elevations derived from the pressure transducers installed in May 2014 and corrected for barometric pressures are plotted by well for January through December 2017 (Attachment B). These elevations were calculated by EBMUD staff.

Groundwater elevation contour maps were generated using groundwater elevation data collected at specific times using the pressure transducers. Groundwater elevation contours for July 1, 2017, corresponding to a low tide in San Francisco Bay, are shown on Figure 2. Groundwater elevation contours for December 1, 2017, corresponding to a high tide in San Francisco Bay, are shown on Figure 3. As shown on Figures 2 and 3, the groundwater flow direction was primarily to the northeast at low tide (Figure 2) and northeasterly to northerly at high tide (Figure 3). The horizontal hydraulic gradients were variable with lower gradients generally further from the bay and higher gradients closer to the bay.

Groundwater elevations during low tide ranged from -15.64 feet above mean sea level (amsl) to -10.73 feet amsl for the five wells shown on Figure 2. Groundwater elevations during high tide ranged from -14.92 feet amsl to -4.54 feet amsl at the same wells (Figure 3).

Vertical hydraulic gradients were calculated based on groundwater elevations and the distance to the center of the screened interval specified in Table 4 for the nested wells MW-5S, MW-5I, and MW-5D. Specifically, vertical gradients were calculated for a low tide using groundwater elevation data from around 12:40 AM on July 1, 2017, and for a high tide using groundwater elevation data from around 9:00 AM on December 1, 2017. The calculated vertical gradients for these dates, including supporting data for the calculations, are presented in Table 4. The overall vertical gradient under both conditions was downward at approximately 0.03 to 0.04 feet per foot. These results are consistent with the vertical gradients reported in the 2016 Annual Report.

GROUNDWATER QUALITY RESULTS

The 2017 analytical results are included in the following tables, along with historical water quality results for the previous five years (2012 through 2016):

- Table 5 includes data for general water quality parameters (e.g. pH, chlorine residual, total dissolved solids (TDS), ammonia, nitrate, chloride, manganese, and iron) and standard minerals (e.g. calcium, magnesium, potassium, sodium, sulfate, total alkalinity [including alkalinity series], and hardness).
- Table 6 includes data for DBPs (e.g. total trihalomethanes (THMs) and haloacetic acids (HAAs) including their individual components).

Copies of the analytical laboratory reports for the 2017 water quality data are provided in Attachment C.[3] The laboratory report for the Bayside Well also includes data collected by EBMUD for additional constituents beyond those presented in Tables 5 and 6. These results are for "Title 22" parameters that would be of interest in a future water system permit application to the State.

For wells with pre-2017 data (Bayside Well, MW-2S, MW-2I, MW-4, MW-5D, and MW-6), the 2017 water quality results summarized in Table 5 are generally consistent. A number of parameters detected in MW-2S have significantly higher concentrations than the same parameter detected in the other monitoring wells. Monitoring well MW-2S is a much shallower well and may be affected by seawater intrusion.

For the 2017 groundwater quality results summarized in Table 5, TDS has been used as a representative constituent to evaluate overall groundwater quality conditions. The isoconcentration contours shown on Figure 4 are based on TDS concentrations for deep monitoring wells, including the Bayside Well, MW-4, MW-5D, and MW-6. The isoconcentration contours indicate the lowest concentration of 150 milligrams per liter (mg/L) occurs at the Bayside Well with increasing TDS concentrations in a northerly direction (i.e. further inland). The highest TDS concentration of 450 mg/L was detected at well MW-5D. TDS concentrations increase in a northeasterly direction away from the Bayside Well. The TDS concentration trend shown on Figure 4 is similar in shape to the northeasterly groundwater gradient measured at high-tide (Figure 3). Comparison of Figures 3 and 4 shows that TDS concentrations increase hydraulically downgradient from the Bayside Well.

The current DBPs data summarized in Table 6 are consistent with the historical groundwater monitoring results, with all but two constituents below method detection limits (MDLs). Both chloroform detected at 14 µg/L, and bromodichloromethane detected at 1.2 µg/L, were measured in the Bayside Well. The combined DBPs as HAA(5),[4] HAA(9),[5] and total THMs are within the range of historical results. The data also indicate there are no exceedances of the Permit's water quality limits for HAAs and TTHMs at 60 µg/L and 80 µg/L, respectively.

CONCLUSIONS

EBMUD conducted the 2017 groundwater monitoring for the Bayside Groundwater Project site in accordance with the Self Monitoring and Reporting Program of Waste Discharge Requirements Order No. R2-2007-0038, with few exceptions as noted above in this report. EBMUD will continue to implement groundwater monitoring for the Group 3 wells during 2018. The 2018 Annual Report will be submitted to the Regional Board by March 1, 2019.

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[3] The laboratory reports in Attachment C include results for additional parameters beyond those required by the SMRP. EBMUD collected this information per drinking water regulations unrelated to the Permit and SMRP. These data are not discussed in this Report.

[4] HAA(5) includes the sum of dibromoacetic, dichloroacetic, monobromoacetic, monochloroacetic, and trichloroacetic acids.

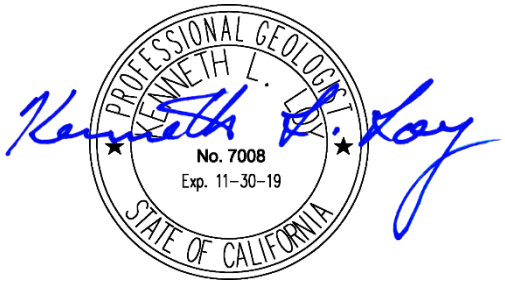
[5] HAA(9) includes the sum of all nine haloacetic acids.

Please call Charles Hardy at (925) 949-5814 or Ken Loy at (530) 792-3276 with any questions or comments on this Report.

Sincerely,

WEST YOST ASSOCIATES

Charles E. Hardy, PE
Senior Engineer
RCE #C71015



Kenneth L. Loy
Principal Hydrogeologist
PG 7008, CEG 2214, CHG 720

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1. Regional Board, 2007, Order No. R2-2007-0038 *Waste Discharge Requirements for East Bay Municipal Utility District, Bayside Groundwater Project, San Lorenzo, Alameda County*, Adopted May 9, 2007.

Table 1. Groundwater Monitoring Well Construction Details

Well ID	Latitude	Longitude	Address	City	Completion Date	Drilled Depth, feet bgs[a]	Casing Depth, feet bgs	Depth to Top of Perforation, feet bgs	Depth to Bottom of Perforation, feet bgs	Casing Diameter, inches	Reference Elevation, feet amsl[b]	Reference Location on Well
MW-1	37° 40' 4.8"	122° 9' 25.2"	2600 Grant Avenue	San Lorenzo		665	650	520	640	2	8.71	Top of steel casing
MW-2S						210	60	40	60	2	9.90	Top of steel casing
MW-2I[c]						210	200	160	190	2		
MW-3	37° 40' 4.8"	122° 9' 28.8"				665	660	520	650	2	8.12	Top of steel casing
MW-4	37° 40' 11.6"	122° 9' 28.8"	2575 Grant Avenue			705	650	520	650	2	8.96	Top of steel rim
MW-5S	37° 40' 34.4"	122° 9' 06.6"	2006 Via Barrett		Sep. 2008	460	210	200	210	2	13.88	Seal of vault lid at easterly edge
MW-5I	37° 40' 34.4"	122° 9' 06.6"	2005 Via Barrett		Sep. 2008	460	325	315	325	2		
MW-5D	37° 40' 34.4"	122° 9' 06.6"	2007 Via Barrett		Feb. 2001	1,025	640	500	630	4	13.76	Top of casing at northerly edge
MW-6	37° 40' 07"	122° 9' 04.5"	15600 Worthley		Nov. 2000	1,000	655	480	650	4	9.46	Top of casing at easterly edge
MW-7	37° 39' 56.5"	122° 8' 44.2"	Western tip of San Lorenzo Park		Nov. 2000	972	680	510	630	4	7.42	Top of casing at northerly edge
MW-8D	37° 43' 04"	122° 11' 50.3"	1970 Davis Street			910	490	420	480	2	14.76	Top of steel rim
MW-9S	37° 41' 11"	122° 6' 46"	589 E. Lewelling Avenue		Jan. 2008	460	120	110	120	2	54.39	Seal of vault lid at westerly edge
MW-9I					Jan. 2008	460	210	200	210	2		
MW-9D[d]					Jan. 2008	460	335	325	335	2		
MW-10S	37° 41' 19"	122° 9' 43"	15526 Wick Boulevard	San Leandro	Sep. 2008	680	120	100	120	2	11.76	Seal of vault lid at easterly edge
MW-10I					Sep. 2008	680	360	340	360	2		
MW-10D					Sep. 2008	680	610	590	610	2		

[a] bgs = below ground surface

[b] amsl = above Mean Sea Level

[c] Well MW-2I is referred to in the Permit as "MW-2D."

[d] Well MW-9D is referred to in the Permit as "MW-9."

Table 2. Historical Injected and Recovered Water Volumes		
Year	Injected Volume, gallons	Recovered Volume, gallons
2009	445,000	4,545,000
2010	0	113,000,000
2011	28,432,401	0
2012	0	0
2013	0	0
2014	0	0
2015	0	0
2016	0	0
2017	1,310,000	0
Total	**30,187,401**	**117,545,000**

Table 3. Summary of Groundwater Elevation and Depth

Measurement Date	Groundwater Elevation, ft amsl								Depth to Groundwater, ft							
	Bayside	MW-1	MW-2S	MW-2I	MW-4	MW-6	MW-5D	MW-7	Bayside	MW-1	MW-2S	MW-2I	MW-4	MW-6	MW-5D	MW-7
12/8/08			0.99		-4.07	[a]					8.78[b]		12.68[b]			
12/9/08		-5.06		1.09						13.74[b]		8.73[b]				
12/14/09					-3.75								12.71			
12/15/09			0.95	1.44							8.95	8.46				
12/8/10	-7.22		1.71	0.25	-7.45				15.6		8.19	9.65	16.41			
12/21/11		-4.16	1.12	3.59	-4.17					12.87	8.78	6.31	13.13			
1/5/12		-3.94	1.04	6.24	-3.97					12.65	8.86	3.66	12.93			
12/13/12		-4.49	2.38	1.72	-4.16	-4.52				13.20	7.52	8.18	13.12	13.98		
12/18/13		-4.06	1.59	0.37	-6.68	-6.46				12.77	8.31	9.53	15.64	15.92		
12/12-12/17/14		-6.54	2.75	0.18	-6.01	-5.99	-5.76	[c]		15.25	7.15	9.72	14.97	15.45	19.52	[c]
11/16-12/15/15		-5.48	2.90	0.32	-4.94	[d]	-5.87	[c]		14.19[e]	7.00	9.58	13.9	[d]	19.63	[c]
12/21-12/27/16		-2.00	2.90	2.88	-1.95	-1.96	-1.96	[c]		10.71	7.00	7.02	10.91	11.42	15.72	[c]
12/19-12/20/17		-5.05	1.86	-1.07	-1.42	-1.80	-1.47	-11.69		13.76	8.04	10.97	10.38	11.26	15.23	20.40

[a] Gray shaded cells indicate that no monitoring was required for the well at that time period, reflecting the transition between monitoring groups.
[b] Applicable well reference elevations are different from those in Table 1.
[c] Well MW-7 was damaged in 2012, and accurate data collection was not feasible until 2016. In 2016, a sample was not collected because the pump EBMUD owns was found to be incompatible with the well.
[d] Well MW-6 was not monitored in late 2015 due to a pump equipment failure.
[e] Depth to Groundwater for MW-1 was incorrectly reported in the 2015 Annual Report as -13.56 ft.

Table 4. Calculated Vertical Hydraulic Gradients for Low Tide and High Tide in San Francisco Bay

Nested Well	Measurement Date and Time	Screened Interval, ft	Center of Screened Intervals, ft bgs	Groundwater Elevation, ft amsl	Shallow to Intermediate Vertical Gradient, ft/ft	Intermediate to Deep Vertical Gradient, ft/ft	Shallow to Deep Vertical Gradient, ft/ft	Vertical Gradient Direction
Low Tide								
MW-5S	7/1/2017 @ 0:47	200 - 210	205	-2.18	0.035	--	0.036	downward
MW-5I	7/1/2017 @ 0:48	315 - 325	320	-6.15		0.037		
MW-5D	7/1/2017 @ 0:52	500 - 630	575	-15.64	--			
High Tide								
MW-5S	12/1/2017 @ 09:14	200 - 210	205	-1.75	0.038	--	0.036	downward
MW-5I	12/1/2017 @ 09:15	315 - 325	320	-6.17		0.034		
MW-5D	12/1/2017 @ 09:19	500 - 630	575	-14.92	--			

Table 5. Current and Historical Groundwater Quality Results for General Water Quality Parameters and Standard Minerals[a]

Sample Date	General Water Quality Parameters								Standard Minerals									
															Alkalinity (as CaCO3)			
	pH	Chlorine Residual, mg/L	TDS, mg/L	Ammonia, mg/L	Nitrate as N, mg/L	Chloride, mg/L	Manganese, µg/L	Iron, µg/L	Calcium, mg/L	Magnesium, mg/L	Potassium, mg/L	Sodium, mg/L	Sulfate, mg/L	Hardness, mg/L	Total, mg/L	Hydroxide, mg/L	Carbonate, mg/L	Bicarbonate, mg/L
Bayside Well																		
1/5/2012	7.82	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/13/2012	7.98	ND	110	<0.3	0.0074	10	16.8	236	12.2	3.12	0.789	21.3	13	47	59	<0.1	0.53	59
12/18/2013	7.87	ND	120	0.56	<0.003	13	22.8	580	14.0	3.77	1.05	22.5	15	50	65	<0.1	0.45	64
12/17/2014	8.19	ND	130	0.42	<0.00090	15	23.0	52.3	14.7	3.88	1.07	28.0	15	70	69	<0.1	0.99	68
11/16/2015	7.68	0.10	75	<0.3	<0.00090	15	22.3	215	13.5	3.64	1.01	23.3	16	48	70	<0.1	<0.1	70
12/7/2016	8.09	0.10	140	0.112	<0.00090	17	16.2	70.2	16.4	4.15	1.13	27.1	18	55	68	<0.1	<0.1	68
12/5/2017	7.91	ND	150	0.25	0.040	16	12.9	66.5	16.5	4.17	1.19	25.0	21	62	68	<0.1	<0.1	68
MW-2S																		
1/5/2012	6.83	0.09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/13/2012	6.29	ND	83,000	0.42	E0.19	E52,000	36,700	<31.2	1,230	2,950	488	24,900	6,700	16,000	390	<0.1	<0.1	390
12/18/2013	6.67	0.08	85,000	0.7	<0.15	45,000	36,100	2,530	1,230	2,580	568	22,300	5,700	17,000	430	<0.1	0.19	420
12/13/2014	6.57	0.20	83,000	<0.3	23[b]	39,000	36,900	<31.2	1,230	2,680	462	22,000	6,100	17,000	380	<0.1	0.13	380
12/10/2015	6.85	ND	76,000	<0.3	27	41,000	21,900	76.8	1,250	3,040	401	20,500	5,200	16,000	390	<0.1	<0.1	390
12/27/2016	6.73	0.07	77,000	0.336	<0.65	42,000	38,100	<62.4	1,330	3,150	510	20,600	5,700	16,000	390	<0.1	<0.1	390
12/19/2017	6.27	ND	73,000	1.2	<11	41,000	33,200	<62.4	1,210	2,800	501	21,200	5,500	17,000	390	<0.1	<0.1	390
MW-2I																		
1/5/2012	7.82	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/13/2012	8.08	ND	520	<0.3	E0.0036	82	105	190	14.8	13.0	5.60	177	31	93	310	<0.1	3.5	310
12/18/2013	7.83	ND	500	<0.3	<0.003	75	115	606	14.8	13.4	6.76	153	32	89	310	<0.1	1.9	300
12/12/2014	7.90	ND	520	1.12	<0.0090	81	98.7	213	14.6	12.6	5.33	153	31	94	310	<0.1	2.3	310
12/15/2015	7.75	ND	490	0.56	0.044	59	105	177	14.4	12.5	6.73	156	34	90	300	<0.1	<0.1	300
12/27/2016	8.10	0.02	540	0.28	0.18	84	111	98	15.2	13.2	6.16	148	30	94	320	<0.1	<0.1	320
12/19/2017	7.69	0.05	630	1.01	0.18	150	139	1220	17.8	15.9	7.61	193	13	130	350	<0.1	<0.1	350
MW-4																		
1/5/2012	7.42	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
12/13/2012	7.64	ND	420	<0.3	0.0071	57	232	84.2	28.9	11.2	2.49	119	40	120	250	<0.1	1.0	240
12/18/2013	7.78	ND	430	<0.3	<0.003	59	237	31.2	32.2	13.0	3.05	113	42	130	260	<0.1	1.5	260
12/16/2014	8.22	0.10	450	<0.3	0.028	56	239	33.7	32.2	12.8	2.72	113	39	130	270	<0.1	4.2	270
12/8/2015	7.98	ND	420	<0.3	0.039	56	215	32.5	28.8	11.7	3.08	106	41	130	250	<0.1	<0.1	250
12/27/2016	8.14	ND	440	0.336	0.098	59	222	31.6	31.4	12.6	2.76	108	42	120	260	<0.1	<0.1	260
12/20/2017	7.55	ND	410	0.250	0.091	57	196	24.4	27.9	10.7	2.69	107	40	130	240	<0.1	<0.1	240
MW-5D																		
12/16/2014	7.00	0.40	490	<0.3	<0.009	96	241	180	42.8	10.8	2.59	123	46	150	230	<0.1	0.22	230
11/18/2015	7.53	0.20	450	<0.3	<0.009	82	175	46.4	35.6	9.06	2.30	112	49	140	240	<0.1	<0.1	240
12/21/2016	7.68	0.02	470	<0.220	<0.013	84	195	34.6	39.0	9.74	2.34	130	49	130	230	<0.1	<0.1	230
12/19/2017	7.37	0.01	450	<0.250	<0.19	83	164	130	34.2	8.56	2.39	99	49	150	230	<0.1	<0.1	230

Table 5. Current and Historical Groundwater Quality Results for General Water Quality Parameters and Standard Minerals[a]

Sample Date	General Water Quality Parameters								Standard Minerals									
															Alkalinity (as CaCO3)			
	pH	Chlorine Residual, mg/L	TDS, mg/L	Ammonia, mg/L	Nitrate as N, mg/L	Chloride, mg/L	Manganese, µg/L	Iron, µg/L	Calcium, mg/L	Magnesium, mg/L	Potassium, mg/L	Sodium, mg/L	Sulfate, mg/L	Hardness, mg/L	Total, mg/L	Hydroxide, mg/L	Carbonate, mg/L	Bicarbonate, mg/L
MW-6																		
12/13/2012	7.26	ND	420	<0.3	0.099	56	302	144	31.0	7.68	1.88	117	46	120	220	<0.1	0.38	220
12/18/2013	7.41	0.07	420	<0.3	0.017	120	223	60.4	32.4	8.58	2.14	110	95	110	230	<0.1	0.55	230
12/13/2014	7.92	0.10	430	<0.3	0.0042	58	209	25.4	34.1	8.89	2.39	110	56	120	230	<0.1	1.8	230
12/10/2015	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)	(c)
12/27/2016	7.72	ND	400	0.336	0.17	68	192	21.0	35.6	8.25	3.00	87.7	40	120	210	<0.1	<0.1	210
12/20/2017	7.19	ND	400	0.250	0.18	55	170	13.1	31.4	7.58	2.97	104	45	130	210	<0.1	<0.1	210
MW-7																		
2016	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)
2017	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)	(d)

[a] Symbols and data qualifiers are described as follows:
"<" or "ND" indicates non-detect (ND) results, with the Method Detection Limit (MDL) shown as the value following "<".
"B" preceding a value indicates that the parameter was detected in the laboratory blank associated with the reported result.
"E" preceding a value indicates a detected results with a value reported as "estimated" between the MDL and the Reporting Limit.
"--" indicates that no result was reported for the analyte on the corresponding sample date.

[b] The analytical laboratory report notes that the analysis for nitrate exceeded the hold time for the MW-2S sample collected 12/13/2014.

[c] Well MW-6 was not sampled in 2015 due to pump equipment failure.

[d] Well MW-7 was not sampled in 2016 and 2017 because the pump EBMUD owns was found to be incompatible with the well.

Table 6. Current and Historical Groundwater Quality Results for Disinfection Byproducts[a]

Sample Date	Haloacetic Acids											Trihalomethanes				
	HAA(5),[a] µg/L	HAA(9),[b] µg/L	Bromochloro-acetic Acid, µg/L	Bromodichloro-acetic Acid, µg/L	Chlorodibromo-acetic Acid, µg/L	Dibromo-acetic Acid, µg/L	Dichloro-acetic Acid, µg/L	Monobromo-acetic Acid, µg/L	Monochloro-acetic Acid, µg/L	Tribromo-acetic Acid, µg/L	Trichloro-acetic Acid, µg/L	TTHMs,[d] µg/L	Chloroform, µg/L	Bromodichloro-methane, µg/L	Dibromochloro-methane, µg/L	Bromoform, µg/L
Bayside Well																
1/5/2012	--	--	--	--	--	--	--	--	--	--	--	<40.09	38	1.6	0.26	<0.23
12/13/2012	ND	ND	<0.14	<0.16	<0.19	<0.11	<0.23	<0.22	<0.68	<0.44	<0.21	<9.71	9.1	0.25	<0.13	<0.23
12/18/2013	0.35	1.6	I 1.3	<0.16	<0.19	I 0.35	<0.23	<0.22	<0.68	<0.44	<0.21	<2.94	2.5	<0.079	<0.13	<0.23
12/17/2014	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.89	0.45	<0.079	<0.13	<0.23
11/16/2015	<1.7	<3.2	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.36	<0.98	0.37	<0.145	<0.20	<0.27
12/7/2016	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<4.95	4.4	0.19	<0.13	<0.23
12/5/2017	<1.6	<3.1	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.26	<15.56	14	1.2	<0.13	<0.23
MW-2S																
1/5/2012	--	--	--	--	--	--	--	--	--	--	--	<0.609	<0.17	<0.079	<0.13	<0.23
12/13/2012	ND	ND	<0.14	<0.16	<0.19	<0.11	<0.23	<0.22	<0.68	<0.44	<0.21	<0.609	<0.17	<0.079	<0.13	<0.23
12/18/2013	ND	ND	<0.14	<0.16	<0.19	<0.11	<0.23	<0.22	<0.68	<0.44	<0.21	<0.609	<0.17	<0.079	<0.13	<0.23
12/13/2014	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	N,J <0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/10/2015	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/27/2016	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/19/2017	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
MW-2I																
1/5/2012	--	--	--	--	--	--	--	--	--	--	--	<0.609	<0.17	<0.079	<0.13	<0.23
12/13/2012	ND	ND	<0.14	<0.16	<0.19	<0.11	<0.23	<0.22	<0.68	<0.44	<0.21	<0.609	<0.17	<0.079	<0.13	<0.23
12/18/2013	0.34	0.34	<0.14	<0.16	<0.19	I 0.34	<0.23	<0.22	<0.68	<0.44	<0.21	<0.609	<0.17	<0.079	<0.13	<0.23
12/12/2014	ND	<3.4	0.50	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	J <0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/15/2015	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/27/2016	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/19/2017	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
MW-4																
1/5/2012	--	--	--	--	--	--	--	--	--	--	--	<0.609	<0.17	<0.079	<0.13	<0.23
12/13/2012	ND	ND	<0.14	<0.16	<0.19	<0.11	<0.23	<0.22	<0.68	<0.44	<0.21	<0.609	<0.17	<0.079	<0.13	<0.23
12/18/2013	0.36	4.0	I 3.6	<0.16	<0.19	0.36	<0.23	<0.22	<0.68	<0.44	<0.21	<0.609	<0.17	<0.079	<0.13	<0.23
12/16/2014	<1.6	<3.1	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	0.72	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/8/2015	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/27/2016	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/20/2017	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
MW-5D																
12/16/2014	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
11/18/2015	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.170	<0.17	<0.079	<0.13	<0.23
12/21/2016	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/19/2017	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23

Table 6. Current and Historical Groundwater Quality Results for Disinfection Byproducts[a]

Sample Date	Haloacetic Acids											Trihalomethanes				
	HAA(5),[a] µg/L	HAA(9),[b] µg/L	Bromochloro-acetic Acid, µg/L	Bromodichloro-acetic Acid, µg/L	Chlorodibromo-acetic Acid, µg/L	Dibromo-acetic Acid, µg/L	Dichloro-acetic Acid, µg/L	Monobromo-acetic Acid, µg/L	Monochloro-acetic Acid, µg/L	Tribromo-acetic Acid, µg/L	Trichloro-acetic Acid, µg/L	TTHMs,[d] µg/L	Chloroform, µg/L	Bromodichloro-methane, µg/L	Dibromochloro-methane, µg/L	Bromoform, µg/L
MW-6																
12/13/2012	ND	ND	<0.14	<0.16	<0.19	<0.11	<0.23	<0.22	<0.68	<0.44	<0.21	<0.609	<0.17	<0.079	<0.13	<0.23
12/18/2013	0.34	3.9	I, N 3.6	<0.16	<0.19	0.34	<0.23	<0.22	<0.68	<0.44	<0.21	<0.609	<0.17	<0.079	<0.13	<0.23
12/13/2014	(e)	(e)	(e)	(e)	(e)	(e)	(e)	(e)	(e)	(e)	(e)	<0.609	<0.17	<0.079	<0.13	<0.23
12/10/2015	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)	(f)
12/27/2016	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
12/19/2017	ND	ND	<0.15	<0.31	<0.31	<0.25	<0.18	<0.29	<0.65	<0.72	<0.17	<0.609	<0.17	<0.079	<0.13	<0.23
MW-7																
2016	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)
2017	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)	(g)

[a] Symbols and data qualifiers are described as follows:
"<" or "ND" indicates non-detect (ND) results, with the Method Detection Limit (MDL) shown as the value following "<", except for total haloacetic acids (HAA) and total trihalomethanes (TTHMs) as detailed below.
"I" preceding a value indicates a dual column quantitation difference greater than 40 percent Relative Percent Difference.
"J" preceding a value indicates that the quantitation of the result does not meet the laboratory's Standard Operating Procedure criteria.
"N" preceding a value indicates that the spike recovery for the result was outside the laboratory control limits.
"--" indicates that no result was reported for the analyte on the corresponding sample date.

[b] HAA5 value is calculated by adding values for dibromoacetic, dichloroacetic, monobromoacetic, monochloroacetic, and trichloroacetic acids, with "<" indicating that the total includes ND data (MDLs used). If all results are ND, then the total is indicated as ND.

[c] HAA9 value is calculated by adding results for all individual haloacetic acids shown, with "<" indicating that the total includes ND data (MDLs used). If all results are ND, then the total is indicated as ND.

[d] TTHMs value is calculated by adding individual trihalomethane results (including MDLs for ND data). If ND data is included, "<" is indicated with the TTHMs result.

[e] Well MW-6 was not monitored for haloacetic acids in 2014.

[f] Well MW-6 was not monitored in 2015 due to pump equipment failure.

[g] Well MW-7 was not sampled in 2016 and 2017 because the pump EBMUD owns was found to be incompatible with the well.

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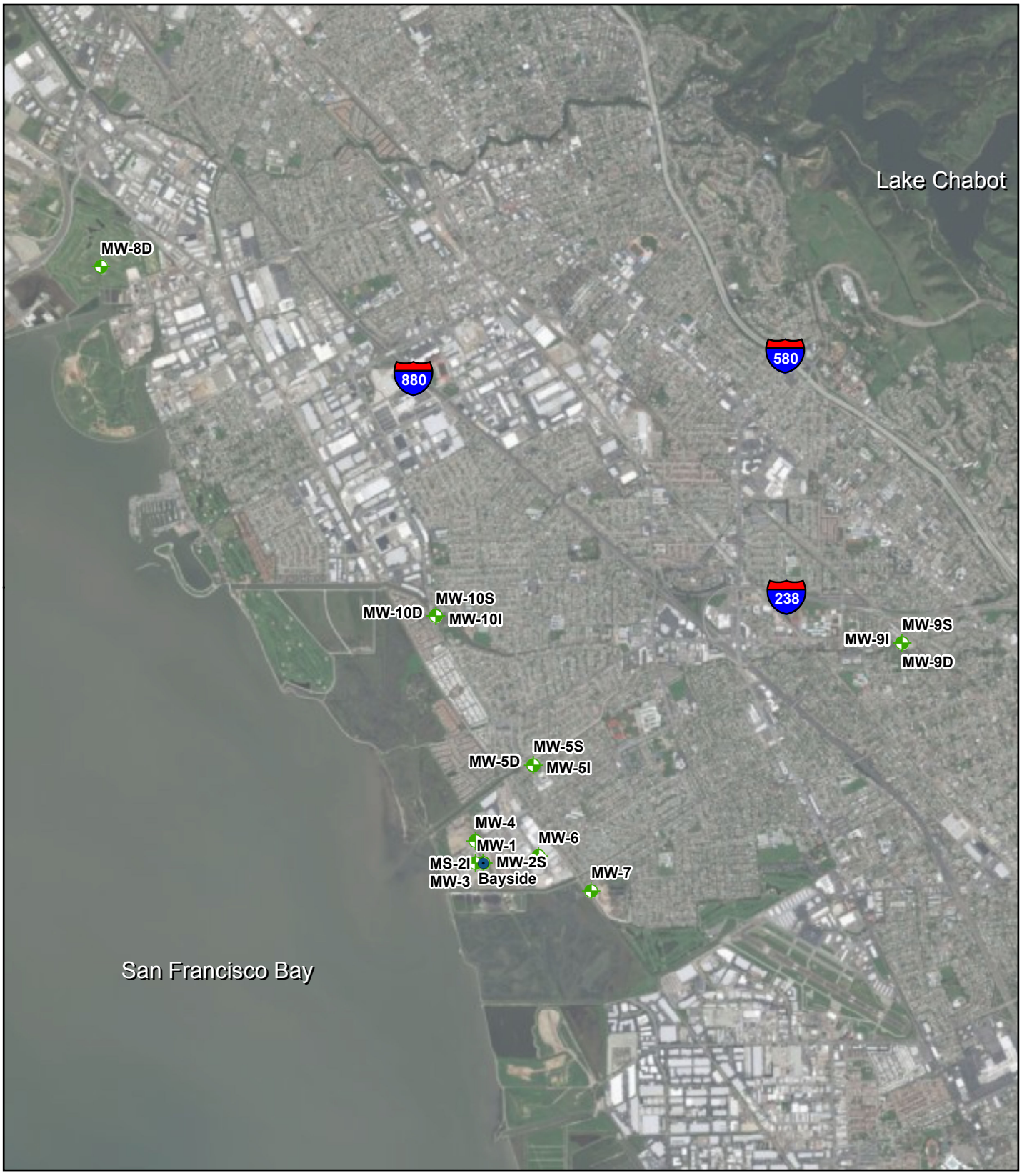


LEGEND

- Groundwater Monitoring Well
- Aquifer Storage and Recovery Bayside Well

N

0 0.5 1

Miles

FIGURE 1

East Bay Municipal Utility District
2017 Bayside Annual Report

Well Location Map

WEST YOST ASSOCIATES

LEGEND

- Groundwater monitoring well and elevation, feet above mean sea level (amsl)
- Groundwater elevation contour, feet amsl, dashed where approximate
- Approximate horizontal groundwater gradient direction and magnitude

N

0 300 600

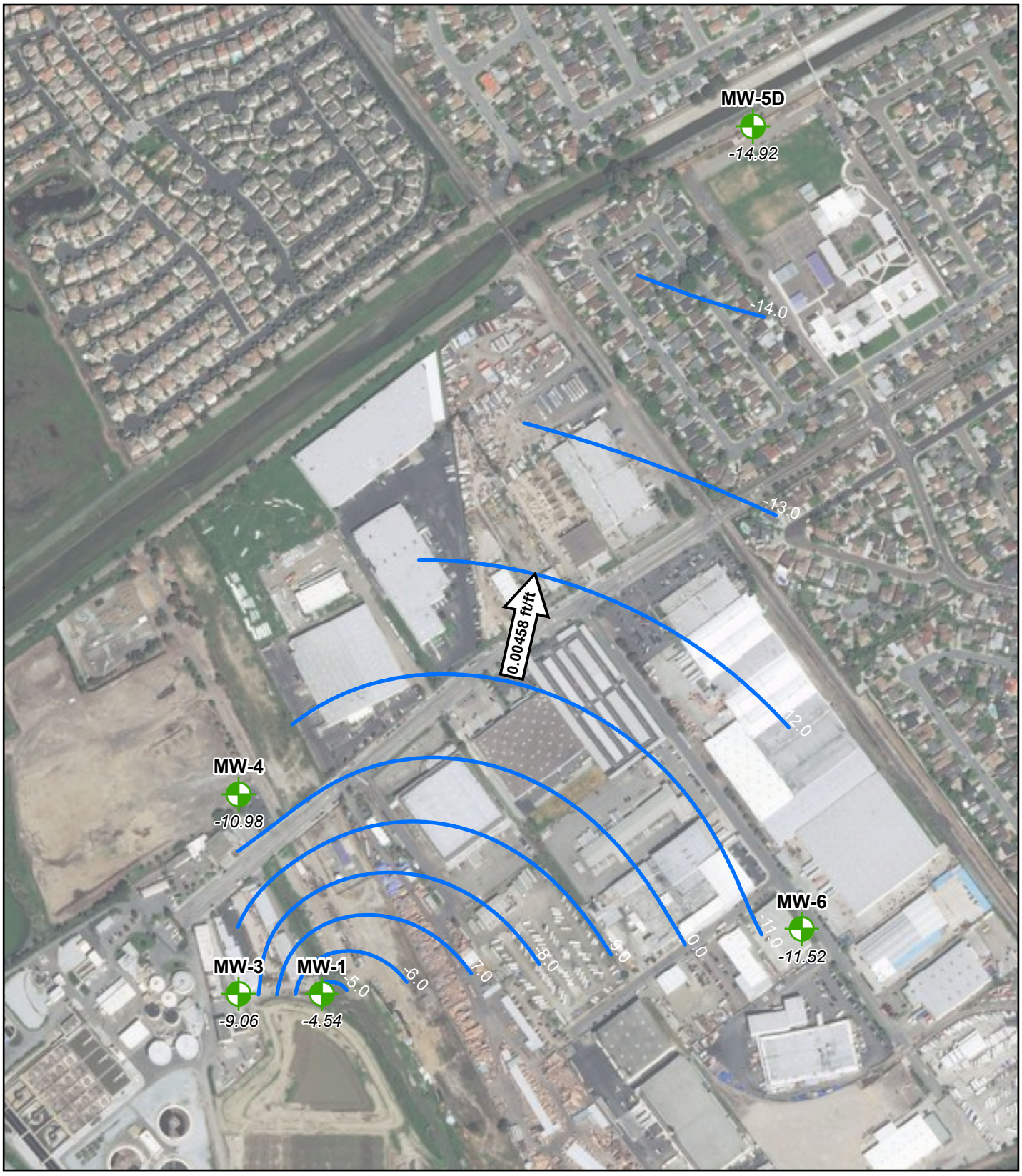
Scale in Feet

FIGURE 2

East Bay Municipal Utility District
2017 Bayside Annual Report

Groundwater Elevation Contours
Low Tide (July 1, 2017)

WEST YOST ASSOCIATES



LEGEND

- Groundwater monitoring well and elevation, feet above mean sea level (amsl)
- Groundwater elevation contour, feet amsl, dashed where approximate
- Approximate horizontal groundwater gradient direction and magnitude

N

0 300 600

Scale in Feet

FIGURE 3

East Bay Municipal Utility District
2017 Bayside Annual Report

Groundwater Elevation Contours
High Tide (December 1, 2017)

WEST YOST ASSOCIATES

LEGEND

- Groundwater monitoring well and TDS concentration in mg/L.
- TDS concentration contour, dashed where approximate.

N

0 300 600

Scale in Feet

FIGURE 4

East Bay Municipal Utility District
2017 Bayside Annual Report

Groundwater TDS Contours
December 2017

WEST YOST ASSOCIATES

ATTACHMENT A

Groundwater Purging Logs

Site Name: Bayside

Well No. MW-2I | Inspector: EMS/BA | Date: 12/19/17

Purging Data

Well Diameter:	Tubing Diameter (inches):	Well Screen Interval Depth:	Static Depth to Water (feet)	Purge Pump Type:
2"	3/8"	200-160 TD 240'	10.97	12V whale

Well Purge Volume: 1 well volume = (total well depth - static depth to water) x well capacity
Show calculation here: 34.69 x 3 = 104.07 gal

Initial Pump or Tubing Depth in Well (Feet):	Purging Initiated at:	Purging Ended at:	Total Volume Purged (gallons):	Final Static Depth to Water (feet):
~~30'~~ 35'	1300	1445	~~110~~ 105	35.35' btoc

Time	Volume Purged (gallons)	Total Volume Purged (gallons)	pH (standard units)	Temp (°C)	Conductivity (circle units) µmhos/cm or µS/cm	Notes
1305	15	15	7.74	17.8	1090	dtw 17.23 btoc
1310	5	20	7.69	17.5	1089	dtw 25.64 btoc
1315						Stop pump
						started pump @ 40' btoc
1320	0	20	7.74	17.1	1091	dtw 16.47 btoc
1350	30	50	7.69	17.2	1181	dtw 31.98 btoc
1415	25	75	7.69	17.1	1150	dtw 34.71 btoc
1445	30	105	7.69	17.1	1122	dtw 35.35 btoc

Purging Equipment Codes:
B = Bailer BP = Bladder Pump ESP = Electric Submersible Pump PP= Peristaltic Pump O = Other

Colorimeter 0.05 mg/L

2

Residual chlorine: 0.05 mg/L
Date: 12/19/17
Time: 1445

5 sec/2 pump

Site Name: Bayside					
Well No. MW-2S	Inspector: EMS/BA			Date: 12/19/17	
Purging Data					
Well Diameter: 2"	Tubing Diameter (inches): 3/8"	Well Screen Interval Depth: 40-60 TD 60'	Static Depth to Water (feet) 8.04		Purge Pump Type: 12V whale
Well Purge Volume: 1 well volume = (total well depth - static depth to water) x well capacity Show calculation here: 9.06 gal * 3 = 27.18 gal					
Initial Pump or Tubing Depth in Well (Feet): 15'	Purging Initiated at: 1500	Purging Ended at: 1515	Total Volume Purged (gallons): 30 gal		Final Static Depth to Water (feet): 8.67' btoc

Time	Volume Purged (gallons)	Total Volume Purged (gallons)	pH (standard units)	Temp (°C)	Conductivity (circle units) µmhos/cm or µS/cm	Notes
1500	0	0	6.31	17.7	99089	8.54' btoc
1505	10	10	6.25	17.5	99367	8.60' btoc
1510	10	20	6.26	17.5	99447	8.62' btoc
1515	10	30	6.27	17.5	99452	8.67' btoc

Purging Equipment Codes:
B = Bailer BP = Bladder Pump ESP = Electric Submersible Pump PP= Peristaltic Pump O = Other

Residual chlorine = 0.0 mg/L
Date: 12/19/17
Time: 1515

2 gal/min

Site Name: Bayside					
Well No. MW-4		Inspector: EMS/BA		Date: 12/20/17	
Purging Data					
Well Diameter: 2"	Tubing Diameter (inches): 3/8"	Well Screen Interval Depth: 520 - 650	Static Depth to Water (feet) 10.38		Purge Pump Type: 12 whale 4/per

Well Purge Volume: 1 well volume = (total well depth - static depth to water) x well capacity
Show calculation here:

$650 - 10.38 = 111.49_{gal} \times 3 = 334.47$ gal

Initial Pump or Tubing Depth in Well (Feet): ~15'	Purging Initiated at: ~~1515~~ 1516	Purging Ended at: 1710	Total Volume Purged (gallons): 342	Final Static Depth to Water (feet): 10.92' btoc

Time	Volume Purged (gallons)	Total Volume Purged (gallons)	pH (standard units)	Temp (°C)	Conductivity (circle units) µmhos/cm or µS/cm	Notes
1520	12	12	7.60	18.1	~~964~~ 694	10.58' dtw btoc
1545	75	87	7.57	18.0	697	10.61' dtw btoc
1605	60	147	7.59	18.8	699	10.66' dtw btoc
1630	75	222	7.64	18.9	692	10.79' dtw btoc
1650	60	282	7.57	18.9	688	10.88' dtw btoc
1710	60	342	7.55	19.0	684	10.92' dtw btoc

Purging Equipment Codes:
B = Bailer BP = Bladder Pump ESP = Electric Submersible Pump PP= Peristaltic Pump O = Other

Residual chlorine = 0.0 mg/L
Date: 12/20/17
Time: 1710

Site Name: Bayside					
Well No. MW-5D	Inspector: EMS / BA		Date: 12/19/17		
Purging Data					
Well Diameter: 4"	Tubing Diameter (inches): 3/8"	Well Screen Interval Depth: 500 - 630 TD@640'	Static Depth to Water (feet) 15.23	Purge Pump Type: 2" grundfos	

Well Purge Volume: 1 well volume = (total well depth - static depth to water) x well capacity
Show calculation here: 640 - 15.23 = 413.14 gal x 3 = 1239.42 gal

Initial Pump or Tubing Depth in Well (Feet):	Purging Initiated at:	Purging Ended at:	Total Volume Purged (gallons):	Final Static Depth to Water (feet):
20'	1020	1130	~~1300~~ (ES) 1400	14.79' btoc @ 1200 after sampling

Time	Volume Purged (gallons)	Total Volume Purged (gallons)	pH (standard units)	Temp (°C)	Conductivity (circle units) µmhos/cm or µS/cm	Notes
1030	200	200	6.23	19.0	77.4	15.33' dtw
1040	200	~~400~~	6.25	20.5	74.4	15.06' dtw
1110	600	1,000	7.27	22.2	75.9	15.05' dtw
1130	400	1400	7.37	22.1	80.3	15.02' dtw

Purging Equipment Codes:
B = Bailer BP = Bladder Pump ESP = Electric Submersible Pump PP= Peristaltic Pump O = Other

20 gal/min

Residual chlorine : 0.01 mg/L
Date: 12/19/17
Time : 11:35

Site Name: Bayside					
Well No. MW-6	Inspector: EMS/BA			Date: 12/20/17	
Purging Data					
Well Diameter: 4"	Tubing Diameter (inches): 3/8"	Well Screen Interval Depth: 650-480 TD@655'	Static Depth to Water (feet) 11.26	Purge Pump Type: 12 V whale tperi	
Well Purge Volume: 1 well volume = (total well depth - static depth to water) x well capacity Show calculation here: 655 - 11.26 = 425.68 x 3 = 1277.04 gal					
Initial Pump or Tubing Depth in Well (Feet): 20'	Purging Initiated at: 0725	Purging Ended at: 1430	Total Volume Purged (gallons): 1272.5	Final Static Depth to Water (feet): 10.71' btoc	

Time	Volume Purged (gallons)	Total Volume Purged (gallons)	pH (standard units)	Temp (°C)	Conductivity (circle units) µmhos/cm or µS/cm	Notes
0730	12.5	12.5	7.41	19.3	328.4	11.38' dtw btoc
0830	180	192.5	7.89	18.7	678	11.32' dtw btoc
0930	180	372.5	7.39	19.3	623	11.24' dtw btoc
1030	180	552.5	7.23	19.8	657	11.11' dtw btoc
1130	180	732.5	7.21	19.9	658	10.95' dtw btoc
1230	180	912.5	7.20	20.0	658	10.76' dtw btoc
1330	180	1092.5	7.20	20.0	658	10.87' dtw btoc
1430	180	1272.5	7.19	20.0	660	10.71' dtw btoc

Purging Equipment Codes:
B = Bailer BP = Bladder Pump ESP = Electric Submersible Pump PP= Peristaltic Pump O = Other

2.5 gal/min w/ whale
3 gal/min w/whale & peri

Resdual chlorine: 0.0
Date: 12/20/17
Time: 1435

ATTACHMENT B

Groundwater Elevation Trends for Monitoring Wells

Figure B-1. 2017 MW-1 Groundwater Elevation Trend

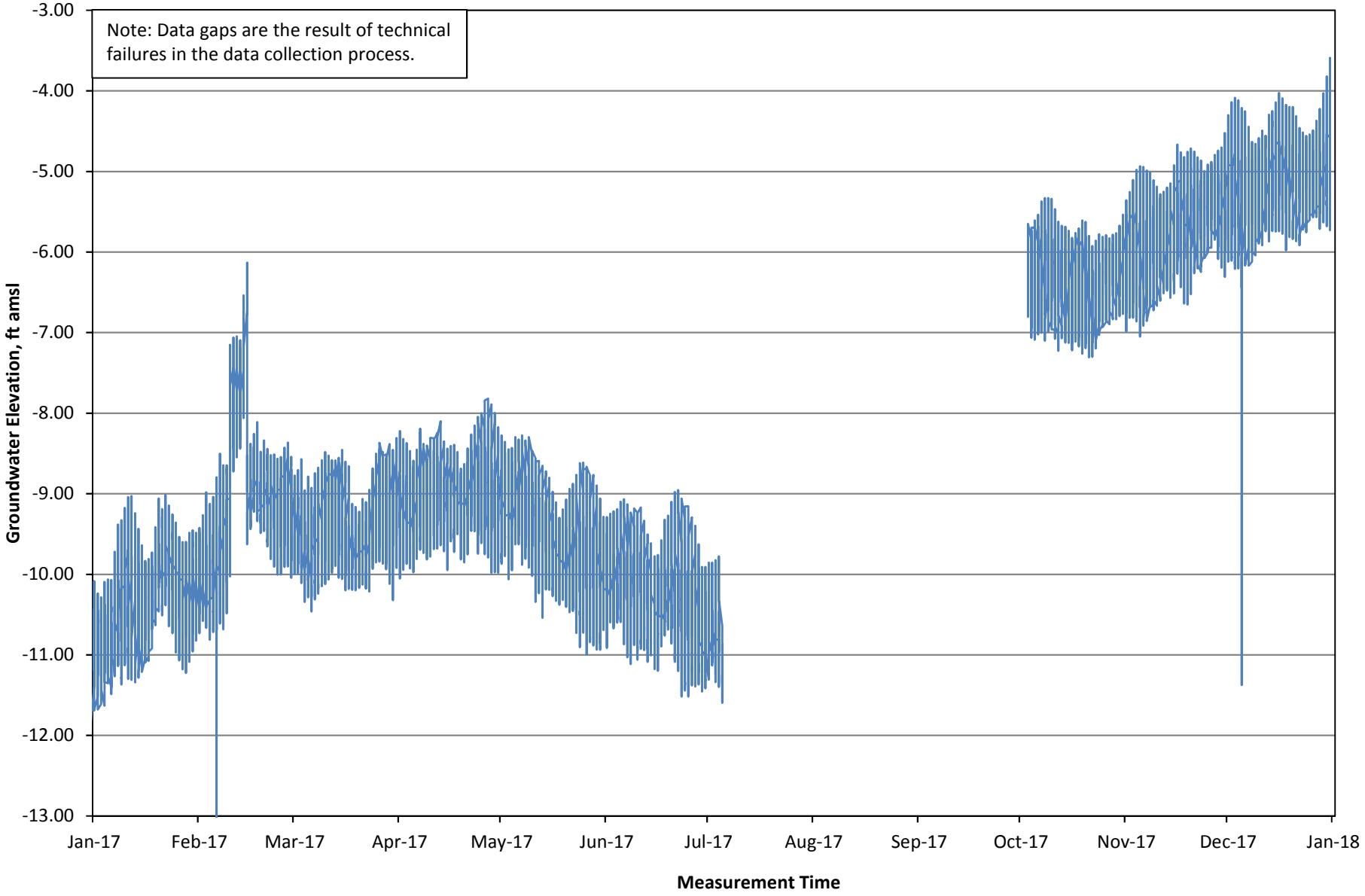


Figure B-2. 2017 MW-2S Groundwater Elevation Trend

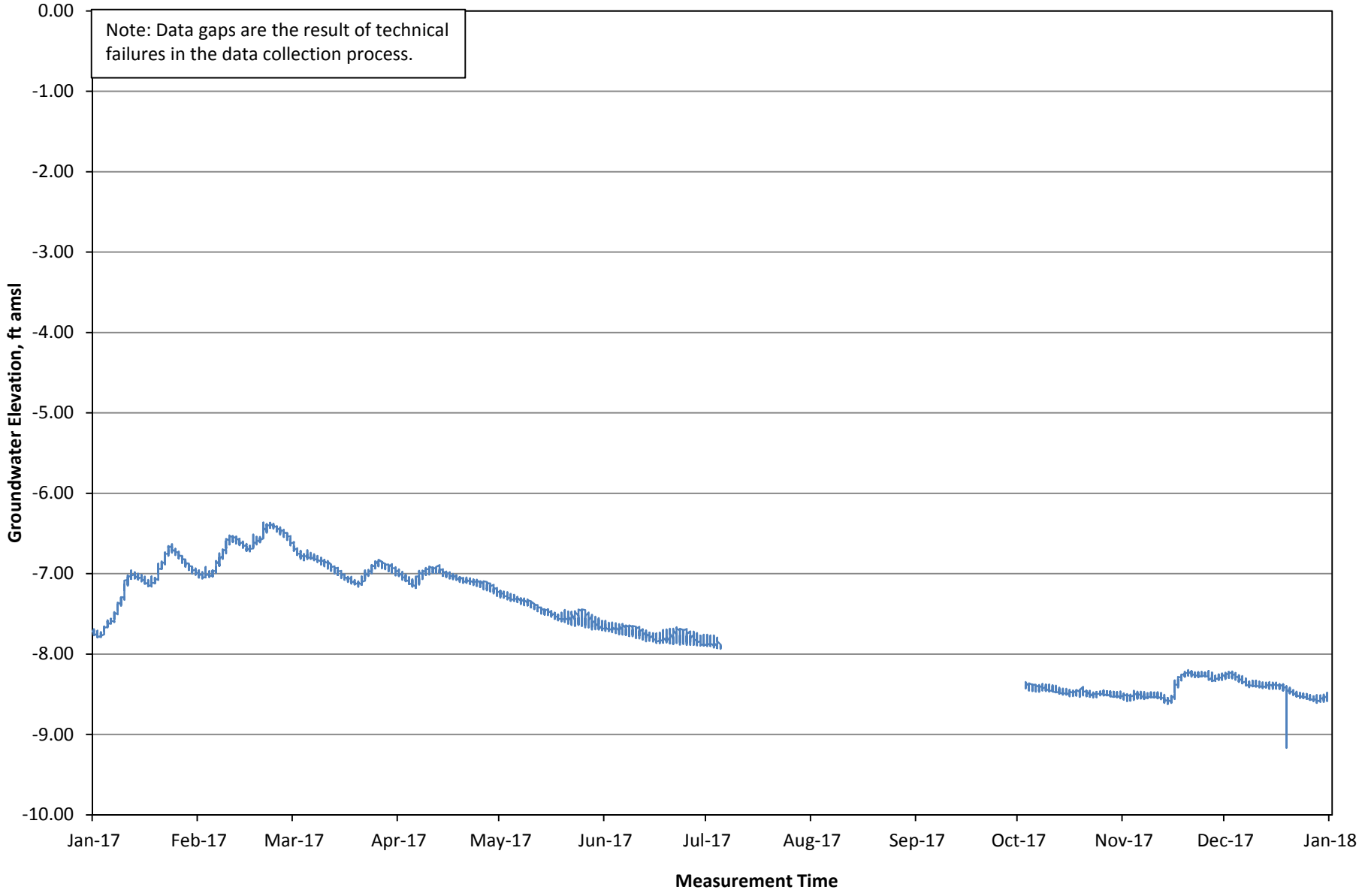


Figure B-3. 2017 MW-2I Groundwater Elevation Trend

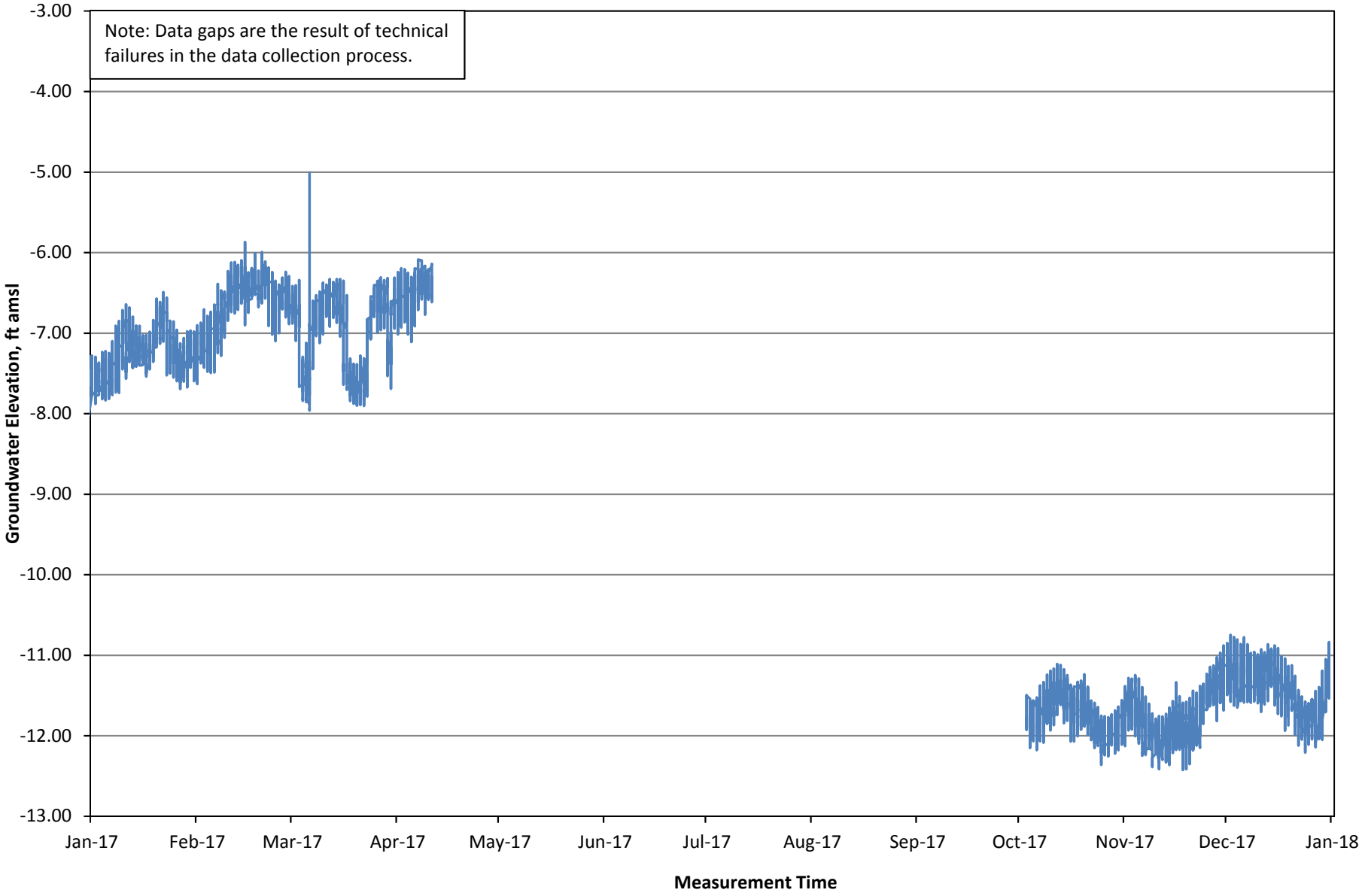


Figure B-4. 2017 MW-3 Groundwater Elevation Trend

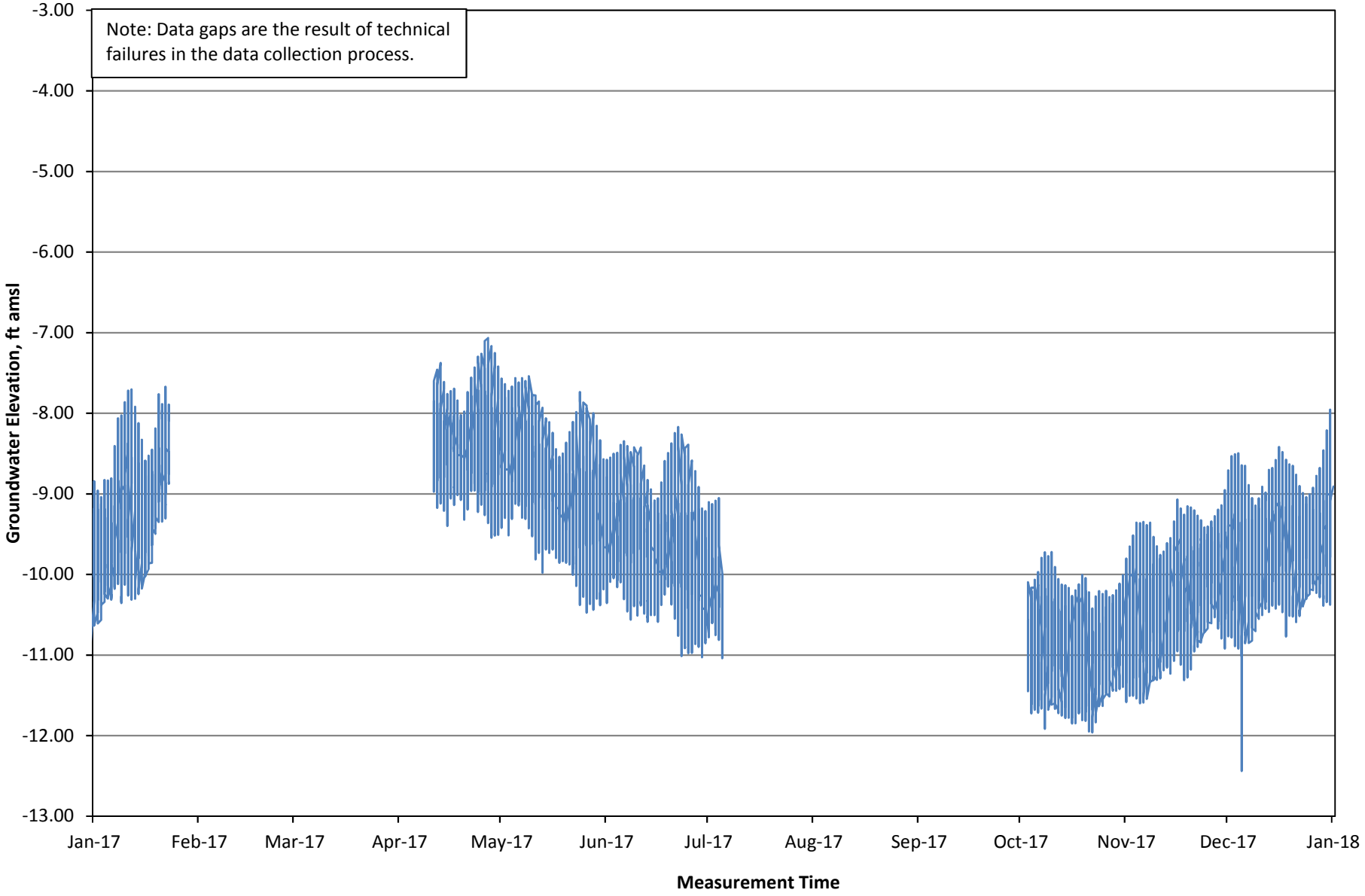


Figure B-5. 2017 MW-4 Groundwater Elevation Trend

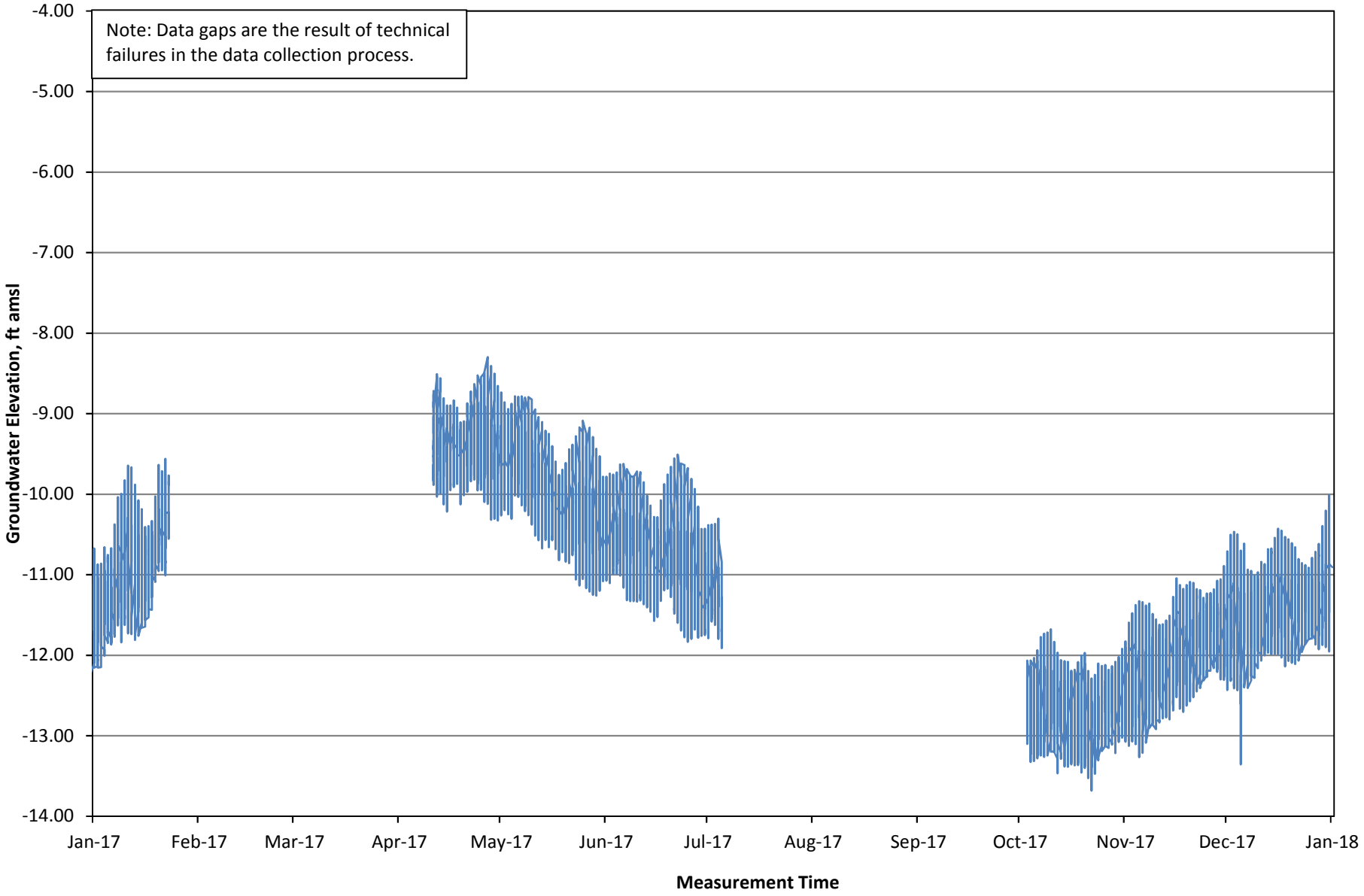


Figure B-6. 2017 MW-5S Groundwater Elevation Trend

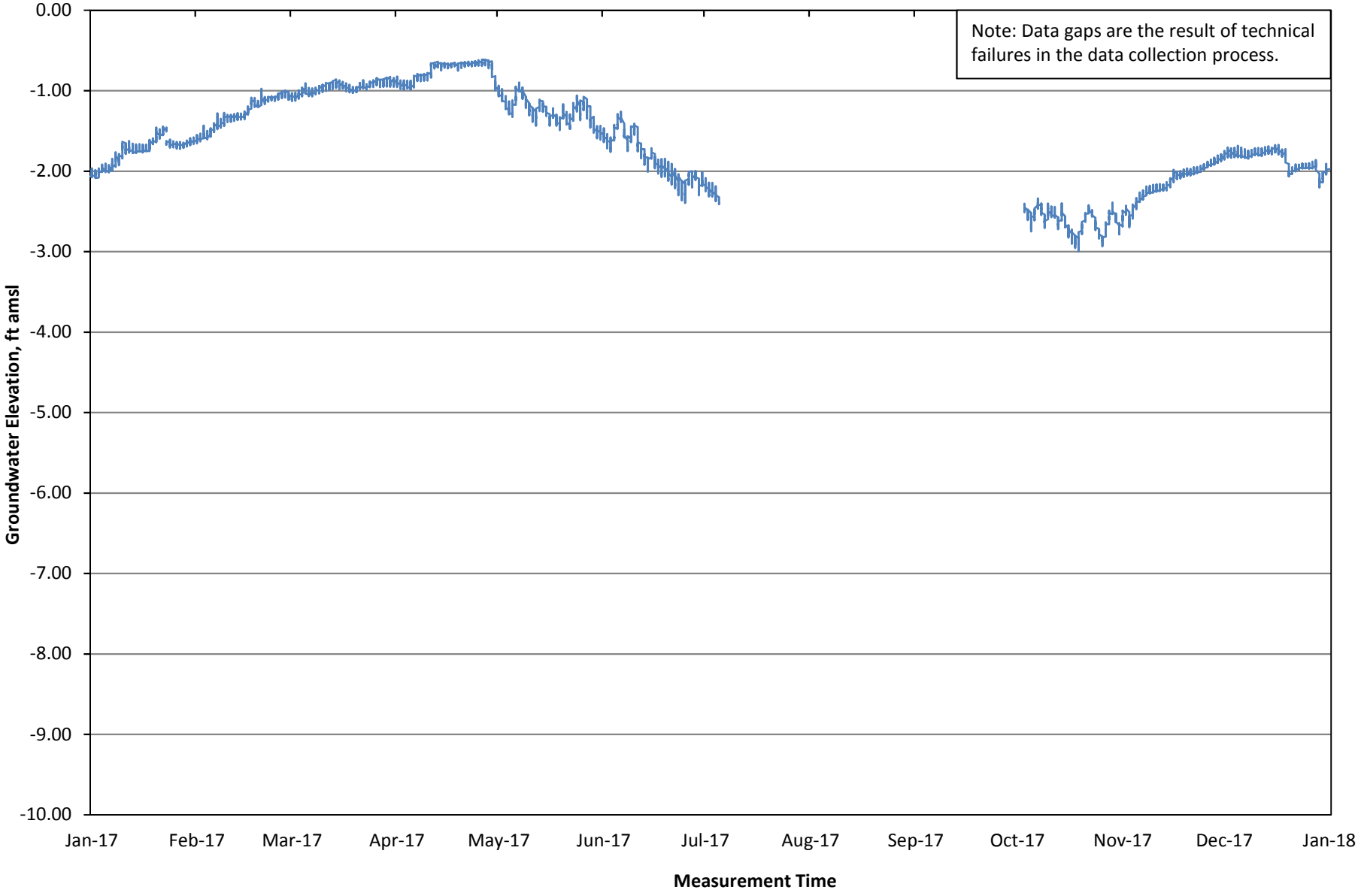


Figure B-7. 2017 MW-5I Groundwater Elevation Trend

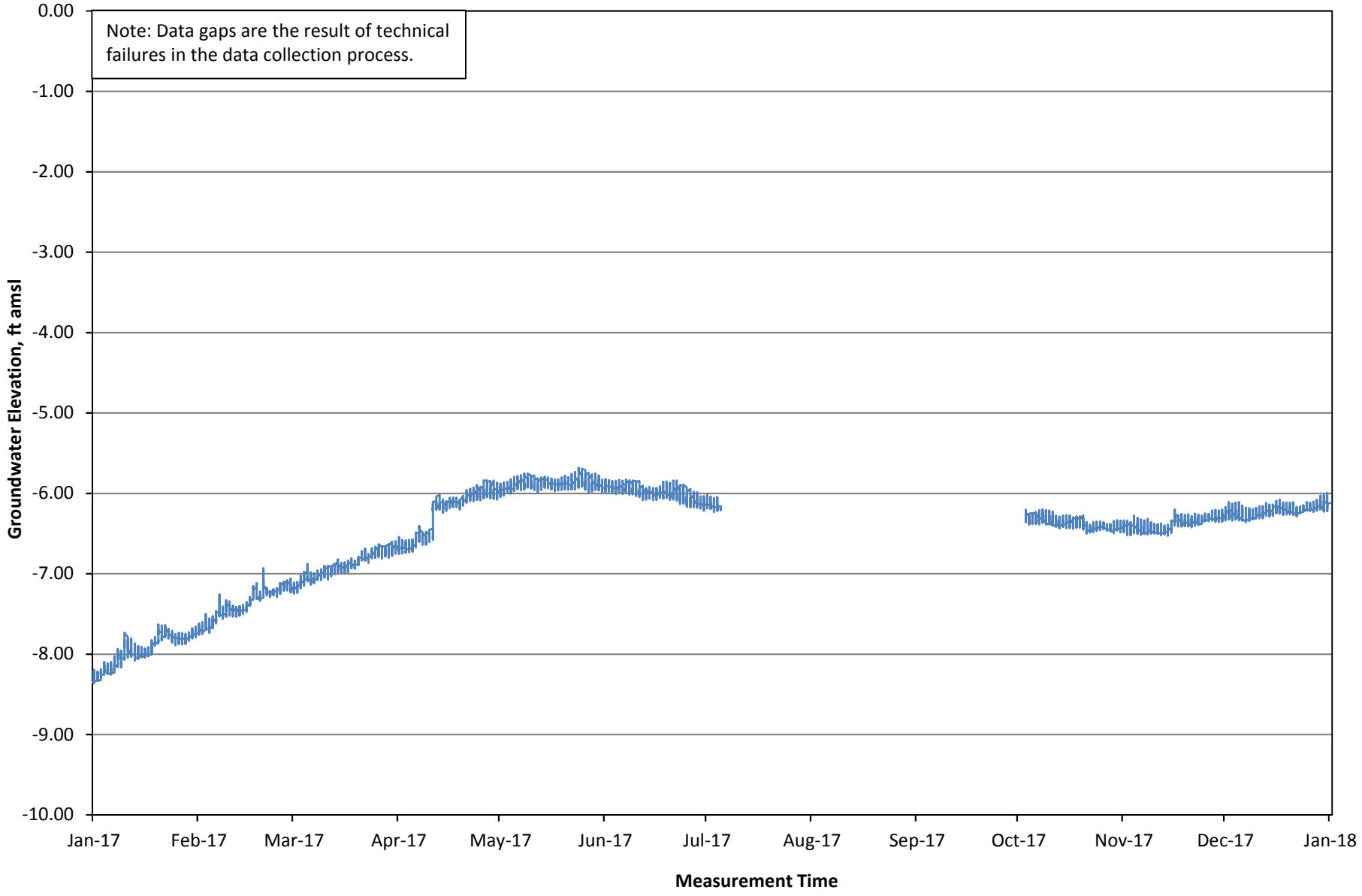


Figure B-8. 2017 MW-5D Groundwater Elevation Trend

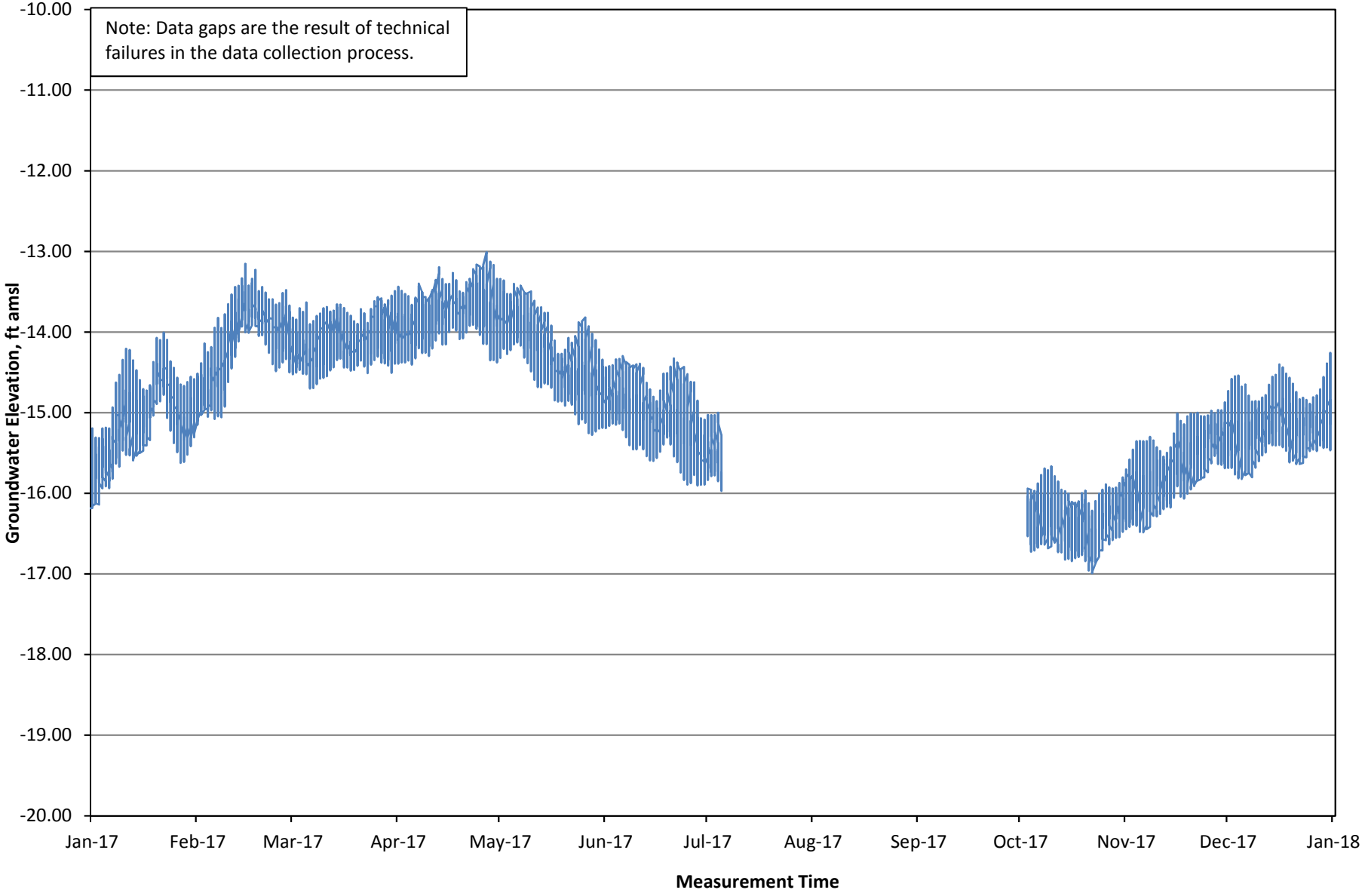


Figure B-9. 2017 MW-6 Groundwater Elevation Trend

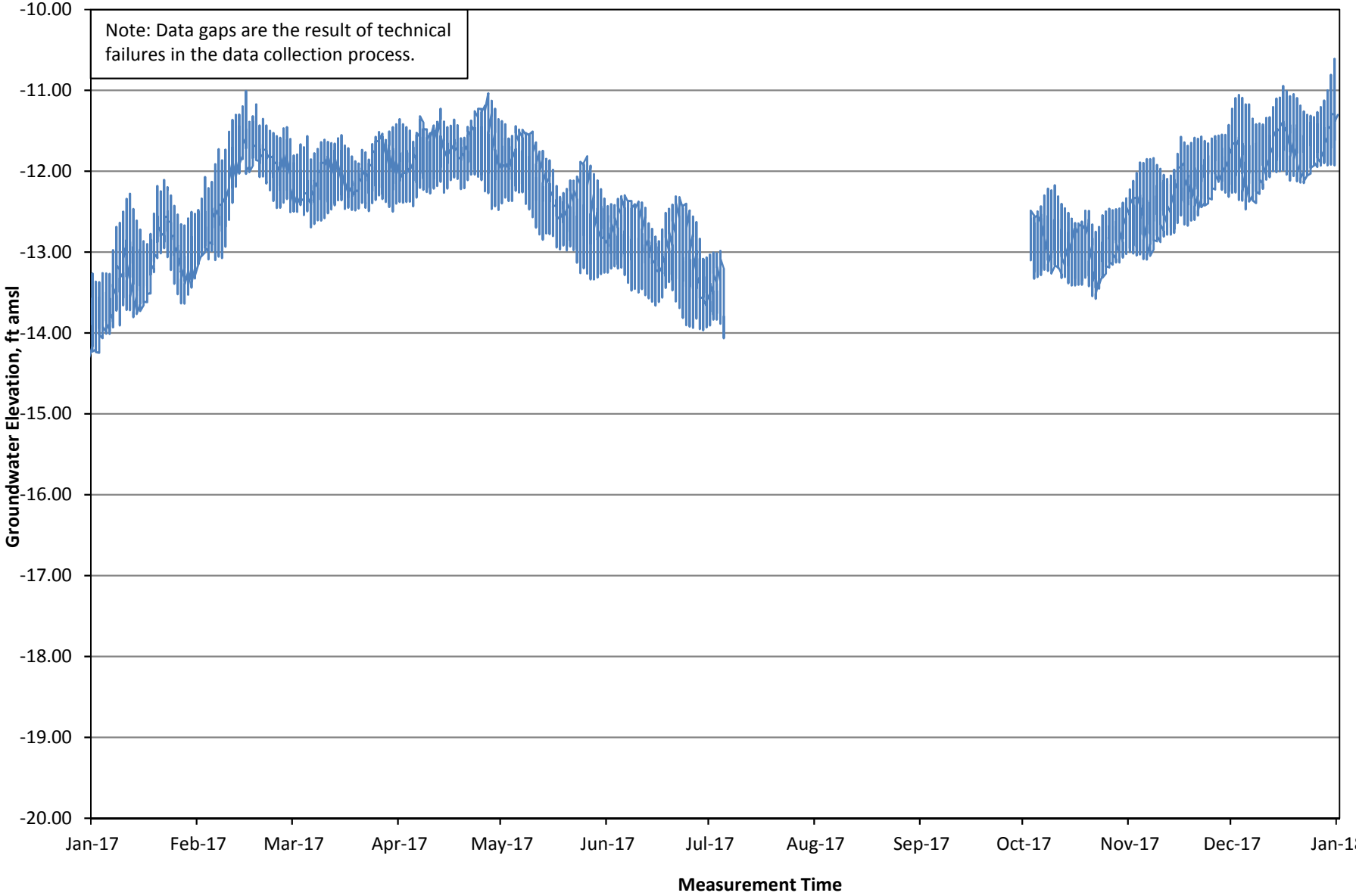


Figure B-10. 2017 MW-7 Groundwater Elevation Trend

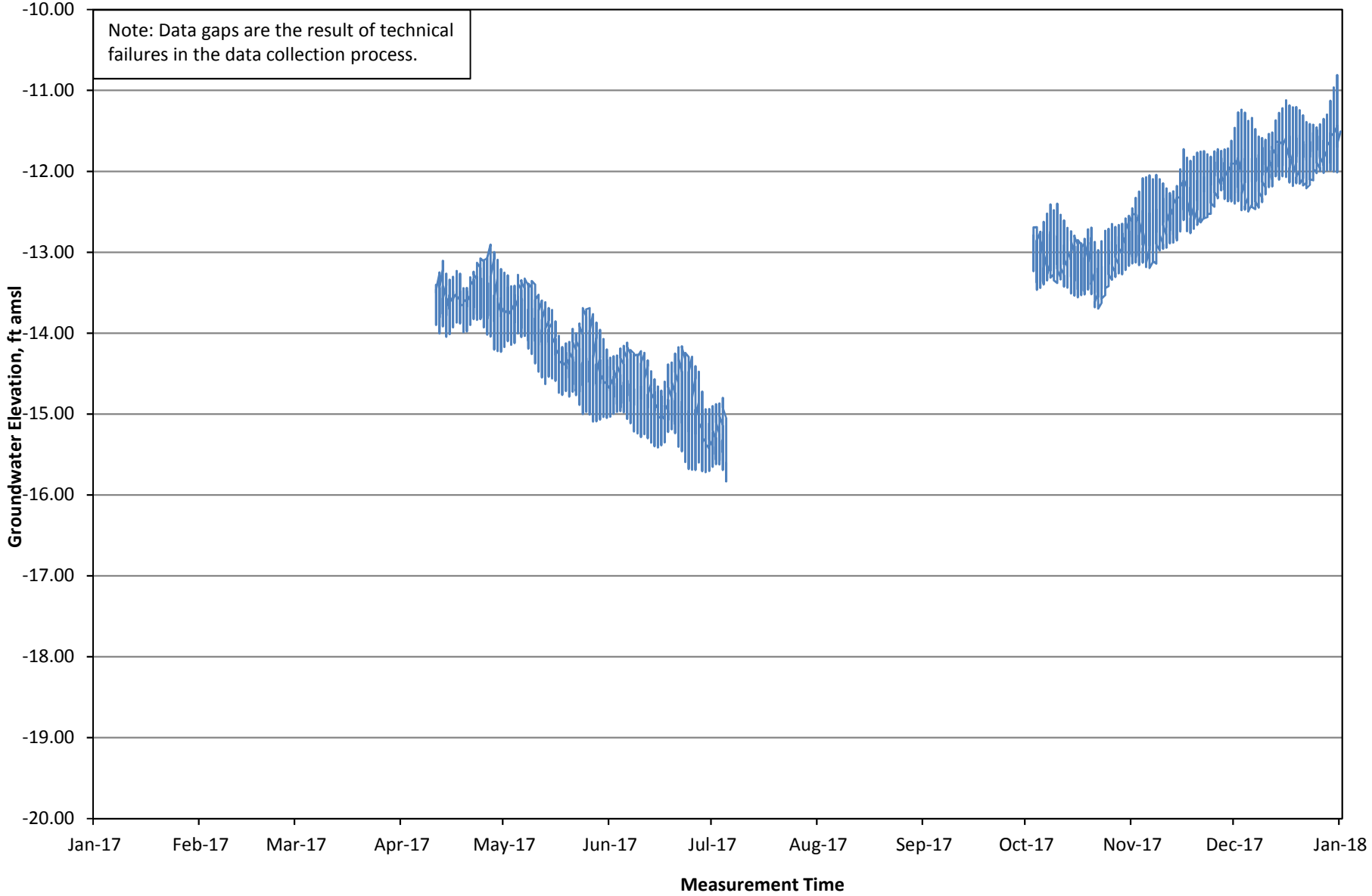


Figure B-11. 2017 MW-9D Groundwater Elevation Trend

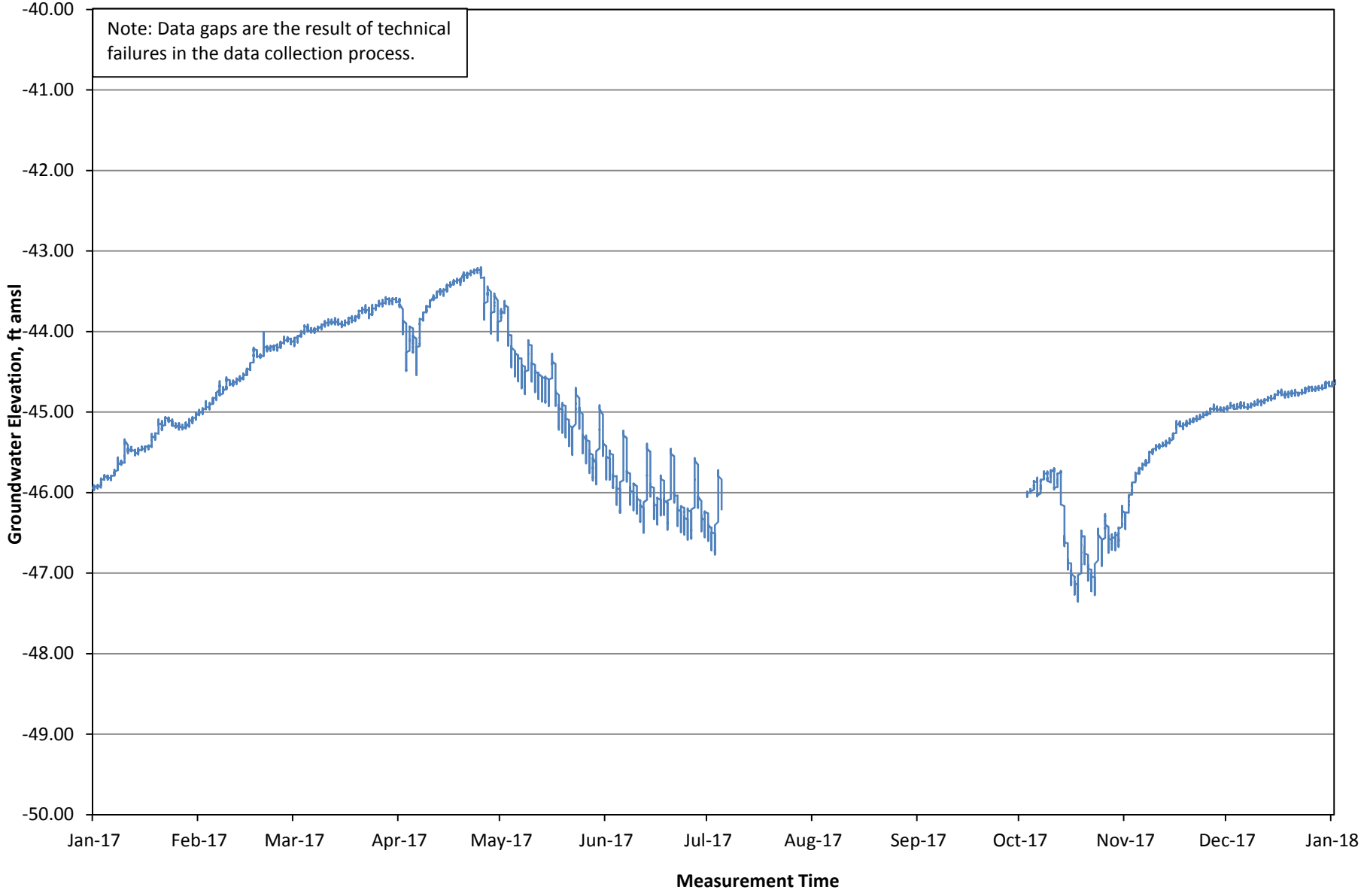


Figure B-12. 2017 MW-10I Groundwater Elevation Trend

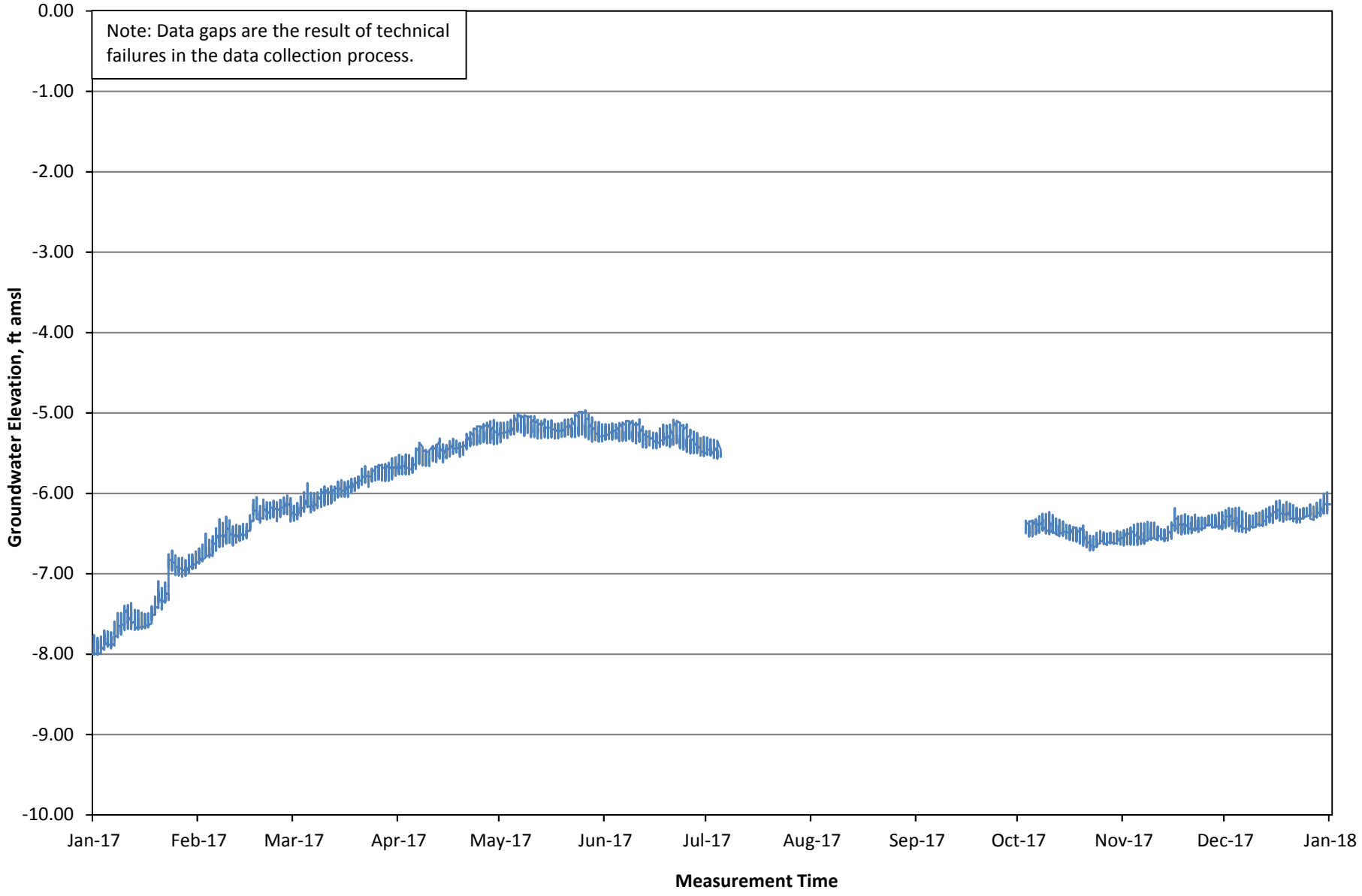
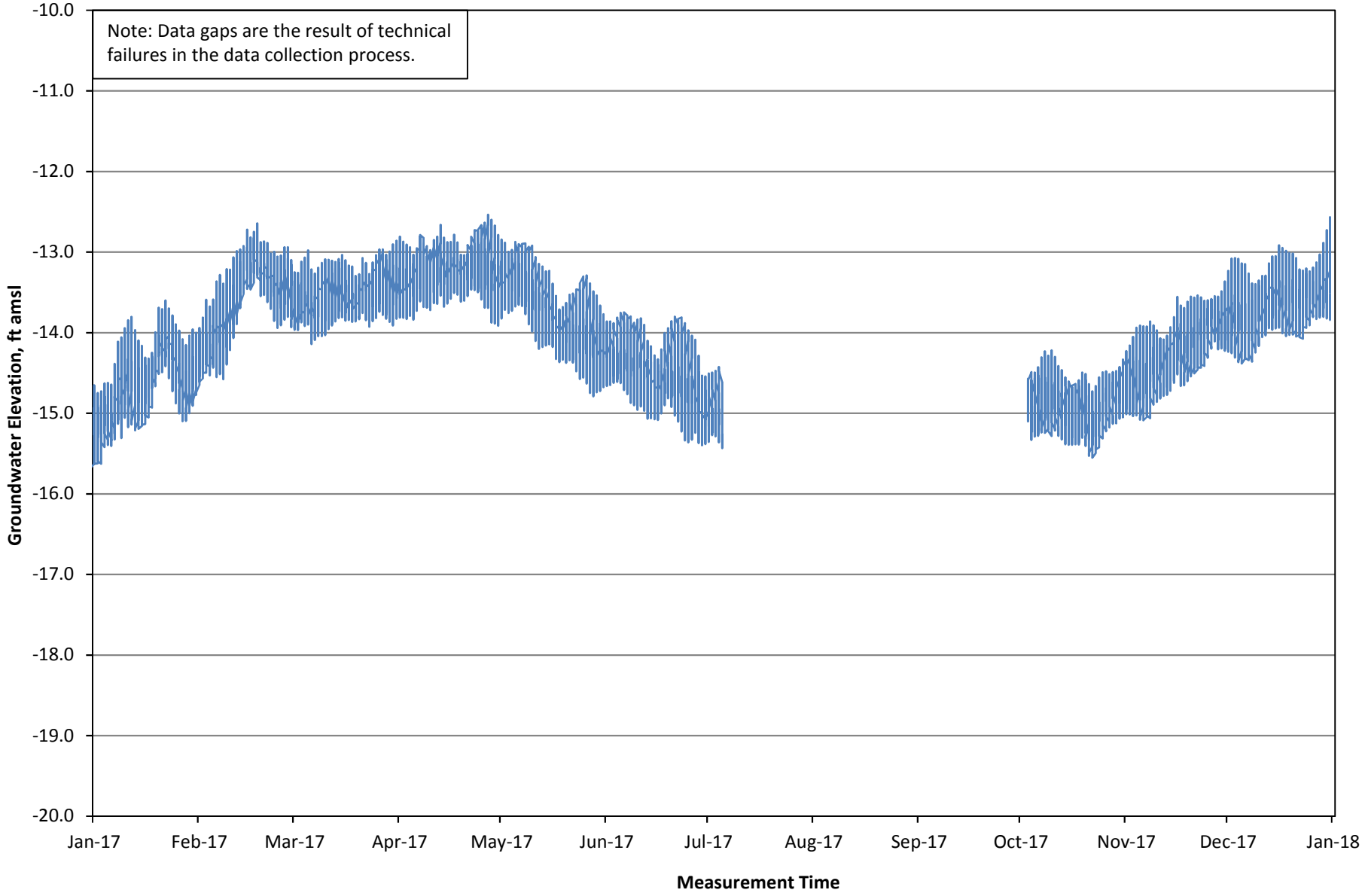


Figure B-13. 2017 MW-10D Groundwater Elevation Trend



ATTACHMENT C

Analytical Lab Reports for 2017 Water Quality Monitoring

EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
Phone (510)287-1432 Fax (510)465-5462
PO Box 24055, MS 59, Oakland, CA 94623

Analytical Report Prepared for DREW LERER

Report generated on: Dec 18, 2017 03:34 pm
Login No.: L218462

Reported by:

KRISTI LORENSON
Laboratory Program Manager

Approved by:

NIRMELA ARSEM
Laboratory Services Division Manager

LSR B455-0706-1
Project Title: BAYSIDE GROUND WATER PROJECT

Login Performance Summary
1 - Sample received by the lab on: Dec 05 2017, 11:34 am
0 - Lost Analyses
0 - Hold Time Exceedences
Turn-around-time met

Samples included in this report:

Sample	Type Collected	Site	Locator	ClientID
L218462-1	GRAB 05-Dec-2017 10:35	WTP BAYSIDE	BAY WELL HEAD	Bayside Well

Legend to the laboratory qualifiers used in this report:
U - Analyte not detected
Qualifiers for subcontract work - See textvalue for description

EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
PO Box 24055, MS 59, Oakland, CA 94623
Phone (510)287-1432 Fax (510)465-5462

Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: WTP BAYSIDE Bayside GW Project Extraction Wells at 2540 Grant Avenue, San Lorenzo
Locator: BAY WELL HEAD Sample tap at the well, as shown in Drawing No. 2097-C-002
ClientID: Bayside Well
Lab ID: L218462-1 (P227098-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 05 2017, 10:35am Sample collector: C. Yee/P. Hansen
Date Received: Dec 05 2017, 11:34am Sample receiver: RMOLINA
Sample Comments: Bayside Well; +FLD DATA: pH = 7.91 ; Cl2R < 0.02 mg/L; Labelled as RAW WATER for the program.

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix / Tag
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA							GroundH2O
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS							
PH		**7.91**	pH units	1			
CHLORINE RESIDUAL: TOTAL	U	0.02	mg/L	1	0.02		
Run ID: R281666 / Work Group No.: WG218888							
Prep Date1: 05-DEC-17 Analyzed 05-Dec-17 10:35							
Method: EPA 8260B - Trihalomethanes, GC/MS							GroundH2O
TARGET ANALYTES							
CHLOROFORM		**14**	ug/L	1	0.17		
BROMODICHLOROMETHANE		**1.2**	ug/L	1	0.079		
DIBROMOCHLOROMETHANE	U	0.13	ug/L	1	0.13		
BROMOFORM	U	0.23	ug/L	1	0.23		
INTERNAL STANDARD							
FLUOROBENZENE		93.0	% recovery				
D5-CHLOROBENZENE		96.6	% recovery				
D4-1,4-DICHLOROBENZENE		90.4	% recovery				
SURROGATE							
D8-TOLUENE		101	% recovery				
4-BROMOFLUOROBENZENE		98.4	% recovery				
Run ID: R281702 / Work Group No.: WG218945							
Prep Date1: 06-DEC-17 Analyzed 06-Dec-17 18:22							
Method: EPA 300.1 - Ion Chromatography							GroundH2O
Instrument calibrated 14-NOV-17							
TARGET ANALYTES							
CHLORIDE		**16**	mg/L	2	0.01		
NITRATE AS N		**0.040**	mg/L	2	0.0026	0.4	
SULFATE		**21**	mg/L	2	0.013	0.5	
SURROGATE							
DICHLOROACETATE		97	% recovery	2			
Run ID: R281683 / Work Group No.: WG218925							
Prep Date1: 05-DEC-17 Analyzed 05-Dec-17 16:30							
Method: EPA 552.2 - Haloacetic Acids & Dalapon							GroundH2O
TARGET ANALYTES							
BROMOCHLOROACETIC ACID	U	0.15	ug/L	1	0.15		
BROMODICHLOROACETIC ACID	U	0.31	ug/L	1	0.31		
CHLORODIBROMOACETIC ACID	U	0.31	ug/L	1	0.31		
DALAPON	U	0.53	ug/L	1	0.53		
DIBROMOACETIC ACID	U	0.25	ug/L	1	0.25	1	
DICHLOROACETIC ACID	U	0.18	ug/L	1	0.18	1	
MONOBROMOACETIC ACID	U	0.29	ug/L	1	0.29	1	
MONOCHLOROACETIC ACID	U	0.65	ug/L	1	0.65	2	
TRIBROMOACETIC ACID	U	0.72	ug/L	1	0.72		
TRICHLOROACETIC ACID		**0.26**	ug/L	1	0.17	1	
VALUE CALCULATED FROM OTHER RESULTS							
HAA(5)	U	1.0	ug/L				
HAA (5) calculation uses a zero for any individual HAA result less than the California DLR for that HAA							
HAA(9)	U	1.0	ug/L				
INTERNAL STANDARD							

RL is either the client requested or regulatory mandated Reporting Limit. ML is the regulatory mandated Minimum Level

EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
PO Box 24055, MS 59, Oakland, CA 94623
Phone (510)287-1432 Fax (510)465-5462

Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: WTP BAYSIDE Bayside GW Project Extraction Wells at 2540 Grant Avenue, San Lorenzo
Locator: BAY WELL HEAD Sample tap at the well, as shown in Drawing No. 2097-C-002
ClientID: Bayside Well
Lab ID: L218462-1 (P227098-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 05 2017, 10:35am Sample collector: C. Yee/P. Hansen
Date Received: Dec 05 2017, 11:34am Sample receiver: RMOLINA
Sample Comments: Bayside Well; +FLD DATA: pH = 7.91 ; Cl2R < 0.02 mg/L; Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML
Method Reference						Matrix Tag
1,2,3-TRICHLOROPROPANE		96	% recovery		1	
SURROGATE						
2,3-DIBROMOPROPIONIC ACID		100	% recovery		1	
Run ID: R281815 / Work Group No.: WG219058						
Prep Date1: 08-DEC-17 Prep Date2: 12-DEC-17 Analyzed 12-Dec-17 14:14						
Method: SM2320B - 1997, Titration						GroundH2O
TARGET ANALYTES						
ALKALINITY: TOTAL AS CACO3		**68**	mg/L	1	5	
Run ID: R281770 / Work Group No.: WG219032						
Prep Date1: 11-DEC-17 Analyzed 11-Dec-17 07:00						
Method: SM2320B-1997 - Calculation						GroundH2O
TARGET ANALYTES						
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1	
Run ID: R281778 / Work Group No.: WG219045						
Prep Date1: 11-DEC-17 Analyzed 11-Dec-17 13:45						
Method: SM2320B-1997 - Calculation						GroundH2O
TARGET ANALYTES						
ALKALINITY: BICARBONATE		**68**	mg/L	1	5	
Run ID: R281778 / Work Group No.: WG219045						
Prep Date1: 11-DEC-17 Analyzed 11-Dec-17 13:45						
Method: SM2320B-1997 - Calculation						GroundH2O
TARGET ANALYTES						
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1	
Run ID: R281778 / Work Group No.: WG219045						
Prep Date1: 11-DEC-17 Analyzed 11-Dec-17 13:45						
Method: SM2340C - 1997, Titration: EDTA						GroundH2O
TARGET ANALYTES						
HARDNESS: TOTAL AS CACO3		**62**	mg/L	1	3	
Run ID: R281823 / Work Group No.: WG219099						
Prep Date1: 12-DEC-17 Analyzed 12-Dec-17 12:00						
Method: SM2540C - 1997, Dried at 180C						GroundH2O
TARGET ANALYTES						
TOTAL DISSOLVED SOLIDS		**150**	mg/L	1	10	
Run ID: R281800 / Work Group No.: WG219029						
Prep Date1: 11-DEC-17 Analyzed 11-Dec-17 09:10						
Method: SM4500-NH3 B, C - 1997, Distillation & Titration						GroundH2O
TARGET ANALYTES						
AMMONIA AS N	U	0.250	mg/L	1	0.25	
Run ID: R281718 / Work Group No.: WG218966						
Prep Date1: 07-DEC-17 Analyzed 07-Dec-17 07:00						

RL is either the client requested or regulatory mandated Reporting Limit. ML is the regulatory mandated Minimum Level

EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
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Phone (510)287-1432 Fax (510)465-5462

Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: WTP BAYSIDE Bayside GW Project Extraction Wells at 2540 Grant Avenue, San Lorenzo
Locator: BAY WELL HEAD Sample tap at the well, as shown in Drawing No. 2097-C-002
ClientID: Bayside Well
Lab ID: L218462-1 (P227098-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 05 2017, 10:35am Sample collector: C. Yee/P. Hansen
Date Received: Dec 05 2017, 11:34am Sample receiver: RMOLINA
Sample Comments: Bayside Well; +FLD DATA: pH = 7.91 ; Cl2R < 0.02 mg/L; Labelled as RAW WATER for the program.

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method: EPA 200.7 - Rev. 4.4, ICP Scan							RawH2O	
TARGET ANALYTES								
CALCIUM		**16,500**	ug/L	1.04	18.1			
IRON		**66.5**	ug/L	1.04	0.624	100		
POTASSIUM		**1,190**	ug/L	1.04	11.9			
MAGNESIUM		**4,170**	ug/L	1.04	2.39			
MANGANESE		**12.9**	ug/L	1.04	0.104	20		
SODIUM		**25,000**	ug/L	1.04	3.12			

Run ID: R281747 / Work Group No.: WG219004
Prep Date1: 08-DEC-17 Analyzed 08-Dec-17 10:05

RL is either the client requested or regulatory mandated Reporting Limit. ML is the regulatory mandated Minimum Level

EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
Phone (510)287-1432 Fax (510)465-5462
PO Box 24055, MS 59, Oakland, CA 94623

Analytical Report Prepared for DREW LERER

Report regenerated on: Feb 15, 2018 04:01 pm
Login No.: L218781

Reported by:

KRISTI LORENSON
Laboratory Program Manager

Approved by:

NIRMELA ARSEM
Laboratory Services Division Manager

LSR B455-0706-1
Project Title: BAYSIDE GROUND WATER PROJECT

Comment: Reissued to include sodium result and remove duplicate anion entries.

Login Performance Summary
1 - Sample received by the lab on: Dec 20 2017, 08:25 am
0 - Lost Analyses
0 - Hold Time Exceedences
Turn-around-time not met

Samples included in this report:

Sample	Type	Collected	Site	Locator	ClientID
L218781-1	GRAB	19-Dec-2017 15:15	GW BAYSIDE	BAY1-MW2S	MW-2S

Legend to the laboratory qualifiers used in this report:
* - Duplicate value outside of control limits
B - Analyte detected in method blank
N - Spike recovery outside of control limits
U - Analyte not detected
Qualifiers for subcontract work - See textvalue for description

EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
PO Box 24055, MS 59, Oakland, CA 94623
Phone (510)287-1432 Fax (510)465-5462

Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW2S OW-1 the same parcel as the Bayside Well on Oro Loma Property; formerly BAY1-MW2-60
ClientID: MW-2S
Lab ID: L218781-1 (P227091-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 19 2017, 03:15pm Sample collector: BAguayo/ERRG
Date Received: Dec 20 2017, 08:25am Sample receiver: CSOOHOO
Sample Comments: MW-2S; +FLD DATA: pH = 6.27; Cl2R = 0.0 mg/L; Depth to GW = 8.67 feet; GW Elevation =(not provided by sampler) feet; Labelled as RAW WATER for the program. [Analyst Note: May need to dilute for ICP & IC due to salt water intrusion]

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Tag
Method Reference						Matrix	
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal for oxygen 18						GroundH2O	
Subcontract data from Alpha Analytical Lab							
Comment: Refer to sublab data report attached							
SUBCONTRACT LAB DATA							
DATA TRANSMITTAL							
Run ID: R282640 / Work Group No.: WG219899							
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 00:00							
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal						GroundH2O	
Subcontract data							
Comment: Original report transmitted to client. Copy of report archived with data packet.							
SUBCONTRACT LAB DATA							
DATA TRANSMITTAL							
Run ID: R282637 / Work Group No.: WG219897							
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 00:00							
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA						GroundH2O	
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS							
PH		**6.27**	pH units	1			
DEPTH		**8.67**	feet	1			
CHLORINE RESIDUAL: TOTAL	U	0.01	mg/L	1	0.01		
Run ID: R282050 / Work Group No.: WG219331							
Prep Date1: 19-DEC-17 Analyzed 19-Dec-17 15:15							
Method: EPA 8260B - Trihalomethanes, GC/MS						GroundH2O	
TARGET ANALYTES							
CHLOROFORM	U,N,*	0.17	ug/L	1	0.17		
BROMODICHLOROMETHANE	U,N	0.079	ug/L	1	0.079		
DIBROMOCHLOROMETHANE	U	0.13	ug/L	1	0.13		
BROMOFORM	U	0.23	ug/L	1	0.23		
INTERNAL STANDARD							
FLUOROBENZENE		72.0	% recovery				
D5-CHLOROBENZENE		88.0	% recovery				
D4-1,4-DICHLOROBENZENE		85.4	% recovery				
SURROGATE							
D8-TOLUENE		109	% recovery				
4-BROMOFLUOROBENZENE		96.6	% recovery				
Run ID: R281967 / Work Group No.: WG219222							
Prep Date1: 20-DEC-17 Analyzed 20-Dec-17 13:18							
Method: EPA 300.1 - Ion Chromatography						GroundH2O	1
Instrument calibrated 14-NOV-17							
TARGET ANALYTES							
NITRATE AS N		**11**	mg/L	500	0.65	0.4	
SULFATE		**5,500**	mg/L	500	3.3	0.5	
SURROGATE							
DICHLOROACETATE		100	% recovery	500			
Run ID: R281966 / Work Group No.: WG219219							
Prep Date1: 20-DEC-17 Analyzed 20-Dec-17 18:49							

RL is either the client requested or regulatory mandated Reporting Limit. ML is the regulatory mandated Minimum Level

EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
PO Box 24055, MS 59, Oakland, CA 94623
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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW2S OW-1 the same parcel as the Bayside Well on Oro Loma Property; formerly BAY1-MW2-60
ClientID: MW-2S
Lab ID: L218781-1 (P227091-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 19 2017, 03:15pm Sample collector: BAguayo/ERRG
Date Received: Dec 20 2017, 08:25am Sample receiver: CSOOHOO
Sample Comments: MW-2S; +FLD DATA: pH = 6.27; Cl2R = 0.0 mg/L; Depth to GW = 8.67 feet; GW Elevation =(not provided by sampler) feet; Labelled as RAW WATER for the program. [Analyst Note: May need to dilute for ICP & IC due to salt water intrusion]

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method: EPA 300.1 - Ion Chromatography							GroundH2O	
Instrument calibrated 14-NOV-17								
TARGET ANALYTES								
CHLORIDE		**41,000**	mg/L	5000	26			
SURROGATE								
DICHLOROACETATE		100	% recovery	5000				
Run ID: R281966 / Work Group No.: WG219219								
Prep Date1: 20-DEC-17 Analyzed 20-Dec-17 18:11								
Method: EPA 552.2 - Haloacetic Acids & Dalapon							GroundH2O	
TARGET ANALYTES								
BROMOCHLOROACETIC ACID	U	0.15	ug/L	1	0.15			
BROMODICHLOROACETIC ACID	U	0.31	ug/L	1	0.31			
CHLORODIBROMOACETIC ACID	U	0.31	ug/L	1	0.31			
DALAPON	U	0.53	ug/L	1	0.53			
DIBROMOACETIC ACID	U	0.25	ug/L	1	0.25	1		
DICHLOROACETIC ACID	U	0.18	ug/L	1	0.18	1		
MONOBROMOACETIC ACID	U	0.29	ug/L	1	0.29	1		
MONOCHLOROACETIC ACID	U	0.65	ug/L	1	0.65	2		
TRIBROMOACETIC ACID	U	0.72	ug/L	1	0.72			
TRICHLOROACETIC ACID	U	0.17	ug/L	1	0.17	1		
VALUE CALCULATED FROM OTHER RESULTS								
HAA(5)	U	1.0	ug/L					
HAA (5) calculation uses a zero for any individual HAA result less than the California DLR for that HAA								
HAA(9)	U	1.0	ug/L					
INTERNAL STANDARD								
1,2,3-TRICHLOROPROPANE		100	% recovery		1			
SURROGATE								
2,3-DIBROMOPROPIONIC ACID		120	% recovery		1			
Run ID: R281997 / Work Group No.: WG219263								
Prep Date1: 21-DEC-17 Prep Date2: 21-DEC-17 Analyzed 21-Dec-17 21:37								
Method: SM2320B - 1997, Titration							GroundH2O	
TARGET ANALYTES								
ALKALINITY: TOTAL AS CACO3		**390**	mg/L	1	5			
Run ID: R282044 / Work Group No.: WG219316								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1			
Run ID: R282047 / Work Group No.: WG219325								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW2S OW-1 the same parcel as the Bayside Well on Oro Loma Property; formerly BAY1-MW2-60
ClientID: MW-2S
Lab ID: L218781-1 (P227091-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 19 2017, 03:15pm Sample collector: BAguayo/ERRG
Date Received: Dec 20 2017, 08:25am Sample receiver: CSOOHOO
Sample Comments: MW-2S; +FLD DATA: pH = 6.27; Cl2R = 0.0 mg/L; Depth to GW = 8.67 feet; GW Elevation =(not provided by sampler) feet; Labelled as RAW WATER for the program. [Analyst Note: May need to dilute for ICP & IC due to salt water intrusion]

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1			
Run ID: R282047 / Work Group No.: WG219325								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: BICARBONATE		**390**	mg/L	1	5			
Run ID: R282047 / Work Group No.: WG219325								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								
Method: SM2340C - 1997, Titration: EDTA							GroundH2O	
TARGET ANALYTES								
HARDNESS: TOTAL AS CACO3		**17,000**	mg/L	100	300			
Run ID: R282118 / Work Group No.: WG219391								
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 07:30								
Method: SM2540C - 1997, Dried at 180C							GroundH2O	
TARGET ANALYTES								
TOTAL DISSOLVED SOLIDS		**73,000**	mg/L	25	250			
Run ID: R282030 / Work Group No.: WG219270								
Prep Date1: 22-DEC-17 Analyzed 22-Dec-17 08:15								
Method: SM4500-NH3 B, C - 1997, Distillation & Titration							GroundH2O	
TARGET ANALYTES								
AMMONIA AS N		**1.23**	mg/L	1	0.25			
Run ID: R282069 / Work Group No.: WG219340								
Prep Date1: 28-DEC-17 Analyzed 28-Dec-17 07:40								
Method: EPA 200.7 - Rev. 4.4, ICP Scan							RawH2O	
TARGET ANALYTES								
CALCIUM		**1.21E+06**	ug/L	104	1810			
IRON	U	62.4	ug/L	104	62.4	100		
POTASSIUM	**B**	**501,000**	ug/L	104	1190			
MAGNESIUM		**2.80E+06**	ug/L	104	239			
MANGANESE		**33,200**	ug/L	104	10.4	20		
Run ID: R282094 / Work Group No.: WG219366								
Prep Date1: 29-DEC-17 Analyzed 29-Dec-17 12:55								
Method: EPA 200.7 - Rev. 4.4, ICP Scan							RawH2O	1
TARGET ANALYTES								
SODIUM		**2.12E+07**	ug/L	104	312			
Run ID: R282094 / Work Group No.: WG219366								
Prep Date1: 29-DEC-17 Analyzed 29-Dec-17 12:55								

Results with 6 figures or more are expressed in scientific notation.
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Analytical Report Prepared for DREW LERER

Report generated on: Jan 31, 2018 03:54 pm
Login No.: L218782

Reported by:

KRISTI LORENSON
Laboratory Program Manager

Approved by:

NIRMELA ARSEM
Laboratory Services Division Manager

LSR B455-0706-1
Project Title: BAYSIDE GROUND WATER PROJECT

Login Performance Summary
1 - Sample received by the lab on: Dec 20 2017, 08:25 am
0 - Lost Analyses
0 - Hold Time Exceedences
Turn-around-time not met

Samples included in this report:

Sample	Type	Collected	Site	Locator	ClientID
L218782-1	GRAB	19-Dec-2017 14:45	GW BAYSIDE	BAY1-MW2I	MW-2I

Legend to the laboratory qualifiers used in this report:
U - Analyte not detected
Qualifiers for subcontract work - See textvalue for description

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW2I OW-1 the same parcel as the Bayside Well on Oro Loma Property; aka BAY1-MW2D until 11-2009; formerly BAY1-MW2-190
ClientID: MW-2I
Lab ID: L218782-1 (P227094-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 19 2017, 02:45pm Sample collector: BAguayo/ERRG
Date Received: Dec 20 2017, 08:25am Sample receiver: CSOOHOO
Sample Comments: MW-2I; +FLD DATA: pH = 7.69; Cl2R = 0.05 mg/L; Depth to GW = 35.35 feet; GW Elevation = (not provided by sampler) feet; Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal							GroundH2O	
Subcontract data								
Comment: Original report transmitted to client. Copy of report archived with data packet.								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R282637 / Work Group No.: WG219897								
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 00:00								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal for oxygen 18							GroundH2O	
Subcontract data from Alpha Analytical Lab								
Comment: Refer to sublab data report attached								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R282640 / Work Group No.: WG219899								
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 00:00								
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA							GroundH2O	
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS								
PH		**7.69**	pH units	1				
DEPTH		**35.35**	feet	1				
CHLORINE RESIDUAL: TOTAL		**0.05**	mg/L	1	0.05			
Run ID: R282048 / Work Group No.: WG219332								
Prep Date1: 19-DEC-17 Analyzed 19-Dec-17 14:45								
Method: EPA 8260B - Trihalomethanes, GC/MS							GroundH2O	
TARGET ANALYTES								
CHLOROFORM	U	0.17	ug/L	1	0.17			
BROMODICHLOROMETHANE	U	0.079	ug/L	1	0.079			
DIBROMOCHLOROMETHANE	U	0.13	ug/L	1	0.13			
BROMOFORM	U	0.23	ug/L	1	0.23			
INTERNAL STANDARD								
FLUOROBENZENE		72.4	% recovery					
D5-CHLOROBENZENE		85.8	% recovery					
D4-1,4-DICHLOROBENZENE		81.8	% recovery					
SURROGATE								
D8-TOLUENE		106	% recovery					
4-BROMOFLUOROBENZENE		98.8	% recovery					
Run ID: R281967 / Work Group No.: WG219222								
Prep Date1: 20-DEC-17 Analyzed 20-Dec-17 13:41								
Method: EPA 300.1 - Ion Chromatography							GroundH2O	
Instrument calibrated 14-NOV-17								
TARGET ANALYTES								
CHLORIDE		**150**	mg/L	10	0.052			
NITRATE AS N		**0.18**	mg/L	10	0.013	0.4		
SULFATE		**13**	mg/L	10	0.066	0.5		
SURROGATE								
DICHLOROACETATE		100	% recovery	10				
Run ID: R281966 / Work Group No.: WG219219								
Prep Date1: 20-DEC-17 Analyzed 20-Dec-17 19:26								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW2I OW-1 the same parcel as the Bayside Well on Oro Loma Property; aka BAY1-MW2D until 11-2009; formerly BAY1-MW2-190
ClientID: MW-2I
Lab ID: L218782-1 (P227094-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 19 2017, 02:45pm Sample collector: BAguayo/ERRG
Date Received: Dec 20 2017, 08:25am Sample receiver: CSOOHOO
Sample Comments: MW-2I; +FLD DATA: pH = 7.69; Cl2R = 0.05 mg/L; Depth to GW = 35.35 feet; GW Elevation = (not provided by sampler) feet; Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: EPA 552.2 - Haloacetic Acids & Dalapon							GroundH2O	
TARGET ANALYTES								
BROMOCHLOROACETIC ACID	U	0.15	ug/L	1	0.15			
BROMODICHLOROACETIC ACID	U	0.31	ug/L	1	0.31			
CHLORODIBROMOACETIC ACID	U	0.31	ug/L	1	0.31			
DALAPON	U	0.53	ug/L	1	0.53			
DIBROMOACETIC ACID	U	0.25	ug/L	1	0.25	1		
DICHLOROACETIC ACID	U	0.18	ug/L	1	0.18	1		
MONOBROMOACETIC ACID	U	0.29	ug/L	1	0.29	1		
MONOCHLOROACETIC ACID	U	0.65	ug/L	1	0.65	2		
TRIBROMOACETIC ACID	U	0.72	ug/L	1	0.72			
TRICHLOROACETIC ACID	U	0.17	ug/L	1	0.17	1		
VALUE CALCULATED FROM OTHER RESULTS								
HAA(5)	U	1.0	ug/L					
HAA (5) calculation uses a zero for any individual HAA result less than the California DLR for that HAA								
HAA(9)	U	1.0	ug/L					
INTERNAL STANDARD								
1,2,3-TRICHLOROPROPANE		100	% recovery		1			
SURROGATE								
2,3-DIBROMOPROPIONIC ACID		120	% recovery		1			
Run ID: R281997 / Work Group No.: WG219263								
Prep Date1: 21-DEC-17 Prep Date2: 21-DEC-17 Analyzed 21-Dec-17 22:01								
Method: SM2320B - 1997, Titration							GroundH2O	
TARGET ANALYTES								
ALKALINITY: TOTAL AS CACO3		**350**	mg/L	1	5			
Run ID: R282044 / Work Group No.: WG219316								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: BICARBONATE		**350**	mg/L	1	5			
Run ID: R282047 / Work Group No.: WG219325								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1			
Run ID: R282047 / Work Group No.: WG219325								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1			
Run ID: R282047 / Work Group No.: WG219325								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW2I OW-1 the same parcel as the Bayside Well on Oro Loma Property; aka BAY1-MW2D until 11-2009; formerly BAY1-MW2-190
ClientID: MW-2I
Lab ID: L218782-1 (P227094-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 19 2017, 02:45pm Sample collector: BAguayo/ERRG
Date Received: Dec 20 2017, 08:25am Sample receiver: CSOOHOO
Sample Comments: MW-2I; +FLD DATA: pH = 7.69; Cl2R = 0.05 mg/L; Depth to GW = 35.35 feet; GW Elevation = (not provided by sampler) feet; Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: SM2340C - 1997, Titration: EDTA							GroundH2O	
TARGET ANALYTES								
HARDNESS: TOTAL AS CACO3		**130**	mg/L	1	3			
Run ID: R282118 / Work Group No.: WG219391								
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 07:30								
Method: SM2540C - 1997, Dried at 180C							GroundH2O	
TARGET ANALYTES								
TOTAL DISSOLVED SOLIDS		**630**	mg/L	2	20			
Run ID: R282030 / Work Group No.: WG219270								
Prep Date1: 22-DEC-17 Analyzed 22-Dec-17 08:15								
Method: SM4500-NH3 B, C - 1997, Distillation & Titration							GroundH2O	
TARGET ANALYTES								
AMMONIA AS N		**1.01**	mg/L	1	0.25			
Run ID: R282069 / Work Group No.: WG219340								
Prep Date1: 28-DEC-17 Analyzed 28-Dec-17 07:40								
Method: EPA 200.7 - Rev. 4.4, ICP Scan							RawH2O	
TARGET ANALYTES								
CALCIUM		**17,800**	ug/L	1.04	18.1			
IRON		**1,220**	ug/L	1.04	0.624	100		
POTASSIUM		**7,610**	ug/L	1.04	11.9			
MAGNESIUM		**15,900**	ug/L	1.04	2.39			
MANGANESE		**139**	ug/L	1.04	0.104	20		
SODIUM		**193,000**	ug/L	52	156			
Run ID: R282134 / Work Group No.: WG219396								
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 12:16								

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Analytical Report Prepared for DREW LERER

Report generated on: Jan 31, 2018 03:53 pm
Login No.: L218783

Reported by:

KRISTI LORENSON
Laboratory Program Manager

Approved by:

NIRMELA ARSEM
Laboratory Services Division Manager

LSR B455-0706-1
Project Title: BAYSIDE GROUND WATER PROJECT

Login Performance Summary
1 - Sample received by the lab on: Dec 20 2017, 08:25 am
0 - Lost Analyses
0 - Hold Time Exceedences
Turn-around-time not met

Samples included in this report:

Sample	Type	Collected	Site	Locator	ClientID
L218783-1	GRAB	19-Dec-2017 11:35	GW BAYSIDE	BAY1-MW5D	MW-5D

Legend to the laboratory qualifiers used in this report:
N - Spike recovery outside of control limits
U - Analyte not detected
Qualifiers for subcontract work - See textvalue for description

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW5D Q APN 411-0003-0083 Via Barrett, San Lorenzo; Formerly BAY-MW-BARETT
ClientID: MW-5D
Lab ID: L218783-1 (P227097-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 19 2017, 11:35am Sample collector: BAguayo/ERRG
Date Received: Dec 20 2017, 08:25am Sample receiver: CSOOHOO
Sample Comments: MW-5D; +FLD DATA: pH = 7.37 ; Cl2R = 0.01 mg/L; Depth to GW = 15.02 feet;
GW Elevation = (not provided by sampler) feet; Labelled as RAW WATER for
the program.

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix / Tag
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal							GroundH2O
Subcontract data							
Comment: Original report transmitted to client. Copy of report archived with data packet.							
SUBCONTRACT LAB DATA							
DATA TRANSMITTAL							
Run ID: R282637 / Work Group No.: WG219897							
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 00:00							
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal for oxygen 18							GroundH2O
Subcontract data from Alpha Analytical Lab							
Comment: Refer to sublab data report attached							
SUBCONTRACT LAB DATA							
DATA TRANSMITTAL							
Run ID: R282640 / Work Group No.: WG219899							
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 00:00							
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA							GroundH2O
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS							
PH		**7.37**	pH units	1			
DEPTH		**15.02**	feet	1			
CHLORINE RESIDUAL: TOTAL		**0.01**	mg/L	1			
Run ID: R282051 / Work Group No.: WG219330							
Prep Date1: 19-DEC-17 Analyzed 19-Dec-17 11:35							
Method: EPA 8260B - Trihalomethanes, GC/MS							GroundH2O
TARGET ANALYTES							
CHLOROFORM	U	0.17	ug/L	1	0.17		
BROMODICHLOROMETHANE	U	0.079	ug/L	1	0.079		
DIBROMOCHLOROMETHANE	U	0.13	ug/L	1	0.13		
BROMOFORM	U	0.23	ug/L	1	0.23		
INTERNAL STANDARD							
FLUOROBENZENE		66.0	% recovery				
D5-CHLOROBENZENE		79.8	% recovery				
D4-1,4-DICHLOROBENZENE		81.2	% recovery				
SURROGATE							
D8-TOLUENE		112	% recovery				
4-BROMOFLUOROBENZENE		101	% recovery				
Run ID: R281967 / Work Group No.: WG219222							
Prep Date1: 20-DEC-17 Analyzed 20-Dec-17 14:04							
Method: EPA 300.1 - Ion Chromatography							GroundH2O
Instrument calibrated 14-NOV-17							
TARGET ANALYTES							
CHLORIDE		**83**	mg/L	10	0.052		
NITRATE AS N		**0.19**	mg/L	10	0.013	0.4	
SULFATE		**49**	mg/L	10	0.066	0.5	
SURROGATE							
DICHLOROACETATE		100	% recovery	10			
Run ID: R281966 / Work Group No.: WG219219							
Prep Date1: 20-DEC-17 Analyzed 20-Dec-17 20:03							

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW5D Q APN 411-0003-0083 Via Barrett, San Lorenzo; Formerly BAY-MW-BARETT
ClientID: MW-5D
Lab ID: L218783-1 (P227097-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 19 2017, 11:35am Sample collector: BAguayo/ERRG
Date Received: Dec 20 2017, 08:25am Sample receiver: CSOOHOO
Sample Comments: MW-5D; +FLD DATA: pH = 7.37 ; Cl2R = 0.01 mg/L; Depth to GW = 15.02 feet;
GW Elevation = (not provided by sampler) feet; Labelled as RAW WATER for
the program.

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	Matrix / RL/ML	Tag
Method: EPA 552.2 - Haloacetic Acids & Dalapon						GroundH2O	
TARGET ANALYTES							
BROMOCHLOROACETIC ACID	U	0.15	ug/L	1	0.15		
BROMODICHLOROACETIC ACID	U	0.31	ug/L	1	0.31		
CHLORODIBROMOACETIC ACID	U	0.31	ug/L	1	0.31		
DALAPON	U	0.53	ug/L	1	0.53		
DIBROMOACETIC ACID	U	0.25	ug/L	1	0.25	1	
DICHLOROACETIC ACID	U	0.18	ug/L	1	0.18	1	
MONOBROMOACETIC ACID	U	0.29	ug/L	1	0.29	1	
MONOCHLOROACETIC ACID	U	0.65	ug/L	1	0.65	2	
TRIBROMOACETIC ACID	U,N	0.72	ug/L	1	0.72		
TRICHLOROACETIC ACID	U	0.17	ug/L	1	0.17	1	
VALUE CALCULATED FROM OTHER RESULTS							
HAA(5)	U	1.0	ug/L				
HAA (5) calculation uses a zero for any individual HAA result less than the California DLR for that HAA							
HAA(9)	U	1.0	ug/L				
INTERNAL STANDARD							
1,2,3-TRICHLOROPROPANE		97	% recovery		1		
SURROGATE							
2,3-DIBROMOPROPIONIC ACID		120	% recovery		1		
Run ID: R281997 / Work Group No.: WG219263							
Prep Date1: 21-DEC-17 Prep Date2: 21-DEC-17 Analyzed 21-Dec-17 00:00							
Method: SM2320B - 1997, Titration						GroundH2O	
TARGET ANALYTES							
ALKALINITY: TOTAL AS CACO3		**230**	mg/L	1	5		
Run ID: R282044 / Work Group No.: WG219316							
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45							
Method: SM2320B-1997 - Calculation						GroundH2O	
TARGET ANALYTES							
ALKALINITY: BICARBONATE		**230**	mg/L	1	5		
Run ID: R282047 / Work Group No.: WG219325							
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45							
Method: SM2320B-1997 - Calculation						GroundH2O	
TARGET ANALYTES							
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1		
Run ID: R282047 / Work Group No.: WG219325							
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45							
Method: SM2320B-1997 - Calculation						GroundH2O	
TARGET ANALYTES							
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1		
Run ID: R282047 / Work Group No.: WG219325							
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45							

RL is either the client requested or regulatory mandated Reporting Limit. ML is the regulatory mandated Minimum Level

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW5D Q APN 411-0003-0083 Via Barrett, San Lorenzo; Formerly BAY-MW-BARETT
ClientID: MW-5D
Lab ID: L218783-1 (P227097-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 19 2017, 11:35am Sample collector: BAguayo/ERRG
Date Received: Dec 20 2017, 08:25am Sample receiver: CSOOHOO
Sample Comments: MW-5D; +FLD DATA: pH = 7.37 ; Cl2R = 0.01 mg/L; Depth to GW = 15.02 feet;
GW Elevation = (not provided by sampler) feet; Labelled as RAW WATER for
the program.

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	Matrix / RL/ML	Tag
Method: SM2340C - 1997, Titration: EDTA						GroundH2O	
TARGET ANALYTES							
HARDNESS: TOTAL AS CACO3		**150**	mg/L	1	3		
Run ID: R282118 / Work Group No.: WG219391							
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 07:30							
Method: SM2540C - 1997, Dried at 180C						GroundH2O	
TARGET ANALYTES							
TOTAL DISSOLVED SOLIDS		**450**	mg/L	2	20		
Run ID: R282030 / Work Group No.: WG219270							
Prep Date1: 22-DEC-17 Analyzed 22-Dec-17 08:15							
Method: SM4500-NH3 B, C - 1997, Distillation & Titration						GroundH2O	
TARGET ANALYTES							
AMMONIA AS N	U	0.250	mg/L	1	0.25		
Run ID: R282069 / Work Group No.: WG219340							
Prep Date1: 28-DEC-17 Analyzed 28-Dec-17 07:40							
Method: EPA 200.7 - Rev. 4.4, ICP Scan						RawH2O	
TARGET ANALYTES							
CALCIUM		**34,200**	ug/L	1.04	18.1		
IRON		**130**	ug/L	1.04	0.624	100	
POTASSIUM		**2,390**	ug/L	1.04	11.9		
MAGNESIUM		**8,560**	ug/L	1.04	2.39		
MANGANESE		**164**	ug/L	1.04	0.104	20	
SODIUM		**98,500**	ug/L	52	156		
Run ID: R282134 / Work Group No.: WG219396							
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 12:20							

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Analytical Report Prepared for DREW LERER

Report generated on: Jan 31, 2018 03:54 pm
Login No.: L218813

Reported by:

KRISTI LORENSON
Laboratory Program Manager

Approved by:

NIRMELA ARSEM
Laboratory Services Division Manager

LSR B455-0706-1
Project Title: BAYSIDE GROUND WATER PROJECT

Login Performance Summary
1 - Sample received by the lab on: Dec 21 2017, 08:09 am
0 - Lost Analyses
0 - Hold Time Exceedences
Turn-around-time not met

Samples included in this report:

Sample	Type Collected	Site	Locator	ClientID
L218813-1	GRAB 20-Dec-2017 17:10	GW BAYSIDE	BAY1-MW4	MW-4

Legend to the laboratory qualifiers used in this report:
B - Analyte detected in method blank
N - Spike recovery outside of control limits
U - Analyte not detected
Qualifiers for subcontract work - See textvalue for description

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW4 OW-1 the same parcel as the Bayside Well on Oro Loma Property; formerly BAY1-MW5
ClientID: MW-4
Lab ID: L218813-1 (P227095-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 20 2017, 05:10pm Sample collector: E. Seigel/ERRG
Date Received: Dec 21 2017, 08:09am Sample receiver: RMOLINA
Sample Comments: MW-4; +FLD DATA: pH = 7.55 ; Cl2R = 0.0 mg/L; Depth to GW = 10.92 feet; GW Elevation = Not provided by sampler ; Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal							GroundH2O	
Subcontract data								
Comment: Original report transmitted to client. Copy of report archived with data packet.								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R282637 / Work Group No.: WG219897								
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 00:00								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal for oxygen 18							GroundH2O	
Subcontract data from Alpha Analytical Lab								
Comment: Refer to sublab data report attached								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R282640 / Work Group No.: WG219899								
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 00:00								
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA							GroundH2O	
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS								
PH		**7.55**	pH units	1				
DEPTH		**10.92**	feet	1				
CHLORINE RESIDUAL: TOTAL	U	0.01	mg/L	1	0.01			
Run ID: R282052 / Work Group No.: WG219329								
Prep Date1: 20-DEC-17 Analyzed 20-Dec-17 17:10								
Method: EPA 8260B - Trihalomethanes, GC/MS							GroundH2O	
TARGET ANALYTES								
CHLOROFORM	U	0.17	ug/L	1	0.17			
BROMODICHLOROMETHANE	U	0.079	ug/L	1	0.079			
DIBROMOCHLOROMETHANE	U	0.13	ug/L	1	0.13			
BROMOFORM	U	0.23	ug/L	1	0.23			
INTERNAL STANDARD								
FLUOROBENZENE		100	% recovery					
D5-CHLOROBENZENE		101	% recovery					
D4-1,4-DICHLOROBENZENE		97.2	% recovery					
SURROGATE								
D8-TOLUENE		100	% recovery					
4-BROMOFLUOROBENZENE		96.0	% recovery					
Run ID: R282088 / Work Group No.: WG219298								
Prep Date1: 26-DEC-17 Analyzed 27-Dec-17 11:12								
Method: EPA 300.1 - Ion Chromatography							GroundH2O	
Instrument calibrated 14-NOV-17								
TARGET ANALYTES								
CHLORIDE		**57**	mg/L	5	0.026			
NITRATE AS N	**N**	**0.091**	mg/L	5	0.0065	0.4		
SULFATE		**40**	mg/L	5	0.033	0.5		
SURROGATE								
DICHLOROACETATE		100	% recovery	5				
Run ID: R281988 / Work Group No.: WG219249								
Prep Date1: 21-DEC-17 Analyzed 21-Dec-17 13:50								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW4 OW-1 the same parcel as the Bayside Well on Oro Loma Property; formerly BAY1-MW5
ClientID: MW-4
Lab ID: L218813-1 (P227095-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 20 2017, 05:10pm Sample collector: E. Seigel/ERRG
Date Received: Dec 21 2017, 08:09am Sample receiver: RMOLINA
Sample Comments: MW-4; +FLD DATA: pH = 7.55 ; Cl2R = 0.0 mg/L; Depth to GW = 10.92 feet; GW Elevation = Not provided by sampler ; Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: EPA 552.2 - Haloacetic Acids & Dalapon							GroundH2O	
TARGET ANALYTES								
BROMOCHLOROACETIC ACID	U	0.15	ug/L	1	0.15			
BROMODICHLOROACETIC ACID	U	0.31	ug/L	1	0.31			
CHLORODIBROMOACETIC ACID	U	0.31	ug/L	1	0.31			
DALAPON	U	0.53	ug/L	1	0.53			
DIBROMOACETIC ACID	U	0.25	ug/L	1	0.25	1		
DICHLOROACETIC ACID	U	0.18	ug/L	1	0.18	1		
MONOBROMOACETIC ACID	U	0.29	ug/L	1	0.29	1		
MONOCHLOROACETIC ACID	U	0.65	ug/L	1	0.65	2		
TRIBROMOACETIC ACID	U	0.72	ug/L	1	0.72			
TRICHLOROACETIC ACID	U	0.17	ug/L	1	0.17	1		
VALUE CALCULATED FROM OTHER RESULTS								
HAA(5)	U	1.0	ug/L					
HAA (5) calculation uses a zero for any individual HAA result less than the California DLR for that HAA								
HAA(9)	U	1.0	ug/L					
INTERNAL STANDARD								
1,2,3-TRICHLOROPROPANE		99	% recovery		1			
SURROGATE								
2,3-DIBROMOPROPIONIC ACID		100	% recovery		1			
Run ID: R282169 / Work Group No.: WG219421								
Prep Date1: 28-DEC-17 Prep Date2: 03-JAN-18 Analyzed 03-Jan-18 16:39								
Method: SM2320B - 1997, Titration							GroundH2O	
TARGET ANALYTES								
ALKALINITY: TOTAL AS CACO3		**240**	mg/L	1	5			
Run ID: R282044 / Work Group No.: WG219316								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: BICARBONATE		**240**	mg/L	1	5			
Run ID: R282047 / Work Group No.: WG219325								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1			
Run ID: R282047 / Work Group No.: WG219325								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1			
Run ID: R282047 / Work Group No.: WG219325								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW4 OW-1 the same parcel as the Bayside Well on Oro Loma Property; formerly BAY1-MW5
ClientID: MW-4
Lab ID: L218813-1 (P227095-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 20 2017, 05:10pm Sample collector: E. Seigel/ERRG
Date Received: Dec 21 2017, 08:09am Sample receiver: RMOLINA
Sample Comments: MW-4; +FLD DATA: pH = 7.55 ; Cl2R = 0.0 mg/L; Depth to GW = 10.92 feet; GW Elevation = Not provided by sampler ; Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method: SM2340C - 1997, Titration: EDTA							GroundH2O	
TARGET ANALYTES								
HARDNESS: TOTAL AS CACO3		**130**	mg/L	1	3			
Run ID: R282118 / Work Group No.: WG219391								
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 07:30								
Method: SM2540C - 1997, Dried at 180C							GroundH2O	
TARGET ANALYTES								
TOTAL DISSOLVED SOLIDS		**410**	mg/L	2	20			
Run ID: R282030 / Work Group No.: WG219270								
Prep Date1: 22-DEC-17 Analyzed 22-Dec-17 08:15								
Method: SM4500-NH3 B, C - 1997, Distillation & Titration							GroundH2O	
TARGET ANALYTES								
AMMONIA AS N	U	0.250	mg/L	1	0.25			
Run ID: R282069 / Work Group No.: WG219340								
Prep Date1: 28-DEC-17 Analyzed 28-Dec-17 07:40								
Method: EPA 200.7 - Rev. 4.4, ICP Scan							RawH2O	
TARGET ANALYTES								
CALCIUM		**27,900**	ug/L	1.04	18.1			
IRON		**24.4**	ug/L	1.04	0.624	100		
POTASSIUM	**B**	**2,690**	ug/L	1.04	11.9			
MAGNESIUM		**10,700**	ug/L	1.04	2.39			
MANGANESE		**196**	ug/L	1.04	0.104	20		
SODIUM		**107,000**	ug/L	1.04	3.12			
Run ID: R282094 / Work Group No.: WG219366								
Prep Date1: 29-DEC-17 Analyzed 29-Dec-17 13:31								

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Analytical Report Prepared for DREW LERER

Report generated on: Jan 31, 2018 03:54 pm
Login No.: L218814

Reported by:

KRISTI LORENSON
Laboratory Program Manager

Approved by:

NIRMELA ARSEM
Laboratory Services Division Manager

LSR B455-0706-1
Project Title: BAYSIDE GROUND WATER PROJECT

Login Performance Summary
1 - Sample received by the lab on: Dec 21 2017, 08:09 am
0 - Lost Analyses
0 - Hold Time Exceedences
Turn-around-time not met

Samples included in this report:

Sample	Type	Collected	Site	Locator	ClientID
L218814-1	GRAB	20-Dec-2017 14:35	GW BAYSIDE	BAY1-MW6	MW-6

Legend to the laboratory qualifiers used in this report:
B - Analyte detected in method blank
U - Analyte not detected
Qualifiers for subcontract work - See textvalue for description

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW6 R APN 438-0010-003 2364 Baumann Ave., San Lorenzo; formerly BAY-MW-WORTHLEY
ClientID: MW-6
Lab ID: L218814-1 (P227096-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 20 2017, 02:35pm Sample collector: E. Seigel/ERRG
Date Received: Dec 21 2017, 08:09am Sample receiver: RMOLINA
Sample Comments: MW-6; +FLD DATA: pH = 7.19 ; Cl2R = 0.0 mg/L; Depth to GW = 10.71 feet; GW Elevation = Not provided by sampler Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal							GroundH2O	
Subcontract data								
Comment: Original report transmitted to client. Copy of report archived with data packet.								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R282637 / Work Group No.: WG219897								
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 00:00								
Method: PER SUBCONTRACT LABORATORY REPORT - Subcontract data transmittal for oxygen 18							GroundH2O	
Subcontract data from Alpha Analytical Lab								
Comment: Refer to sublab data report attached								
SUBCONTRACT LAB DATA								
DATA TRANSMITTAL								
Run ID: R282640 / Work Group No.: WG219899								
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 00:00								
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA							GroundH2O	
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS								
PH		**7.19**	pH units	1				
DEPTH		**10.71**	feet	1				
CHLORINE RESIDUAL: TOTAL	U	0.01	mg/L	1	0.01			
Run ID: R282053 / Work Group No.: WG219328								
Prep Date1: 20-DEC-17 Analyzed 20-Dec-17 14:35								
Method: EPA 8260B - Trihalomethanes, GC/MS							GroundH2O	
TARGET ANALYTES								
CHLOROFORM	U	0.17	ug/L	1	0.17			
BROMODICHLOROMETHANE	U	0.079	ug/L	1	0.079			
DIBROMOCHLOROMETHANE	U	0.13	ug/L	1	0.13			
BROMOFORM	U	0.23	ug/L	1	0.23			
INTERNAL STANDARD								
FLUOROBENZENE		94.4	% recovery					
D5-CHLOROBENZENE		98.6	% recovery					
D4-1,4-DICHLOROBENZENE		96.2	% recovery					
SURROGATE								
D8-TOLUENE		103	% recovery					
4-BROMOFLUOROBENZENE		98.2	% recovery					
Run ID: R282088 / Work Group No.: WG219298								
Prep Date1: 26-DEC-17 Analyzed 27-Dec-17 11:35								
Method: EPA 300.1 - Ion Chromatography							GroundH2O	
Instrument calibrated 14-NOV-17								
TARGET ANALYTES								
CHLORIDE		**55**	mg/L	10	0.052			
NITRATE AS N		**0.18**	mg/L	10	0.013	0.4		
SULFATE		**45**	mg/L	10	0.066	0.5		
SURROGATE								
DICHLOROACETATE		100	% recovery	10				
Run ID: R281988 / Work Group No.: WG219249								
Prep Date1: 21-DEC-17 Analyzed 21-Dec-17 15:42								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW6 R APN 438-0010-003 2364 Baumann Ave., San Lorenzo; formerly BAY-MW-WORTHLEY
ClientID: MW-6
Lab ID: L218814-1 (P227096-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 20 2017, 02:35pm Sample collector: E. Seigel/ERRG
Date Received: Dec 21 2017, 08:09am Sample receiver: RMOLINA
Sample Comments: MW-6; +FLD DATA: pH = 7.19 ; Cl2R = 0.0 mg/L; Depth to GW = 10.71 feet; GW Elevation = Not provided by sampler Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: EPA 552.2 - Haloacetic Acids & Dalapon							GroundH2O	
TARGET ANALYTES								
BROMOCHLOROACETIC ACID	U	0.15	ug/L	1	0.15			
BROMODICHLOROACETIC ACID	U	0.31	ug/L	1	0.31			
CHLORODIBROMOACETIC ACID	U	0.31	ug/L	1	0.31			
DALAPON	U	0.53	ug/L	1	0.53			
DIBROMOACETIC ACID	U	0.25	ug/L	1	0.25	1		
DICHLOROACETIC ACID	U	0.18	ug/L	1	0.18	1		
MONOBROMOACETIC ACID	U	0.29	ug/L	1	0.29	1		
MONOCHLOROACETIC ACID	U	0.65	ug/L	1	0.65	2		
TRIBROMOACETIC ACID	U	0.72	ug/L	1	0.72			
TRICHLOROACETIC ACID	U	0.17	ug/L	1	0.17	1		
VALUE CALCULATED FROM OTHER RESULTS								
HAA(5)	U	1.0	ug/L					
HAA (5) calculation uses a zero for any individual HAA result less than the California DLR for that HAA								
HAA(9)	U	1.0	ug/L					
INTERNAL STANDARD								
1,2,3-TRICHLOROPROPANE		99	% recovery		1			
SURROGATE								
2,3-DIBROMOPROPIONIC ACID		100	% recovery		1			
Run ID: R282169 / Work Group No.: WG219421								
Prep Date1: 28-DEC-17 Prep Date2: 03-JAN-18 Analyzed 03-Jan-18 17:03								
Method: SM2320B - 1997, Titration							GroundH2O	
TARGET ANALYTES								
ALKALINITY: TOTAL AS CACO3		**210**	mg/L	1	5			
Run ID: R282044 / Work Group No.: WG219316								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: BICARBONATE		**210**	mg/L	1	5			
Run ID: R282047 / Work Group No.: WG219325								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1			
Run ID: R282047 / Work Group No.: WG219325								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1			
Run ID: R282047 / Work Group No.: WG219325								
Prep Date1: 27-DEC-17 Analyzed 27-Dec-17 07:45								

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Analytical Results Report

LSR B455-0706-1 BAYSIDE GROUND WATER PROJECT
Site: GW BAYSIDE East Bay Ground Water Injection/Extraction Project Bayside Groundwater
Locator: BAY1-MW6 R APN 438-0010-003 2364 Baumann Ave., San Lorenzo; formerly BAY-MW-WORTHLEY
ClientID: MW-6
Lab ID: L218814-1 (P227096-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Dec 20 2017, 02:35pm Sample collector: E. Seigel/ERRG
Date Received: Dec 21 2017, 08:09am Sample receiver: RMOLINA
Sample Comments: MW-6; +FLD DATA: pH = 7.19 ; Cl2R = 0.0 mg/L; Depth to GW = 10.71 feet; GW Elevation = Not provided by sampler Labelled as RAW WATER for the program.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: SM2340C - 1997, Titration: EDTA							GroundH2O	
TARGET ANALYTES								
HARDNESS: TOTAL AS CACO3		**130**	mg/L	1	3			
Run ID: R282118 / Work Group No.: WG219391								
Prep Date1: 02-JAN-18 Analyzed 02-Jan-18 07:30								
Method: SM2540C - 1997, Dried at 180C							GroundH2O	
TARGET ANALYTES								
TOTAL DISSOLVED SOLIDS		**400**	mg/L	2	20			
Run ID: R282030 / Work Group No.: WG219270								
Prep Date1: 22-DEC-17 Analyzed 22-Dec-17 08:15								
Method: SM4500-NH3 B, C - 1997, Distillation & Titration							GroundH2O	
TARGET ANALYTES								
AMMONIA AS N	U	0.250	mg/L	1	0.25			
Run ID: R282069 / Work Group No.: WG219340								
Prep Date1: 28-DEC-17 Analyzed 28-Dec-17 07:40								
Method: EPA 200.7 - Rev. 4.4, ICP Scan							RawH2O	
TARGET ANALYTES								
CALCIUM		**31,400**	ug/L	1.04	18.1			
IRON		**13.1**	ug/L	1.04	0.624	100		
POTASSIUM	**B**	**2,970**	ug/L	1.04	11.9			
MAGNESIUM		**7,580**	ug/L	1.04	2.39			
MANGANESE		**170**	ug/L	1.04	0.104	20		
SODIUM		**104,000**	ug/L	1.04	3.12			
Run ID: R282094 / Work Group No.: WG219366								
Prep Date1: 29-DEC-17 Analyzed 29-Dec-17 13:37								

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Analytical Report Prepared for ANTHONY BOITANO

Report generated on: Feb 20, 2018 01:10 pm
Login No.: L219546

Reported by:

KRISTI LORENSON
Laboratory Program Manager

Approved by:

NIRMELA ARSEM
Laboratory Services Division Manager

LSR B762-0206-1
Project Title: CAMANCHE SOUTH SHORE - WASTEWATER

Login Performance Summary
4 - Samples received by the lab on: Jan 31 2018, 12:50 pm
0 - Lost Analyses
0 - Hold Time Exceedences
Turn-around-time met

Samples included in this report:

Sample	Type	Collected	Site	Locator	ClientID
L219546-1	GRAB	31-Jan-2018 09:05	WW CAMANCHE SS	MW 5	-
L219546-2	GRAB	31-Jan-2018 09:45	WW CAMANCHE SS	MW 6	-
L219546-3	GRAB	31-Jan-2018 10:00	WW CAMANCHE SS	MW 7	-
L219546-4	GRAB	31-Jan-2018 10:15	WW CAMANCHE SS	MW 8	-

Legend to the laboratory qualifiers used in this report:
< - Less than
B - Analyte detected in method blank
U - Analyte not detected
Qualifiers for subcontract work - See textvalue for description

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Analytical Results Report

LSR B762-0206-1 CAMANCHE SOUTH SHORE - WASTEWATER
Site: WW CAMANCHE SS Camanche South Shore Recreation Area, wastewater system
Locator: MW 5 Groundwater monitoring well 5, North of Catfish Pond
Lab ID: L219546-1 (P227482-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Jan 31 2018, 09:05am Sample collector: GHunter
Date Received: Jan 31 2018, 12:50pm Sample receiver: CSOOHOO
Sample Comments: Annual Std Min (Q1 or Q3); field pH = 5.64, depth to water: 16.60 ft

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA							GroundH2O	
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS								
PH		**5.64**	pH units	1				
DEPTH		**16.6**	feet	1				
Run ID: R282688 / Work Group No.: WG219951								
Prep Date1: 31-JAN-18 Analyzed 31-Jan-18 09:05								
Method: EPA 300.1 - Ion Chromatography							GroundH2O	
Instrument calibrated 22-JAN-18								
TARGET ANALYTES								
NITRATE AS N		**0.91**	mg/L	5	0.0065	0.4		
SULFATE		**1.8**	mg/L	5	0.033	0.5		
SURROGATE								
DICHLOROACETATE		97	% recovery	5				
Run ID: R282711 / Work Group No.: WG219941								
Prep Date1: 31-JAN-18 Analyzed 01-Feb-18 02:05								
Method: EPA 300.1 - Ion Chromatography							GroundH2O	1
Instrument calibrated 01-FEB-18								
TARGET ANALYTES								
CHLORIDE		**260**	mg/L	50	0.26			
SURROGATE								
DICHLOROACETATE		100	% recovery	50				
Run ID: R282783 / Work Group No.: WG220004								
Prep Date1: 02-FEB-18 Analyzed 02-Feb-18 20:01								
Method: SM2320B - 1997, Titration							GroundH2O	
TARGET ANALYTES								
ALKALINITY: TOTAL AS CACO3		**15**	mg/L	1	5			
Run ID: R282904 / Work Group No.: WG220160								
Prep Date1: 09-FEB-18 Analyzed 09-Feb-18 12:53								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1			
Run ID: R282903 / Work Group No.: WG220166								
Prep Date1: 09-FEB-18 Analyzed 09-Feb-18 12:53								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1			
Run ID: R282903 / Work Group No.: WG220166								
Prep Date1: 09-FEB-18 Analyzed 09-Feb-18 12:53								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: BICARBONATE		**15**	mg/L	1	5			
Run ID: R282903 / Work Group No.: WG220166								
Prep Date1: 09-FEB-18 Analyzed 09-Feb-18 12:53								

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Analytical Results Report

LSR B762-0206-1 CAMANCHE SOUTH SHORE - WASTEWATER
Site: WW CAMANCHE SS Camanche South Shore Recreation Area, wastewater system
Locator: MW 5 Groundwater monitoring well 5, North of Catfish Pond
Lab ID: L219546-1 (P227482-1)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Jan 31 2018, 09:05am Sample collector: GHunter
Date Received: Jan 31 2018, 12:50pm Sample receiver: CSOOHOO
Sample Comments: Annual Std Min (Q1 or Q3); field pH = 5.64, depth to water: 16.60 ft

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: SM2340C - 1997, Titration: EDTA							GroundH2O	
TARGET ANALYTES								
HARDNESS: TOTAL AS CACO3		**220**	mg/L	1	3			
Run ID: R282978 / Work Group No.: WG220206								
Prep Date1: 13-FEB-18 Analyzed 13-Feb-18 15:20								
Method: SM2540C - 1997, Dried at 180C							GroundH2O	
TARGET ANALYTES								
TOTAL DISSOLVED SOLIDS		**730**	mg/L	1	10			
Sample hygroscopic, unable to obtain confirmation weight within acceptance.								
Run ID: R282868 / Work Group No.: WG219969								
Prep Date1: 01-FEB-18 Analyzed 01-Feb-18 09:00								
Method: EPA 6010 - ICP Scan							GroundH2O	
TARGET ANALYTES								
BARIUM		**700**	ug/L	1.1	0.242			
CALCIUM		**48,700**	ug/L	1.1	3.63			
IRON		**1,050**	ug/L	1.1	2.31			
POTASSIUM		**4,380**	ug/L	1.1	10.9			
MAGNESIUM	**B**	**23,100**	ug/L	1.1	0.891			
MANGANESE		**77.3**	ug/L	1.1	0.11			
SODIUM		**70,200**	ug/L	1.1	4.4			
Run ID: R283030 / Work Group No.: WG220266								
Prep Date1: 15-FEB-18 Analyzed 15-Feb-18 09:59								
Method: SM9221B - 2006, Multiple Tube Fermentation							GroundH2O	
TARGET ANALYTES								
TOTAL COLIFORMS	<	1.8	MPN/100 mL		1.8			
Run ID: R282779 / Work Group No.: WG219946								
Prep Date1: 31-JAN-18 Analyzed 31-Jan-18 14:35								

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Analytical Results Report

LSR B762-0206-1 CAMANCHE SOUTH SHORE - WASTEWATER
Site: WW CAMANCHE SS Camanche South Shore Recreation Area, wastewater system
Locator: MW 6 Groundwater monitoring well 6, East of WW Pond 3
Lab ID: L219546-2 (P227482-2)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Jan 31 2018, 09:45am Sample collector: GHunter
Date Received: Jan 31 2018, 12:50pm Sample receiver: CSOOHOO
Sample Comments: Annual Std Min (Q1 or Q3); field pH = 6.59, depth to water: 9.82 ft, M. Well flooded.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference							GroundH2O	
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA							GroundH2O	
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS								
PH		**6.59**	pH units	1				
DEPTH		**9.82**	feet	1				
Run ID: R282688 / Work Group No.: WG219951								
Prep Date1: 31-JAN-18 Analyzed 31-Jan-18 09:45								
Method: EPA 300.1 - Ion Chromatography							GroundH2O	
Instrument calibrated 22-JAN-18								
TARGET ANALYTES								
CHLORIDE		**150**	mg/L	25	0.13			
NITRATE AS N		**0.34**	mg/L	25	0.032	0.4		
SULFATE		**6.1**	mg/L	25	0.16	0.5		
SURROGATE								
DICHLOROACETATE		97	% recovery	25				
Run ID: R282711 / Work Group No.: WG219941								
Prep Date1: 31-JAN-18 Analyzed 01-Feb-18 02:44								
Method: SM2320B - 1997, Titration							GroundH2O	
TARGET ANALYTES								
ALKALINITY: TOTAL AS CACO3		**400**	mg/L	1	5			
Run ID: R282789 / Work Group No.: WG220026								
Prep Date1: 05-FEB-18 Analyzed 05-Feb-18 08:28								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1			
Run ID: R282795 / Work Group No.: WG220035								
Prep Date1: 05-FEB-18 Analyzed 05-Feb-18 08:28								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1			
Run ID: R282795 / Work Group No.: WG220035								
Prep Date1: 05-FEB-18 Analyzed 05-Feb-18 08:28								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: BICARBONATE		**400**	mg/L	1	5			
Run ID: R282795 / Work Group No.: WG220035								
Prep Date1: 05-FEB-18 Analyzed 05-Feb-18 08:28								
Method: SM2340C - 1997, Titration: EDTA							GroundH2O	
TARGET ANALYTES								
HARDNESS: TOTAL AS CACO3		**350**	mg/L	2	6			
Run ID: R282978 / Work Group No.: WG220206								
Prep Date1: 13-FEB-18 Analyzed 13-Feb-18 15:20								

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Analytical Results Report

LSR B762-0206-1 CAMANCHE SOUTH SHORE - WASTEWATER
Site: WW CAMANCHE SS Camanche South Shore Recreation Area, wastewater system
Locator: MW 6 Groundwater monitoring well 6, East of WW Pond 3
Lab ID: L219546-2 (P227482-2)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Jan 31 2018, 09:45am Sample collector: GHunter
Date Received: Jan 31 2018, 12:50pm Sample receiver: CSOOHOO
Sample Comments: Annual Std Min (Q1 or Q3); field pH = 6.59, depth to water: 9.82 ft, M. Well flooded.

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference								
Method: SM2540C - 1997, Dried at 180C							GroundH2O	
TARGET ANALYTES								
TOTAL DISSOLVED SOLIDS		**750**	mg/L	2	20			
Run ID: R282868 / Work Group No.: WG219969								
Prep Date1: 01-FEB-18 Analyzed 01-Feb-18 09:00								
Method: EPA 6010 - ICP Scan							GroundH2O	
TARGET ANALYTES								
BARIUM		**950**	ug/L	1.1	0.242			
CALCIUM		**77,600**	ug/L	1.1	3.63			
IRON		**35,400**	ug/L	1.1	2.31			
POTASSIUM		**1,980**	ug/L	1.1	10.9			
MAGNESIUM	**B**	**25,200**	ug/L	1.1	0.891			
MANGANESE		**1,360**	ug/L	1.1	0.11			
SODIUM		**122,000**	ug/L	1.1	4.4			
Run ID: R283030 / Work Group No.: WG220266								
Prep Date1: 15-FEB-18 Analyzed 15-Feb-18 10:16								
Method: SM9221B - 2006, Multiple Tube Fermentation							GroundH2O	
TARGET ANALYTES								
TOTAL COLIFORMS	<	1.8	MPN/100 mL		1.8			
Run ID: R282779 / Work Group No.: WG219946								
Prep Date1: 31-JAN-18 Analyzed 31-Jan-18 14:35								

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Analytical Results Report

LSR B762-0206-1 CAMANCHE SOUTH SHORE - WASTEWATER
Site: WW CAMANCHE SS Camanche South Shore Recreation Area, wastewater system
Locator: MW 7 Groundwater monitoring well 7, North-west of Trout Pond
Lab ID: L219546-3 (P227482-3)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Jan 31 2018, 10:00am Sample collector: GHunter
Date Received: Jan 31 2018, 12:50pm Sample receiver: CSOOHOO
Sample Comments: Annual Std Min (Q1 or Q3); field pH = 5.26, depth to water: 10.70 ft

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA							GroundH2O	
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS								
PH		**5.26**	pH units	1				
DEPTH		**10.7**	feet	1				
Run ID: R282688 / Work Group No.: WG219951								
Prep Date1: 31-JAN-18 Analyzed 31-Jan-18 10:00								
Method: EPA 300.1 - Ion Chromatography							GroundH2O	
Instrument calibrated 22-JAN-18								
TARGET ANALYTES								
CHLORIDE		**28**	mg/L	10	0.052			
NITRATE AS N		**0.85**	mg/L	10	0.013	0.4		
SULFATE		**59**	mg/L	10	0.066	0.5		
SURROGATE								
DICHLOROACETATE		97	% recovery	10				
Run ID: R282711 / Work Group No.: WG219941								
Prep Date1: 31-JAN-18 Analyzed 01-Feb-18 03:23								
Method: SM2320B - 1997, Titration							GroundH2O	
TARGET ANALYTES								
ALKALINITY: TOTAL AS CACO3		**5.9**	mg/L	1	5			
Run ID: R282904 / Work Group No.: WG220160								
Prep Date1: 09-FEB-18 Analyzed 09-Feb-18 12:53								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1			
Run ID: R282903 / Work Group No.: WG220166								
Prep Date1: 09-FEB-18 Analyzed 09-Feb-18 12:53								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1			
Run ID: R282903 / Work Group No.: WG220166								
Prep Date1: 09-FEB-18 Analyzed 09-Feb-18 12:53								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: BICARBONATE		**5.9**	mg/L	1	5			
Run ID: R282903 / Work Group No.: WG220166								
Prep Date1: 09-FEB-18 Analyzed 09-Feb-18 12:53								
Method: SM2340C - 1997, Titration: EDTA							GroundH2O	
TARGET ANALYTES								
HARDNESS: TOTAL AS CACO3		**66**	mg/L	1	3			
Run ID: R282978 / Work Group No.: WG220206								
Prep Date1: 13-FEB-18 Analyzed 13-Feb-18 15:20								
Method: SM2540C - 1997, Dried at 180C							GroundH2O	
TARGET ANALYTES								
TOTAL DISSOLVED SOLIDS		**220**	mg/L	1	10			
Run ID: R282868 / Work Group No.: WG219969								
Prep Date1: 01-FEB-18 Analyzed 01-Feb-18 09:00								

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Analytical Results Report

LSR B762-0206-1 CAMANCHE SOUTH SHORE - WASTEWATER
Site: WW CAMANCHE SS Camanche South Shore Recreation Area, wastewater system
Locator: MW 7 Groundwater monitoring well 7, North-west of Trout Pond
Lab ID: L219546-3 (P227482-3)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Jan 31 2018, 10:00am Sample collector: GHunter
Date Received: Jan 31 2018, 12:50pm Sample receiver: CSOOHOO
Sample Comments: Annual Std Min (Q1 or Q3); field pH = 5.26, depth to water: 10.70 ft

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	Matrix / RL/ML	Tag
Method: EPA 6010 - ICP Scan						GroundH2O	
TARGET ANALYTES							
BARIUM		**171**	ug/L	1.1	0.242		
CALCIUM		**15,600**	ug/L	1.1	3.63		
IRON		**319**	ug/L	1.1	2.31		
POTASSIUM		**3,350**	ug/L	1.1	10.9		
MAGNESIUM	**B**	**4,300**	ug/L	1.1	0.891		
MANGANESE		**1,500**	ug/L	1.1	0.11		
SODIUM		**21,400**	ug/L	1.1	4.4		
Run ID: R283030 / Work Group No.: WG220266							
Prep Date1: 15-FEB-18 Analyzed 15-Feb-18 09:44							
Method: SM9221B - 2006, Multiple Tube Fermentation						GroundH2O	
TARGET ANALYTES							
TOTAL COLIFORMS	<	1.8	MPN/100 mL		1.8		
Run ID: R282779 / Work Group No.: WG219946							
Prep Date1: 31-JAN-18 Analyzed 31-Jan-18 14:35							

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Analytical Results Report

LSR B762-0206-1 CAMANCHE SOUTH SHORE - WASTEWATER
Site: WW CAMANCHE SS Camanche South Shore Recreation Area, wastewater system
Locator: MW 8 Groundwater monitoring well 8, South of WW Pond 3
Lab ID: L219546-4 (P227482-4)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Jan 31 2018, 10:15am Sample collector: GHunter
Date Received: Jan 31 2018, 12:50pm Sample receiver: CSOOHOO
Sample Comments: Annual Std Min (Q1 or Q3); field pH = 5.03, depth to water: 16.43 ft

Parameter	Qualifier	Result	Units	Dilution	MDL	RL/ML	Matrix	Tag
Method Reference							GroundH2O	
Method: SAMPLER PROVIDED FIELD MEASUREMENTS - DATA ENTRY LIST FOR FIELD DATA							GroundH2O	
FIELD ANALYSIS/OBSERVATION DATA PARAMETERS								
PH		**5.03**	pH units	1				
DEPTH		**16.43**	feet	1				
Run ID: R282688 / Work Group No.: WG219951								
Prep Date1: 31-JAN-18 Analyzed 31-Jan-18 10:15								
Method: EPA 300.1 - Ion Chromatography							GroundH2O	
Instrument calibrated 22-JAN-18								
TARGET ANALYTES								
CHLORIDE		**57**	mg/L	10	0.052			
NITRATE AS N		**2.6**	mg/L	10	0.013	0.4		
SULFATE		**32**	mg/L	10	0.066	0.5		
SURROGATE								
DICHLOROACETATE		96	% recovery	10				
Run ID: R282711 / Work Group No.: WG219941								
Prep Date1: 31-JAN-18 Analyzed 01-Feb-18 04:02								
Method: SM2320B - 1997, Titration							GroundH2O	
TARGET ANALYTES								
ALKALINITY: TOTAL AS CACO3	U	5.0	mg/L	1	5			
Run ID: R282904 / Work Group No.: WG220160								
Prep Date1: 09-FEB-18 Analyzed 09-Feb-18 12:53								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: HYDROXIDE	U	0.10	mg/L	1	0.1			
Run ID: R282903 / Work Group No.: WG220166								
Prep Date1: 09-FEB-18 Analyzed 09-Feb-18 12:53								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: CARBONATE	U	0.10	mg/L	1	0.1			
Run ID: R282903 / Work Group No.: WG220166								
Prep Date1: 09-FEB-18 Analyzed 09-Feb-18 12:53								
Method: SM2320B-1997 - Calculation							GroundH2O	
TARGET ANALYTES								
ALKALINITY: BICARBONATE	U	5.0	mg/L	1	5			
Run ID: R282903 / Work Group No.: WG220166								
Prep Date1: 09-FEB-18 Analyzed 09-Feb-18 12:53								
Method: SM2340C - 1997, Titration: EDTA							GroundH2O	
TARGET ANALYTES								
HARDNESS: TOTAL AS CACO3		**58**	mg/L	1	3			
Run ID: R282978 / Work Group No.: WG220206								
Prep Date1: 13-FEB-18 Analyzed 13-Feb-18 15:20								
Method: SM2540C - 1997, Dried at 180C							GroundH2O	
TARGET ANALYTES								
TOTAL DISSOLVED SOLIDS		**260**	mg/L	1	10			
Run ID: R282868 / Work Group No.: WG219969								
Prep Date1: 01-FEB-18 Analyzed 01-Feb-18 09:00								

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EAST BAY MUNICIPAL UTILITY DISTRICT
Laboratory Services Division
PO Box 24055, MS 59, Oakland, CA 94623
Phone (510)287-1432 Fax (510)465-5462

Analytical Results Report

LSR B762-0206-1 CAMANCHE SOUTH SHORE - WASTEWATER
Site: WW CAMANCHE SS Camanche South Shore Recreation Area, wastewater system
Locator: MW 8 Groundwater monitoring well 8, South of WW Pond 3
Lab ID: L219546-4 (P227482-4)
Sample Type: GRAB (Instantaneous Grab)
Date Collected: Jan 31 2018, 10:15am Sample collector: GHunter
Date Received: Jan 31 2018, 12:50pm Sample receiver: CSOOHOO
Sample Comments: Annual Std Min (Q1 or Q3); field pH = 5.03, depth to water: 16.43 ft

Method Reference / Parameter	Qualifier	Result	Units	Dilution	MDL	Matrix / RL/ML	Tag
Method: EPA 6010 - ICP Scan						GroundH2O	
TARGET ANALYTES							
BARIUM		**837**	ug/L	1.1	0.242		
CALCIUM		**7,390**	ug/L	1.1	3.63		
IRON		**2,800**	ug/L	1.1	2.31		
POTASSIUM		**5,930**	ug/L	1.1	10.9		
MAGNESIUM	**B**	**7,660**	ug/L	1.1	0.891		
MANGANESE		**275**	ug/L	1.1	0.11		
SODIUM		**29,100**	ug/L	1.1	4.4		
Run ID: R283030 / Work Group No.: WG220266							
Prep Date1: 15-FEB-18 Analyzed 15-Feb-18 10:20							
Method: SM9221B - 2006, Multiple Tube Fermentation						GroundH2O	
TARGET ANALYTES							
TOTAL COLIFORMS		**4.0**	MPN/100 mL		1.8		
Run ID: R282779 / Work Group No.: WG219946							
Prep Date1: 31-JAN-18 Analyzed 31-Jan-18 14:35							

RL is either the client requested or regulatory mandated Reporting Limit. ML is the regulatory mandated Minimum Level

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

January 9, 2018

Robbie C. Phillips
Alpha Analytical Laboratories, Inc.
208 Mason St.
Ukiah, CA 95482

Laboratory Report Supplement
DOX & File as Data Approval Worksheet
WG 219897 / R282637
Approved By:
Approved On: 1/31/2018

RE: **17L1988**

Pace Workorder: *25180*

Dear Robbie Phillips:

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, December 28, 2017. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ruth Welsh

Ruth Welsh 01/09/2018
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

RECEIVED
1/29/18

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 15

Pace Analytical Energy Services LLC
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Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

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SAMPLE SUMMARY

Workorder: 25180 17L1988

Lab ID	Sample ID	Matrix	Date Collected	Date Received
251800001	17L1988-01	Water	12/19/2017 15:15	12/28/2017 11:45
251800002	17L1988-02	Water	12/19/2017 14:45	12/28/2017 11:45
251800003	17L1988-03	Water	12/19/2017 11:35	12/28/2017 11:45
251800004	17L1988-04	Water	12/20/2017 17:10	12/28/2017 11:45
251800005	17L1988-05	Water	12/20/2017 14:35	12/28/2017 11:45

Pace Analytical Energy Services LLC
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ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800001** Date Received: 12/28/2017 11:45 Matrix: Water

Sample ID: **17L1988-01** Date Collected: 12/19/2017 15:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O		Analytical Method: D18O						
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

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ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800002** Date Received: 12/28/2017 11:45 Matrix: Water
Sample ID: **17L1988-02** Date Collected: 12/19/2017 14:45

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O		Analytical Method: D18O						
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

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ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800003** Date Received: 12/28/2017 11:45 Matrix: Water
Sample ID: **17L1988-03** Date Collected: 12/19/2017 11:35

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O		Analytical Method: D18O						
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

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ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800004** Date Received: 12/28/2017 11:45 Matrix: Water

Sample ID: **17L1988-04** Date Collected: 12/20/2017 17:10

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O	Analytical Method: D18O							
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

CERTIFICATE OF ANALYSIS

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800005** Date Received: 12/28/2017 11:45 Matrix: Water
Sample ID: **17L1988-05** Date Collected: 12/20/2017 14:35

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O			Analytical Method: D18O					
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

Pace Analytical Energy Services LLC
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ANALYTICAL RESULTS QUALIFIERS

Workorder: 25180 17L1988

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

Pace Analytical Energy Services LLC
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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 25180 17L1988

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
251800001	17L1988-01			D18O	CSIA/1738
251800002	17L1988-02			D18O	CSIA/1738
251800003	17L1988-03			D18O	CSIA/1738
251800004	17L1988-04			D18O	CSIA/1738
251800005	17L1988-05			D18O	CSIA/1738

Pace Analytical®

Client	Alpha Analytical Laboratories, Inc.	CSIA Center of Excellence
	208 Mason Street	Pace Analytical Energy Services
	Ukiah, CA 95482	220 William Pitt Way
Project	17L1988	Pittsburgh
Project #	17L1988	Pennsylvania 15238
Report to	Robbie Phillips	United States
Tel:	707-468-0401	Tel: 412.826.5245
Email:	rphillips@alpha.com	

REPORT OF ENVIRONMENTAL FORENSICS ISOTOPE ANALYSES

Date Received: 12/28/2017
Date Reported: 1/8/2018

Water samples submitted for ^{18}O and ^{2}H (‰ VSMOW) stable isotope analysis

Pace CSIA ID	Sample ID	δD_{H2O}	$\delta^{18}O_{H2O}$
251800001	17L1988-01	-25.84	-3.14
251800002	17L1988-02	-41.37	-6.54
251800003	17L1988-03	-47.81	-7.34
251800004	17L1988-04	-47.18	-6.85
251800005	17L1988-05	-47.77	-7.16

VSMOW: Vienna Standard Mean Ocean Water (Hydrogen and Oxygen Isotope Standard)
D: Deuterium, Hydrogen-2

Lab ID	δD_{H2O}	$\delta^{18}O_{H2O}$
QC-01	-94.19	-13.33
QC-02	-94.18	-13.29
Mean	-94.19	-13.31
Analytical precision (1σ)	0.01	0.03

The $\delta^{18}O_{H2O}$ and δD_{H2O} isotopes were subcontracted to Colorado Plateau Stable Laboratory (CPSIL).

25180

SUBCONTRACT ORDER

Alpha Analytical Laboratories, Inc.

17L1988

SENDING LABORATORY:

Alpha Analytical Laboratories, Inc.
208 Mason St.
Ukiah, CA 95482
Phone: (707)468-0401
Fax: (707)468-5267
Project Manager: Robbie C. Phillips

RECEIVING LABORATORY:

Zymax / Pace Lab
220 William Pitt Way
Pittsburgh, PA 15238
Phone :(412) 826-5245
Fax: (412) 660-0256
Terms: Net 30

Analysis	Due	Expires	Comments
17L1988-01 L218781-1 GW BAYSIDE / BAY1-MW2S [Water] Sampled 12/19/17 15:15			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/17/18 15:15	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-02 L218782-1 GW BAYSIDE / BAY1-MW2I [Water] Sampled 12/19/17 14:45			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/17/18 14:45	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-03 L218783-1 GW BAYSIDE / BAY1-MW5D [Water] Sampled 12/19/17 11:35			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/17/18 11:35	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-04 L218813-1 GW BAYSIDE / BAY1-MW4 [Water] Sampled 12/20/17 17:10			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/18/18 17:10	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-05 L218814-1 GW BAYSIDE / BAY1-MW6 [Water] Sampled 12/20/17 ~~14:34~~ 1435			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/18/18 14:34	
Containers Supplied: 500 mL Poly Unpres (A)			

Released By	Date	Received By	Date
[signature]	12-22-17	[signature] / PAES	12/28/17 10:45

SUBCONTRACT ORDER

Alpha Analytical Laboratories, Inc.

17L1988

25180

☐ *Report to State*

System Name: _____ **Employed by:** _____

User ID: _____ **Sampler:** _____

System Number: _____

+QC
+MDL

Released By | Date | Received By | Date

12-22-17

Released By | Date | Received By | Date

Cooler Receipt Form

Client Name: Alpha Project: 171988 Lab Work Order: 25180

A. **Shipping/Container Information** (circle appropriate response)

Courier: FedEx (UPS) USPS Client Other:_____ **Air bill Present:** (Yes) No

Tracking Number: 1Z 894250136002 2708

Custody Seal on Cooler/Box Present: (Yes) No **Seals Intact:** (Yes) No

Cooler/Box Packing Material: Bubble Wrap Absorbent Foam (Other): None

Type of Ice: (Wet) (Blue) None **Ice Intact:** (Yes) Melted

Cooler Temperature: 0.1 **Radiation Screened:** Yes (No) **Chain of Custody Present:** (Yes) No

Comments:_____

B. **Laboratory Assignment/Log-in** (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	X			
Chain of Custody relinquished	X			
Sampler Name & Signature on COC		X		
Containers intact	X			
Were samples in separate bags		X		
Sample container labels match COC Sample name/date and time collected		X		
Sufficient volume provided	X			
PAES containers used	X			
Are containers properly preserved for the requested testing? (as labeled)			X	
If an unknown preservation state, were containers checked? Exception: VOA's coliform			X	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			X	
Headspace present?	X			

Comments:_____

Cooler contents examined/received by: _____ **Date:** 12/28/17

Project Manager Review: RW **Date:** 12-28-17

NON-CONFORMANCE FORM

PAES Work Order #: 25180

Date: 12/8/17 Time of Receipt: 10:45 Receiver: JM

Client: Alpha

REASON FOR NON-CONFORMANCE:

Sample 17L1988-05 had a sample time of 14:34 written on the label

ACTION TAKEN:

Client name: _____ Date: _____ Time: _____

Logged in per COC

Customer Service Initials: CW Date: 12-28-17

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

2.4°

Page 1 of 6

17L1988

RMN 12/21/17

Prelog or Login No.: L218781

Project Title: BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DREW LERER
Tel No.: 287-0247
Lab PM: KRISTI LORENSON

Sampled by: BAguayo/ERRG
Rcvd: 20-DEC-17 08:25
Sample Date: 19-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218781-1	GRAB	15:15	GW BAYSIDE	BAY1-MW2S	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434008 PLSTM			10-JAN-18

ClientID: MW-2S

Sample Comments: MW-2S; +FLD DATA: pH = 6.27; Cl2R = 0.0 mg/L; Depth to GW = 8.67 feet; GW Elevation = feet; Labelled as RAW WATER for the program. [Analyst Note: May need to dilute for ICP & IC due to salt water intrusion] Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Mollic	Robert Mollic	1238	12/21/17
		Cynthia L Schon	08:31	20 DEC 17
				RMN 12/21/17
Received by		Johnny Hillier	1238	12/21/17
Relinquished by		Johnny Hillier	1620	12/21/17
Received by			19:03	12-21-17
Relinquished by			21:35	12-21-17
Received by			21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg Na2S2O3, 40 mL
A125N - Glass, amber, NM, septa top, NH4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:_____ Date:_____

Approved by:_____ Date:_____

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO# BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

2,40

2 of 2 1/L1780

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

Page ~~1 of 1~~ 2 of 2 RMM 12/21/17

Prelog or Login No.: L218782	Project Title: BAYSIDE GROUND WATER PROJECT Account or Project: B455-0706-1	Client PM: DREW LERER Tel No.: 287-0247 Lab PM: KRISTI LORENSON	Sampled by: BAguayo/ERRG Rcvd: 20-DEC-17 08:25 Sample Date: 19-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218782-1	GRAB	14:45	GW BAYSIDE	BAY1-MW2I	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434022 PLSTM			10-JAN-18

ClientID: MW-2I

Sample Comments: MW-2I; +FLD DATA: pH = 7.69; Cl2R = 0.05 mg/L; Depth to GW = 35.35 feet; GW Elevation = feet; Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Molina	Robert Molina ~~Cynthia L Suenoo~~ RMM 12/21/17	1238 ~~08:25~~	12/21/17 ~~20-DEC-17~~
Received by	[signature]	Johnny Hillier	1238	12/21/17
Relinquished by	[signature]	Johnny Hillier	1620	12/21/17
Received by	[signature]		19:03	12-21-17
Relinquished by	[signature]		21:35	12-21-17
Received by	[signature]		21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg $Na_2S_2O_3$, 40 mL
A125N - Glass, amber, NM, septa top, NH_4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:________ Date:________

Approved by:________ Date:________

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO# BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

2.4°

3 of 6 1'/L1988

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

Prelog or Login No.: L218783	Project Title: BAYSIDE GROUND WATER PROJECT Account or Project: B455-0706-1	Client PM: DREW LERER Tel No.: 287-0247 Lab PM: KRISTI LORENSON	Sampled by: BAguayo/ERRG Rcvd: 20-DEC-17 08:25 Sample Date: 19-DEC-17

Lab. No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218783-1	GRAB	11:35	GW BAYSIDE	BAY1-MW5D	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434058 PLSTM			10-JAN-18

ClientID: MW-5D

Sample Comments: MW-5D; +FLD DATA: pH = 7.37 ; Cl2R = 0.01 mg/L; Depth to GW = 15.02 feet; GW Elevation = feet; Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Mohr	Robert Mohr ~~Cynthia L Gachoo~~ RMM 12/21/17	1238 ~~08:25~~	12/21/17 ~~20-DEC-17~~
Received by	[signature]	Johnny Hillier	1238	12/21/17
Relinquished by	[signature]	Johnny Hillier	1620	12/21/17
Received by	[signature]		19:03	12-21-17
Relinquished by	[signature]		21:35	12-21-17
Received by	[signature]		21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg $Na_2S_2O_3$, 40 mL
A125N - Glass, amber, NM, septa top; NH_4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:_______ Date:_______

Approved by:_______ Date:_______

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO# BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

2.4°

4 of 6 17L1988

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

Page ~~1~~ of 1 PM-12/21/17

Prelog or Login No.: L218813

Project Title
BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DREW LERER
Tel No.: 287-0247
Lab PM: KRISTI LORENSON

Sampled by: E. Seigel/ERRG
Rcvd: 21-DEC-17 08:09
Sample Date: 20-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218813-1	GRAB	17:10	GW BAYSIDE	BAY1-MW4	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434034	PLSTM		11-JAN-18

ClientID: MW-4

Sample Comments: MW-4; +FLD DATA: pH = 7.55 ; Cl2R = 0.0 mg/L; Depth to GW = 10.92 feet; GW Elevation = Not provided by sampler ; Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Molina	Robert M Molina	1238 PM-12/21/17	21-DEC-17
Received by	Johnny Hillier	Johnny Hillier	1238	12/21/17
Relinquished by	Johnny Hillier	Johnny Hillier	1620	12/21/17
Received by	CN		19:03	12-21-17
Relinquished by	CN		21:35	12-21-17
Received by	CN		21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg Na2S2O3, 40 ml
A125N - Glass, amber, NM, septa top, NH4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:_____ Date:_____

Approved by:_____ Date:_____

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO# BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

2.4° 5 of 5 12/21/1988

Page 1 of 1

Prelog or Login No.: L218814

Project Title
BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DREW LERER
Tel No.: 287-0247
Lab PM: KRISTI LORENSON

Sampled by: E. Seigel/ERRG
Rcvd: 21-DEC-17 08:09
Sample Date: 20-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218814-1	GRAB	14:35	GW BAYSIDE	BAY1-MW6	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434046 PLSTM			11-JAN-18

ClientID: MW-6

Sample Comments: MW-6; +FLD DATA: pH = 7.19 ; Cl2R = 0.0 mg/L; Depth to GW = 10.71 feet; GW Elevation = Not provided by sampler Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by		Robert M Molina	1238	21-DEC-17
Received by		Johnny Hiller	1238	12/21/17
Relinquished by		Johnny Hiller	1620	12/21/17
Received by			19:03	12-21-17
Relinquished by			21:35	12-21-17
Received by			21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg Na2S2O3, 40 ml
A125N - Glass, amber, NM, septa top, NH4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:_____ Date:_____

Approved by:_____ Date:_____

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
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Dublin CA 94568
(925)828-6226
PO#.BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

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17L1988

Chain of Custody Attachment

(page _6_ of _6_)

Submitted to: Pace CSIA
220 William Pitt Way
Pittsburgh, PA 15238
Attn: Dr. Wang Yi
(412)-826-5245

Through: Robbie Phillips
Alpha Analytical Laboratories
6398 Dougherty Road, Suite 3
Dublin, CA 94568
(925) 828-6226
Billing: Visa Card on File

Date samples submitted: December 21, 2017

Login#	Site/Locator	Sample Date / Time
L218781-1	GW BAYSIDE / BAY1-MW2S	19-DEC-17 15:15
L218782-1	GW BAYSIDE / BAY1-MW2I	19-DEC-17 14:45
L218783-1	GW BAYSIDE / BAY1-MW5D	19-DEC-17 11:35
L218813-1	GW BAYSIDE / BAY1-MW4	20-DEC-17 17:10
L218814-1	GW BAYSIDE / BAY1-MW6	20-DEC-17 14:34

Analyses : Hydrogen-2 and Oxygen-18 isotopes

Comments: Please comply with hold time (3 months).

TAT: Standard

Results to: Alpha and East Bay MUD (Kristi Lorenson)
EBMUD Laboratory
P.O. Box 24055 MS # 59
Oakland, California. 94623
Tel No: 510-287-1696
Fax No: 510-465-5462
kristi.lorenson@ebmud.com

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

January 9, 2018

Robbie C. Phillips
Alpha Analytical Laboratories, Inc.
208 Mason St.
Ukiah, CA 95482

Laboratory Report Supplement
DOX & File as Data Approval Worksheet
WG 219897 / R282637
Approved By:
Approved On: 1/31/2018

RE: **17L1988**

Pace Workorder: *25180*

Dear Robbie Phillips:

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, December 28, 2017. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ruth Welsh

Ruth Welsh 01/09/2018
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

RECEIVED
1/29/18

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 15

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 25180 17L1988

Lab ID	Sample ID	Matrix	Date Collected	Date Received
251800001	17L1988-01	Water	12/19/2017 15:15	12/28/2017 11:45
251800002	17L1988-02	Water	12/19/2017 14:45	12/28/2017 11:45
251800003	17L1988-03	Water	12/19/2017 11:35	12/28/2017 11:45
251800004	17L1988-04	Water	12/20/2017 17:10	12/28/2017 11:45
251800005	17L1988-05	Water	12/20/2017 14:35	12/28/2017 11:45

Pace Analytical Energy Services LLC
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Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800001** Date Received: 12/28/2017 11:45 Matrix: Water

Sample ID: **17L1988-01** Date Collected: 12/19/2017 15:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O		Analytical Method: D18O						
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

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ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800002** Date Received: 12/28/2017 11:45 Matrix: Water
Sample ID: **17L1988-02** Date Collected: 12/19/2017 14:45

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O		Analytical Method: D18O						
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

Pace Analytical Energy Services LLC
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Pittsburgh, PA 15238
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Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800003** Date Received: 12/28/2017 11:45 Matrix: Water
Sample ID: **17L1988-03** Date Collected: 12/19/2017 11:35

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O		Analytical Method: D18O						
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800004** Date Received: 12/28/2017 11:45 Matrix: Water

Sample ID: **17L1988-04** Date Collected: 12/20/2017 17:10

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O	Analytical Method: D18O							
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

CERTIFICATE OF ANALYSIS

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800005** Date Received: 12/28/2017 11:45 Matrix: Water
Sample ID: **17L1988-05** Date Collected: 12/20/2017 14:35

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O			Analytical Method: D18O					
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS QUALIFIERS

Workorder: 25180 17L1988

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 25180 17L1988

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
251800001	17L1988-01			D18O	CSIA/1738
251800002	17L1988-02			D18O	CSIA/1738
251800003	17L1988-03			D18O	CSIA/1738
251800004	17L1988-04			D18O	CSIA/1738
251800005	17L1988-05			D18O	CSIA/1738

Pace Analytical®

Client	Alpha Analytical Laboratories, Inc.	CSIA Center of Excellence
	208 Mason Street	Pace Analytical Energy Services
	Ukiah, CA 95482	220 William Pitt Way
Project	17L1988	Pittsburgh
Project #	17L1988	Pennsylvania 15238
Report to	Robbie Phillips	United States
Tel:	707-468-0401	Tel: 412.826.5245
Email:	rphillips@alpha.com	

REPORT OF ENVIRONMENTAL FORENSICS ISOTOPE ANALYSES

Date Received: 12/28/2017
Date Reported: 1/8/2018

Water samples submitted for ^{18}O and ^{2}H (‰ VSMOW) stable isotope analysis

Pace CSIA ID	Sample ID	δD_{H2O}	$\delta^{18}O_{H2O}$
251800001	17L1988-01	-25.84	-3.14
251800002	17L1988-02	-41.37	-6.54
251800003	17L1988-03	-47.81	-7.34
251800004	17L1988-04	-47.18	-6.85
251800005	17L1988-05	-47.77	-7.16

VSMOW: Vienna Standard Mean Ocean Water (Hydrogen and Oxygen Isotope Standard)
D: Deuterium, Hydrogen-2

Lab ID	δD_{H2O}	$\delta^{18}O_{H2O}$
QC-01	-94.19	-13.33
QC-02	-94.18	-13.29
Mean	-94.19	-13.31
Analytical precision (1σ)	0.01	0.03

The $\delta^{18}O_{H2O}$ and δD_{H2O} isotopes were subcontracted to Colorado Plateau Stable Laboratory (CPSIL).

SUBCONTRACT ORDER

Alpha Analytical Laboratories, Inc.

17L1988

25180

SENDING LABORATORY:	**RECEIVING LABORATORY:**
Alpha Analytical Laboratories, Inc.	Zymax / Pace Lab
208 Mason St.	220 William Pitt Way
Ukiah, CA 95482	Pittsburgh, PA 15238
Phone: (707)468-0401	Phone :(412) 826-5245
Fax: (707)468-5267	Fax: (412) 660-0256
Project Manager: Robbie C. Phillips	**Terms: Net 30**

Analysis	Due	Expires	Comments
17L1988-01 L218781-1 GW BAYSIDE / BAY1-MW2S [Water] Sampled 12/19/17 15:15			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/17/18 15:15	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-02 L218782-1 GW BAYSIDE / BAY1-MW2I [Water] Sampled 12/19/17 14:45			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/17/18 14:45	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-03 L218783-1 GW BAYSIDE / BAY1-MW5D [Water] Sampled 12/19/17 11:35			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/17/18 11:35	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-04 L218813-1 GW BAYSIDE / BAY1-MW4 [Water] Sampled 12/20/17 17:10			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/18/18 17:10	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-05 L218814-1 GW BAYSIDE / BAY1-MW6 [Water] Sampled 12/20/17 ~~14:34~~ 1435			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/18/18 14:34	
Containers Supplied: 500 mL Poly Unpres (A)			

Released By	Date	Received By	Date
[signature]	12-22-17	[signature] / PAES	12/28/17 10:45

Released By | Date | Received By | Date

SUBCONTRACT ORDER

Alpha Analytical Laboratories, Inc.

17L1988

25180

☐ *Report to State*

System Name: _____ **Employed by:** _____

User ID: _____ **Sampler:** _____

System Number: _____

+QC
+MDL

Released By | Date | Received By | Date

12-22-17

Released By | Date | Received By | Date

Cooler Receipt Form

Client Name: Alpha Project: 171988 Lab Work Order: 25180

A. **Shipping/Container Information** (circle appropriate response)

Courier: FedEx (UPS) USPS Client Other:_____ **Air bill Present:** (Yes) No

Tracking Number: 1Z 894250136002 2708

Custody Seal on Cooler/Box Present: (Yes) No **Seals Intact:** (Yes) No

Cooler/Box Packing Material: Bubble Wrap Absorbent Foam (Other): None

Type of Ice: (Wet) (Blue) None **Ice Intact:** (Yes) Melted

Cooler Temperature: 0.1 **Radiation Screened:** Yes (No) **Chain of Custody Present:** (Yes) No

Comments:_____

B. **Laboratory Assignment/Log-in** (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	X			
Chain of Custody relinquished	X			
Sampler Name & Signature on COC		X		
Containers intact	X			
Were samples in separate bags		X		
Sample container labels match COC Sample name/date and time collected		X		
Sufficient volume provided	X			
PAES containers used	X			
Are containers properly preserved for the requested testing? (as labeled)			X	
If an unknown preservation state, were containers checked? Exception: VOA's coliform			X	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			X	
Headspace present?	X			

Comments:_____

Cooler contents examined/received by: _____ **Date:** 12/28/17

Project Manager Review: RW **Date:** 12-28-17

NON-CONFORMANCE FORM

PAES Work Order #: 25180

Date: 12/8/17 Time of Receipt: 10:45 Receiver: JM

Client: Alpha

REASON FOR NON-CONFORMANCE:

Sample 17L1988-05 had a sample time of 14:34 written on the label

ACTION TAKEN:

Client name: _____ Date: _____ Time: _____

Logged in per COC

Customer Service Initials: CW Date: 12-28-17

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

2.4°

Page 1 of 6

17L1988

RMN 12/21/17

Prelog or Login No.: L218781

Project Title: BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DREW LERER
Tel No.: 287-0247
Lab PM: KRISTI LORENSON

Sampled by: BAguayo/ERRG
Rcvd: 20-DEC-17 08:25
Sample Date: 19-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218781-1	GRAB	15:15	GW BAYSIDE	BAY1-MW2S	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434008 PLSTM			10-JAN-18

ClientID: MW-2S

Sample Comments: MW-2S; +FLD DATA: pH = 6.27; Cl2R = 0.0 mg/L; Depth to GW = 8.67 feet; GW Elevation = feet; Labelled as RAW WATER for the program. [Analyst Note: May need to dilute for ICP & IC due to salt water intrusion] Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Mollic	Robert Mollic	1238	12/21/17
		Cynthia L Schon	08:31	20 DEC 17
				RMN 12/21/17
Received by		Johnny Hillier	1238	12/21/17
Relinquished by		Johnny Hillier	1620	12/21/17
Received by			19:03	12-21-17
Relinquished by			21:35	12-21-17
Received by			21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg Na2S2O3, 40 mL
A125N - Glass, amber, NM, septa top, NH4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:_____ Date:_____

Approved by:_____ Date:_____

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO# BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

2,40 | 2 of 2 | 1/L1980

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

Prelog or Login No.: L218782

Project Title: BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DREW LERER
Tel No.: 287-0247
Lab PM: KRISTI LORENSON

Sampled by: BAguayo/ERRG
Rcvd: 20-DEC-17 08:25
Sample Date: 19-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218782-1	GRAB	14:45	GW BAYSIDE	BAY1-MW2I	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434022 PLSTM			10-JAN-18

ClientID: MW-2I
Sample Comments: MW-2I; +FLD DATA: pH = 7.69; Cl2R = 0.05 mg/L; Depth to GW = 35.35 feet; GW Elevation = feet; Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Molha	Robert Molha ~~Cynthia L Suenoo~~ RMM 12/21/17	1238 ~~08:25~~	12/21/17 ~~20-DEC-17~~
Received by	[signature]	Johnny Hillier	1238	12/21/17
Relinquished by	[signature]	Johnny Hillier	1620	12/21/17
Received by	[signature]		19:03	12-21-17
Relinquished by	[signature]		21:35	12-21-17
Received by	[signature]		21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg $Na_2S_2O_3$, 40 mL
A125N - Glass, amber, NM, septa top, NH_4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:________ Date:__________

Approved by:________ Date:__________

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
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Please advise EBMUD laboratory if Due Date will be missed

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2.4°

3 of 6 L1988

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

Prelog or
Login No.: L218783

Project Title
BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DREW LERER
Tel No.: 287-0247
Lab PM: KRISTI LORENSON

Sampled by: BAguayo/ERRG
Rcvd: 20-DEC-17 08:25
Sample Date: 19-DEC-17

Lab. No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218783-1	GRAB	11:35	GW BAYSIDE	BAY1-MW5D	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434058 PLSTM			10-JAN-18

ClientID: MW-5D
Sample Comments: MW-5D; +FLD DATA: pH = 7.37 ; Cl2R = 0.01 mg/L; Depth to GW = 15.02 feet; GW Elevation = feet; Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Mohr	Robert Mohr ~~Cynthia L Gachoo~~ RMM 12/21/17	1238 ~~08:25~~	12/21/17 ~~20-DEC-17~~
Received by	[signature]	Johnny Hillier	1238	12/21/17
Relinquished by	[signature]	Johnny Hillier	1620	12/21/17
Received by	[signature]		19:03	12-21-17
Relinquished by	[signature]		21:35	12-21-17
Received by	[signature]		21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg $Na_2S_2O_3$, 40 mL
A125N - Glass, amber, NM, septa top; NH_4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:________ Date:________

Approved by:________ Date:________

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
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Dublin CA 94568
(925)828-6226
PO# BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

2.4°

4 of 6 17L1988

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

Page ~~1~~ of 1 PM-12/21/17

Prelog or Login No.: L218813

Project Title
BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DREW LERER
Tel No.: 287-0247
Lab PM: KRISTI LORENSON

Sampled by: E. Seigel/ERRG
Rcvd: 21-DEC-17 08:09
Sample Date: 20-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218813-1	GRAB	17:10	GW BAYSIDE	BAY1-MW4	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434034	PLSTM		11-JAN-18

ClientID: MW-4

Sample Comments: MW-4; +FLD DATA: pH = 7.55 ; Cl2R = 0.0 mg/L; Depth to GW = 10.92 feet; GW Elevation = Not provided by sampler ; Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Molina	Robert M Molina	1238 PM-12/21/17	21-DEC-17
Received by	Johnny Hillier	Johnny Hillier	1238	12/21/17
Relinquished by	Johnny Hillier	Johnny Hillier	1620	12/21/17
Received by	CN		19:03	12-21-17
Relinquished by	CN		21:35	12-21-17
Received by	CN		21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg Na2S2O3, 40 ml
A125N - Glass, amber, NM, septa top, NH4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:_____ Date:_____

Approved by:_____ Date:_____

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO# BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

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East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

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Page 1 of 1

Prelog or Login No.: L218814

Project Title
BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DREW LERER
Tel No.: 287-0247
Lab PM: KRISTI LORENSON

Sampled by: E. Seigel/ERRG
Rcvd: 21-DEC-17 08:09
Sample Date: 20-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218814-1	GRAB	14:35	GW BAYSIDE	BAY1-MW6	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434046 PLSTM			11-JAN-18

ClientID: MW-6

Sample Comments: MW-6; +FLD DATA: pH = 7.19 ; Cl2R = 0.0 mg/L; Depth to GW = 10.71 feet; GW Elevation = Not provided by sampler Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by		Robert M Molina	1238	21-DEC-17
Received by		Johnny Hiller	1238	12/21/17
Relinquished by		Johnny Hiller	1620	12/21/17
Received by			19:03	12-21-17
Relinquished by			21:35	12-21-17
Received by			21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg Na2S2O3, 40 ml
A125N - Glass, amber, NM, septa top, NH4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:_____ Date:_____

Approved by:_____ Date:_____

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO#.BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

17L1988

Chain of Custody Attachment

(page _6_ of _6_)

Submitted to: Pace CSIA
220 William Pitt Way
Pittsburgh, PA 15238
Attn: Dr. Wang Yi
(412)-826-5245

Through: Robbie Phillips
Alpha Analytical Laboratories
6398 Dougherty Road, Suite 3
Dublin, CA 94568
(925) 828-6226
Billing: Visa Card on File

Date samples submitted: December 21, 2017

Login#	Site/Locator	Sample Date / Time
L218781-1	GW BAYSIDE / BAY1-MW2S	19-DEC-17 15:15
L218782-1	GW BAYSIDE / BAY1-MW2I	19-DEC-17 14:45
L218783-1	GW BAYSIDE / BAY1-MW5D	19-DEC-17 11:35
L218813-1	GW BAYSIDE / BAY1-MW4	20-DEC-17 17:10
L218814-1	GW BAYSIDE / BAY1-MW6	20-DEC-17 14:34

Analyses : Hydrogen-2 and Oxygen-18 isotopes

Comments: Please comply with hold time (3 months).

TAT: Standard

Results to: Alpha and East Bay MUD (Kristi Lorenson)
EBMUD Laboratory
P.O. Box 24055 MS # 59
Oakland, California. 94623
Tel No: 510-287-1696
Fax No: 510-465-5462
kristi.lorenson@ebmud.com

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

January 9, 2018

Robbie C. Phillips
Alpha Analytical Laboratories, Inc.
208 Mason St.
Ukiah, CA 95482

Laboratory Report Supplement
DOX & File as Data Approval Worksheet
WG 219897 / R282637
Approved By:
Approved On: 1/31/2018

RE: **17L1988**

Pace Workorder: *25180*

Dear Robbie Phillips:

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, December 28, 2017. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ruth Welsh

Ruth Welsh 01/09/2018
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

RECEIVED
1/29/18

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 15

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 25180 17L1988

Lab ID	Sample ID	Matrix	Date Collected	Date Received
251800001	17L1988-01	Water	12/19/2017 15:15	12/28/2017 11:45
251800002	17L1988-02	Water	12/19/2017 14:45	12/28/2017 11:45
251800003	17L1988-03	Water	12/19/2017 11:35	12/28/2017 11:45
251800004	17L1988-04	Water	12/20/2017 17:10	12/28/2017 11:45
251800005	17L1988-05	Water	12/20/2017 14:35	12/28/2017 11:45

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800001** Date Received: 12/28/2017 11:45 Matrix: Water

Sample ID: **17L1988-01** Date Collected: 12/19/2017 15:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O		Analytical Method: D18O						
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800002** Date Received: 12/28/2017 11:45 Matrix: Water
Sample ID: **17L1988-02** Date Collected: 12/19/2017 14:45

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O		Analytical Method: D18O						
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800003** Date Received: 12/28/2017 11:45 Matrix: Water
Sample ID: **17L1988-03** Date Collected: 12/19/2017 11:35

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O		Analytical Method: D18O						
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800004** Date Received: 12/28/2017 11:45 Matrix: Water

Sample ID: **17L1988-04** Date Collected: 12/20/2017 17:10

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O	Analytical Method: D18O							
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

CERTIFICATE OF ANALYSIS

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800005** Date Received: 12/28/2017 11:45 Matrix: Water
Sample ID: **17L1988-05** Date Collected: 12/20/2017 14:35

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O			Analytical Method: D18O					
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS QUALIFIERS

Workorder: 25180 17L1988

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 25180 17L1988

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
251800001	17L1988-01			D18O	CSIA/1738
251800002	17L1988-02			D18O	CSIA/1738
251800003	17L1988-03			D18O	CSIA/1738
251800004	17L1988-04			D18O	CSIA/1738
251800005	17L1988-05			D18O	CSIA/1738

Pace Analytical®

Client	Alpha Analytical Laboratories, Inc.	CSIA Center of Excellence
	208 Mason Street	Pace Analytical Energy Services
	Ukiah, CA 95482	220 William Pitt Way
Project	17L1988	Pittsburgh
Project #	17L1988	Pennsylvania 15238
Report to	Robbie Phillips	United States
Tel:	707-468-0401	Tel: 412.826.5245
Email:	rphillips@alpha.com	

REPORT OF ENVIRONMENTAL FORENSICS ISOTOPE ANALYSES

Date Received: 12/28/2017
Date Reported: 1/8/2018

Water samples submitted for ^{18}O and ^{2}H (‰ VSMOW) stable isotope analysis

Pace CSIA ID	Sample ID	δD_{H2O}	$\delta^{18}O_{H2O}$
251800001	17L1988-01	-25.84	-3.14
251800002	17L1988-02	-41.37	-6.54
251800003	17L1988-03	-47.81	-7.34
251800004	17L1988-04	-47.18	-6.85
251800005	17L1988-05	-47.77	-7.16

VSMOW: Vienna Standard Mean Ocean Water (Hydrogen and Oxygen Isotope Standard)
D: Deuterium, Hydrogen-2

Lab ID	δD_{H2O}	$\delta^{18}O_{H2O}$
QC-01	-94.19	-13.33
QC-02	-94.18	-13.29
Mean	-94.19	-13.31
Analytical precision (1σ)	0.01	0.03

The $\delta^{18}O_{H2O}$ and δD_{H2O} isotopes were subcontracted to Colorado Plateau Stable Laboratory (CPSIL).

SUBCONTRACT ORDER

Alpha Analytical Laboratories, Inc.

17L1988

25180

SENDING LABORATORY:

Alpha Analytical Laboratories, Inc.
208 Mason St.
Ukiah, CA 95482
Phone: (707)468-0401
Fax: (707)468-5267
Project Manager: Robbie C. Phillips

RECEIVING LABORATORY:

Zymax / Pace Lab
220 William Pitt Way
Pittsburgh, PA 15238
Phone :(412) 826-5245
Fax: (412) 660-0256
Terms: Net 30

Analysis	Due	Expires	Comments
17L1988-01 L218781-1 GW BAYSIDE / BAY1-MW2S [Water] Sampled 12/19/17 15:15			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/17/18 15:15	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-02 L218782-1 GW BAYSIDE / BAY1-MW2I [Water] Sampled 12/19/17 14:45			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/17/18 14:45	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-03 L218783-1 GW BAYSIDE / BAY1-MW5D [Water] Sampled 12/19/17 11:35			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/17/18 11:35	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-04 L218813-1 GW BAYSIDE / BAY1-MW4 [Water] Sampled 12/20/17 17:10			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/18/18 17:10	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-05 L218814-1 GW BAYSIDE / BAY1-MW6 [Water] Sampled 12/20/17 ~~14:34~~ 1435			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/18/18 14:34	
Containers Supplied: 500 mL Poly Unpres (A)			

Released By	Date	Received By	Date
[signature]	12.22.17	[signature] / PAES	12/28/17 10:45

SUBCONTRACT ORDER

Alpha Analytical Laboratories, Inc.

17L1988

25180

☐ *Report to State*

System Name: _____ **Employed by:** _____

User ID: _____ **Sampler:** _____

System Number: _____

+QC
+MDL

Released By | Date | Received By | Date

12-22-17

Released By | Date | Received By | Date

Cooler Receipt Form

Client Name: Alpha Project: 171988 Lab Work Order: 25180

A. **Shipping/Container Information** (circle appropriate response)

Courier: FedEx (UPS) USPS Client Other:_____ **Air bill Present:** (Yes) No

Tracking Number: 1Z 894250136002 2708

Custody Seal on Cooler/Box Present: (Yes) No **Seals Intact:** (Yes) No

Cooler/Box Packing Material: Bubble Wrap Absorbent Foam (Other): None

Type of Ice: (Wet) (Blue) None **Ice Intact:** (Yes) Melted

Cooler Temperature: 0.1 **Radiation Screened:** Yes (No) **Chain of Custody Present:** (Yes) No

Comments:_____

B. **Laboratory Assignment/Log-in** (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	X			
Chain of Custody relinquished	X			
Sampler Name & Signature on COC		X		
Containers intact	X			
Were samples in separate bags		X		
Sample container labels match COC Sample name/date and time collected		X		
Sufficient volume provided	X			
PAES containers used	X			
Are containers properly preserved for the requested testing? (as labeled)			X	
If an unknown preservation state, were containers checked? Exception: VOA's coliform			X	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			X	
Headspace present?	X			

Comments:_____

Cooler contents examined/received by: _____ **Date:** 12/28/17

Project Manager Review: RW **Date:** 12-28-17

NON-CONFORMANCE FORM

PAES Work Order #: 25180

Date: 12/8/17 Time of Receipt: 10:45 Receiver: JM

Client: Alpha

REASON FOR NON-CONFORMANCE:

Sample 17L1988-05 had a sample time of 14:34 written on the label

ACTION TAKEN:

Client name: _____ Date: _____ Time: _____

Logged in per COC

Customer Service Initials: CW Date: 12-28-17

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

2.4°

Page 1 of 6

17L1988

RMN 12/21/17

Prelog or Login No.: L218781

Project Title: BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DREW LERER
Tel No.: 287-0247
Lab PM: KRISTI LORENSON

Sampled by: BAguayo/ERRG
Rcvd: 20-DEC-17 08:25
Sample Date: 19-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218781-1	GRAB	15:15	GW BAYSIDE	BAY1-MW2S	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434008 PLSTM			10-JAN-18

ClientID: MW-2S

Sample Comments: MW-2S; +FLD DATA: pH = 6.27; Cl2R = 0.0 mg/L; Depth to GW = 8.67 feet; GW Elevation = feet; Labelled as RAW WATER for the program. [Analyst Note: May need to dilute for ICP & IC due to salt water intrusion] Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Mollic	Robert Mollic	1238	12/21/17
		Cynthia L Schon	08:31	20 DEC 17
				RMN 12/21/17
Received by		Johnny Hillier	1238	12/21/17
Relinquished by		Johnny Hillier	1620	12/21/17
Received by			19:03	12-21-17
Relinquished by			21:35	12-21-17
Received by			21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg Na2S2O3, 40 mL
A125N - Glass, amber, NM, septa top, NH4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:_____ Date:_____

Approved by:_____ Date:_____

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO# BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

2,40

1/L1780

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

Prelog or Login No.: L218782	Project Title: BAYSIDE GROUND WATER PROJECT	Client PM: DREW LERER	Sampled by: BAguayo/ERRG
	Account or Project: B455-0706-1	Tel No.: 287-0247	Rcvd: 20-DEC-17 08:25
		Lab PM: KRISTI LORENSON	Sample Date: 19-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218782-1	GRAB	14:45	GW BAYSIDE	BAY1-MW2I	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434022 PLSTM			10-JAN-18

ClientID: MW-2I

Sample Comments: MW-2I; +FLD DATA: pH = 7.69; Cl2R = 0.05 mg/L; Depth to GW = 35.35 feet; GW Elevation = feet; Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert A Molha	Robert Molha ~~Cynthia L Suonoo~~ RM 12/21/17	1238 ~~08:25~~	12/21/17 ~~20-DEC-17~~
Received by	JH	Johnny Hillier	1238	12/21/17
Relinquished by	JH	Johnny Hillier	1620	12/21/17
Received by	PW		19:03	12-21-17
Relinquished by	PW		21:35	12-21-17
Received by	PW		21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg Na2S2O3, 40 mL
A125N - Glass, amber, NM, septa top, NH4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:________ Date:__________

Approved by:________ Date:__________

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO# BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

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2.4° 3 of 6 17L1988

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

Page ~~1 of 1~~

Prelog or Login No.: L218783

Project Title: BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DREW LERER
Tel No.: 287-0247
Lab PM: KRISTI LORENSON

Sampled by: BAguayo/ERRG
Rcvd: 20-DEC-17 08:25
Sample Date: 19-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218783-1	GRAB	11:35	GW BAYSIDE	BAY1-MW5D	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434058 PLSTM			10-JAN-18

ClientID: MW-5D

Sample Comments: MW-5D; +FLD DATA: pH = 7.37 ; Cl2R = 0.01 mg/L; Depth to GW = 15.02 feet; GW Elevation = feet; Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Mohr	Robert Mohr ~~Cynthia L Gaoboo~~	1238 ~~08:25~~	12/21/17 ~~20-DEC-17~~
Received by	[signature]	Johnny Hillier	1238	12/21/17
Relinquished by	[signature]	Johnny Hillier	1620	12/21/17
Received by	[signature]		19:03	12-21-17
Relinquished by	[signature]		21:35	12-21-17
Received by	[signature]		21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg $Na_2S_2O_3$, 40 mL
A125N - Glass, amber, NM, septa top; NH_4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:________ Date:________

Approved by:________ Date:________

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO# BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

2.4°

4 of 6 17L1988

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

Page ~~1~~ of 1 PM-12/21/17

Prelog or Login No.: L218813

Project Title
BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DREW LERER
Tel No.: 287-0247
Lab PM: KRISTI LORENSON

Sampled by: E. Seigel/ERRG
Rcvd: 21-DEC-17 08:09
Sample Date: 20-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218813-1	GRAB	17:10	GW BAYSIDE	BAY1-MW4	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434034	PLSTM		11-JAN-18

ClientID: MW-4

Sample Comments: MW-4; +FLD DATA: pH = 7.55 ; Cl2R = 0.0 mg/L; Depth to GW = 10.92 feet; GW Elevation = Not provided by sampler ; Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Molina	Robert M Molina	1238 PM-12/21/17	21-DEC-17
Received by	Johnny Hillier	Johnny Hillier	1238	12/21/17
Relinquished by	Johnny Hillier	Johnny Hillier	1620	12/21/17
Received by	CN		19:03	12-21-17
Relinquished by	CN		21:35	12-21-17
Received by	CN		21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg Na2S2O3, 40 ml
A125N - Glass, amber, NM, septa top, NH4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:_____ Date:_____

Approved by:_____ Date:_____

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO# BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

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Page 1 of 1

Prelog or Login No.: L218814

Project Title
BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DREW LERER
Tel No.: 287-0247
Lab PM: KRISTI LORENSON

Sampled by: E. Seigel/ERRG
Rcvd: 21-DEC-17 08:09
Sample Date: 20-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218814-1	GRAB	14:35	GW BAYSIDE	BAY1-MW6	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434046 PLSTM			11-JAN-18

ClientID: MW-6

Sample Comments: MW-6; +FLD DATA: pH = 7.19 ; Cl2R = 0.0 mg/L; Depth to GW = 10.71 feet; GW Elevation = Not provided by sampler Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by		Robert M Molina	1238	21-DEC-17
Received by		Johnny Hiller	1238	12/21/17
Relinquished by		Johnny Hiller	1620	12/21/17
Received by			19:03	12-21-17
Relinquished by			21:35	12-21-17
Received by			21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg Na2S2O3, 40 ml
A125N - Glass, amber, NM, septa top, NH4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:_____ Date:_____

Approved by:_____ Date:_____

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO#.BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

17L1988

Chain of Custody Attachment

(page _6_ of _6_)

Submitted to: Pace CSIA
220 William Pitt Way
Pittsburgh, PA 15238
Attn: Dr. Wang Yi
(412)-826-5245

Through: Robbie Phillips
Alpha Analytical Laboratories
6398 Dougherty Road, Suite 3
Dublin, CA 94568
(925) 828-6226
Billing: Visa Card on File

Date samples submitted: December 21, 2017

Login#	Site/Locator	Sample Date / Time
L218781-1	GW BAYSIDE / BAY1-MW2S	19-DEC-17 15:15
L218782-1	GW BAYSIDE / BAY1-MW2I	19-DEC-17 14:45
L218783-1	GW BAYSIDE / BAY1-MW5D	19-DEC-17 11:35
L218813-1	GW BAYSIDE / BAY1-MW4	20-DEC-17 17:10
L218814-1	GW BAYSIDE / BAY1-MW6	20-DEC-17 14:34

Analyses : Hydrogen-2 and Oxygen-18 isotopes

Comments: Please comply with hold time (3 months).

TAT: Standard

Results to: Alpha and East Bay MUD (Kristi Lorenson)
EBMUD Laboratory
P.O. Box 24055 MS # 59
Oakland, California. 94623
Tel No: 510-287-1696
Fax No: 510-465-5462
kristi.lorenson@ebmud.com

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

January 9, 2018

Robbie C. Phillips
Alpha Analytical Laboratories, Inc.
208 Mason St.
Ukiah, CA 95482

Laboratory Report Supplement
DOX & File as Data Approval Worksheet
WG 219897 / R282637
Approved By:
Approved On: 1/31/2018

RE: **17L1988**

Pace Workorder: *25180*

Dear Robbie Phillips:

Enclosed are the analytical results for sample(s) received by the laboratory on Thursday, December 28, 2017. Results reported herein conform to the most current NELAC standards, where applicable, unless otherwise narrated in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ruth Welsh

Ruth Welsh 01/09/2018
Ruth.Welsh@pacelabs.com

Customer Service Representative

Enclosures

RECEIVED
1/29/18

As a valued client we would appreciate your comments on our service.
Please email PAESfeedback@pacelabs.com.

Total Number of Pages 15

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

LABORATORY ACCREDITATIONS & CERTIFICATIONS

Accreditor:	Pennsylvania Department of Environmental Protection, Bureau of Laboratories
Accreditation ID:	02-00538
Scope:	NELAP Non-Potable Water
Accreditor:	West Virginia Department of Environmental Protection, Division of Water and Waste Management
Accreditation ID:	395
Scope:	Non-Potable Water
Accreditor:	South Carolina Department of Health and Environmental Control, Office of Environmental Laboratory Certification
Accreditation ID:	89009003
Scope:	Clean Water Act (CWA); Resource Conservation and Recovery Act (RCRA)
Accreditor:	State of Virginia
Accreditation ID:	460201
Scope:	Non-Potable Water
Accreditor:	NELAP: New Jersey, Department of Environmental Protection
Accreditation ID:	PA026
Scope:	Non-Potable Water
Accreditor:	NELAP: New York, Department of Health Wadsworth Center
Accreditation ID:	11815
Scope:	Non-Potable Water
Accreditor:	State of Connecticut, Department of Public Health, Division of Environmental Health
Accreditation ID:	PH-0263
Scope:	Clean Water Act (CWA) Resource Conservation and Recovery Act (RCRA)
Accreditor:	NELAP: Texas, Commission on Environmental Quality
Accreditation ID:	T104704453-09-TX
Scope:	Non-Potable Water
Accreditor:	State of New Hampshire
Accreditation ID:	299409
Scope:	Non-potable water
Accreditor:	State of Georgia
Accreditation ID:	Chapter 391-3-26
Scope:	As per the Georgia EPD Rules and Regulations for Commercial Laboratories, PAES is accredited by the Pennsylvania Department of Environmental Protection Bureau of Laboratories under the National Environmental Laboratory Approval Program (NELAC).

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

SAMPLE SUMMARY

Workorder: 25180 17L1988

Lab ID	Sample ID	Matrix	Date Collected	Date Received
251800001	17L1988-01	Water	12/19/2017 15:15	12/28/2017 11:45
251800002	17L1988-02	Water	12/19/2017 14:45	12/28/2017 11:45
251800003	17L1988-03	Water	12/19/2017 11:35	12/28/2017 11:45
251800004	17L1988-04	Water	12/20/2017 17:10	12/28/2017 11:45
251800005	17L1988-05	Water	12/20/2017 14:35	12/28/2017 11:45

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800001** Date Received: 12/28/2017 11:45 Matrix: Water

Sample ID: **17L1988-01** Date Collected: 12/19/2017 15:15

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O		Analytical Method: D18O						
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800002** Date Received: 12/28/2017 11:45 Matrix: Water
Sample ID: **17L1988-02** Date Collected: 12/19/2017 14:45

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O		Analytical Method: D18O						
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800003** Date Received: 12/28/2017 11:45 Matrix: Water
Sample ID: **17L1988-03** Date Collected: 12/19/2017 11:35

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O		Analytical Method: D18O						
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800004** Date Received: 12/28/2017 11:45 Matrix: Water

Sample ID: **17L1988-04** Date Collected: 12/20/2017 17:10

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O	Analytical Method: D18O							
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

CERTIFICATE OF ANALYSIS

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS

Workorder: 25180 17L1988

Lab ID: **251800005** Date Received: 12/28/2017 11:45 Matrix: Water
Sample ID: **17L1988-05** Date Collected: 12/20/2017 14:35

Parameters	Results	Units	PQL	MDL	DF	Analyzed	By	Qualifiers
Compound Specific Isotopic - PAES								
Analysis Desc: D18O			Analytical Method: D18O					
Hydrogen 2 (Deuterium) Isotope	**Complete**				1	1/2/2018 00:00	NAU	
Oxygen 18 Isotope	**Complete**				1	1/2/2018 00:00	NAU	

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

ANALYTICAL RESULTS QUALIFIERS

Workorder: 25180 17L1988

DEFINITIONS/QUALIFIERS

MDL	Method Detection Limit. Can be used synonymously with LOD; Limit Of Detection.
PQL	Practical Quanitation Limit. Can be used synonymously with LOQ; Limit Of Quantitation.
ND	Not detected at or above reporting limit.
DF	Dilution Factor.
S	Surrogate.
RPD	Relative Percent Difference.
% Rec	Percent Recovery.
U	Indicates the compound was analyzed for, but not detected at or above the noted concentration.
J	Estimated concentration greater than the set method detection limit (MDL) and less than the set reporting limit (PQL).

Pace Analytical Energy Services LLC
220 William Pitt Way
Pittsburgh, PA 15238
Phone: (412) 826-5245
Fax: (412) 826-3433

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Workorder: 25180 17L1988

Lab ID	Sample ID	Prep Method	Prep Batch	Analysis Method	Analysis Batch
251800001	17L1988-01			D18O	CSIA/1738
251800002	17L1988-02			D18O	CSIA/1738
251800003	17L1988-03			D18O	CSIA/1738
251800004	17L1988-04			D18O	CSIA/1738
251800005	17L1988-05			D18O	CSIA/1738

Pace Analytical®

Client	Alpha Analytical Laboratories, Inc.	CSIA Center of Excellence
	208 Mason Street	Pace Analytical Energy Services
	Ukiah, CA 95482	220 William Pitt Way
Project	17L1988	Pittsburgh
Project #	17L1988	Pennsylvania 15238
Report to	Robbie Phillips	United States
Tel:	707-468-0401	Tel: 412.826.5245
Email:	rphillips@alpha.com	

REPORT OF ENVIRONMENTAL FORENSICS ISOTOPE ANALYSES

Date Received: 12/28/2017
Date Reported: 1/8/2018

Water samples submitted for ^{18}O and ^{2}H (‰ VSMOW) stable isotope analysis

Pace CSIA ID	Sample ID	δD_{H2O}	$\delta^{18}O_{H2O}$
251800001	17L1988-01	-25.84	-3.14
251800002	17L1988-02	-41.37	-6.54
251800003	17L1988-03	-47.81	-7.34
251800004	17L1988-04	-47.18	-6.85
251800005	17L1988-05	-47.77	-7.16

VSMOW: Vienna Standard Mean Ocean Water (Hydrogen and Oxygen Isotope Standard)
D: Deuterium, Hydrogen-2

Lab ID	δD_{H2O}	$\delta^{18}O_{H2O}$
QC-01	-94.19	-13.33
QC-02	-94.18	-13.29
Mean	-94.19	-13.31
Analytical precision (1σ)	0.01	0.03

The $\delta^{18}O_{H2O}$ and δD_{H2O} isotopes were subcontracted to Colorado Plateau Stable Laboratory (CPSIL).

SUBCONTRACT ORDER

Alpha Analytical Laboratories, Inc.

17L1988

25180

SENDING LABORATORY:	**RECEIVING LABORATORY:**
Alpha Analytical Laboratories, Inc.	Zymax / Pace Lab
208 Mason St.	220 William Pitt Way
Ukiah, CA 95482	Pittsburgh, PA 15238
Phone: (707)468-0401	Phone :(412) 826-5245
Fax: (707)468-5267	Fax: (412) 660-0256
Project Manager: Robbie C. Phillips	**Terms: Net 30**

Analysis	Due	Expires	Comments
17L1988-01 L218781-1 GW BAYSIDE / BAY1-MW2S [Water] Sampled 12/19/17 15:15			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/17/18 15:15	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-02 L218782-1 GW BAYSIDE / BAY1-MW2I [Water] Sampled 12/19/17 14:45			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/17/18 14:45	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-03 L218783-1 GW BAYSIDE / BAY1-MW5D [Water] Sampled 12/19/17 11:35			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/17/18 11:35	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-04 L218813-1 GW BAYSIDE / BAY1-MW4 [Water] Sampled 12/20/17 17:10			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/18/18 17:10	
Containers Supplied: 500 mL Poly Unpres (A)			
17L1988-05 L218814-1 GW BAYSIDE / BAY1-MW6 [Water] Sampled 12/20/17 ~~14:34~~ 1435			
Oxygen 18 - Isotope / Hydrogen - 2	01/11/18 12:00	06/18/18 14:34	
Containers Supplied: 500 mL Poly Unpres (A)			

Released By	Date	Received By	Date
[signature]	12-22-17	J. McGrath / PAES	12/28/17 10:45

SUBCONTRACT ORDER

Alpha Analytical Laboratories, Inc.

17L1988

25180

☐ *Report to State*

System Name: _____ **Employed by:** _____

User ID: _____ **Sampler:** _____

System Number: _____

+QC
+MDL

Released By | Date | Received By | Date

12-22-17

Released By | Date | Received By | Date

Cooler Receipt Form

Client Name: Alpha Project: 171988 Lab Work Order: 25180

A. **Shipping/Container Information** (circle appropriate response)

Courier: FedEx (UPS) USPS Client Other:_____ **Air bill Present:** (Yes) No

Tracking Number: 1Z 894250136002 2708

Custody Seal on Cooler/Box Present: (Yes) No **Seals Intact:** (Yes) No

Cooler/Box Packing Material: Bubble Wrap Absorbent Foam (Other): None

Type of Ice: (Wet) (Blue) None **Ice Intact:** (Yes) Melted

Cooler Temperature: 0.1 **Radiation Screened:** Yes (No) **Chain of Custody Present:** (Yes) No

Comments:_____

B. **Laboratory Assignment/Log-in** (check appropriate response)

	YES	NO	N/A	Comment Reference non-Conformance
Chain of Custody properly filled out	X			
Chain of Custody relinquished	X			
Sampler Name & Signature on COC		X		
Containers intact	X			
Were samples in separate bags		X		
Sample container labels match COC Sample name/date and time collected		X		
Sufficient volume provided	X			
PAES containers used	X			
Are containers properly preserved for the requested testing? (as labeled)			X	
If an unknown preservation state, were containers checked? Exception: VOA's coliform			X	If yes, see pH form.
Was volume for dissolved testing field filtered, as noted on the COC? Was volume received in a preserved container?			X	
Headspace present?	X			

Comments:_____

Cooler contents examined/received by: _____ **Date:** 12/28/17

Project Manager Review: RW **Date:** 12-28-17

NON-CONFORMANCE FORM

PAES Work Order #: 25180

Date: 12/8/17 Time of Receipt: 10:45 Receiver: JM

Client: Alpha

REASON FOR NON-CONFORMANCE:

Sample 17L1988-05 had a sample time of 14:34 written on the label

ACTION TAKEN:

Client name: _____ Date: _____ Time: _____

Logged in per COC

Customer Service Initials: CW Date: 12-28-17

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

2.4°

Page 1 of 6

17L1988

RMN 12/21/17

Prelog or Login No.: L218781

Project Title: BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DREW LERER
Tel No.: 287-0247
Lab PM: KRISTI LORENSON

Sampled by: BAguayo/ERRG
Rcvd: 20-DEC-17 08:25
Sample Date: 19-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218781-1	GRAB	15:15	GW BAYSIDE	BAY1-MW2S	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434008 PLSTM			10-JAN-18

ClientID: MW-2S

Sample Comments: MW-2S; +FLD DATA: pH = 6.27; Cl2R = 0.0 mg/L; Depth to GW = 8.67 feet; GW Elevation = feet; Labelled as RAW WATER for the program. [Analyst Note: May need to dilute for ICP & IC due to salt water intrusion] Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Mollic	Robert Mollic	1238	12/21/17
		Cynthia L Schon	08:31	20 DEC 17
				RMN 12/21/17
Received by		Johnny Hillier	1238	12/21/17
Relinquished by		Johnny Hillier	1620	12/21/17
Received by			19:03	12-21-17
Relinquished by			21:35	12-21-17
Received by			21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg Na2S2O3, 40 mL
A125N - Glass, amber, NM, septa top, NH4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:_____ Date:_____

Approved by:_____ Date:_____

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO# BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

2,40

2 of 2 1/L1980

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

Prelog or Login No.: L218782	Project Title: BAYSIDE GROUND WATER PROJECT Account or Project: B455-0706-1	Client PM: DREW LERER Tel No.: 287-0247 Lab PM: KRISTI LORENSON	Sampled by: BAguayo/ERRG Rcvd: 20-DEC-17 08:25 Sample Date: 19-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218782-1	GRAB	14:45	GW BAYSIDE	BAY1-MW2I	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434022 PLSTM			10-JAN-18

ClientID: MW-2I

Sample Comments: MW-2I; +FLD DATA: pH = 7.69; Cl2R = 0.05 mg/L; Depth to GW = 35.35 feet; GW Elevation = feet; Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Molina	Robert Molina ~~Cynthia L Suenoo~~ RMM 12/21/17	1238 ~~08:25~~	12/21/17 ~~20-DEC-17~~
Received by	[signature]	Johnny Hillier	1238	12/21/17
Relinquished by	[signature]	Johnny Hillier	1620	12/21/17
Received by	[signature]		19:03	12-21-17
Relinquished by	[signature]		21:35	12-21-17
Received by	[signature]		21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg $Na_2S_2O_3$, 40 mL
A125N - Glass, amber, NM, septa top, NH_4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:________ Date:__________

Approved by:________ Date:__________

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO# BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

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East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

Prelog or Login No.: L218783	Project Title: BAYSIDE GROUND WATER PROJECT Account or Project: B455-0706-1	Client PM: DREW LERER Tel No.: 287-0247 Lab PM: KRISTI LORENSON	Sampled by: BAguayo/ERRG Rcvd: 20-DEC-17 08:25 Sample Date: 19-DEC-17

Lab. No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218783-1	GRAB	11:35	GW BAYSIDE	BAY1-MW5D	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434058 PLSTM			10-JAN-18

ClientID: MW-5D

Sample Comments: MW-5D; +FLD DATA: pH = 7.37 ; Cl2R = 0.01 mg/L; Depth to GW = 15.02 feet; GW Elevation = feet; Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Mohr	Robert Mohr ~~Cynthia L Gachoo~~ RMM 12/21/17	1238 ~~08:25~~	12/21/17 ~~20-DEC-17~~
Received by	[signature]	Johnny Hillier	1238	12/21/17
Relinquished by	[signature]	Johnny Hillier	1620	12/21/17
Received by	[signature]		19:03	12-21-17
Relinquished by	[signature]		21:35	12-21-17
Received by	[signature]		21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg $Na_2S_2O_3$, 40 mL
A125N - Glass, amber, NM, septa top; NH_4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:________ Date:________

Approved by:________ Date:________

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

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2.4°

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East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

Page ~~1~~ of 1 PM-12/21/17

Prelog or Login No.: L218813

Project Title
BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DREW LERER
Tel No.: 287-0247
Lab PM: KRISTI LORENSON

Sampled by: E. Seigel/ERRG
Rcvd: 21-DEC-17 08:09
Sample Date: 20-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218813-1	GRAB	17:10	GW BAYSIDE	BAY1-MW4	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434034	PLSTM		11-JAN-18

ClientID: MW-4

Sample Comments: MW-4; +FLD DATA: pH = 7.55 ; Cl2R = 0.0 mg/L; Depth to GW = 10.92 feet; GW Elevation = Not provided by sampler ; Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by	Robert Molina	Robert M Molina	1238 PM-12/21/17	21-DEC-17
Received by	Johnny Hillier	Johnny Hillier	1238	12/21/17
Relinquished by	Johnny Hillier	Johnny Hillier	1620	12/21/17
Received by	CN		19:03	12-21-17
Relinquished by	CN		21:35	12-21-17
Received by	CN		21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg Na2S2O3, 40 ml
A125N - Glass, amber, NM, septa top, NH4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:_____ Date:_____

Approved by:_____ Date:_____

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
6398 Doughherty Road, Suite 3
Dublin CA 94568
(925)828-6226
PO# BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

East Bay Municipal Utility District
Laboratory Services Chain of Custody Record

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Page 1 of 1

Prelog or Login No.: L218814

Project Title
BAYSIDE GROUND WATER PROJECT
Account or Project: B455-0706-1

Client PM: DREW LERER
Tel No.: 287-0247
Lab PM: KRISTI LORENSON

Sampled by: E. Seigel/ERRG
Rcvd: 21-DEC-17 08:09
Sample Date: 20-DEC-17

Lab No.	Sample Type	Time	Site	Locator	Sample Matrix	Tests Required	Container ID Barcode	Chemical Preservative	Date pH	DueDate Initials
L218814-1	GRAB	14:35	GW BAYSIDE	BAY1-MW6	GroundH2O	OXYGEN 18 (USGS - as (VSMOW).)	1434046 PLSTM			11-JAN-18

ClientID: MW-6

Sample Comments: MW-6; +FLD DATA: pH = 7.19 ; Cl2R = 0.0 mg/L; Depth to GW = 10.71 feet; GW Elevation = Not provided by sampler Labelled as RAW WATER for the program. Pricing: STD

Total containers received: 1

	Signature	Print Name	Time	Date
Relinquished by		Robert M Molina	1238	21-DEC-17
Received by		Johnny Hiller	1238	12/21/17
Relinquished by		Johnny Hiller	1620	12/21/17
Received by			19:03	12-21-17
Relinquished by			21:35	12-21-17
Received by			21:35	12-21-17

Sample Type Descriptions:
GRAB - Instantaneous Grab

Container Type Descriptions:
C500Z - Glass, clear, NM, septa top, 500 mL
PLSTM - Plastic, WM, 500 mL
VOC4T - Glass, clear, septa top, 3.5 mg Na2S2O3, 40 ml
A125N - Glass, amber, NM, septa top, NH4Cl, 125 mL
PLSTL - Plastic, WM, 1000 mL

Reviewed by:_____ Date:_____

Approved by:_____ Date:_____

Email results to:
KRISTI LORENSON (klorenso@ebmud.com)
EBMUD Laboratory
P.O. Box 24055 MS# 59
Oakland, CA 94623
(510) 287-1696

SUBCONTRACT:
Robbie Phillips
Alpha Analytical Laboratories
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PO#.BRD-14208-CX Expires: 31-JUL-13

Please advise EBMUD laboratory if Due Date will be missed

Samples will be retained beyond the approval process only if requested by the client.

17L1988

Chain of Custody Attachment

(page _6_ of _6_)

Submitted to: Pace CSIA
220 William Pitt Way
Pittsburgh, PA 15238
Attn: Dr. Wang Yi
(412)-826-5245

Through: Robbie Phillips
Alpha Analytical Laboratories
6398 Dougherty Road, Suite 3
Dublin, CA 94568
(925) 828-6226
Billing: Visa Card on File

Date samples submitted: December 21, 2017

Login#	Site/Locator	Sample Date / Time
L218781-1	GW BAYSIDE / BAY1-MW2S	19-DEC-17 15:15
L218782-1	GW BAYSIDE / BAY1-MW2I	19-DEC-17 14:45
L218783-1	GW BAYSIDE / BAY1-MW5D	19-DEC-17 11:35
L218813-1	GW BAYSIDE / BAY1-MW4	20-DEC-17 17:10
L218814-1	GW BAYSIDE / BAY1-MW6	20-DEC-17 14:34

Analyses : Hydrogen-2 and Oxygen-18 isotopes

Comments: Please comply with hold time (3 months).

TAT: Standard

Results to: Alpha and East Bay MUD (Kristi Lorenson)
EBMUD Laboratory
P.O. Box 24055 MS # 59
Oakland, California. 94623
Tel No: 510-287-1696
Fax No: 510-465-5462
kristi.lorenson@ebmud.com