**Electronic Report Transmittal Form**

Attention: Brendan Kenny (916) 464-4635

Discharger: Wild Wings County Service Area
Name of Facility: Wild Wings Water Recycling Facility
WDRs Order Number: R5-2002-0077
CIWQS Place 1D: 272537
County: Yolo

I am hereby submitting to the Central Valley Water Board the following information:

**Check all that apply:**

Technical Report Title and Date Wild Wings Water Recycling Facility – Fourth Quarter 2018 Groundwater Monitoring Report WDR Order No. R5-2002-0077 January 2019

Monthly Monitoring Report for the month of N/A

1st/ 2nd / 3rd / (4th) (circle one) Quarterly Monitoring Report for the year of 2018

1st/ 2nd (circle one) Semi-annual Monitoring Report for the year N/A

Annual Monitoring Report for the year N/A

**Violation Notification:**

During the monitoring period, there were / (were not) (circle one) any violations of the WDRs

1. The violations were:

2. Have the violations been corrected? Yes / No. If no, what will be done to correct the violations:

**Certification Statement:**

*"I certify under penalty of law that I have personally examined and am familiar with the Information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there am significant penalties for submitting false information, including the possibility of fine and imprisonment."*

Signature: _____ Phone: _____

Printed Name: _____ Date: _____

# Wild Wings Water Recycling Facility – Fourth Quarter 2018
# Groundwater Monitoring Report
# WDR Order No. R5-2002-0077

Prepared for:

Yolo County, California


January 2018

Prepared by:

California Rural Water Association

California
Rural Water Association

California
Rural Water Association

January 30, 2019

Ms. Beth Gabor
Yolo County
625 Court Street,
Room 202
Woodland, CA 95695

VIA Email.

**Re: Groundwater Monitoring Report Fourth Quarter 2018**
**Wild Wings Water Recycling Facility, Yolo County, CA WDR No. R5-2002-0077**

Dear Ms. Gabor:

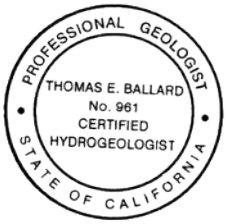
California Rural Water Association is pleased to present this report as a summary of the Groundwater Monitoring Data from the Fourth Quarter of 2018.

If you have any questions regarding this report, please call our Senior Hydrogeologist, Thomas Ballard, CHG, at (916) 761-3700 or Dan DeMoss at (916) 553-4900.

Sincerely,
California Rural Water Association

Dan DeMoss
Executive Director

Thomas Ballard
Senior Hydrogeologist






1234 North Market Blvd. | Sacramento, CA 95834
toll-free: 800.833.0322 | phone: 916.553.4900
fax: 916.553.4904 | www.calruralwater.org

**TABLE OF CONTENTS**



**FIGURES**



**TABLES**



**CHARTS**

**APPENDIX A – Field Data Forms**

**APPENDIX B – Laboratory Analytical Results & Chain of Custody**

## 1.0 INTRODUCTION

California Rural Water Association (CRWA) prepared this groundwater monitoring report on behalf of Yolo County for the Wild Wings Water Recycling Facility (WWRF) at the Wild Wings residential development, in Yolo County, California. This report represents and summarizes data collected and analyzed by CRWA, in conjunction with contract laboratory work, in December 2018; and also includes historical data and information from previous reports, consultants and laboratories.

Yolo County requested that CRWA provide groundwater monitoring and reporting for the WWRF to comply with Regional Water Quality Control Board (RWQCB) Waste Discharge Requirements (WDR) Order R5-2002-0077. The WDR requires quarterly monitoring and reporting of the groundwater levels and quality at the monitoring wells. National, under contract with Yolo County, began operating the WWRF on April 1, 2016. CRWA performed the field sampling and monitoring at the site on September 27, 2018.

### 1.1 LOCATION

The Wild Wings development is located north of Highway 16 and west of County Road 94B at 18530 Wildwings Drive, Woodland, CA 95695, and is surrounded by agricultural land to the west, Cache Creek and the Yolo Fliers Golf Club to the north, the Watts-Woodland Airport to the east, and several rural residences to the south. In early 2015, almond orchards were planted in the agricultural land to the west of the site and water wells were installed to provide water for the orchards. The WWRF encompasses 3.67 acres (400 by 400 feet) along the southwestern side of the Wild Wings development. Figure 1 shows the location of the WWRF along with general site information and locations of seven (7) monitoring wells.

### 1.2 SITE INFORMATION

The Wild Wings development consists of over 300 homes, a nine-hole golf course (including several ponds/lakes), and the WWRF, all built on 238 acres of previously undeveloped land. The WWRF has been operating since February 2005. Domestic wastewater from the Wild Wings development is treated to a tertiary level at the WWRF. The treated water is then blended with groundwater obtained from two deep on-site water supply wells and is used for irrigation of the golf course. The mixture of applied irrigation water typically consists of approximately one-fourth recycled water, but this ratio will vary by month. When irrigation demands are reduced, a lined storage pond on the WWRF site stores the recycled water. National does not operate or maintain the golf course irrigation system or ponds on the golf course.

## 1.3 MONITORING WELLS

Seven monitoring wells, MW-1 through MW-7, were constructed in May through June 2004. The monitoring wells were installed on the Wild Wings development in the vicinity of the WWRF. The locations of the monitoring wells are shown on Figure 1.

The WDR required that the monitoring wells be constructed to monitor the uppermost aquifer. While drilling, soil samples were collected to assess the subsurface lithology and to locate the uppermost aquifer. Review of the well logs shows that clays with various amounts of silt, sand, and gravel are predominant at the site. However, beds of coarse-grained materials, sands and gravels, with trace amounts of silt and clay were also logged at all monitoring well sites.

The monitoring wells were completed to depths ranging from 31 to 74 feet below ground surface (bgs). Each well is constructed with 2-inch schedule 40 PVC well casing and screen. The screen intervals are 10 feet in length at most wells, with the exception of MW-4 and MW-5R, which have 15-foot and 20-foot screen intervals, respectively. The top of each well casing is fitted with an expandable plug to prevent surface water from entering the wells. The top of each well is secured in a subsurface vault. Table 1 summarizes the well construction details. The well screens are not at the same depth in all of the monitoring wells. The depths varied based on when groundwater was first encountered. Thick clay beds were encountered at MW-4 and MW-5R and continued to relatively deep depths. MW-4 and MW-5R have deeper screen intervals than the other monitoring wells, ranging from an elevation of 51 to 71 feet mean sea level (msl). In contrast, MW-1, MW-2, MW-6, and MW-7 are screened at shallower depths, between 73 to 95 feet msl. MW-3 has the shallowest screen interval ranging from an elevation of 90 to 100 feet msl.

The lithologic sequences of strata encountered during well drilling show a heterogeneous appearance across the site making lateral geologic correlation difficult on a site scale (Luhdorff and Scalmanini, 2006). Furthermore, the uppermost water-bearing zone in which all monitoring wells are screened has weak to no lateral continuity across the site based on the lithologic logs. Based on evaluation of the lithology and well construction details, the consistent anomalously high groundwater elevations, and analytical results from previous monitoring reports, MW-3 appears to be screened in a perched water zone and not within the unconfined to semi-confined aquifers in which the other monitoring wells are screened. Therefore, groundwater in MW-3 does not appear to be in direct hydraulic communication with the other network wells.

## 1.4. SAMPLING PUMP DETAILS

Sampling and purging of the monitoring wells is accomplished with the use of a low flow electric submersible pump powered by portable battery system. Plastic tubing, which is disinfected prior to purging, between purging and sampling and after sampling, is used to conduct both the purging of the well and collection of groundwater samples. The pump is portable and is transported between wells.

## 1.5 HISTORIC MONITORING RESULTS

The WWRF has been active since February 2005. The WDR required that three monitoring events take place prior to the startup of the WWRF; however, only one monitoring event was performed. Quarterly monitoring commenced in March 2005. Historic monitoring results are summarized below:

- Groundwater levels have ranged from 19.7 to 56.7 feet below top of casing (btoc) or 64.0 to 101.7 feet mean sea level (msl). Groundwater has consistently been the shallowest at MW-3 and the deepest at MW-4. Since the fourth quarter 2008 MW-7 has been dry about 75 percent of the sampling events and has been dry from the third quarter 2013 until the first quarter of 2017 – corresponding to the California regional drought conditions. Table 2 summarizes the historic groundwater levels and Figure 2 displays a line graph of these historical groundwater levels.

- Groundwater flow direction has been consistently towards the northeast to east-northeast. Using MW-1, MW-4, and MW-5R to determine flow direction and gradient, the flow direction has varied from 53.3 to 75.0 degrees and the groundwater gradient has ranged from 0.005 to 0.009 ft./ft. The gradient has gradually steepened and the flow direction has changed to a more easterly direction since monitoring started in 2005. The most recent monitoring event in February 2018 indicates a 3-point gradient of 0.006 ft./ft. and a direction of 72 degrees. Table 3 summarizes historic groundwater flow directions and gradients.

- MW-1 has been consistently up-gradient of the recycled water effluent pond, whereas MW-4, MW-6, and MW-7 have consistently been down-gradient of the recycled water effluent pond. MW-2 is located adjacent to the recycled water effluent pond. MW-5R appears to be an up-gradient well that is recharged from Cache Creek, but is slightly down-gradient to the recycled water effluent pond.

- MW-3 has consistently had higher groundwater surface elevations than the other monitoring wells. Because of this, supplemented by the shallow screen interval, poor recharge, persistent presence of total coliform organisms as well as an overall different water quality than the other wells, and often gray to tan color of the water, MW-3 appears to be screened in a perched water zone. This perched or mounded water table appears prominently in the August 2017 data – but the November 2017 data did not look as pronounced.

- The WDR requires that monitoring wells be sampled and analyzed for the following constituents: pH, total dissolved solids (TDS), sodium, chloride, boron, iron, manganese, nitrate (as nitrogen), nitrite (as nitrogen), ammonia (as nitrogen), total nitrogen, total coliform organisms, and total trihalomethanes (TTHMs). In addition to the WDR requirements, samples collected up to February 2008 were analyzed for fecal coliform. Historical monitoring results are summarized in Table 4. Figures 3 through 9 show concentration trend graphs for the monitoring parameters.

- Metals analyses are required from the monitoring wells. Sampling protocol requires that the turbidity be below 5 Nephelometric Units (NTU) when collecting water samples for metal analyses, otherwise the sample must be filtered prior to being collected and reported as dissolved metals. Due to historical issues with turbidity and purging, the sampling protocol for Q4 2017 was adopted to field filter and continued for Q1 of 2018.

- Total coliform organisms have been sporadically detected at all wells since monitoring commenced. They have been most consistently detected at MW-3, which also has had positive results for fecal bacteria; however, since the second quarter 2013, total coliform organisms at MW-3 have only been detected four times. MW-3 has had past worm-like organisms and has been treated with disinfection products. Recently, no organisms have been visible and the Q3 sampling event had no detections for disinfection by-products, as analyzed for TTHM's.

- Groundwater quality samples were not obtained from MW-7 between November 2006 and November 2016, except for May and August 2011, due to either the well being dry or an insufficient amount of water in the well to collect samples. Since the wet weather in winter 2016 -2017, sufficient amounts of sample water from MW-7 have been retrieved for laboratory analyses – Until November 2017. In November 2017, there was not sufficient water to purge in MW-7 to collect samples and perform laboratory analyses. Again, in February 2018, there was insufficient water in MW-7 for sample collection.

- Groundwater quality analytical results were not available for the fourth quarter 2006 (except for total coliform results), first quarter 2007, and first quarter 2008.

- MW-2 has had historical security issues related to soils and foreign water entering the well vault. Previous reports contain details of this issue.

## 1.6 GROUNDWATER QUALITY LIMITATIONS

### Interim Groundwater Limitations

Borings HB-2, HB-3, HB-7, and B-27 were drilled prior to the startup of the WWRF and within the vicinity of the WWRF. Water samples collected from these borings were used as the background water quality, using the average value for each constituent. Interim groundwater limitations for the WWRF were developed by comparing the basin plan Water Quality Objectives (WQOs) and background water quality data and using the highest value as the interim groundwater limitation. The interim groundwater limitations are listed at the top of Table 4.

The following summarizes how the WWRF monitoring wells have historically compared to the interim groundwater limitations:

- Boron has exceeded the interim groundwater limitations at all wells since quarterly monitoring commenced. Down-gradient monitoring wells MW-2 and MW-6 have had higher concentrations than up-gradient well MW-1.

- Up-gradient MW-1 is typically at or exceeding the interim groundwater limitations for TDS, chloride, nitrate (as nitrogen), and total nitrogen. Historically the TDS, chloride, nitrate (as nitrogen) and total nitrogen results are higher at MW-1 than at any other well in the monitoring well network. However, since 2013 chloride has been highest at down-gradient well MW-4. Nitrate concentrations have been variable and now (Q3 of 2018) several wells exceed the nitrate levels in MW-1.

- MW-2, the closest well to the WWRF, regularly exceeded the interim groundwater limitations for total nitrogen prior to 2008, from 2008 through 2016 total nitrogen has been less than the interim limitations. But since 2017, is again above the interim limit. For Q1 2018, MW-2 depicts higher nitrate and total nitrogen than the recent past. Prior to the fourth quarter 2013 the interim groundwater limitations were occasionally exceeded for sodium at MW-2, but since this time they have been below the interim groundwater limitations, until June 2017 when they again were slightly above the interim limit. Sodium in MW-2 has declined in recent sampling events but remains barely above the interim standard. Chloride levels at MW-2 exceeded the interim groundwater limitations from the fourth quarter 2010 through the first quarter 2012, but since this time the levels have been less than the interim limitations.

- Quarterly monitoring results at cross-gradient MW-5R and down-gradient MW-4, MW-6, and MW-7 have rarely exceeded the interim groundwater limitations for any constituent, with the exception of chloride and total nitrogen at MW-4 and sodium at MW-6 (with some exceptions).

**Final Groundwater Limitations**

On January 8, 2008, the RWQCB requested Yolo County prepare a Background Groundwater Quality Study/Groundwater Degradation Assessment Report to establish statistically derived water quality limitations. Central Valley Environmental, Incorporated (CVEI) prepared a Background Groundwater Quality Study/Groundwater Degradation Assessment Report dated April 1, 2009. Yolo County submitted the report to the RWQCB. CVEI used statistical methods to derive tolerance intervals representing the $95^{th}$ quantile of all water quality sampling results from 2004 through February 2009. CVEI used these values in conjunction with the WQOs, using the greater of the two, to recommend Final Groundwater Limitations. Approval of the Final Groundwater Limitations by the RWQCB is still pending. However, since 2009 the sample population has more than doubled and therefore the analyses may be outdated.

## 2.0 GROUNDWATER MONITORING

Groundwater monitoring was performed on December 28, 2018 by CRWA personnel experienced with groundwater sampling. The following sections describe the monitoring

protocol used to measure the depth to water, purge the wells, and collect water quality samples from the monitoring wells.

## 2.1 GROUNDWATER LEVELS

CRWA personnel measured the depth to groundwater at the monitoring wells using an electric water level sounder accurate to 0.01 foot. The sounder was cleaned and decontaminated prior to the first monitoring well measurement and between each well site by thoroughly washing and scrubbing the sounding probe and line with a laboratory-grade detergent (Alconox) and distilled water, followed by a triple rinse with distilled water. The sounding probe and line was then sprayed with a 10 percent bleach solution to kill any bacteria. The sounding probe was allowed to air dry between wells.

## 2.2 PRE-SAMPLING ACTIVITIES

After the depth to groundwater was measured at a monitoring well, the well was purged. Each monitoring well was purged through the use of a portable low flow submersible pump. Prior to purging, the top 6 inches of the polyethylene tubing was decontaminated. The polyethylene tube was then connected to a vinyl tube via a double-barbed nipple and the vinyl tubing was routed to an empty 5-gallon bucket. The double-barbed nipple and vinyl tubing were cleaned and decontaminated prior to initial use and between each well (primary disinfection). The procedures for cleaning and decontaminating are the same as listed above (Groundwater Levels) except the vinyl tubing received six rinses with distilled water after cleaning.

Prior to collecting the groundwater samples, each monitoring well was micro purged (verbal approval, RWQCB 2008). Micro purging consisted of pumping each well until field parameters such as pH, temperature, and EC stabilized. Field parameters were measured by collecting purge water from the discharge line at select intervals and using a calibrated multi-parameter meter to record the readings. The volume purged and field parameters are documented on field data sheets, which are presented in Appendix A. The purge water was collected in 5-gallon buckets and then transported back to the WWRF and discharged to the wastewater holding tanks.

## 2.3 GROUNDWATER SAMPLING

Once each monitoring well was purged, CRWA personnel collected water samples in laboratory-prepared bottles. Prior to collecting the first sample, the vinyl tube connected to the 5-gallon bucket was disconnected from the bucket and the tip was sprayed with a 10 percent bleach solution to kill any bacteria that may have been present in the bucket and inadvertently transferred to the sampling tube (secondary disinfection). To eliminate any residual chlorine, pumping was then resumed for about 30 to 60 seconds (approximately 0.25 to 0.5 gallons) and the end of the vinyl tube was elevated and pinched so that the entire tubing surface was in contact with the purge water prior to sampling. The bacteriological (total coliform) sample was the first sample collected and was collected directly from the end of the vinyl tube, followed by

collection of samples for THMs. The samples for all other constituents analyzed were collected next. Water samples for metals were filtered in the field using a disposable 0.45 micron filter before being placed into acidified laboratory prepared sample bottles. Trip blanks are included by CLS for TTHM's analysis, when requested.

Nitrile gloves were worn while collecting samples. A new set of gloves was used at every monitoring well. The samples were placed in an ice chest and cooled to 4 degrees Celsius and delivered to California Laboratory Services (CLS) of Rancho Cordova, California, a California-certified laboratory, under standard chain-of-custody procedures. Samples collected from the monitoring wells were analyzed for TDS, sodium, boron, iron, manganese, nitrate (as N), nitrite (as N), ammonia (as N), total N, total coliform organisms, and total trihalomethanes per the WDR requirements. Table 4 presents the results for the monitoring wells and Table 5 presents the results for any trip blank and equipment blank samples. Appendix B contains the laboratory data sheets and chain-of-custody forms.

### 2.4 GROUNDWATER LEVELS AND FLOW DIRECTION

The measured groundwater levels in each well were subtracted from the surveyed ground surface elevation at each well. Table 2 lists the elevation of the top of the well casing (TOC) (reference point) at each well and presents the current and historic depths-to-water and groundwater surface elevations. The groundwater surface elevations were used to generate groundwater contours from which the groundwater gradient was calculated. Figure 10 shows the groundwater contours and flow direction for December 2018. Groundwater gradients and flow directions were estimated using wells MW-1, MW-4, and MW-5R. Table 3 summarizes these estimates.

## 3.0 FINDINGS

### 3.1 GROUNDWATER LEVELS

Groundwater levels in December 2018 (fourth quarter 2018) ranged from 67.29 feet msl in MW-4 to 94.88 feet msl in MW-1, and were within historic ranges. Monitoring wells MW-2 and MW-3 showed the greatest changes in groundwater levels this quarter. This transition from late summer/fall seasonal low water level trend into a wetter winter trend continues and is fairly consistent within the monitoring well network. Table 2 lists the water level measurements. Chart 1 shows the current and historic groundwater levels.

Due to MW-3 being screened within a perched water zone it was left out of groundwater contouring, flow direction, and gradient calculations.

Between the third quarter of 2018 and fourth quarter of 2018, groundwater levels rose an average of 1.76 feet, with the water level in MW-4 actually declining slightly. This matches what is commonly understood to be seasonal variations with moving from a relatively dry fall into a somewhat wetter winter season. Looking at the generalized pattern of rainfall and groundwater

levels in the area since fall 2016 the trends in those 2 parameters tend to correlate. There is generally a strong correlation between precipitation/recharge with water levels in the shallow groundwater zone.

## 3.2 GROUNDWATER FLOW DIRECTION AND GRADIENT

The groundwater flow direction and gradient for December 2018 were calculated using wells MW-1, MW-4, and MW-5R, which is consistent with past practice and historically reported data. Using these wells, the groundwater flow direction was to the east northeast (69.0 degrees) with a gradient of 0.007 feet/feet. The groundwater gradient and direction are consistent with historic results. Figure 2 displays the groundwater surface elevations at each well, the groundwater contours, and flow direction. In the northern portion of the site the groundwater flow direction appears to be influenced by Cache Creek. Table 3 lists the historic and current groundwater flow directions and gradients.

## 3.3 GROUNDWATER QUALITY

Tables 4 and 5 summarize the analytical results in table format and Charts 2 through 8 show the historical water quality parameter concentrations in graphical format.

Current (fourth quarter 2018) water quality results were compared to historic water quality results to assess potential increasing trends. Overall, the water quality analytical testing results for the fourth quarter of 2018 were within historical ranges and trends. While nitrates and total nitrogen showed a slight increase in concentrations MW-2 after the first quarter 2017, these concentrations have generally stabilized and are declining back towards historic levels. Concentrations for boron and TDS have remained consistent during the past 6 quarters, with TDS showing a general decline across most of the wells this quarter. pH levels this quarter are consistent with historical ranges. Boron and sodium are generally consistent with past analytical data and they generally show a declining trend tis quarter. Nitrogen and nitrate levels showed an overall slight decline with the exception of a nitrate increase in MW-1. Overall TDS levels appear very close to historical levels and ranges at each well, but are generally showing a recent declining trend. The spatial variation of TDS, nitrate and boron concentrations over the recent past are best explained by the recent rainfall/dryness patterns, recharge and pumping changes in the area groundwater. No other significant trends in groundwater quality trends were observed from this quarter's monitoring results.

MW-3 has been an outlier in water quality with results that are significantly different from the remaining monitoring wells, and this quarter showed increases in sodium and chloride.

Historically, up-gradient MW-1 has had the highest concentrations of TDS, chloride, nitrate (as N), and total nitrogen. However, beginning in 2013 chloride concentrations at MW-4 have consistently been above those at MW-1 although chloride levels in the sample from MW-1 slightly exceeded MW-4 this quarter (4rd 2018).

Recently, increases in water quality parameters at MW-2 have caused it to tend to match or exceed the historic pattern of MW-1 (up gradient) being the location of the highest TDS, chloride and sodium concentrations in groundwater. For the fourth quarter 2018, the sample from MW-2 shows the highest concentrations for sodium, boron, and nitrate/TN. Refer to the water quality figures for additional trends.

Samples from wells MW-1 and MW-4 had the highest chloride concentrations at 230 and 200 mg/L, respectively. Chloride trends in samples from individual wells fluctuate up and down within general ranges and the results this quarter are generally consistent with prior trends.

The highest nitrate (as N) (18 mg/L) and total N (18 mg/L) concentrations were detected in the sample from MW-1, slightly exceeding the nitrate and total nitrogen levels detected in the samples from MW-2 and MW-4. The sample from MW-2 again had the highest boron (5.5 mg/L) concentration detected, also consistent with historic results and mirroring the recent trend of all boron levels being elevated.

For fourth quarter 2018 sampling, total coliform was not detected in samples form any of the monitoring wells at the site, including MW-3 and MW-6, which have had detections of total coliform detections in the recent past. In general, the fourth quarter 2018 results represent a water quality improvement over other recent monitoring events for total coliform detections.

Ammonia (as N) was not detected at measurable concentrations in any of the wells sampled this quarter. Ammonia (as N) is not typically detected at any of the wells in the monitoring network, aside from MW-3.

Neither iron nor manganese were reported in any of the monitoring wells sampled for the fourth quarter 2018. Manganese has been intermittently detected in samples from MW-3 in the past, but there were no detections this quarter.

TTHMs were detected at 33 ug/L in the sample from MW-3, 2 ug/L in the sample from MW-4 and 3 ug/L in the sample from MW-6 this quarter. In the sample from MW-3, the TTHM mainly consisted of Chloroform with smaller proportions of Bromodichloromethane and Dibromochloromethane. The TTHM in the sample from MW-4 consisted exclusively of Bromoform, while the TTHMs in the sample from MW-6 consisted of Bromoform and Chloroform. No trip blanks were submitted this quarter, so it is unclear if there were any cross contamination concerns at the field, transit or lab. The detected concentration of TTHMs in the samples from MW-4 and MW-6 are consistent with intermittent prior detections and do not appear to indicate a major concern. Samples from MW-3 have also recorded intermittent TTHM detections, although 33 ug/L is a historically high detection, although still well below Water Quality Objectives. The trend in MW-3 will be closely monitored in the First Quarter 2019 results to determine if this detection was anomalous.

## 3.4 COMPARISON TO INTERIM GROUNDWATER LIMITATIONS

The water quality results from the fourth quarter 2018 monitoring event show that every monitoring well sampled exceeded the interim groundwater limitation for boron, consistent with historic results.

Based on the understanding that the interim groundwater quality limits remain the higher of the background level for the site and the basin wide WQO (water quality objective), the following is a summary of each wells exceedances for the current quarter (Fourth Quarter 2018) for other general mineral analytes (excluding boron). Comparing to the previous quarter, the number of parameters in exceedance is more, but the previous quarter did not include chloride.

MW-1: chloride, total nitrogen
MW-2: total nitrogen
MW-3: sodium, chloride
MW-4: chloride, total nitrogen
MW-5R: none
MW-6: total nitrogen
MW-7: No Data. Insufficient sample volume.

## 4.0 CONCLUSIONS

The groundwater contours and flow directions show there are two potential sources of groundwater to the area. MW-5R monitors water entering the area that is recharged by Cache Creek, north of the WWRF area. Water also enters the area from the south near MW- 1 and MW-2 from regions used for agriculture. MW-4, MW-6, and MW-7 are in a mixing zone between these water sources and as such minor shifts in groundwater gradients may result in a change in water quality that reflects these two different water sources. In 2015, almond orchards were planted in the fields just west of the monitoring area and water wells were installed to provide water for the orchards. Deep percolation from irrigation or pumping for water supply could affect groundwater levels and flow directions, but to date they do not appear to be affecting groundwater beneath the WWRF area. In past monitoring events, it appeared groundwater pumping east of the monitoring well network was affecting MW-4 and could be affecting MW-7.

In general, the annual rainfall amounts, irrigation practices at farm lands and golf courses, and variations in groundwater pumping to meet local domestic water needs can impact the local groundwater contours, flow direction and gradients. However, for the fourth quarter 2018 monitoring event, these parameters remained within historical ranges for groundwater levels. The most recent GW contours reflect an overall increase from the third quarter 2018 data corresponding to a wetter winter season. Generally, groundwater levels changes track each other across the various monitoring wells. GW flow gradients remain in the range of historical observations at 0.007 ft/ft for the quarter and the direction of flow remains to the east north east.

The analytical results from the fourth quarter 2018 sampling event show several results above the interim groundwater limitations. All wells exceeded the interim groundwater limitations for boron, which is consistent with historic monitoring results. Additionally, several wells have total nitrogen levels slightly above the interim limits, one well had sodium levels above the interim limits and two wells had chloride concentrations which exceeded the interim limits. However, overall, the fourth quarter 2018 sample event indicated trends generally consistent with historical patterns in mineral concentrations in groundwater samples when compared to recent past quarters.

MW-1 shows a recent increasing trend for nitrate and total nitrogen compared to recent sample data, but below historical highs. Chloride concentrations showed an increase this quarter, but are still within historical ranges.

MW-3 showed an increase in sodium compared to recent sample data, with the current concentration at the upper limit of the historical range for this constituent . Chloride concentrations showed an increase this quarter, but are still within historical ranges.

MW-4 showed a slight increase in chloride concentrations this quarter, but well within historical trends. After declining in the third quarter 2018, total nitrogen concentrations returned to levels consistent with those detected in recent sampling events.

The fourth quarter 2018 analyses for TTHMs resulted in detections in three wells consisting of chloroform, bromodichloromethane and bromoform . This could indicate possible cross-contamination in the field, transit or lab. Field blanks were not submitted this quarter.

Review of the current quarter and historical data trends indicate the local groundwater quality appears to remain in historical ranges since before and after the operations of the WWRF.

# FIGURES


**Figure 1**
**Site and Vicinity**

Notes:
All locations are approximate.
Aerial Source: *USDA, National Agriculture Imagery Program*, 8 July 2016

**Fourth Quarter 2018 Monitoring Report**
*Wild Wings Water Recycling Facility*
*18530 Wildwings Drive*
*Woodland, Yolo County, California*


Feet
0 500 1,000

Notes:
All locations are approximate
ft msl = feet above mean sea level
*Groundwater monitoring well is screened at a shallower depth, therefore it is not included in groundwater elevation contouring
Aerial Source: *USDA, National Agriculture Imagery Program, 8 July 2016*

California Rural Water Association

# Figure 2
# Groundwater Elevation Contours

**Fourth Quarter 2018 Monitoring Report**
*Wild Wings Water Recycling Facility*
*18530 Wildwings Drive*
*Woodland, Yolo County, California*

# TABLES

**Table 1**
**Monitoring Well Construction Details**
**Wild Wings Water Recycling Facility, Yolo County, CA**

| Well | Date Installed | Depth of Borehole (feet bgs) | Depth of Well Casing (feet bgs) | Screened Interval (feet bgs) | Slot Size (inches) | Grout (feet bgs) | Bentonite Seal (feet bgs) | Sand Pack (feet bgs) | Casing Material | TOC Elevation (feet msl) | Screen Elevations (feet msl) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1 | 6/3/2004 | 46 | 41 | 31-41 | 0.010 | 0.5-25.5 | 25.5-28.5 | 28.5-45 | 2-inch Sch. 40 PVC, flush thread | 126.22 | 95.22 - 85.22 |
| MW-2 | 6/2/2004 | 51.5 | 47 | 37-47 | 0.010 | 0.5-31 | 31-34.5 | 34.5-47 | 2-inch Sch. 40 PVC, flush thread | 124.93 | 87.93 - 77.93 |
| MW-3 | 6/3/2004 | 31.5 | 31 | 21-31 | 0.010 | 0.5-14.5 | 14.5-19 | 19-32 | 2-inch Sch. 40 PVC, flush thread | 121.37 | 100.37 - 90.37 |
| MW-4 | 6/1/2004 | 71.5 | 70 | 55-70 | 0.010 | 0.5-48 | 48-52 | 52-70 | 2-inch Sch. 40 PVC, flush thread | 120.71 | 65.71 - 50.71 |
| MW-5R | 6/10/2004 | 75 | 74 | 54-74 | 0.010 | 0.5-47 | 47-52 | 52-75 | 2-inch Sch. 40 PVC, flush thread | 125.42 | 71.42 - 51.42 |
| MW-6 | 5/27/2004 | 50 | 49 | 39-49 | 0.010 | 0.5-33 | 33-37 | 37-50 | 2-inch Sch. 40 PVC, flush thread | 121.59 | 82.59 - 72.59 |
| MW-7 | 5/28/2004 | 45 | 39 | 29-39 | 0.010 | 0.5-22 | 22-26.5 | 26.5-45 | 2-inch Sch. 40 PVC, flush thread | 114.55 | 85.55 - 75.55 |

**Notes:**

Information for monitoring wells was extracted from Monitoring Well Installation Report (Geologic and Hydrogeologic Study) for the Wild Wings Residential Development , Jacobson Helgoth Consultants, Inc., August 2004.

All monitoring wells were drilled and constructed by PC Exploration of Rocklin, CA. An Ingersol Rand A-400 drill rig with an 8-inch diameter hollow stem auger was used. Oversight was provided by Jacobson Helgoth Consultants. Wellheads were constructed in subsurface vaults with flush mount covers and locking well caps. The top of the PVC casing is approximately 1.3 feet below ground surface (bgs).

TOC = top of casing; surveyed in reference to mean sea level by Morrow Surveying of West Sacramento, CA, on June 26, 2004

**Table 2 (MW-1)**
**Static Water Level Measurement in Monitoring Wells**
**Wild Wings Water Recycling Facility, Yolo County, CA**

| Well | Date | TOC Elevation (feet msl) | DTW (feet btoc) | Water Surface Elevation (feet msl) |
|---|---|---|---|---|
| MW-1 | 6/15/2004 | 126.22 | 32.81 | 93.41 |
| | 3/29/2005 | | 30.62 | 95.6 |
| | 6/16/2005 | | 29.62 | 96.6 |
| | 9/29/2005 | | 31.75 | 94.47 |
| | 12/6/2005 | | 31.4 | 94.82 |
| | 2/16/2006 | | 29.99 | 96.23 |
| | 5/16/2006 | | 27.25 | 98.97 |
| | 8/21/2006 | | 29.73 | 96.49 |
| | 11/20/2006 | | 30.27 | 95.95 |
| | 2/8/2007 | | 31.37 | 94.85 |
| | 5/7/2007 | | 30.79 | 95.43 |
| | 8/29/2007 | | 32.38 | 93.84 |
| | 2/21/2008 | | 29.96 | 96.26 |
| | 5/27/2008 | | 29.7 | 96.52 |
| | 8/27/2008 | | 30.49 | 95.73 |
| | 11/24/2008 | | 32.43 | 93.79 |
| | 2/18/2009 | | 30.72 | 95.5 |
| | 5/21/2009 | | 31.28 | 94.94 |
| | 8/7/2009 | | 32.96 | 93.26 |
| | 11/5/2009 | | 34.34 | 91.88 |
| | 2/8/2010 | | 32.05 | 94.17 |
| | 5/7/2010 | | 31.85 | 94.37 |
| | 8/18/2010 | | 31.22 | 95.0 |
| | 11/2/2010 | | 32 | 94.22 |
| | 12/28/2010 | | 30.76 | 95.46 |
| | 2/23/2011 | | 31.33 | 94.89 |
| | 5/5/2011 | | 29.44 | 96.78 |
| | 8/16/2011 | | 30.23 | 95.99 |
| | 11/8/2011 | | 31.95 | 94.27 |
| | 2/27/2012 | | 32.84 | 93.38 |
| | 5/21/2012 | | 32.8 | 93.42 |
| | 8/9/2012 | | 33.84 | 92.38 |
| | 11/19/2012 | | 34.39 | 91.83 |
| | 2/21/2013 | | 32.1 | 94.12 |
| | 5/15/2013 | | 31.73 | 94.49 |
| | 8/15/2013 | | 32.84 | 93.38 |
| | 11/7/2013 | | 33.69 | 92.53 |
| | 2/25/2014 | | 34.38 | 91.84 |
| | 5/22/2014 | | 35.22 | 91.0 |
| | 8/27/2014 | | 36.65 | 89.57 |
| | 11/12/2014 | | 36.93 | 89.29 |
| | 2/26/2015 | | 34.88 | 91.34 |
| | 5/13/2015 | | 35.6 | 90.62 |
| | 8/4/2015 | | 36.03 | 90.19 |
| | 11/5/2015 | | 36.9 | 89.32 |
| | 2/4/2016 | | 35.33 | 90.89 |
| | 6/30/2016 | | 34.37 | 91.85 |
| | 8/25/2016 | | 34.59 | 91.63 |
| | 11/17/2016 | | 34.9 | 91.32 |
| | 3/7/2017 | | 26.18 | 100.04 |
| | 6/27/2017 | | 28.14 | 98.08 |
| | 8/23/2017 | | 30.09 | 96.13 |
| | 11/14/2017 | | 31.07 | 95.15 |
| | 2/21/2018 | | 32.94 | 93.28 |
| | 5/24/2018 | | 33.03 | 93.19 |
| | 9/27/2018 | | 34.07 | 92.15 |
| | 12/28/2018 | | 31.34 | 94.88 |

**Table 2 (MW-2)**
**Static Water Level Measurement in Monitoring Wells**
**Wild Wings Water Recycling Facility, Yolo County, CA**

| Well | Date | TOC Elevation (feet msl) | DTW (feet btoc) | Water Surface Elevation (feet msl) |
|---|---|---|---|---|
| MW-2 | 6/15/2004 | 124.93 | 34.75 | 90.18 |
| | 3/29/2005 | | 33.2 | 91.73 |
| | 6/16/2005 | | 31.71 | 93.22 |
| | 9/29/2005 | | 36.67 | 88.26 |
| | 12/6/2005 | | 36.29 | 88.64 |
| | 2/16/2006 | | 31.85 | 93.08 |
| | 5/16/2006 | | 28.12 | 96.81 |
| | 8/21/2006 | | 33.17 | 91.76 |
| | 11/20/2006 | | 34.75 | 90.18 |
| | 2/8/2007 | | 34.81 | 90.12 |
| | 5/7/2007 | | 35.53 | 89.4 |
| | 8/29/2007 | | 39.92 | 85.01 |
| | 2/21/2008 | | 33.15 | 91.78 |
| | 5/27/2008 | | 34.25 | 90.68 |
| | 8/27/2008 | | 37.59 | 87.34 |
| | 11/25/2008 | | 37.3 | 87.63 |
| | 2/19/2009 | | 36.01 | 88.92 |
| | 5/21/2009 | | 36.47 | 88.46 |
| | 8/7/2009 | | 40.14 | 84.79 |
| | 11/5/2009 | | 41.38 | 83.55 |
| | 2/8/2010 | | 38.48 | 86.45 |
| | 5/7/2010 | | 35.8 | 89.13 |
| | 8/18/2010 | | 36.66 | 88.27 |
| | 11/2/2010 | | 38.25 | 86.68 |
| | 12/28/2010 | | 37.08 | 87.85 |
| | 2/23/2011 | | 35.68 | 89.25 |
| | 5/5/2011 | | 30.87 | 94.06 |
| | 8/16/2011 | | 33.73 | 91.2 |
| | 11/8/2011 | | 35.93 | 89 |
| | 2/27/2012 | | 36.04 | 88.89 |
| | 5/21/2012 | | 35.89 | 89.04 |
| | 8/9/2012 | | 37.54 | 87.39 |
| | 11/19/2012 | | 37.9 | 87.03 |
| | 2/21/2013 | | 34.6 | 90.33 |
| | 5/15/2013 | | 36.4 | 88.53 |
| | 8/15/2013 | | 38.8 | 86.13 |
| | 11/7/2013 | | 38.74 | 86.19 |
| | 2/25/2014 | | 38.78 | 86.15 |
| | 5/22/2014 | | 41.17 | 83.76 |
| | 8/27/2014 | | dry | |
| | 11/12/2014 | | 45.07 | 79.86 |
| | 2/26/2015 | | 39.83 | 85.1 |
| | 5/13/2015 | | 39.72 | 85.21 |
| | 8/4/2015 | | 39.35 | 85.58 |
| | 11/5/2015 | | 41.79 | 83.14 |
| | 2/4/2016 | | 40.41 | 84.52 |
| | 6/30/2016 | | 37.44 | 87.49 |
| | 8/25/2016 | | 38.39 | 86.54 |
| | 11/17/2016 | | 37.67 | 87.26 |
| | 3/7/2017 | | 27.4 | 97.53 |
| | 6/27/2017 | | 30.42 | 94.51 |
| | 8/23/2017 | | 33.31 | 91.62 |
| | 11/14/2017 | | 35.97 | 88.96 |
| | 2/21/2018 | | 35.87 | 89.06 |
| | 5/24/2018 | | 35.5 | 89.43 |
| | 9/27/2018 | | 37.08 | 87.85 |
| | 12/28/2018 | | 34.06 | 90.87 |

**Table 2 (MW-3)**
**Static Water Level Measurement in Monitoring Wells**
**Wild Wings Water Recycling Facility, Yolo County, CA**

| Well | Date | TOC Elevation (feet msl) | DTW (feet btoc) | Water Surface Elevation (feet msl) |
|---|---|---|---|---|
| MW-3 | 6/15/2004 | 121.37 | 20.42 | 100.95 |
| | 3/29/2005 | | 21.33 | 100.04 |
| | 6/16/2005 | | 20.14 | 101.23 |
| | 9/29/2005 | | 22.45 | 98.92 |
| | 12/6/2005 | | 21.54 | 99.83 |
| | 2/16/2006 | | 21.65 | 99.72 |
| | 5/16/2006 | | 26.51 | 94.86 |
| | 8/21/2006 | | 21.49 | 99.88 |
| | 11/20/2006 | | 21.14 | 100.23 |
| | 2/8/2007 | | 23.02 | 98.35 |
| | 5/7/2007 | | 20.63 | 100.74 |
| | 8/29/2007 | | 22.99 | 98.38 |
| | 2/21/2008 | | 21.24 | 100.13 |
| | 5/27/2008 | | 22.19 | 99.18 |
| | 8/28/2008 | | 23 | 98.37 |
| | 11/25/2008 | | 24.39 | 96.98 |
| | 2/19/2009 | | 19.67 | 101.7 |
| | 5/21/2009 | | 21.31 | 100.06 |
| | 8/7/2009 | | 22.49 | 98.88 |
| | 11/5/2009 | | 24.29 | 97.08 |
| | 2/8/2010 | | 20.2 | 101.17 |
| | 5/7/2010 | | 23.21 | 98.16 |
| | 8/18/2010 | | 23.55 | 97.82 |
| | 11/2/2010 | | 25.13 | 96.24 |
| | 12/28/2010 | | 19.95 | 101.42 |
| | 2/23/2011 | | 20.66 | 100.71 |
| | 5/5/2011 | | 21.64 | 99.73 |
| | 8/16/2011 | | 23.3 | 98.07 |
| | 11/8/2011 | | 25.03 | 96.34 |
| | 2/27/2012 | | 24.69 | 96.68 |
| | 5/21/2012 | | 24.44 | 96.93 |
| | 8/9/2012 | | 25.58 | 95.79 |
| | 11/19/2012 | | 25.96 | 95.41 |
| | 2/21/2013 | | 24.15 | 97.22 |
| | 5/15/2013 | | 25.45 | 95.92 |
| | 8/16/2013 | | 26.67 | 94.7 |
| | 11/7/2013 | | 25.97 | 95.4 |
| | 2/25/2014 | | 25.44 | 95.93 |
| | 5/22/2014 | | 26.5 | 94.87 |
| | 8/27/2014 | | 28.75 | 92.62 |
| | 11/12/2014 | | 29.53 | 91.84 |
| | 2/26/2015 | | 21.33 | 100.04 |
| | 5/13/2015 | | 23.53 | 97.84 |
| | 8/4/2015 | | 25.7 | 95.67 |
| | 11/5/2015 | | 28.7 | 92.67 |
| | 2/4/2016 | | 24.81 | 96.56 |
| | 6/30/2016 | | 25.89 | 95.48 |
| | 8/25/2016 | | 27.74 | 93.63 |
| | 11/17/2016 | | 29.6 | 91.77 |
| | 3/7/2017 | | 19.13 | 102.24 |
| | 6/27/2017 | | 22.75 | 98.62 |
| | 8/23/2017 | | 23.33 | 98.04 |
| | 11/14/2017 | | 25.87 | 95.5 |
| | 2/21/2018 | | 26.98 | 94.39 |
| | 5/24/2018 | | 25.54 | 95.83 |
| | 9/27/2018 | | 27.37 | 94.0 |
| | 12/28/2018 | | 24.25 | 97.1 |

**Table 2 (MW-4)**
**Static Water Level Measurement in Monitoring Wells**
**Wild Wings Water Recycling Facility, Yolo County, CA**

| Well | Date | TOC Elevation (feet msl) | DTW (feet btoc) | Water Surface Elevation (feet msl) |
|---|---|---|---|---|
| MW-4 | 6/15/2004 | 120.71 | 44.59 | 76.12 |
| | 3/29/2005 | | 42.83 | 77.88 |
| | 6/16/2005 | | 41.93 | 78.78 |
| | 9/29/2005 | | na | |
| | 12/6/2005 | | 46.6 | 74.11 |
| | 2/16/2006 | | 42.31 | 78.4 |
| | 5/16/2006 | | 37.61 | 83.1 |
| | 8/21/2006 | | 42.25 | 78.46 |
| | 11/20/2006 | | 41.8 | 78.91 |
| | 2/8/2007 | | 40.85 | 79.86 |
| | 5/7/2007 | | 40.92 | 79.79 |
| | 8/29/2007 | | 46.13 | 74.58 |
| | 2/21/2008 | | 41.2 | 79.51 |
| | 5/27/2008 | | 42.34 | 78.37 |
| | 8/28/2008 | | 45.65 | 75.06 |
| | 11/25/2008 | | 46.07 | 74.64 |
| | 2/19/2009 | | 45.29 | 75.42 |
| | 5/21/2009 | | 44.44 | 76.27 |
| | 8/7/2009 | | 49.54 | 71.17 |
| | 11/5/2009 | | 51 | 69.71 |
| | 2/8/2010 | | 49.31 | 71.4 |
| | 5/7/2010 | | 45.94 | 74.77 |
| | 8/18/2010 | | 48.05 | 72.66 |
| | 11/2/2010 | | 49.05 | 71.66 |
| | 12/28/2010 | | 48.01 | 72.7 |
| | 2/23/2011 | | 46.31 | 74.4 |
| | 5/5/2011 | | 42.04 | 78.67 |
| | 8/16/2011 | | 45.02 | 75.69 |
| | 11/8/2011 | | 46.64 | 74.07 |
| | 2/27/2012 | | 44.72 | 75.99 |
| | 5/21/2012 | | 44.56 | 76.15 |
| | 8/9/2012 | | 48.08 | 72.63 |
| | 11/19/2012 | | 49.78 | 70.93 |
| | 2/21/2013 | | 45.9 | 74.81 |
| | 5/15/2013 | | 46.69 | 74.02 |
| | 8/16/2013 | | 50.67 | 70.04 |
| | 11/7/2013 | | 51.99 | 68.72 |
| | 2/25/2014 | | 50.88 | 69.83 |
| | 5/22/2014 | | 51.08 | 69.63 |
| | 8/27/2014 | | 55.49 | 65.22 |
| | 11/12/2014 | | 56.36 | 64.35 |
| | 2/26/2015 | | 53.85 | 66.86 |
| | 5/13/2015 | | 53.9 | 66.81 |
| | 8/4/2015 | | 55.42 | 65.29 |
| | 11/5/2015 | | 56.74 | 63.97 |
| | 2/4/2016 | | 56.4 | 64.31 |
| | 6/30/2016 | | 54.22 | 66.49 |
| | 8/25/2016 | | 55.21 | 65.5 |
| | 11/17/2016 | | 55.54 | 65.17 |
| | 3/7/2017 | | 48.46 | 72.25 |
| | 6/27/2017 | | 47.06 | 73.65 |
| | 8/23/2017 | | 48.59 | 72.12 |
| | 11/14/2017 | | 49.98 | 70.73 |
| | 2/21/2018 | | 49.98 | 70.73 |
| | 5/24/2018 | | 49.69 | 71.02 |
| | 9/27/2018 | | 53.11 | 67.6 |
| | 12/28/2018 | | 53.42 | 67.29 |

**Table 2 (MW-5R)**
**Static Water Level Measurement in Monitoring Wells**
**Wild Wings Water Recycling Facility, Yolo County, CA**

| Well | Date | TOC Elevation (feet msl) | DTW (feet btoc) | Water Surface Elevation (feet msl) |
|---|---|---|---|---|
| MW-5R | 6/15/2004 | 125.42 | 39.37 | 86.05 |
| | 3/29/2005 | | 37.65 | 87.77 |
| | 6/16/2005 | | 35.62 | 89.8 |
| | 9/29/2005 | | 40.73 | 84.69 |
| | 12/6/2005 | | 40.78 | 84.64 |
| | 2/16/2006 | | 36.02 | 89.4 |
| | 5/16/2006 | | 37.05 | 88.37 |
| | 8/21/2006 | | 36.12 | 89.3 |
| | 11/20/2006 | | 38.95 | 86.47 |
| | 2/8/2007 | | 38.97 | 86.45 |
| | 5/7/2007 | | 38.42 | 87 |
| | 8/29/2007 | | 42.97 | 82.45 |
| | 2/21/2008 | | 37.5 | 87.92 |
| | 5/27/2008 | | 38.06 | 87.36 |
| | 8/27/2008 | | 41.41 | 84.01 |
| | 11/24/2008 | | 41.84 | 83.58 |
| | 2/18/2009 | | 40.73 | 84.69 |
| | 5/21/2009 | | 40.54 | 84.88 |
| | 8/7/2009 | | 43.1 | 82.32 |
| | 11/5/2009 | | 45.2 | 80.22 |
| | 2/8/2010 | | 42.4 | 83.02 |
| | 5/7/2010 | | 39.77 | 85.65 |
| | 8/18/2010 | | 40.15 | 85.27 |
| | 11/2/2010 | | 42.53 | 82.89 |
| | 12/28/2010 | | 41.53 | 83.89 |
| | 2/23/2011 | | 40.1 | 85.32 |
| | 5/5/2011 | | 34.65 | 90.77 |
| | 8/16/2011 | | 36.78 | 88.64 |
| | 11/8/2011 | | 40.14 | 85.28 |
| | 2/27/2012 | | 40.31 | 85.11 |
| | 5/21/2012 | | 38.6 | 86.82 |
| | 8/9/2012 | | 40.68 | 84.74 |
| | 11/19/2012 | | 42.11 | 83.31 |
| | 2/21/2013 | | 39.03 | 86.39 |
| | 5/15/2013 | | 39.69 | 85.73 |
| | 8/15/2013 | | 41.55 | 83.87 |
| | 11/7/2013 | | 42.43 | 82.99 |
| | 2/25/2014 | | 42.28 | 83.14 |
| | 5/22/2014 | | 44.12 | 81.3 |
| | 8/27/2014 | | 49.26 | 76.16 |
| | 11/12/2014 | | 48.34 | 77.08 |
| | 2/26/2015 | | 43.39 | 82.03 |
| | 5/13/2015 | | 43.03 | 82.39 |
| | 8/4/2015 | | 42.8 | 82.62 |
| | 11/5/2015 | | 45.3 | 80.12 |
| | 2/4/2016 | | 43.76 | 81.66 |
| | 6/30/2016 | | 41.06 | 84.36 |
| | 8/25/2016 | | 42.23 | 83.19 |
| | 11/17/2016 | | 41.53 | 83.89 |
| | 3/7/2017 | | 32.08 | 93.34 |
| | 6/27/2017 | | 34.96 | 90.46 |
| | 8/23/2017 | | 38.11 | 87.31 |
| | 11/14/2017 | | 39.69 | 85.73 |
| | 2/21/2018 | | 40.39 | 85.03 |
| | 5/24/2018 | | 38.03 | 87.39 |
| | 9/27/2018 | | 41.65 | 83.77 |
| | 12/28/2018 | | 40.7 | 84.72 |

**Table 2 (MW-6)**
**Static Water Level Measurement in Monitoring Wells**
**Wild Wings Water Recycling Facility, Yolo County, CA**

| Well | Date | TOC Elevation (feet msl) | DTW (feet btoc) | Water Surface Elevation (feet msl) |
|---|---|---|---|---|
| MW-6 | 6/15/2004 | 121.59 | 37.96 | 83.63 |
| | 3/29/2005 | | 37.26 | 84.33 |
| | 6/16/2005 | | 34.92 | 86.67 |
| | 9/29/2005 | | 40.59 | 81 |
| | 12/6/2005 | | 40.77 | 80.82 |
| | 2/16/2006 | | 35.32 | 86.27 |
| | 5/16/2006 | | 30.28 | 91.31 |
| | 8/21/2006 | | 35.59 | 86 |
| | 11/20/2006 | | 38.57 | 83.02 |
| | 2/8/2007 | | 38.46 | 83.13 |
| | 5/7/2007 | | 37.97 | 83.62 |
| | 8/29/2007 | | 42.96 | 78.63 |
| | 2/21/2008 | | 37.02 | 84.57 |
| | 5/27/2008 | | 37.56 | 84.03 |
| | 8/27/2008 | | 41.26 | 80.33 |
| | 11/24/2008 | | 41.98 | 79.61 |
| | 2/18/2009 | | 40.67 | 80.92 |
| | 5/21/2009 | | 39.94 | 81.65 |
| | 8/7/2009 | | 42.98 | 78.61 |
| | 11/5/2009 | | 45.37 | 76.22 |
| | 2/8/2010 | | 42.51 | 79.08 |
| | 5/7/2010 | | 39.51 | 82.08 |
| | 8/18/2010 | | 40.14 | 81.45 |
| | 11/2/2010 | | 42 | 75.57 |
| | 12/28/2010 | | 41.67 | 79.92 |
| | 2/23/2011 | | 40.1 | 81.49 |
| | 5/5/2011 | | 34.03 | 87.56 |
| | 8/16/2011 | | 36.23 | 85.36 |
| | 11/8/2011 | | 40.27 | 81.32 |
| | 2/27/2012 | | 40.2 | 81.39 |
| | 5/21/2012 | | 38.67 | 82.92 |
| | 8/9/2012 | | 41.03 | 80.56 |
| | 11/19/2012 | | 42.47 | 79.12 |
| | 2/21/2013 | | 38.91 | 82.68 |
| | 5/15/2013 | | 39.64 | 81.95 |
| | 8/15/2013 | | 41.84 | 79.75 |
| | 11/7/2013 | | 42.65 | 78.94 |
| | 2/25/2014 | | 42.34 | 79.25 |
| | 5/22/2014 | | 44.14 | 77.45 |
| | 8/27/2014 | | dry | |
| | 11/12/2014 | | dry | |
| | 2/26/2015 | | 43.62 | 77.97 |
| | 5/13/2015 | | 43.65 | 77.94 |
| | 8/4/2015 | | 43.2 | 78.39 |
| | 11/5/2015 | | 45.58 | 76.01 |
| | 2/4/2016 | | 43.92 | 77.67 |
| | 6/30/2016 | | 41.31 | 80.28 |
| | 8/25/2016 | | 42.62 | 78.97 |
| | 11/17/2016 | | 41.8 | 79.79 |
| | 3/7/2017 | | 31.88 | 89.71 |
| | 6/27/2017 | | 34.37 | 87.22 |
| | 8/23/2017 | | 37.96 | 83.63 |
| | 11/14/2017 | | 39.71 | 81.88 |
| | 2/21/2018 | | 40.15 | 81.44 |
| | 5/24/2018 | | 39.25 | 82.34 |
| | 9/27/2018 | | 41.78 | 79.81 |
| | 12/28/2018 | | 40.71 | 80.88 |

**Table 2 (MW-7)**
**Static Water Level Measurement in Monitoring Wells**
**Wild Wings Water Recycling Facility, Yolo County, CA**

| Well | Date | TOC Elevation (feet msl) | DTW (feet btoc) | Water Surface Elevation (feet msl) |
|---|---|---|---|---|
| MW-7 | 6/15/2004 | 114.55 | 36.22 | 78.33 |
| | 3/29/2005 | | 35.8 | 78.75 |
| | 6/16/2005 | | 33.77 | 80.78 |
| | 9/29/2005 | | 38.09 | 76.46 |
| | 12/6/2005 | | dry | |
| | 2/16/2006 | | 34.08 | 80.47 |
| | 5/16/2006 | | 28.69 | 85.86 |
| | 8/21/2006 | | 34.29 | 80.26 |
| | 11/20/2006 | | 36.96 | 77.59 |
| | 2/8/2007 | | 36.85 | 77.7 |
| | 5/7/2007 | | 36.22 | 78.33 |
| | 8/29/2007 | | dry | |
| | 2/21/2008 | | 35.55 | 79 |
| | 5/27/2008 | | 35.92 | 78.63 |
| | 8/27/2008 | | 38.16 | 76.39 |
| | 11/24/2008 | | dry | |
| | 2/18/2009 | | dry | |
| | 5/21/2009 | | dry | |
| | 8/7/2009 | | dry | |
| | 11/5/2009 | | dry | |
| | 2/8/2010 | | dry | |
| | 5/7/2010 | | 37.4 | 77.15 |
| | 8/18/2010 | | dry | |
| | 11/2/2010 | | dry | |
| | 12/28/2010 | | dry | |
| | 2/23/2011 | | 37.95 | 76.6 |
| | 5/5/2011 | | 33.15 | 81.4 |
| | 8/16/2011 | | 34.92 | 79.63 |
| | 11/8/2011 | | dry | |
| | 2/27/2012 | | 38.04 | 76.51 |
| | 5/21/2012 | | 36.95 | 77.6 |
| | 8/9/2012 | | dry | |
| | 11/19/2012 | | dry | |
| | 2/21/2013 | | 37.21 | 77.34 |
| | 5/15/2013 | | 37.55 | 77 |
| | 8/15/2013 | | dry | |
| | 11/7/2013 | | dry | |
| | 2/25/2014 | | dry | |
| | 5/22/2014 | | dry | |
| | 8/27/2014 | | dry | |
| | 11/12/2010 | | dry | |
| | 2/26/2015 | | dry | |
| | 5/13/2015 | | dry | |
| | 8/4/2015 | | dry | |
| | 11/5/2015 | | dry | |
| | 2/4/2016 | | dry | |
| | 6/30/2016 | | dry | |
| | 8/25/2016 | | dry | |
| | 11/17/2016 | | dry | |
| | 3/7/2017 | | 32.01 | 82.54 |
| | 6/27/2017 | | 33.57 | 80.98 |
| | 8/23/2017 | | 36.69 | 77.86 |
| | 11/14/2017 | | 38.26 | 76.29 |
| | 2/21/18 | | 38.42 | 76.13 |
| | 5/24/2018 | | 39.35 | 75.20 |
| | 9/27/2018 | | dry | |
| | 12/28/2018 | | dry | |

**Table 3**
**Groundwater Flow Direction and Gradient**
**Wild Wings Water Recycling Facility, Yolo County, CA**

| Sample Date | Water Surface Elevation [1] MW-1 | MW-5R | MW-4 | Gradient (ft/ft) | Flow Direction (degrees)[2] |
|---|---|---|---|---|---|
| 6/15/2004 | 93.41 | 86.05 | 76.12 | 0.006 | 65 |
| 3/29/2005 | 95.6 | 87.77 | 77.88 | 0.006 | 64.2 |
| 6/16/2005 | 96.6 | 89.8 | 78.78 | 0.006 | 67.3 |
| 9/29/2005 | 94.47 | 84.69 | n/a | n/a | n/a |
| 12/6/2005 | 94.82 | 84.64 | 74.11 | 0.007 | 61.7 |
| 2/16/2006 | 96.23 | 89.4 | 78.4 | 0.006 | 67.2 |
| 5/16/2006 | 98.97 | 88.37 | 83.1 | 0.006 | 53.3 |
| 8/21/2006 | 96.49 | 89.3 | 78.46 | 0.006 | 66.4 |
| 11/20/2006 | 95.95 | 86.47 | 78.91 | 0.006 | 58.5 |
| 2/8/2007 | 94.85 | 86.45 | 79.86 | 0.005 | 58.3 |
| 5/7/2007 | 95.43 | 87 | 79.79 | 0.005 | 59.4 |
| 8/29/2007 | 93.84 | 82.45 | 74.58 | 0.007 | 56.9 |
| 2/21/2008 | 96.26 | 87.92 | 79.51 | 0.006 | 61.4 |
| 5/27/2008 | 96.52 | 87.36 | 78.37 | 0.006 | 61.1 |
| 8/27/2008 | 95.73 | 84.01 | 75.06 | 0.007 | 58 |
| 11/24/2008 | 93.79 | 83.58 | 74.64 | 0.007 | 59.7 |
| 2/18/2009 | 95.5 | 84.69 | 75.42 | 0.007 | 59.4 |
| 5/21/2009 | 94.9 | 84.88 | 76.27 | 0.006 | 59.4 |
| 8/4/2009 | 93.26 | 82.32 | 71.17 | 0.008 | 61.5 |
| 11/5/2009 | 91.88 | 80.22 | 69.71 | 0.008 | 60 |
| 2/8/2010 | 94.17 | 83.02 | 71.4 | 0.008 | 61.8 |
| 5/7/2010 | 94.37 | 85.65 | 74.77 | 0.007 | 64 |
| 8/18/2010 | 95 | 85.27 | 72.66 | 0.008 | 64.5 |
| 11/2/2010 | 94.22 | 82.89 | 71.66 | 0.008 | 61.2 |
| 12/28/2010 | 95.46 | 83.89 | 72.7 | 0.008 | 60.9 |
| 2/23/2011 | 94.89 | 85.32 | 74.4 | 0.007 | 62.9 |
| 5/5/2011 | 96.78 | 90.77 | 78.67 | 0.006 | 69.9 |
| 8/16/2011 | 95.99 | 88.64 | 75.69 | 0.007 | 68.3 |
| 11/8/2011 | 94.27 | 85.28 | 74.07 | 0.007 | 64 |
| 2/27/2012 | 93.38 | 85.11 | 75.99 | 0.006 | 62.5 |
| 5/21/2012 | 93.42 | 86.82 | 76.15 | 0.006 | 67.3 |
| 8/9/2012 | 92.38 | 84.74 | 72.63 | 0.007 | 67 |
| 11/19/2012 | 91.83 | 83.31 | 70.93 | 0.007 | 65.9 |
| 2/21/2013 | 94.12 | 86.39 | 74.81 | 0.007 | 66.3 |
| 5/15/2013 | 94.49 | 85.73 | 74.02 | 0.007 | 64.9 |
| 8/15/2013 | 93.38 | 83.87 | 70.04 | 0.008 | 66 |
| 11/7/2013 | 92.53 | 82.99 | 68.72 | 0.008 | 66.3 |
| 2/25/2014 | 91.84 | 83.14 | 69.83 | 0.007 | 66.6 |
| 5/22/2014 | 91 | 81.3 | 69.63 | 0.007 | 63.6 |
| 8/27/2014 | 89.57 | 76.16 | 65.22 | 0.009 | 58.8 |
| 11/12/2014 | 89.29 | 77.08 | 64.35 | 0.009 | 61.8 |
| 2/26/2015 | 91.34 | 82.03 | 66.86 | 0.008 | 67.4 |
| 5/13/2015 | 90.62 | 82.39 | 66.81 | 0.008 | 69.2 |
| 8/4/2015 | 90.19 | 82.62 | 65.29 | 0.008 | 71.3 |
| 11/5/2015 | 89.32 | 80.12 | 63.97 | 0.009 | 68.3 |
| 2/4/2016 | 90.89 | 81.66 | 64.31 | 0.009 | 69.1 |
| 6/30/2016 | 91.85 | 84.36 | 66.49 | 0.009 | 71.8 |
| 8/25/2016 | 91.63 | 83.19 | 65.5 | 0.009 | 70.3 |
| 11/17/2016 | 91.32 | 83.89 | 65.17 | 0.009 | 72.4 |
| 3/7/2017 | 100.04 | 93.34 | 72.25 | 0.009 | 74.7 |
| 6/27/2017 | 98.08 | 90.46 | 73.66 | 0.008 | 71.0 |
| 8/23/17 | 96.13 | 87.31 | 72.12 | 0.006 | 74.0 |
| 11/14/2017 | 95.15 | 85.73 | 70.73 | 0.006 | 75.0 |
| 2/21/2018 | 93.28 | 85.03 | 70.73 | 0.006 | 72.0 |
| 5/24/2018 | 93.19 | 87.39 | 71.02 | 0.006 | 79.0 |
| 9/27/2018 | 92.15 | 83.77 | 67.60 | 0.005 | 71.1 |
| 12/28/2018 | 94.88 | 84.72 | 67.29 | 0.007 | 69.0 |

[1] Groundwater elevations from 6/15/04 to 2/21/08 were provided by DelTech; groundwater elevations from 5/27/08 to 3/7/2017 were provided by GEI; groundwater elevations from 6/27/2017 to 6/30/18 by SSAL; groundwater elevations from 9/27/2018 through present provided by CRWA.

[2] Measured clockwise with North as 0.0 degrees, Using graphical methods perpendicular to groundwater contours.

TOC = Top of Casing

msl = mean sea level

DTW = depth to water

btoc = below top of casing

**Table 4**
**Groundwater Quality Monitoring Results**
**Wild Wings Water Recycling Facility, Yolo County, CA**

| Sampling Point | Sample Date | Lab | pH Std Unit | TDS mg/L | Na (d) mg/L | Cl mg/L | B (d) mg/L | Fe (d) mg/L | Mn (d) mg/L | NO3-N mg/L | NO2-N mg/L | NH3-N mg/L | Total Nitrogen mg/L | Coliform Bacteria (total) (MPN/100 mL) | *(fecal)* (MPN/100 mL) | *(E. coli)* (MPN/100 mL) | TTHM (1) (EPA 601) ug/L | Lab Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Recommended | WO Objective | | 6.5-8.5 | 450 | 69 | 106 | 0.6 | 0.3 | 0.05 | 10 | 1 | 0.5 | 10 | ND | ND | ND | 100 | |
| Interim Limitation [2] | Background | | 7.6 | 1100 | 155 | 138 | - | <0.1 | 0.64 | 18 | - | 0.5 | - | <2.0 | <2.0 | - | - | - |
| MW-1 | 6/15/2004 | STL | 7.7 | 1410 | 112 | 391 | 2.1 | <0.10 | - | 18.7 | <0.05 | <0.10 | 18.7 | >23.0 | <1.1 | <1.1 | <0.5 | |
| MW-1 | 3/29/2005 | BSK | 7.9 | 1200 | 160 | 360 | 3.7 | <0.05 | <0.01 | 27 | <0.15 | <1 | 27 | 2.2 | <1.1 | - | <0.5 | |
| MW-1 | 6/16/2005 | BSK | 7.7 | 1200 | 130 | 340 | 3.2 | <0.05 | <0.01 | 25 | <0.20 | <1 | 25 | <1.1 | <1.1 | - | 5.1 | 3 |
| MW-1 | 9/29/2005 | BSK | 7.8 | 1200 | 130 | 310 | 3.2 | <0.05 | <0.01 | 27 | <0.15 | <1 | 27 | <1.1 | <1.1 | - | <0.5 | |
| MW-1 | 12/6/2005 | BSK | 8.1 | 1100 | 120 | 340 | 2.9 | <0.05 | <0.01 | 27 | <0.15 | <1 | 27 | <1.1 | <1.1 | <1.1 | 6.12 | 3 |
| MW-1 | 2/16/2006 | BSK | 8.0 | 1300 | 110 | 340 | 2.7 | <0.05 | <0.01 | 27 | <0.10 | <1 | 27 | <1.1 | <1.1 | - | <0.5 | |
| MW-1 | 5/16/2006 | BSK | 8.0 | 1100 | 130 | 300 | 3.4 | <0.05 | <0.01 | 27 | <0.15 | <1 | 27 | <1.1 | <1.1 | - | <0.5 | |
| MW-1 | 8/21/2006 | BSK | 8.0 | 1000 | 120 | 270 | 3.6 | <0.05 | <0.01 | 25 | <0.05 | <0.10 | | <1.1 | <1.1 | - | <0.5 | |
| MW-1 | 11/20/2006 | BSK | - | - | - | - | - | - | - | - | - | - | - | >23.0 | <1.1 | - | - | |
| MW-1 | 2/16/2007 | | | | | | | | No sample retrieved | | | | | | | | | |
| MW-1 | 5/7/2007 | BSK | 8.0 | 1100 | 140 | 250 | 4.2 | <0.05 | <0.01 | 27 | <0.05 | <1.0 | 27 | 2.2 | <1.1 | - | <0.5 | |
| MW-1 | 8/29/2007 | BSK | 8.0 | 1100 | 110 | 240 | 3.6 | <0.05 | <0.01 | 24 | * | <1.0 | 24 | <1.1 | <1.1 | - | <0.5 | |
| MW-1 | 11/28/2007 | BSK | 8.0 | 1100 | 130 | 220 | 4.0 | <0.05 | <0.01 | 24 | * | <1.0 | 26 | <1.1 | <1.1 | - | <0.5 | |
| MW-1 | 2/21/2008 | BSK | - | - | - | - | - | | - | | | - | | <1.1 | <1.1 | - | | |
| MW-1 | 5/27/2008 | CLS | 7.3 | 1100 | 120 | 250 | 3.5 | 0.10 | <0.02 | 23 | <0.10 | <0.10 | 23 | 13 | - | - | <0.50 | |
| MW-1 | 8/27/2008 | CLS | 7.4 | 1100 | 120 | 230 | 3.6 | <0.10 | <0.02 | 24 | <0.10 | <0.10 | 24 | <1.8 | - | - | <0.50 | |
| MW-1 | 11/24/2008 | CLS | 7.4 | 1100 | 120 | 260 | 3.2 | 0.44 | <0.02 | 25 | <0.10 | <0.10 | 25 | <1.8 | - | - | <0.50 | |
| MW-1 | 2/18/2009 | CLS | | 980 (5) | 130 | 170 | 4 | <010 | <0.02 | 19 | <0.10 | <010 | 19 | <1 8 | - | - | <0 50 | |
| MW-1 | 5/21/2009 | CLS | 7.3 | 1100 | 110 | 210 | 3.5 | <0.10 | <0.02 | 21 | <0.10 | <0.10 | 21 | <1.8 | - | - | <0.50 | |
| MW-1 | 8/4/2009 | CLS | 7.3 | 1100 | 96 | 240 | 3.1 | 0.13 | <0.02 | 23 | <0.10 | <0.10 | 23 | 2.0 | - | - | <0.50 | |
| MW-1 | 11/5/2009 | CLS | 7.16 | 1100 (5) | 110 | 260 | 3.1 | 0.15 | <0.02 | 24 | <0.10 | <0.10 | 24 | <1.8 | - | - | <0.50 | |
| MW-1 | 2/8/2010 | CLS | 7.4 | 1200 | 120 | 290 | 3.5 | <0.10 | <0.02 | 25 | <0.10 | <0.10 | 25 | <1.8 | - | - | <0.50 | |
| MW-1 | 5/7/2010 | CLS | 7.4 | 1100 | 120 | 280 | 3.0 | <0.10 | <0.02 | 25 | <0.10 | <0.10 | 25 | <1.8 | - | - | <0.50 | |
| MW-1 | 8/18/2010 | CLS | 7.2 | 1100 | 140 | 250 | 3.6 | <0.10 | <0.02 | 24 | <0.10 | <0.10 | 24 | 2.0 | - | - | <0.50 | |
| MW-1 | 11/2/2010 | CLS | 7.4 | 1200 | 130 | 280 | 3.3 | <0.10 | <0.02 | 26 | <0.10 | <0.10 | 27 | <1.8 | - | - | <0.50 | |
| MW-1 | 2/23/2011 | CLS | 7.4 | 1100 | 130 | 270 | 3.6 | <0.10 | <0.02 | 26 | <0.10 | <0.10 | 26 | <1.8 | - | - | <0.50 | |
| MW-1 | 5/5/2011 | CLS | 7.4 | 1100 | 130 | 250 | 3.7 | <0.10 | <0.02 | 24 | <0.10 | <0.10 | 24 | <1.8 | - | - | <0.50 | |
| MW-1 | 8/16/2011 | CLS | 7.4 | 1200 | 140 | 200 | 4.2 | <0.10 | <0.02 | 24 | <0.10 | <0.10 | 24 | <1.8 | - | - | <0.50 | |
| MW-1 | 11/8/2011 | CLS | 7.3 | 1200 | 130 | 220 | 4.0 | <0.10 | <0.02 | 20 | <0.10 | <0.10 | 20 | <1.8 | - | - | <0.50 | |
| MW-1 | 2/27/2012 | CLS | 7.3 | 1100 | 140 | 220 | 4.4 | <0.10 | <0.02 | 21 | <0.10 | <0.10 | 21 | <1.8 | - | - | <0.50 | |
| MW-1 | 5/21/2012 | CLS | 7.5 | 1100 | 130 | 230 | 4.0 | <0.10 | <0.02 | 23 | <0.10 | 0.13 | 23 | <1.8 | - | - | <0.50 | |
| MW-1 | 8/9/2012 | CLS | 7.6 | 1100 | 130 | 210 | 3.9 | <0.10 | <0.02 | 20 | <0.10 | <0.10 | 20 | <1.8 | - | - | <0.50 | |
| MW-1 | 11/19/2012 | CLS | 7.3 | 1200 | 120 | 220 | 3.5 | <0.10 | <0.02 | 20 | <0.10 | <0.10 | 20 | <1.8 | - | - | <0.50 | |
| MW-1 | 2/21/2013 | CLS | 7.2 | 1100 | 140 | 200 | 4.1 | <0.10 | <0.02 | 19 | <0.10 | 0.14 | 19 | <1.8 | - | - | <0.50 | |
| MW-1 | 5/15/2013 | CLS | 7.2 | 1200 | 130 | 220 | 4.1 | <0.10 | <0.02 | 23 | <0.10 | <0.10 | 23 | <1.8 | - | - | <0.50 | |
| MW-1 | 8/15/2013 | CLS | 7.3 | 1100 | 130 | 230 | 3.7 | 0.15 | <0.02 | 22 | <0.10 | <0.10 | 22 | <1.8 | - | - | <0.50 | |
| MW-1 | 11/7/2013 | CLS | 7.4 | 1100 | 150 | 240 | 3.4 | <0.10 | <0.02 | 22 | <0.10 | <0.10 | 22 | <1.8 | - | - | <0.50 | |
| MW-1 | 2/25/2014 | CLS | 7.4 | 1100 | 100 | 260 | 3.5 | <0.10 | <0.02 | 22 | <0.10 | <0.10 | 22 | <1.8 | - | - | <0.50 | |
| MW-1 | 5/22/2014 | CLS | 7.4 | 1100 | 110 | 220 | 3.3 | <0.10 | <0.02 | 20 | <0.10 | <0.10 | 20 | <1.8 | - | - | <0.50 | |
| MW-1 | 8/27/2014 | CLS | 7.5 | 1200 | 110 | 230 | 3.5 | <0.10 | <0.02 | 20 | <0.10 | <0.10 | 20 | <1.8 | - | - | <0.50 | |
| MW-1 | 11/12/2014 | CLS | 7.36 | 1000 (7) | 93 | 240 | 2.8 | <0.10 | <0.02 | 20 | <0.10 | <0.10 | 20 | <1 | - | - | <0.50 | |
| MW-1 | 2/26/2015 | CLS | 7.3 | 990 | 110 | 200 | 3.5 | <0.10 | <0.02 | 17 | <0.10 | <0.10 | 17 | <1.8 | - | - | <0.50 | |
| MW-1 | 5/13/2015 | CLS | 7.4 | 1100 | 100 | 200 | 3.5 | <0.10 | <0.02 | 17 | <0.10 | <0.10 | 17 | <1.8 | - | - | <0.50 | |
| MW-1 | 8/4/2015 | CLS | 7.3 | 1200 | 110 | 200 | 3.6 | <0.10 | <0.02 | 19 | <0.10 | <0.10 | 19 | <1.8 | - | - | <0.50 | |
| MW-1 | 11/5/2015 | CLS | 7.3 | 1200 | 100 | 220 | 3.2 | <0.10 | <0.02 | 20 | <0.10 | <0.10 | 20 | <1.8 | - | - | <0.50 | |
| MW-1 | 2/4/2016 | CLS | 7.3 | 1200 | 110 | 200 | 3.9 | <0.10 | <0.02 | 20 | <0.40 | <0.10 | 20 | <1.8 | - | - | <0.50 | |
| MW-1 | 6/30/2016 | CLS | 7.2 | 1100 | 110 | 180 | 3.9 | <0.10 | <0.02 | 16 | <0.40 | <0.10 | 16 | <1.8 | - | - | <0.50 | |
| MW-1 | 8/25/2016 | CLS | 7.3 | 990 | 100 | 170 | 3.3 | <0.10 | <0.02 | 16 | <0.40 | <0.10 | 16 | 2.0 | - | - | 8.5 | |
| MW-1 | 11/17/2016 | CLS | 7.4 | 1100 | 110 | 180 | 3.7 | <0.10 | <0.02 | 17 | <0.40 | <0.10 | 17 | <1.8 | - | - | <0.50 | |
| MW-1 | 3/7/2017 | CLS | 7.4 | 990 | 110 | 230 | 3.5 | <0.10 | <0.02 | 15 | <0.40 | 0.18 | 15 | <1.8 | - | - | <0.50 | |
| MW-1 | 6/27/2017 | CLS | 7.1 | 1100 | 150 | 140 | 4.6 | <0.10 | <0.02 | 16 | <0.40 | 0.19 | 16 | 2.0 | - | - | <0.50 | |

| Sampling Point | Sample Date | Lab | pH Std Unit | TDS mg/L | Na (d) mg/L | Cl mg/L | B (d) mg/L | Fe (d) mg/L | Mn (d) mg/L | NO3-N mg/L | NO2-N mg/L | NH3-N mg/L | Total Nitrogen mg/L | Coliform Bacteria (total) (MPN/100 mL) | *(fecal)* (MPN/100 mL) | *(E. coli)* (MPN/100 mL) | TTHM (1) (EPA 601) ug/L | Lab Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Recommended | WO Objective | | 6.5-8.5 | 450 | 69 | 106 | 0.6 | 0.3 | 0.05 | 10 | 1 | 0.5 | 10 | ND | ND | ND | 100 | |
| Interim Limitation [2] | Background | | 7.6 | 1100 | 155 | 138 | - | <0.1 | 0.64 | 18 | - | 0.5 | - | <2.0 | <2.0 | - | - | - |
| MW-1 | 8/23/2017 | CLS | 6.6 | 960 | 150 | 130 | 5.1 | <0.10 | <0.02 | 14 | <0.40 | <0.10 | 14 | 2.0 | - | - | <0.50 | |
| MW-1 | 11/14/2017 | CLS | 7.2 | 960 | 150 | 120 | 5.1 | <0.10 | <0.02 | 11 | <0.40 | <0.10 | 11 | <1.8 | - | - | <0.50 | |
| MW-1 | 2/21/2018 | CLS | 7.4 | 960 | 140 | 120 | 5.4 | <0.10 | <0.02 | 12 | <0.40 | <0.10 | 12 | <1.8 | - | - | <0.50 | |
| MW-1 | 5/24/2018 | CLS | 7.4 | 970 | 120 | 120 | 6.1 | <0.10 | <0.02 | 18 | <0.40 | <0.10 | 18 | <1.8 | - | - | <0.50 | |
| MW-1 | 9/27/2018 | CLS | 7.23 | 1,100 | 130 | - | 4.4 | <0.10 | <0.02 | 14 | <0.40 | <0.10 | 14 | <1.8 | - | - | <0.50 | |
| MW-1 | 12/28/2018 | CLS | 7.32 | 900 | 120 | 230 | 3.4 | <0.10 | <0.02 | 18 | <0.40 | <0.10 | 18 | <1.8 | - | - | <0.50 | |
| MW-2 | 6/15/2004 | STL | 7.6 | 884 | 147 | 78.4 | 5.9 | <0.10 | - | 11.9 | <0.05 | <0.10 | 11.9 | 23 | <1.1 | <1.1 | <0.5 | |
| MW-2 | 3/29/2005 | BSK | 7.8 | 880 | 200 | 95 | 7.2 | <0.05 | <0.01 | 11 | <0.15 | <1 | 11 | 1.1 | <1.1 | - | <0.5 | |
| MW-2 | 6/16/2005 | BSK | 7.6 | 920 | 150 | 100 | 5.5 | <0.05 | <0.01 | 11 | <0.10 | <1 | 11 | >23.0 | <1.1 | - | 4 | 3 |
| MW-2 | 9/29/2005 | BSK | 7.8 | 960 | 170 | 110 | 5.8 | <0.05 | <0.01 | 12 | <0.15 | <1 | 12 | 5.1 | <1.1 | - | <0.5 | |
| MW-2 | 12/6/2005 | BSK | 8 | 970 | 180 | 130 | 6.1 | <0.05 | <0.01 | 12 | <0.10 | <1 | 12 | 1.1 | <1.1 | <1.1 | 1.8 | 3 |
| MW-2 | 2/16/2006 | BSK | 7.9 | 940 | 150 | 120 | 5.4 | <0.05 | <0.01 | 11 | <0.10 | <1 | 11 | <1.1 | <1.1 | - | 1.6 | 3 |
| MW-2 | 5/16/2006 | BSK | 8 | 1,000 | 170 | 120 | 5.9 | <0.05 | <0.01 | 13 | <0.15 | 4 | 13 | <1.1 | <1.1 | - | 1.6 | 3 |
| MW-2 | 8/21/2006 | BSK | 7.9 | 1,000 | 150 | 140 | 5.2 | <0.05 | <0.01 | 14 | <0.05 | <0.10 | - | <1.1 | <1.1 | - | <0.5 | |
| MW-2 | 11/20/2006 | BSK | - | - | - | - | - | - | - | - | - | - | - | >23.0 | <1.1 | - | - | |
| MW-2 | 2/16/2007 | | | | | | | | No sample retrieved | | | | | | | | | |
| MW-2 | 5/7/2007 | BSK | 7.9 | 920 | 170 | 120 | 6 | <0.05 | <0.01 | 11 | <0.05 | <1.0 | 11 | <1.1 | <1.1 | - | <0.5 | |
| MW-2 | 8/29/2007 | BSK | 7.9 | 850 | 130 | 110 | 4.8 | <0.05 | <0.01 | 10 | * | <1.0 | 10 | <1.1 | <1.1 | - | 1.14 | |
| MW-2 | 11/28/2007 | BSK | 7.8 | 890 | 150 | 100 | 5.3 | <0.05 | <0.01 | 11 | * | <1.0 | 11 | <1.1 | <1.1 | - | <0.5 | |
| MW-2 | 2/21/2008 | BSK | - | - | - | - | - | - | - | - | - | - | - | 1.1 | <1.1 | - | - | |
| MW-2 | 5/27/2008 | CLS | 7 | 910 | 170 | 97 | 5.7 | <0.10 | <0.01 | 9.1 | <0.10 | <0.10 | 9.2 | <1.8 | - | - | <0.50 | |
| MW-2 | 8/27/2008 | CLS | 7 | 910 | 150 | 100 | 5 | <0.10 | <0.02 | 9.5 | <0.10 | 0.11 | 9.6 | <1.8 | - | - | <0.50 | |
| MW-2 | 11/24/2008 | CLS | 7.2 | 950 | 150 | 100 | 5 | <0.10 | <0.02 | 9.1 | <0.10 | <0.10 | 9.1 | 79 | - | - | <0.50 | |
| MW-2 | 2/18/2009 | CLS | - | 880 (5) | 140 | 100 | 4.9 | <0.10 | <0.02 | 8.2 | <0.10 | <0.10 | 8.5 | 6.8 | - | - | <0.50 | |
| MW-2 | 5/21/2009 | CLS | 7.1 | 870 | 140 | 89 | 4.7 | <0.10 | <0.02 | 8.1 | <0.10 | <0.10 | 8.3 | <1.8 | - | - | <0.50 | |
| MW-2 | 8/4/2009 | CLS | 7 | 860 | 120 | 91 | 4.2 | <0.10 | <0.02 | 8 | <0.10 | <0.10 | 8 | <1.8 | - | - | <0.50 | |
| MW-2 | 11/5/2009 | CLS | - | 790 (5) | 150 | 100 | 4.8 | <0.10 | <0.02 | 7.9 | <0.10 | <0.10 | 8 | <1.8 | - | - | <0.50 | |
| MW-2 | 2/8/2010 | CLS | 7.2 | 960 | 170 | 110 | 5.6 | 0.1 | <0.02 | 7.9 | <0.10 | <0.10 | 7.9 | 7.8 | - | - | <0.50 | |
| MW-2 | 5/7/2010 | CLS | 7.1 | 950 | 160 | 120 | 5.1 | <0.10 | <0.02 | 7.5 | <0.10 | <0.10 | 7.5 | <1.8 | - | - | <0.50 | |
| MW-2 | 8/18/2010 | CLS | 7.1 | 1,000 | 180 | 130 | 5.7 | 0.22 | <0.02 | 8.3 | <0.10 | 0.11 | 8.5 | <1.8 | - | - | <0.50 | |
| MW-2 | 11/2/2010 | CLS | 7.1 | 1,100 | 210 | 140 | 6.1 | <0.10 | <0.02 | 8.4 | <0.10 | <0.10 | 8.7 | <1.8 | - | - | <0.50 | |
| MW-2 | 2/23/2011 | CLS | 7.1 | 1,200 | 160 | 160 | 5.7 | <0.10 | <0.02 | 8.5 | <0.10 | 0.17 | 11 | 13 | - | - | <0.50 | |
| MW-2 | 5/5/2011 | CLS | 7.1 | 970 | 160 | 150 | 5.6 | <0.10 | <0.02 | 7.3 | <0.10 | <0.10 | 7.6 | <1.8 | - | - | <0.50 | |
| MW-2 | 8/16/2011 | CLS | 7.1 | 1,100 | 190 | 170 | 6.6 | 0.17 | <0.02 | 9.4 | <0.10 | <0.10 | 9.6 | <1.8 | - | - | <0.50 | |
| MW-2 | 11/8/2011 | CLS | 7 | 1,200 | 180 | 170 | 6.3 | <0.10 | <0.02 | 8.8 | <0.10 | <0.10 | 8.8 | <1.8 | - | - | <0.50 | |
| MW-2 | 2/27/2012 | CLS | 7 | 1,100 | 190 | 140 | 7 | <0.10 | <0.02 | 8 | <0.10 | <0.10 | 8.2 | <1.8 | - | - | <0.50 | |
| MW-2 | 5/21/2012 | CLS | 7.1 | 990 | 180 | 130 | 7.3 | <0.10 | <0.02 | 8.2 | <0.10 | 0.2 | 8.4 | 2 | - | - | <0.50 | |
| MW-2 | 8/9/2012 | CLS | 7.4 | 1,000 | 140 | 120 | 4.7 | <0.10 | <0.02 | 8.8 | <0.10 | 0.11 | 9 | <1.8 | - | - | <0.50 | |
| MW-2 | 11/19/2012 | CLS | 7 | 1000 | 170 | 110 | 6 | <0.10 | <0.02 | 8.6 | <0.10 | <0.10 | 8.9 | 2 | - | - | <0.50 | |
| MW-2 | 2/21/2013 | CLS | 7 | 930 | 170 | 100 | 6.2 | 0.14 | <0.02 | 8.7 | <0.10 | 0.12 | 8.9 | 14 | - | - | <0.50 | |
| MW-2 | 5/15/2013 | CLS | 7.1 | 940 | 170 | 120 | 6.2 | <0.10 | <0.02 | 8.6 | <0.10 | <0.10 | 8.7 | <1.8 | - | - | <0.50 | |
| MW-2 | 8/15/2013 | CLS | 7 | 990 | 160 | 120 | 5.2 | <0.10 | <0.02 | 8.3 | <0.10 | <0.10 | 8.6 | <1.8 | - | - | <0.50 | |
| MW-2 | 11/7/2013 | CLS | 7 | 900 | 150 | 110 | 5.7 | <0.10 | <0.02 | 8.1 | <0.10 | 0.17 | 8.4 | <1.8 | - | - | <0.50 | |
| MW-2 | 2/25/2014 | CLS | 7.1 | 830 | 140 | 86 | 5.9 | <0.10 | <0.02 | 8.4 | <0.10 | <0.10 | 8.6 | <1.8 | - | - | <0.50 | |
| MW-2 | 5/22/2014 | CLS | 7 | 830 | 140 | 73 | 5.6 | <0.10 | <0.02 | 8.1 | <0.10 | <0.10 | 8.1 | <1.8 | - | - | <0.50 | |
| MW-2 | 8/27/2014 | | | | | | | | No sample retrieved | | | | | | | | | |
| MW-2 | 11/12/2014 | | | | | | | | No sample retrieved | | | | | | | | | |
| MW-2 | 2/26/2015 | CLS | 7 | 800 | 130 | 87 | 5.3 | <0.10 | <0.02 | 8.3 | <0.10 | <0.10 | 8.4 | <1.8 | - | - | <0.50 | |
| MW-2 | 5/13/2015 | CLS | 7.2 | 830 | 130 | 86 | 5.3 | <0.10 | <0.02 | 9.2 | <0.10 | <0.10 | 9.3 | <1.8 | - | - | <0.50 | |
| MW-2 | 8/4/2015 | CLS | 7.2 | 830 | 150 | 88 | 5.4 | <0.10 | <0.02 | 8.3 | <0.10 | <0.10 | 8.5 | <1.8 | - | - | <0.50 | |
| MW-2 | 11/5/2015 | CLS | 7.1 | 920 | 130 | 84 | 4.5 | <0.10 | <0.02 | 8.5 | <0.10 | <0.10 | 8.6 | <1.8 | - | - | <0.50 | |
| MW-2 | 2/4/2016 | CLS | 7.1 | 840 | 140 | 83 | 5.4 | <0.10 | <0.02 | 9 | <0.40 | <0.10 | 9.2 | <1.8 | - | - | <0.50 | |
| MW-2 | 6/30/2016 | CLS | 7 | 770 | 130 | 83 | 5.1 | <0.10 | <0.02 | 9.2 | <0.40 | <0.10 | 9.2 | <1.8 | - | - | 0.68 | |
| MW-2 | 8/25/2016 | CLS | 7.1 | 820 | 150 | 88 | 4.8 | <0.10 | <0.02 | 9.7 | <0.40 | 0.17 | 9.7 | <1.8 | - | - | 2.1 | |

| Sampling Point | Sample Date | Lab | pH Std Unit | TDS mg/L | Na (d) mg/L | Cl mg/L | B (d) mg/L | Fe (d) mg/L | Mn (d) mg/L | NO3-N mg/L | NO2-N mg/L | NH3-N mg/L | Total Nitrogen mg/L | Coliform Bacteria (total) (MPN/100 mL) | *(fecal)* (MPN/100 mL) | *(E. coli)* (MPN/100 mL) | TTHM (1) (EPA 601) ug/L | Lab Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Recommended Interim Limitation [2] | WO Objective | | 6.5-8.5 | 450 | 69 | 106 | 0.6 | 0.3 | 0.05 | 10 | 1 | 0.5 | 10 | ND | ND | ND | 100 | |
| | Background | | 7.6 | 1100 | 155 | 138 | - | <0.1 | 0.64 | 18 | - | 0.5 | - | <2.0 | <2.0 | - | - | - |
| MW-2 | 11/17/2016 | CLS | 7.3 | 820 | 140 | 94 | 4.9 | <0.10 | <0.02 | 10 | <0.40 | 0.12 | 11 | <1.8 | - | - | <0.50 | |
| MW-2 | 3/7/2017 | CLS | 7.2 | 840 | 140 | 120 | 5.4 | <0.10 | <0.02 | 8.8 | <0.40 | <0.10 | 9 | <1.8 | - | - | <0.50 | |
| MW-2 | 6/27/2017 | CLS | 6.9 | 940 | 160 | 130 | 5.5 | <0.10 | <0.02 | 16 | -- | 0.12 | 16 | 7.8 | - | - | <0.50 | |
| MW-2 | 8/23/2017 | CLS | 7.1 | 960 | 180 | 130 | 6.3 | <0.10 | <0.02 | 18 | <0.40 | <0.10 | 18 | 17 | - | - | <0.50 | |
| MW-2 | 11/14/2017 | CLS | 7.1 | 1000 | 170 | 140 | 6.2 | <0.10 | <0.02 | 21 | <0.40 | 0.1 | 21 | 4.5 | - | - | <0.50 | |
| MW-2 | 2/21/2018 | CLS | 7.1 | 1000 | 160 | 130 | 6.3 | <0.10 | <0.02 | 19 | <0.40 | <0.10 | 19 | 7.8 | - | - | <0.50 | |
| MW-2 | 5/24/2018 | CLS | 7.1 | 970 | 150 | 130 | 6.1 | <0.10 | <0.02 | 18 | <0.40 | <0.10 | 18 | <1.8 | - | - | <0.50 | |
| MW-2 | 9/27/2018 | CLS | 7.03 | 990 | 170 | - | 6.0 | <0.10 | <0.02 | 16 | <0.40 | <0.10 | 16 | <1.8 | - | - | <0.50 | |
| MW-2 | 12/28/2018 | CLS | 7.13 | 890 | 150 | 120 | 5.5 | <0.10 | <0.02 | 14 | <0.40 | <0.10 | 14 | <1.8 | - | - | <0.50 | |
| | | | | | | | | | | | | | | | | | | |
| MW-3 | 6/15/2004 | STL | 7.7 | 435 | 90.6 | 34.8 | 1.7 | <0.10 | - | 1.7 | <0.05 | <0.10 | 1.7 | 23 | <1.1 | <1.1 | <0.5 | |
| MW-3 | 3/29/2005 | BSK | 7.8 | 390 | 96 | 38 | 1.5 | <0.05 | <0.01 | 2.9 | <0.05 | <1 | 2.9 | >23.0 | 1.1 | - | <0.5 | |
| MW-3 | 6/16/2005 | BSK | 7.6 | 380 | 81 | 26 | 1.2 | <0.05 | <0.01 | 0.7 | <0.10 | <1 | 0.7 | 5.1 | <1.1 | - | 1.6 | 3 |
| MW-3 | 9/29/2005 | BSK | 7.8 | 620 | 120 | 57 | 2.0 | <0.05 | <0.01 | 1.8 | <0.10 | <1 | 1.8 | >23.0 | 12 | - | 0.79 | 3 |
| MW-3 | 12/6/2005 | BSK | 8.1 | 610 | 140 | 62 | 2.1 | <0.05 | <0.01 | 1.6 | <0.10 | <1 | 1.6 | >23.0 | 3.6 | 3.6 | 5.4 | 3 |
| MW-3 | 2/16/2006 | BSK | 7.9 | 380 | 74 | 31 | 1.1 | 0.1 | <0.01 | 1.4 | <0.05 | <1 | 1.4 | 16.1 | 1.1 | - | <0.5 | |
| MW-3 | 5/16/2006 | BSK | 8.0 | 420 | 72 | 32 | 1.1 | <0.05 | <0.01 | 1.6 | <0.05 | <1 | 1.6 | >23.0 | 5.1 | - | 2.6 | 3 |
| MW-3 | 8/21/2006 | BSK | 8.0 | 480 | 110 | 49 | 1.7 | 0.15 | <0.01 | 0.9 | <0.05 | <0.10 | - | <1.1 | <1.1 | - | <0.5 | |
| MW-3 | 11/20/2006 | BSK | - | - | - | - | - | - | - | - | - | - | - | >23.0 | <1.1 | - | - | |
| MW-3 | 2/16/2007 | | | | | | | | No sample retrieved | | | | | | | | | |
| MW-3 | 5/7/2007 | BSK | 7.9 | 550 | 160 | 65 | 2.0 | <0.05 | <0.01 | 0.54 | <0.05 | <1.0 | | 2.2 | <1.1 | - | <0.5 | |
| MW-3 | 8/29/2007 | BSK | 7.9 | 690 | 160 | 92 | 2.4 | <0.05 | <0.01 | 1.4 | * | <1.0 | 1.4 | >23.0 | <1.1 | - | <0.5 | |
| MW-3 | 11/28/2007 | BSK | 7.8 | 770 | 170 | 94 | 2.4 | 0.27 | 0.45 | 2.3 | * | <1.0 | 5.3 | 23 | 2.2 | - | <0.5 | |
| MW-3 | 2/21/2008 | BSK | - | - | - | - | - | - | - | - | - | - | - | 12 | <1.1 | - | - | |
| MW-3 | 5/28/2008 | CLS | 7.0 | 530 | 120 | 56 | 1.7 | 7.1 | 0.17 | 2.1 | <0.10 | <0.10 | 9.4 | 280 | - | - | <0.5 | |
| MW-3 | 8/27/2008 | CLS | 7.0 | 640 | 160 | 69 | 2.0 | <0.10 | <0.02 | 2.0 | <0.10 | 0.12 | 2.7 | 540 | - | - | <0.5 | |
| MW-3 | 11/25/2008 | CLS | 7.1 | 680 | 170 | 67 | 2.1 | 0.34 | 0.19 | 0.58 | <0.10 | 0.17 | 1.6 | 240 | - | - | <0.5 | |
| MW-3 | 2/19/2009 | CLS | - | 580(5) | 130 | 75 | 1.8 | 0.69 | 0.14 | 1.3 | <0.10 | 0.14 | 2.6 | >1600 | - | - | <0.5 | |
| MW-3 | 5/21/2009 | CLS | 7.1 | 500 | 130 | 53 | 1.6 | 20 | 0.68 | <0.5 | <0.10 | <0.10 | 1.2 | 79 | - | - | <0.5 | |
| MW-3 | 8/5/2009 | CLS | 7.0 | 690 | 130 | 73 | 1.8 | 0.31 | 0.04 | 0.55 | <0.10 | 0.14 | 1.8 | 430 | - | - | <0.5 | |
| MW-3 | 11/5/2009 | CLS | - | 600(5) | 160 | 77 | 2.1 | 0.33 | 0.25 | 1.0 | <0.10 | 0.64 | 2.8 | >1600 | - | - | <0.5 | |
| MW-3 | 2/8/2010 | CLS | 7.0 | 530 | 130 | 52 | 1.7 | 0.55 | 0.04 | 0.69 | <0.10 | 0.15 | 1.5 | 1600 | - | - | <0.5 | |
| MW-3 | 5/7/2010 | CLS | 6.9 | 580 | 140 | 78 | 1.6 | <0.10 | 0.06 | 1.1 | <0.10 | 0.26 | 2.6 | 23 | - | - | <0.5 | |
| MW-3 | 8/18/2010 | CLS | 7.1 | 670 | 200 | 87 | 2.4 | 2.7 | 0.50 | 1.2 | <0.10 | 0.93 | 3.4 | 350 | - | - | 5.2 | |
| MW-3 | 11/2/2010 | CLS | 7.0 | 870 | 200 | 120 | 2.8 | 0.28 | 0.46 | 5.3 | <0.10 | 0.36 | 7.2 | 280 | - | - | 1.5 | |
| MW-3 | 2/24/2011 | CLS | 6.7 | 590 | 140 | 73 | 1.8 | <0.10 | <0.02 | 1.6 | <0.10 | 0.17 | 2.5 | 1600 | - | - | <0.5 | |
| MW-3 | 5/5/2011 | CLS | 6.9 | 650 | 130 | 95 | 1.9 | 0.11 | 0.03 | 4.0 | <0.10 | 0.3 | 4.6 | 33 | - | - | <0.5 | |
| MW-3 | 8/16/2011 | CLS | 7.4 | 910 | 170 | 120 | 3.2 | <0.10 | <0.02 | 5.0 | <0.10 | <0.10 | 5.4 | 94 | - | - | <0.5 | |
| MW-3 | 11/8/2011 | CLS | 7.0 | 920 | 180 | 130 | 2.7 | 2.0 | 0.35 | 3.7 | <0.10 | 0.56 | 4.9 | 63 | - | - | <0.5 | |
| MW-3 | 2/27/2012 | CLS | 6.9 | 740 | 180 | 110 | 2.4 | 5.5 | 0.33 | 2 | <0.10 | 0.43 | 3.2 | 49 | - | - | <0.5 | |
| MW-3 | 5/21/2012 | CLS | 7.0 | 760 | 160 | 98 | 2.3 | <0.10 | 0.03 | 2.1 | <0.10 | 0.13 | 3 | 13 | - | - | <0.5 | |
| MW-3 | 8/9/2012 | CLS | 7.3 | 850 | 180 | 110 | 2.3 | 0.22 | 0.03 | 2.9 | <0.10 | 0.37 | 3.5 | <1.8 | - | - | 1.7 | |
| MW-3 | 11/19/2012 | CLS | 7.0 | 900 | 180 | 120 | 2.3 | 0.59 | 0.18 | 4.1 | <0.10 | 0.31 | 5.4 | 130 | - | - | <0.5 | |
| MW-3 | 2/21/2013 | CLS | 6.9 | 670 | 170 | 110 | 2.0 | 0.18 | 0.04 | 2.4 | <0.10 | 0.35 | 3.2 | 4 | - | - | <0.5 | |
| MW-3 | 5/15/2013 | CLS | 7.0 | 710 | 160 | 110 | 2.1 | <0.10 | 0.07 | 1.8 | <0.10 | <0.10 | 2.1 | <1.8 | - | - | 0.93 | |
| MW-3 | 8/16/2013 | CLS | 7.4 | 630(5) | 140 | 82 | 1.8 | 9.10 | 0.15 | 1.6 | <0.10 | 0.16 | 3.7 | <1.8 | - | - | 0.63 | |
| MW-3 | 11/7/2013 | CLS | 6.9 | 620 | 150 | 81 | 1.4 | <0.10 | 0.07 | 1.8 | <0.10 | 0.12 | 2.5 | <1.8 | - | - | <0.5 | |
| MW-3 | 2/25/2014 | CLS | 7.2 | 760 | 180 | 170 | 2.3 | 3.10 | 0.13 | 2.7 | <0.10 | 0.32 | 3.3 | >1600 | - | - | <0.5 | |
| MW-3 | 5/22/2014 | CLS | 7.0 | 860 | 170 | 170 | 2.3 | 0.96 | 0.03 | 1.9 | <0.10 | <0.10 | 2.3 | <1.8 | - | - | <0.5 | |
| MW-3 | 8/27/2014 | CLS | 7.1 | 900 | 150 | 170 | 1.9 | 0.55 | 0.13 | 1.8 | <0.10 | 0.2 | 2.4 | <1.8 | - | - | 0.62 | |
| MW-3 | 11/12/2014 | CLS | | | | | | | No sample retrieved | | | | | | | | | |
| MW-3 | 2/25/2015 | CLS | 7.0 | 650 | 130 | 110 | 1.9 | <0.10 | <0.02 | 1.1 | <0.10 | <0.10 | 1.7 | 920 | - | - | <0.5 | |
| MW-3 | 5/13/2015 | CLS | 7.0 | 700 | 140 | 150 | 1.7 | 0.26 | <0.02 | 2.4 | <0.10 | <0.10 | 2.6 | <1.8 | - | - | <0.5 | |
| MW-3 | 8/4/2015 | CLS | 7.0 | 700 | 150 | 120 | 1.9 | 16.00 | 0.32 | 2.1 | <0.10 | 0.3 | 2.7 | <1.8 | - | - | <0.5 | |
| MW-3 | 11/5/2015 | CLS | | | | | | | No sample retrieved | | | | | | | | | |

| Sampling Point | Sample Date | Lab | pH Std Unit | TDS mg/L | Na (d) mg/L | Cl mg/L | B (d) mg/L | Fe (d) mg/L | Mn (d) mg/L | NO3-N mg/L | NO2-N mg/L | NH3-N mg/L | Total Nitrogen mg/L | Coliform Bacteria (total) (MPN/100 mL) | *(fecal)* (MPN/100 mL) | *(E. coli)* (MPN/100 mL) | TTHM (1) (EPA 601) ug/L | Lab Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Recommended | WO Objective | | 6.5-8.5 | 450 | 69 | 106 | 0.6 | 0.3 | 0.05 | 10 | 1 | 0.5 | 10 | ND | ND | ND | 100 | |
| Interim Limitation [2] | Background | | 7.6 | 1100 | 155 | 138 | - | <0.1 | 0.64 | 18 | - | 0.5 | - | <2.0 | <2.0 | - | - | - |
| MW-3 | 2/4/2016 | CLS | 7.1 | 980 | 210 | 230 | 2.1 | <0.10 | <0.02 | 1.7 | <0.4 | 0.25 | 2.4 | 220 | - | - | <0.5 | |
| MW-3 | 6/30/2016 | CLS | 7.0 | 740 | 150 | 150 | 2.1 | 11.00 | 0.18 | 2.2 | <0.4 | 0.16 | 3.1 | 9 | - | - | 3.1 | |
| MW-3 | 8/25/2016 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-3 | 11/17/2016 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-3 | 3/7/2017 | CLS | 7.2 | 420 | 84 | 52 | 0.94 | 1.10 | 0.10 | <0.4 | <0.4 | 0.17 | 0.95 | 23 | - | - | <0.5 | |
| MW-3 | 6/27/2017 | CLS | 6.9 | 510 | 120 | 66 | 1.3 | <0.10 | <0.10 | 0.9 | <0.4 | 0.44 | 4.6 | 540 | - | - | <0.5 | |
| MW-3 | 8/23/2017 | CLS | 7.3 | 610 | 170 | 55 | 2.1 | 0.12 | <0.02 | 0.48 | <0.4 | 0.33 | 1.7 | >1600 | - | - | <0.5 | |
| MW-3 | 11/14/2017 | CLS | 7.1 | 580 | 130 | 78 | 1.7 | <0.10 | 0.039 | 1.6 | <0.4 | 0.13 | 4.2 | 13 | - | - | <0.5 | |
| MW-3 | 2/21/2018 | CLS | 7.1 | 690 | 180 | 110 | 2.3 | <0.10 | 0.30 | 0.94 | <0.4 | 0.26 | 2.2 | 220 | - | - | <0.5 | |
| MW-3 | 5/24/2018 | CLS | 7.3 | 620 | 140 | 81 | 2 | <0.10 | <0.20 | 1.7 | <0.4 | <0.1 | 2.0 | 13 | - | - | <0.5 | |
| MW-3 | 9/27/2018 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-3 | 12/28/2018 | CLS | 6.91 | 690 | 220 | 170 | 2.2 | <0.10 | <0.20 | 2.6 | <0.4 | <0.1 | 3.1 | <1.8 | - | - | 33 | |
| | | | | | | | | | | | | | | | | | | |
| MW-4 | 6/15/2004 | STL | 8 | 647 | 53.3 | 138 | 1 | 0.87 | -- | 8.4 | <0.05 | <0.10 | 8.4 | 9.2 | <1.1 | <1.0 | <0.5 | |
| MW-4 | 3/29/2005 | BSK | 8.1 | 570 | 69 | 170 | 1.2 | <0.05 | <0.01 | 9.7 | <0.10 | <1 | 9.7 | 23 | <1.1 | - | <0.5 | |
| MW-4 | 6/16/2005 | BSK | 8 | 600 | 59 | 170 | 1 | <0.05 | <0.01 | 9.7 | <0.10 | <1 | 9.7 | <1.1 | <1.1 | - | 0.81 | 3 |
| MW-4 | 9/29/2005 | BSK | No sample retrieved | | | | | | | | | | | | | | | |
| MW-4 | 12/6/2005 | BSK | 8.2 | 570 | 55 | 180 | 1.1 | <0.05 | <0.01 | 9.9 | <0.10 | <1 | 9.9 | <1.1 | <1.1 | <1.1 | 1.4 | 3 |
| MW-4 | 2/16/2006 | BSK | 8.1 | 590 | 49 | 180 | 0.96 | <0.05 | <0.01 | 9.7 | <0.10 | <1 | 9.7 | <1.1 | <1.1 | - | 1.8 | 3 |
| MW-4 | 5/16/2006 | BSK | 8.2 | 650 | 56 | 180 | 1.1 | <0.05 | <0.01 | 9.9 | <0.10 | <1 | 9.9 | <1.1 | <1.1 | - | 0.99 | 3 |
| MW-4 | 8/21/2006 | BSK | 8.2 | 590 | 49 | 170 | 1 | <0.05 | <0.01 | 9.7 | <0.05 | <0.10 | - | >23.0 | 9.2 | - | <0.5 | |
| MW-4 | 11/20/2006 | BSK | - | - | - | - | - | - | - | - | - | - | - | <1.1 | <1.1 | - | - | |
| MW-4 | 2/16/2007 | | No sample retrieved | | | | | | | | | | | | | | | |
| MW-4 | 5/7/2007 | BSK | 8.2 | 560 | 54 | 170 | 1.1 | <0.05 | <0.01 | 44 (4) | <0.05 | <1.0 | 44 (4) | <1.1 | <1.1 | - | <0.5 | |
| MW-4 | 8/29/2007 | BSK | 8.2 | 570 | 47 | 180 | 1.1 | <0.05 | <0.01 | 9.5 | * | <1.0 | 9.5 | 6.9 | <1.1 | - | <0.5 | |
| MW-4 | 11/28/2007 | BSK | 8.1 | 570 | 52 | 190 | 1 | <0.05 | <0.01 | 11 | * | <1.0 | 11 | <1.1 | <1.1 | - | <0.5 | |
| MW-4 | 2/21/2008 | BSK | - | - | - | - | - | - | - - - | - | - | - | - | <1.1 | <1.1 | - | - | |
| MW-4 | 5/27/2008 | CLS | 7.7 | 550 | 51 | 180 | 1 | <0.10 | <0.02 | 9.4 | <0.10 | <0.10 | 9.5 | <1.8 | - | - | <0.50 | |
| MW-4 | 8/28/2008 | CLS | 7.5 | 560 | 52 | 170 | 0.94 | <0.10 | <0.02 | 9.5 | <0.10 | <0.10 | 9.7 | <1.8 | - | - | <0.50 | |
| MW-4 | 11/25/2008 | CLS | 7.8 | 620 | 51 | 190 | 0.98 | <0.10 | <0.02 | 10 | <0.10 | <0.10 | 10 | <1.8 | - | - | <0.50 | |
| MW-4 | 2/19/2009 | CLS | - | 650(5) | 53 | 190 | 1.2 | <0.10 | <0.02 | 10 | <0.10 | <0.10 | 10 | <1.8 | - | - | <0.50 | |
| MW-4 | 5/21/2009 | CLS | 7.9 | 620 | 50 | 170 | 0.98 | <0.10 | <0.02 | 9.3 | <0.10 | <0.10 | 9.3 | <1.8 | - | - | <0.50 | |
| MW-4 | 8/5/2009 | CLS | 7.6 | 600 | 41 | 190 | 0.88 | <0.10 | <0.02 | 10 | <0.10 | <0.10 | 10 | <1.8 | - | - | <0.50 | |
| MW-4 | 11/5/2009 | CLS | 7.8 (6) | 710(5) | 53 | 190 | 1 | <0.10 | <0.02 | 10 | <0.10 | <0.10 | 10 | <1.8 | - | - | <0.50 | |
| MW-4 | 2/8/2010 | CLS | 7.8 | 630 | 59 | 210 | 1.2 | 0.15 | <0.02 | 11 | <0.10 | <0.10 | 11 | <1.8 | - | - | <0.50 | |
| MW-4 | 5/7/2010 | CLS | 7.6 | 710 | 54 | 220 | 0.96 | 0.12 | <0.02 | 12 | <0.10 | <0.10 | 12 | <1.8 | - | - | <0.50 | |
| MW-4 | 8/18/2010 | CLS | 7.6 | 560 | 59 | 200 | 1.1 | <0.10 | <0.02 | 11 | <0.10 | <0.10 | 11 | <1.8 | - | - | <0.50 | |
| MW-4 | 11/2/2010 | CLS | 7.8 | 650 | 66 | 210 | 1.2 | <0.10 | <0.02 | 11 | <0.10 | <0.10 | 11 | <1.8 | - | - | <0.50 | |
| MW-4 | 2/23/2011 | CLS | 7.7 | 680 | 57 | 220 | 1.1 | <0.10 | <0.02 | 12 | <0.10 | <0.10 | 12 | <1.8 | - | - | <0.50 | |
| MW-4 | 5/5/2011 | CLS | 7.8 | 810 | 53 | 230 | 0.98 | <0.10 | <0.02 | 12 | <0.10 | <0.10 | 12 | <1.8 | - | - | <0.50 | |
| MW-4 | 8/16/2011 | CLS | 8 | 690 | 58 | 210 | 1.1 | <0.10 | <0.02 | 12 | <0.10 | <0.10 | 12 | <1.8 | - | - | <0.50 | |
| MW-4 | 11/8/2011 | CLS | 7.7 | 630 | 57 | 210 | 1 | <0.10 | <0.02 | 11 | <0.10 | <0.10 | 11 | <1.8 | - | - | <0.50 | |
| MW-4 | 2/27/2012 | CLS | 7.7 | 610 | 62 | 210 | 1.2 | <0.10 | <0.02 | 11 | <0.10 | <0.10 | 11 | <1.8 | - | - | <0.50 | |
| MW-4 | 5/21/2012 | CLS | 7.7 | 650 | 58 | 210 | 1.2 | <0.10 | <0.02 | 12 | <0.10 | 0.26 | 12 | <1.8 | - | - | <0.50 | |
| MW-4 | 8/9/2012 | CLS | 8 | 600 | 63 | 220 | 1.1 | <0.10 | <0.02 | 12 | <0.10 | 0.19 | 12 | <1.8 | - | - | <0.50 | |
| MW-4 | 11/19/2012 | CLS | 7.6 | 610 | 55 | 210 | 1 | <0.10 | <0.02 | 12 | <0.10 | <0.10 | 12 | <1.8 | - | - | <0.50 | |
| MW-4 | 2/21/2013 | CLS | 7.6 | 670 | 66 | 230 | 1.1 | <0.10 | <0.02 | 15 | <0.10 | <0.10 | 15 | <1.8 | - | - | <0.50 | |
| MW-4 | 5/15/2013 | CLS | 7.6 | 680 | 57 | 240 | 1.1 | 0.21 | <0.02 | 15 | <0.10 | <0.10 | 15 | <1.8 | - | - | <0.50 | |
| MW-4 | 8/16/2013 | CLS | 7.7 | 870(5) | 58 | 250 | 1.1 | <0.10 | <0.02 | 14 | <0.10 | 0.14 | 14 | <1.8 | - | - | <0.50 | |
| MW-4 | 11/7/2013 | CLS | 7.6 | 670 | 56 | 250 | 1 | <0.10 | <0.02 | 14 | <0.10 | 0.14 | 14 | <1.8 | - | - | <0.50 | |
| MW-4 | 2/25/2014 | CLS | 7.7 | 830 | 70 | 250 | 1 | <0.10 | <0.02 | 14 | <0.10 | <0.10 | 14 | <1.8 | - | - | <0.50 | |
| MW-4 | 5/22/2014 | CLS | 7.8 | 700 | 57 | 230 | 1.1 | <0.10 | <0.02 | 13 | <0.10 | <0.10 | 13 | <1.8 | - | - | <0.50 | |
| MW-4 | 8/27/2014 | CLS | 7.8 | 840 | 58 | 250 | 1 | <0.10 | <0.02 | 14 | <0.10 | <0.10 | 14 | <1.8 | - | - | <0.50 | |
| MW-4 | 11/12/2014 | CLS | 7.7 (6) | 749(7) | 54 | 260 | 1 | <0.10 | <0.02 | 15 | <0.10 | <0.10 | 15 | <1 | - | - | <0.50 | |
| MW-4 | 2/26/2015 | CLS | 7.7 | 720 | 52 | 260 | 1 | <0.10 | <0.02 | 16 | <0.10 | <0.10 | 16 | <1.8 | - | - | <0.50 | |

| Sampling Point | Sample Date | Lab | pH Std Unit | TDS mg/L | Na (d) mg/L | Cl mg/L | B (d) mg/L | Fe (d) mg/L | Mn (d) mg/L | NO3-N mg/L | NO2-N mg/L | NH3-N mg/L | Total Nitrogen mg/L | Coliform Bacteria (total) (MPN/100 mL) | *(fecal)* (MPN/100 mL) | *(E. coli)* (MPN/100 mL) | TTHM (1) (EPA 601) ug/L | Lab Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Recommended | WO Objective | | 6.5-8.5 | 450 | 69 | 106 | 0.6 | 0.3 | 0.05 | 10 | 1 | 0.5 | 10 | ND | ND | ND | 100 | |
| Interim Limitation [2] | Background | | 7.6 | 1100 | 155 | 138 | - | <0.1 | 0.64 | 18 | - | 0.5 | - | <2.0 | <2.0 | - | - | - |
| MW-4 | 5/13/2015 | CLS | 7.8 | 770 | 53 | 250 | 1 | <0.10 | <0.02 | 15 | <0.10 | <0.10 | 15 | <1.8 | - | - | <0.50 | |
| MW-4 | 8/4/2015 | CLS | 7.8 | 750 | 56 | 240 | 1 | <0.10 | <0.02 | 16 | <0.10 | <0.10 | 16 | <1.8 | - | - | <0.50 | |
| MW-4 | 11/5/2015 | CLS | 7.8 | 970 | 60 | 240 | 1.1 | <0.10 | <0.02 | 17 | <0.10 | <0.10 | 17 | <1.8 | - | - | <0.50 | |
| MW-4 | 2/4/2016 | CLS | 7.8 | 760 | 49 | 240 | 0.82 | <0.10 | <0.02 | 17 | | 0.17 | 17 | <1.8 | - | - | <0.50 | |
| MW-4 | 6/30/2016 | CLS | 7.6 | 690 | 50 | 240 | 0.95 | <0.10 | <0.02 | 16 | <0.40 | <0.10 | 16 | <1.8 | - | - | <0.50 | |
| MW-4 | 8/25/2016 | CLS | 7.7 | 560 | 56 | 220 | 0.88 | <0.10 | <0.02 | 16 | <0.40 | 0.14 | 16 | <1.8 | - | - | 12 | |
| MW-4 | 11/17/2016 | CLS | 7.7 | 660 | 50 | 220 | 0.85 | <0.10 | <0.02 | 17 | <0.40 | <0.10 | 17 | <1.8 | - | - | <0.50 | |
| MW-4 | 3/7/2017 | CLS | 7.7 | 670 | 49 | 250 | 0.95 | <0.10 | <0.02 | 14 | <0.40 | <0.10 | 14 | <1.8 | - | - | <0.50 | |
| MW-4 | 6/27/2017 | CLS | 7.5 | 680 | 55 | 230 | 0.87 | <0.10 | <0.02 | 15 | <0.40 | <0.10 | 15 | <1.8 | - | - | <0.50 | |
| MW-4 | 8/23/2017 | CLS | 7.5 | 630 | 57 | 220 | 1 | <0.10 | <0.02 | 14 | <0.40 | <0.10 | 14 | 79 | - | - | <0.50 | |
| MW-4 | 11/14/2017 | CLS | 7.5 | 660 | 58 | 240 | 0.97 | <0.10 | <0.02 | 15 | <0.40 | 0.13 | 15 | 540 | - | - | <0.50 | |
| MW-4 | 2/21/2018 | CLS | 7.8 | 610 | 53 | 220 | 0.96 | <0.10 | <0.02 | 14 | <0.40 | <0.10 | 15 | 49 | - | - | <0.50 | |
| MW-4 | 5/24/2018 | CLS | 7.7 | 620 | 47 | 210 | 0.93 | <0.10 | <0.02 | 14 | <0.40 | <0.10 | 14 | 2 | - | - | <0.50 | |
| MW-4 | 9/27/2018 | CLS | 7.76 | 610 | 54 | - | 0.97 | <0.10 | <0.02 | 15 | <0.40 | <0.10 | 3 | <1.8 | - | - | <0.50 | |
| MW-4 | 12/28/2018 | CLS | 7.8 | 530 | 52 | 220 | 0.88 | <0.10 | <0.02 | 15 | <0.40 | <0.10 | 15 | <1.8 | - | - | 2 | |
| MW-5R | 6/15/2004 | STL | 8.1 | 461 | 91.7 | 42.3 | 2.1 | <0.10 | - | 1.6 | <0.05 | <0.10 | 1.6 | >23.0 | <1.1 | <1.1 | <0.5 | |
| MW-5R | 3/29/2005 | BSK | 8.2 | 490 | 120 | 48 | 2.6 | <0.05 | <0.01 | 2 | <0.10 | <1 | 2 | 5.1 | <1.1 | - | <0.5 | |
| MW-5R | 6/16/2005 | BSK | 8.2 | 450 | 95 | 49 | 2 | <0.05 | <0.01 | 1.4 | <0.10 | <1 | 1.4 | 1.1 | <1.1 | - | 4 | 3 |
| MW-5R | 9/29/2005 | BSK | 8.2 | 430 | 92 | 48 | 2 | <0.05 | <0.01 | 1.1 | <0.10 | <1 | 1.1 | 1.1 | <1.1 | - | <0.5 | |
| MW-5R | 6/12/2005 | BSK | 8.4 | 430 | 92 | 51 | 2.1 | <0.05 | <0.01 | 1.6 | <0.10 | <1 | 1.6 | <1.1 | <1.1 | <1.1 | 1.8 | 3 |
| MW-5R | 2/16/2006 | BSK | 8.3 | 450 | 91 | 48 | 2 | <0.05 | <0.01 | 1.7 | <0.10 | <1 | 1.7 | <1.1 | <1.1 | - | 1.6 | 3 |
| MW-5R | 5/16/2006 | BSK | 8.3 | 360 | 92 | 47 | 2.1 | <0.05 | <0.01 | 1.1 | <0.10 | <1 | 1.1 | <1.1 | <1.1 | - | 1.6 | 3 |
| MW-5R | 8/21/2006 | BSK | 8.3 | 420 | 78 | 47 | 1.8 | <0.05 | <0.01 | 1.1 | <0.05 | <0.10 | - | <1.1 | <1.1 | - | <0.5 | |
| MW-5R | 11/20/2006 | BSK | - | - | - | - | - | - | - | - | - | - | - | 23 | <1.1 | - | - | |
| MW-5R | 2/16/2007 | | | | | | | | No sample retrieved | | | | | | | | | |
| MW-5R | 7/5/2007 | BSK | 8.3 | 420 | 89 | 49 | 2 | <0.05 | <0.01 | 1.1 | <0.05 | <1.0 | 1.1 | <1.1 | <1.1 | - | <0.5 | |
| MW-5R | 8/29/2007 | BSK | 8.3 | 470 | 91 | 44 | 1.9 | <0.05 | <0.01 | 2 | * | <1.0 | 2 | <1.1 | <1.1 | - | 1.14 | |
| MW-5R | 11/28/2007 | BSK | 8.2 | 460 | 95 | 45 | 2.1 | <0.05 | <0.01 | 2.1 | * | <1.0 | 2.1 | 1.1 | <1.1 | - | <0.5 | |
| MW-5R | 2/21/2008 | BSK | - | - | - | - | - | - | - | - | - | - | - | <1.1 | <1.1 | - | - | |
| MW-5R | 5/28/2008 | CLS | 7.7 | 450 | 97 | 44 | 2.1 | <0.05 | <0.01 | 1.4 | <0.10 | <0.10 | 1.5 | <1.8 | - | - | <0.50 | |
| MW-5R | 8/27/2008 | CLS | 7.9 | 450 | 91 | 44 | 2 | <0.10 | <0.02 | 1.5 | <0.10 | <0.10 | 1.7 | <1.8 | - | - | <0.50 | |
| MW-5R | 11/24/2008 | CLS | 7.9 | 470 | 93 | 46 | 2 | <0.10 | <0.02 | 1.8 | <0.10 | <0.10 | 1.9 | <1.8 | - | - | <0.50 | |
| MW-5R | 2/18/2009 | CLS | - | 470(5) | 92 | 48 | 2.1 | <0.10 | <0.02 | 1.8 | <0.10 | <0.10 | 2 | <1.8 | - | - | <0.50 | |
| MW-5R | 5/21/2009 | CLS | 7.9 | 470 | 86 | 44 | 1.9 | <0.10 | <0.02 | 1.6 | <0.10 | <0.10 | 1.6 | <1.8 | - | - | <0.50 | |
| MW-5R | 4/8/2009 | CLS | 7.9 | 480 | 78 | 44 | 1.9 | <0.10 | <0.02 | 1.7 | <0.10 | <0.10 | 1.7 | <1.8 | - | - | <0.50 | |
| MW-5R | 5/11/2009 | CLS | 7.7(6) | 450(5) | 98 | 44 | 2.1 | <0.10 | <0.02 | 1.7 | <0.10 | <0.10 | 1.8 | <1.8 | - | - | <0.50 | |
| MW-5R | 8/2/2010 | CLS | 7.9 | 490 | 110 | 45 | 2.4 | 0.12 | <0.02 | 2 | <0.10 | <0.10 | 2 | <1.8 | - | - | <0.50 | |
| MW-5R | 7/5/2010 | CLS | 7.9 | 490 | 100 | 43 | 2.1 | <0.10 | <0.02 | 2.2 | <0.10 | <0.10 | 2.2 | <1.8 | - | - | <0.50 | |
| MW-5R | 8/18/2010 | CLS | 7.8 | 520 | 120 | 43 | 2.2 | <0.10 | <0.02 | 2.6 | <0.10 | <0.10 | 2.9 | 110 | - | - | <0.50 | |
| MW-5R | 2/11/2010 | CLS | 8 | 560 | 120 | 42 | 2.2 | <0.10 | <0.02 | 2.8 | <0.10 | <0.10 | 2.8 | <1.8 | - | - | <0.50 | |
| MW-5R | 2/23/2011 | CLS | 7.9 | 520 | 100 | 42 | 2.2 | <0.10 | <0.02 | 3 | <0.10 | <0.10 | 3.4 | <1.8 | - | - | <0.50 | |
| MW-5R | 5/5/2011 | CLS | 7.9 | 380 | 92 | 45 | 1.9 | <0.10 | <0.02 | 2.9 | <0.10 | <0.10 | 2.9 | 2 | - | - | <0.50 | |
| MW-5R | 8/16/2011 | CLS | 7.9 | 470 | 100 | 50 | 2.2 | <0.10 | <0.02 | 1.8 | <0.10 | <0.10 | 1.8 | <1.8 | - | - | <0.50 | |
| MW-5R | 8/11/2011 | CLS | 7.9 | 460 | 97 | 46 | 2.1 | <0.10 | <0.02 | 2.1 | <0.10 | <0.10 | 2.1 | <1.8 | - | - | <0.50 | |
| MW-5R | 2/27/2012 | CLS | 7.9 | 460 | 110 | 45 | 2.3 | <0.10 | <0.02 | 2.3 | <0.10 | <0.10 | 2.3 | <1.8 | - | - | <0.50 | |
| MW-5R | 5/21/2012 | CLS | 8 | 440 | 100 | 44 | 2.3 | <0.10 | <0.02 | 2.4 | <0.10 | <0.10 | 2.6 | <1.8 | - | - | <0.50 | |
| MW-5R | 9/8/2012 | CLS | 8.1 | 510 | 120 | 42 | 2.5 | <0.10 | <0.02 | 2.5 | <0.10 | <0.10 | 2.7 | <1.8 | - | - | <0.50 | |
| MW-5R | 11/19/2012 | CLS | 7.9 | 480 | 100 | 39 | 2.1 | <0.10 | <0.02 | 2.5 | <0.10 | <0.10 | 2.6 | <1.8 | - | - | <0.50 | |
| MW-5R | 2/21/2013 | CLS | 7.8 | 490 | 100 | 39 | 2.1 | <0.10 | <0.02 | 2.2 | <0.10 | <0.10 | 2.2 | 4.5 | - | - | <0.50 | |
| MW-5R | 5/15/2013 | CLS | 7.7 | 460 | 100 | 48 | 2.2 | <0.10 | <0.02 | 2.5 | <0.10 | <0.10 | 2.6 | <1.8 | - | - | <0.50 | |
| MW-5R | 8/15/2013 | CLS | 7.9 | 480 | 110 | 45 | 2 | <0.10 | <0.02 | 2.7 | <0.10 | <0.10 | 3.1 | <1.8 | - | - | <0.50 | |
| MW-5R | 7/11/2013 | CLS | 7.8 | 480 | 110 | 45 | 2.1 | <0.10 | <0.02 | 2.7 | <0.10 | <0.10 | 3 | <1.8 | - | - | <0.50 | |
| MW-5R | 2/25/2014 | CLS | 8 | 520 | 110 | 41 | 2.3 | <0.10 | <0.02 | 2.7 | <0.10 | <0.10 | 2.8 | <1.8 | - | - | <0.50 | |
| MW-5R | 5/22/2014 | CLS | 8 | 490 | 96 | 38 | 2 | <0.10 | <0.02 | 2.5 | <0.10 | <0.10 | 2.5 | <1.8 | - | - | <0.50 | |

| Sampling Point | Sample Date | Lab | pH Std Unit | TDS mg/L | Na (d) mg/L | Cl mg/L | B (d) mg/L | Fe (d) mg/L | Mn (d) mg/L | NO3-N mg/L | NO2-N mg/L | NH3-N mg/L | Total Nitrogen mg/L | Coliform Bacteria (total) (MPN/100 mL) | *(fecal)* (MPN/100 mL) | *(E. coli)* (MPN/100 mL) | TTHM (1) (EPA 601) ug/L | Lab Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Recommended | WO Objective | | 6.5-8.5 | 450 | 69 | 106 | 0.6 | 0.3 | 0.05 | 10 | 1 | 0.5 | 10 | ND | ND | ND | 100 | |
| Interim Limitation [2] | Background | | 7.6 | 1100 | 155 | 138 | - | <0.1 | 0.64 | 18 | - | 0.5 | - | <2.0 | <2.0 | - | - | - |
| MW-5R | 8/27/2014 | CLS | 8 | 530 | 98 | 40 | 2 | <0.10 | <0.02 | 2.7 | <0.10 | <0.10 | 2.7 | <1.8 | - | - | <0.50 | |
| MW-5R | 11/12/2014 | CLS | 7 (6) | 534 (7) | 99 | 35 | 2.1 | <0.10 | <0.02 | 3.2 | <0.10 | <0.10 | 3.2 | <1 | - | - | <0.50 | |
| MW-5R | 2/26/2015 | CLS | 7.9 | 520 | 100 | 39 | 2.2 | <0.10 | <0.02 | 3.4 | <0.10 | <0.10 | 3.5 | <1.8 | - | - | <0.50 | |
| MW-5R | 5/13/2015 | CLS | 8 | 520 | 98 | 43 | 2.1 | <0.10 | <0.02 | 3.3 | <0.10 | <0.10 | 3.3 | <1.8 | - | - | <0.50 | |
| MW-5R | 8/4/2015 | CLS | 7.9 | 530 | 110 | 40 | 2.1 | <0.10 | <0.02 | 3.3 | <0.10 | <0.10 | 3.6 | <1.8 | - | - | <0.50 | |
| MW-5R | 11/5/2015 | CLS | 7.9 | 560 | 95 | 38 | 1.9 | <0.10 | <0.02 | 3.1 | <0.10 | <0.10 | 3.2 | <1.8 | - | - | <0.50 | |
| MW-5R | 2/4/2016 | CLS | 8 | 550 | 99 | 38 | 2.1 | 0.18 | <0.02 | 3.1 | <0.40 | <0.10 | 3.2 | <1.8 | - | - | <0.50 | |
| MW-5R | 6/30/2016 | CLS | 7.8 | 500 | 96 | 38 | 2.1 | <0.10 | <0.02 | 2.9 | <0.40 | <0.10 | 3.2 | <1.8 | - | - | 0.68 | |
| MW-5R | 8/25/2016 | CLS | 7.9 | 490 | 110 | 40 | 2 | <0.10 | <0.02 | 2.9 | <0.40 | <0.10 | 2.9 | <1.8 | - | - | 2.1 | |
| MW-5R | 11/17/2016 | CLS | 8 | 500 | 100 | 39 | 2 | <0.10 | <0.02 | 3 | <0.40 | <0.10 | 3.2 | <1.8 | - | - | <0.50 | |
| MW-5R | 3/7/2017 | CLS | 7.7 | 470 | 77 | 34 | 1.7 | <0.10 | 0.058 | 2 | <0.40 | 0.24 | 2.4 | 920 | - | - | <0.50 | |
| MW-5R | 6/27/2017 | CLS | 7.1 | 290 | 21 | 4 | 0.3 | <0.10 | <0.02 | <0.40 | <0.40 | 0.12 | 0.81 | 170 | <0.50 | | | |
| MW-5R | 8/23/2017 | CLS | 7.7 | 400 | 64 | 41 | 1.5 | <0.10 | <0.02 | 1.5 | <0.40 | 0.31 | 1.9 | 33 | - | - | <0.50 | |
| MW-5R | 11/14/2017 | CLS | 7.7 | 410 | 77 | 51 | 1.8 | <0.10 | <0.02 | <0.40 | <0.40 | <0.10 | <0.20 | <1.8 | - | - | <0.50 | |
| MW-5R | 2/21/2018 | CLS | 7.8 | 400 | 83 | 48 | 1.9 | <0.10 | <0.02 | 2.3 | <0.40 | <0.10 | 2.6 | 4.5 | - | - | 0.61 | |
| MW-5R | 5/24/2018 | CLS | 7.8 | 470 | 81 | 44 | 2.0 | <0.10 | <0.02 | 2.2 | <0.40 | <0.10 | 2.5 | <1.8 | - | - | 0.68 | |
| MW-5R | 9/27/2018 | CLS | 7.94 | 460 | 100 | - | 2.1 | <0.10 | <0.02 | 2.9 | <0.40 | <0.10 | 3 | <1.8 | - | - | <0.50 | |
| MW-5R | 12/28/2018 | CLS | 7.97 | 400 | 92 | 44 | 2 | <0.10 | <0.02 | 2.6 | <0.40 | <0.10 | 2.7 | <1.8 | - | - | <0.50 | |
| | | | | | | | | | | | | | | | | | | |
| MW-6 | 6/15/2004 | STL | 7.6 | 865 | 143 | 87.7 | 5.6 | <0.10 | - | 12.2 | <0.05 | <0.10 | 12.2 | 16.1 | <1.1 | <1.1 | <0.5 | |
| MW-6 | 3/29/2005 | BSK | 7.8 | 870 | 180 | 110 | 6.6 | <0.05 | <0.01 | 11 | <0.15 | <1 | 11 | 5.1 | <1.1 | - | <0.5 | |
| MW-6 | 6/16/2005 | BSK | 7.7 | 910 | 150 | 130 | 5.4 | <0.05 | <0.01 | 12 | <0.15 | <1 | 12 | <1.1 | <1.1 | - | <0.5 | |
| MW-6 | 9/29/2005 | BSK | 7.8 | 870 | 150 | 100 | 5.2 | <0.05 | <0.01 | 11 | <0.15 | <1 | 11 | <1.1 | <1.1 | - | <0.5 | |
| MW-6 | 12/6/2005 | BSK | 8.1 | 900 | 160 | 110 | 5.6 | <0.05 | <0.01 | 12 | <0.05 | <1 | 12 | <1.1 | <1.1 | <1.1 | <0.5 | |
| MW-6 | 2/16/2006 | BSK | 7.9 | 900 | 140 | 130 | 4.9 | <0.05 | <0.01 | 12 | <0.10 | <1 | 12 | <1.1 | <1.1 | - | <0.5 | |
| MW-6 | 5/16/2006 | BSK | 8.0 | 1.000 | 160 | 150 | 5.5 | <0.05 | <0.01 | 13 | <0.10 | <1 | 13 | <1.1 | <1.1 | - | <0.5 | |
| MW-6 | 8/21/2006 | BSK | 7.9 | 860 | 140 | 160 | 4.7 | <0.05 | <0.01 | 13 | <0.05 | <0.10 | - | <1.1 | <1.1 | - | <0.5 | |
| MW-6 | 11/20/2006 | BSK | - | - | - | - | - | - | - | - | - | - | - | >23.0 | <1.1 | - | - | |
| MW-6 | 2/16/2007 | | | | | | | | | No sample retrieved | | | | | | | | |
| MW-6 | 5/7/2007 | BSK | 7.9 | 900 | 160 | 120 | 5.5 | <0.05 | <0.01 | 11 | <0.05 | <1.0 | 11 | 16.1 | <1.1 | - | <0.5 | |
| MW-6 | 8/29/2007 | BSK | 7.8 | 880 | 130 | 100 | 4.5 | <0.05 | <0.01 | 9.7 | * | <1.0 | 9.7 | <1.1 | <1.1 | - | <0.5 | |
| MW-6 | 11/28/2007 | BSK | 7.8 | 850 | 150 | 96 | 5.1 | <0.05 | <0.01 | 8.7 | * | <1.0 | 8.7 | <1.1 | <1.1 | - | <0.5 | |
| MW-6 | 2/21/2008 | BSK | - | - | - | - | - | - | - | - | - | - | - | <1.1 | <1.1 | - | - | |
| MW-6 | 5/27/2008 | CLS | 7.1 | 900 | 150 | 130 | 4.8 | <0.10 | <0.02 | 9 | <0.10 | <0.10 | 9.1 | <1.8 | - | - | <0.50 | |
| MW-6 | 8/27/2008 | CLS | 7.2 | 820 | 150 | 97 | 4.6 | <0.10 | <0.02 | 8.5 | <0.10 | 0.12 | 8.6 | <1.8 | - | - | <0.50 | |
| MW-6 | 11/24/2008 | CLS | 7.2 | 810 | 140 | 92 | 4.3 | <0.10 | <0.02 | 8 | <0.10 | <0.10 | 8.1 | <1.8 | - | - | <0.50 | |
| MW-6 | 2/18/2009 | CLS | - | 820(5) | 140 | 100 | 4.3 | <0.10 | <0.02 | 7.7 | <0.10 | <0.10 | 8.0 | <1.8 | - | - | <0.50 | |
| MW-6 | 5/21/2009 | CLS | 7.2 | 880 | 140 | 97 | 4.3 | <0.10 | <0.02 | 7.9 | <0.10 | <0.10 | 7.9 | <1.8 | - | - | <0.50 | |
| MW-6 | 8/4/2009 | CLS | 7.1 | 860 | 120 | 95 | 3.9 | <0.10 | <0.02 | 7.8 | <0.10 | <0.10 | 7.8 | <1.8 | - | - | <0.50 | |
| MW-6 | 11/5/2009 | CLS | - | 750(5) | 150 | 89 | 4.4 | <0.10 | <0.02 | 7 | <0.10 | <0.10 | 7.2 | 4.5 | - | - | <0.50 | |
| MW-6 | 2/8/2010 | CLS | 7.2 | 850 | 170 | 96 | 5.0 | <0.10 | <0.02 | 7.1 | <0.10 | <0.10 | 7.4 | <1.8 | - | - | <0.50 | |
| MW-6 | 5/7/2010 | CLS | 7.1 | 910 | 160 | 120 | 4.6 | <0.10 | <0.02 | 7.5 | <0.10 | <0.10 | 7.7 | <1.8 | - | - | <0.50 | |
| MW-6 | 8/18/2010 | CLS | 7.0 | 930 | 180 | 120 | 4.9 | <0.10 | <0.02 | 8 | <0.10 | <0.10 | 8.3 | <1.8 | - | - | <0.50 | |
| MW-6 | 11/2/2010 | CLS | 7.2 | 930 | 180 | 110 | 4.8 | <0.10 | <0.02 | 7.7 | <0.10 | <0.10 | 7.9 | 1.8 | - | - | <0.50 | |
| MW-6 | 2/23/2011 | CLS | 7.2 | 920 | 160 | 120 | 4.8 | <0.10 | <0.02 | 7.5 | <0.10 | <0.10 | 8.0 | 2.0 | - | - | <0.50 | |
| MW-6 | 5/5/2011 | CLS | 7.1 | 990 | 150 | 200 | 4.1 | <0.10 | <0.02 | 4.3 | <0.10 | <0.10 | 4.5 | <1.8 | - | - | <0.50 | |
| MW-6 | 8/16/2011 | CLS | 7.2 | 1100 | 160 | 200 | 4.5 | <0.10 | <0.02 | 9.9 | <0.10 | <0.10 | 9.9 | <1.8 | - | - | <0.50 | |
| MW-6 | 11/8/2011 | CLS | 7.0 | 990 | 160 | 140 | 4.6 | <0.10 | <0.02 | 8 | <0.10 | <0.10 | 8.2 | <1.8 | - | - | <0.50 | |
| MW-6 | 2/27/2012 | CLS | 7.1 | 880 | 180 | 120 | 5.4 | <0.10 | <0.02 | 8.5 | <0.10 | 0.13 | 8.5 | <1.8 | - | - | <0.50 | |
| MW-6 | 5/21/2012 | CLS | 7.2 | 870 | 160 | 120 | 5.8 | 0.11 | <0.02 | 8.6 | <0.10 | 0.18 | 8.8 | <1.8 | - | - | <0.50 | |
| MW-6 | 8/9/2012 | CLS | 7.5 | 970 | 130 | 110 | 3.9 | <0.10 | <0.02 | 8.5 | <0.10 | 0.11 | 8.8 | <1.8 | - | - | <0.50 | |
| MW-6 | 11/19/2012 | CLS | 7.1 | 950 | 170 | 100 | 5.1 | <0.10 | <0.02 | 8.1 | <0.10 | <0.10 | 8.3 | <1.8 | - | - | <0.50 | |
| MW-6 | 2/21/2013 | CLS | 6.9 | 900 | 160 | 110 | 5.3 | <0.10 | <0.02 | 7.9 | <0.10 | 0.11 | 7.9 | <1.8 | - | - | <0.50 | |
| MW-6 | 5/15/2013 | CLS | 7.0 | 890 | 160 | 120 | 5.1 | <0.10 | <0.02 | 8.9 | <0.10 | 0.18 | 9.0 | <1.8 | - | - | <0.50 | |
| MW-6 | 8/15/2013 | CLS | 7.1 | 890 | 150 | 110 | 5.0 | <0.10 | <0.02 | 8.9 | <0.10 | <0.10 | 9.3 | <1.8 | - | - | <0.50 | |

| Sampling Point | Sample Date | Lab | pH Std Unit | TDS mg/L | Na (d) mg/L | Cl mg/L | B (d) mg/L | Fe (d) mg/L | Mn (d) mg/L | NO3-N mg/L | NO2-N mg/L | NH3-N mg/L | Total Nitrogen mg/L | Coliform Bacteria (total) (MPN/100 mL) | *(fecal)* (MPN/100 mL) | *(E. coli)* (MPN/100 mL) | TTHM (1) (EPA 601) ug/L | Lab Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Recommended | WO Objective | | 6.5-8.5 | 450 | 69 | 106 | 0.6 | 0.3 | 0.05 | 10 | 1 | 0.5 | 10 | ND | ND | ND | 100 | |
| Interim Limitation [2] | Background | | 7.6 | 1100 | 155 | 138 | - | <0.1 | 0.64 | 18 | - | 0.5 | - | <2.0 | <2.0 | - | - | - |
| MW-6 | 11/7/2013 | CLS | 7.0 | 850 | 180 | 110 | 3.6 | <0.10 | <0.02 | 8.8 | <0.10 | 0.18 | 9.0 | <1.8 | - | - | <0.50 | |
| MW-6 | 2/25/2014 | CLS | 7.2 | 910 | 140 | 100 | 5.4 | <0.10 | <0.02 | 8.4 | <0.10 | <0.10 | 8.6 | <1.8 | - | - | <0.50 | |
| MW-6 | 5/22/2014 | CLS | 7.1 | 880 | 150 | 93 | 5.3 | <0.10 | <0.02 | 8.5 | <0.10 | <0.10 | 8.8 | <1.8 | - | - | <0.50 | |
| MW-6 | 8/27/2014 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-6 | 11/12/2014 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-6 | 2/26/2015 | CLS | 7.1 | 850 | 140 | 94 | 5.2 | 1.0 | 0.04 | 8.3 | <0.10 | <0.10 | 8.4 | <1.8 | - | - | <0.50 | |
| MW-6 | 5/13/2015 | CLS | 7.2 | 860 | 130 | 87 | 4.8 | <0.10 | <0.02 | 8.5 | <0.10 | <0.10 | 8.6 | <1.8 | - | - | <0.50 | |
| MW-6 | 8/4/2015 | CLS | 7.3 | 810 | 140 | 90 | 4.6 | <0.10 | <0.02 | 7.7 | <0.10 | <0.10 | 7.9 | <1.8 | - | - | <0.50 | |
| MW-6 | 11/5/2015 | CLS | 7.2 | 830 | 160 | 81 | 5.0 | <0.10 | <0.02 | 8.5 | <0.10 | <0.10 | 8.6 | <1.8 | - | - | <0.50 | |
| MW-6 | 2/4/2016 | CLS | 7.2 | 810 | 140 | 82 | 4.7 | <0.10 | <0.02 | 8.9 | <0.40 | <0.10 | 9.0 | <1.8 | - | - | <0.50 | |
| MW-6 | 6/30/2016 | CLS | 7.1 | 780 | 120 | 87 | 4.3 | <0.10 | <0.02 | 8.5 | <0.40 | <0.10 | 8.5 | <1.8 | - | - | 0.80 | |
| MW-6 | 8/25/2016 | CLS | 7.1 | 730 | 150 | 86 | 4.3 | <0.10 | <0.02 | 8.5 | <0.40 | <0.10 | 8.5 | <1.8 | - | - | 3.3 | |
| MW-6 | 11/17/2016 | CLS | 7.3 | 760 | 140 | 86 | 4.2 | <0.10 | <0.02 | 9 | <0.40 | 0.11 | 9.2 | <1.8 | - | - | <0.50 | |
| MW-6 | 3/7/2017 | CLS | 7.1 | 1000 | 150 | 260 | 3.8 | <0.10 | <0.02 | 11 | <0.40 | 0.11 | 11.0 | <1.8 | - | - | <0.50 | |
| MW-6 | 6/27/2017 | CLS | 6.9 | 910 | 150 | 190 | 3.8 | <0.10 | <0.02 | 9.9 | <0.40 | 0.18 | 10.0 | 14 | - | - | <0.50 | |
| MW-6 | 8/23/2017 | CLS | 7.2 | 920 | 150 | 160 | 4.2 | <0.10 | <0.02 | 11 | <0.40 | 0.16 | 11.0 | <1.8 | - | - | <0.50 | |
| MW-6 | 11/14/2017 | CLS | 7.0 | 880 | 150 | 130 | 4.3 | <0.10 | <0.02 | 12 | <0.40 | <0.10 | 12 | <1.8 | - | - | <0.50 | |
| MW-6 | 2/21/2018 | CLS | 7.1 | 920 | 150 | 120 | 4.6 | <0.10 | <0.02 | 14 | <0.40 | <0.10 | 14 | 4.5 | - | - | <0.50 | |
| MW-6 | 5/24/2018 | CLS | 7.1 | 950 | 140 | 120 | 4.8 | <0.10 | <0.02 | 14 | <0.40 | <0.10 | 14 | <1.8 | - | - | 0.8 | |
| MW-6 | 9/27/2018 | CLS | 7.09 | 930 | 160 | - | 5.0 | <0.10 | <0.02 | 14 | <0.40 | <0.10 | 14 | 2.0 | - | - | 1.4 | |
| MW-6 | 9/27/2018 | CLS | 7.11 | 860 | 150 | 120 | 4.7 | <0.10 | <0.02 | 12 | <0.40 | <0.10 | 12 | <1.8 | - | - | 3 | |
| MW-7 | 6/15/2004 | STL | 7.6 | 615 | 61.7 | 113 | 1.8 | 0.12 | - | 11.7 | <0.05 | <0.10 | 12.4 | | | | <0.5 | |
| MW-7 | 3/29/2005 | BSK | 7.9 | 540 | 79 | 88 | 2.2 | <0.05 | <0.01 | 7.2 | <0.10 | <1 | 7.2 | | | | <0.5 | |
| MW-7 | 6/16/2005 | BSK | 8.1 | 540 | 69 | 85 | 1.8 | <0.05 | <0.01 | 7.2 | <0.10 | <1 | 7.9 | | | | 0.74 | 3 |
| MW-7 | 9/29/2005 | BSK | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 12/6/2005 | BSK | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 2/16/2006 | BSK | 8.0 | 590 | 69 | 100 | 1.9 | <0.05 | <0.01 | 8.8 | 0.27 | <1 | 9.1 | | | | 1.7 | 3 |
| MW-7 | 5/16/2006 | BSK | 8.0 | 610 | 74 | 92 | 2.0 | <0.05 | <0.01 | 8.6 | <0.10 | <1 | 8.6 | | | | <0.5 | |
| MW-7 | 8/21/2006 | BSK | 8.0 | 530 | 60 | 81 | 1.6 | <0.05 | <0.01 | 6.8 | <0.05 | <0.10 | | | | | <0.5 | |
| MW-7 | 11/20/2006 | BSK | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 2/16/2007 | | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 5/7/2007 | BSK | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 8/29/2007 | BSK | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 11/28/2007 | BSK | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 2/21/2008 | BSK | - | - | - | - | - | - | - | - | - | - | - | | | | - | |
| MW-7 | 5/27/2008 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 8/27/2008 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 11/24/2008 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 2/18/2009 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 5/21/2009 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 8/4/2009 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 11/5/2009 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 2/8/2010 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 5/7/2010 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 8/18/2010 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 11/2/2010 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 2/23/2011 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 5/5/2011 | CLS | 7.1 | 660 | 87 | 100 | 1.8 | <0.10 | <0.02 | 7.2 | <0.10 | <0.10 | 7.4 | | | | <0.50 | |
| MW-7 | 8/16/2011 | CLS | 7.4 | 680 | 95 | 100 | 1.9 | <0.10 | <0.02 | 6.6 | <0.10 | <0.10 | 6.9 | | | | <0.50 | |
| MW-7 | 11/8/2011 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 2/27/2012 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 5/21/2012 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 8/9/2012 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 11/19/2012 | CLS | No sample retrieved | | | | | | | | | | | | | | | |

| Sampling Point | Sample Date | Lab | pH Std Unit | TDS mg/L | Na (d) mg/L | Cl mg/L | B (d) mg/L | Fe (d) mg/L | Mn (d) mg/L | NO3-N mg/L | NO2-N mg/L | NH3-N mg/L | Total Nitrogen mg/L | Coliform Bacteria (total) (MPN/100 mL) | *(fecal)* (MPN/100 mL) | *(E. coli)* (MPN/100 mL) | TTHM (1) (EPA 601) ug/L | Lab Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Recommended Interim Limitation [2] | WO Objective | | 6.5-8.5 | 450 | 69 | 106 | 0.6 | 0.3 | 0.05 | 10 | 1 | 0.5 | 10 | ND | ND | ND | 100 | |
| | Background | | 7.6 | 1100 | 155 | 138 | - | <0.1 | 0.64 | 18 | - | 0.5 | - | <2.0 | <2.0 | - | - | - |
| MW-7 | 2/21/2013 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 5/15/2013 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 8/15/2013 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 11/7/2013 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 2/25/2014 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 5/22/2014 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 8/27/2014 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 11/12/2014 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 2/26/2015 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 5/13/2015 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 8/4/2015 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 11/5/2015 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 2/4/2016 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 6/30/2016 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 8/25/2016 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 11/17/2016 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 3/7/2017 | CLS | 7.3 | 670 | 100 | 120 | 2 | <0.10 | | 7.5 | | 0.16 | 7.8 | | | | 1.2 | |
| MW-7 | 6/27/2017 | CLS | 7.0 | 590 | 93 | 89 | 1.7 | <0.10 | | 4.6 | | 0.19 | 4.9 | | | | <0.50 | |
| MW-7 | 8/23/2017 | CLS | 7.3 | 620 | 99 | 56 | 2 | <0.10 | | 4.3 | | <0.10 | 4.4 | | | | <0.50 | |
| MW-7 | 11/14/2017 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 2/21/2018 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 5/24/2018 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 9/27/2018 | CLS | No sample retrieved | | | | | | | | | | | | | | | |
| MW-7 | 12/28/2018 | CLS | No sample retrieved | | | | | | | | | | | | | | | |

## Laboratory Notes:

STL = Severn Trent Laboratory of West Sacramento, CA; BSK = BSK Laboratories of Fresno, CA; TDS = total dissolved solids; NO3-N = nitrate as nitrogen; NO2-N = nitrite as nitrogen; NH3-N = ammonia as nitrogen; (d) = dissolved fraction; TTHM = total trihalomethanes; nd = nondetect

*italic font style* = Analysis for magnesium, total Kjeldahl nitrogen, fecal coliform and E. coli organisms is not required by RWQCB Order R5-2002-0077.

1 = Total trihalomethanes consist of the sum of bromodichloromethane, bromoform, chloroform, and dibromochloromethane.

2 = See WDRs Item E. 1. Ground Water Limitations; WQ Objective = a variety of applicable regional water quality goals compiled by RWQCB staff; Background = Tolerance Limit (calculated from August 2001 borings and monitoring wells MW-1 and MW-5R)

3 (in Lab Notes column) = Chloroform detection; this compound was also detected in the laboratory method blank; this compound is a common laboratory contaminant.

4 = Nitrate (as nitrogen) laboratory result for 5/7/2007 at MW-4 is reported as shown on the laboratory report although the concentration is about four times higher than historic results. It is probable that the concentration was reported for nitrate (as nitrate). Due to the age of the sample, laboratory validation of the result could not be performed.

5 = Sample was extracted/analyzed outside the EPA recommended holding time

6 = Measured in the field

7 = Calculated using field Electrical Conductivity measurement

* = Nitrate as nitrogen and Nitrite as Nitrogen results were combined as one

- = Sample not collected or not measured for this constituent

Notes on Laboratory Data depicted on Figures.

1. MW-7 – Data for NO3, and TN for 5/7/2007 is not graphed due to concerns with data.
2. MW-5R – Data for Chloride for 6/27/2017 is suspect (dilution factor?) but is shown on graph.
3. Data reported as less than the laboratory reporting limit is shown on figures as “zero”

**Table 5**
**Quality Assurance/Quality Control Samples**
**Wild Wings Water Recycling Facility, Yolo County, CA**

| Sampling Point | Sample Date | Lab | TTHM[1] (ug/L) | Lab Notes |
|---|---|---|---|---|
| EB-1 | 11/17/2017 | CLS | 1.1 | - |
| | 3/7/2017 | CLS | 2.0 | - |
| | | | | |
| Trip Blanks | 11/17/2017 | CLS | <0.50 | - |
| | 3/7/2017 | CLS | <0.50 | - |
| | 6/28/2017 | CLS | <0.50 | - |
| | 8/23/2017 | CLS | <0.50 | - |
| | 2/21/2018 | CLS | <0.50 | - |
| | 5/24/2018 | CLS | <0.50 | Mislabled 3 |
| | 9/27/2018 | CLS | <0.50 | - |

TTHM = total trihalomethanes; nd = nondetect

1 = Total trihalomethanes consists of the sum of bromodichloromethane, bromoform, chloroform, and dibromocholoromethane

# CHARTS

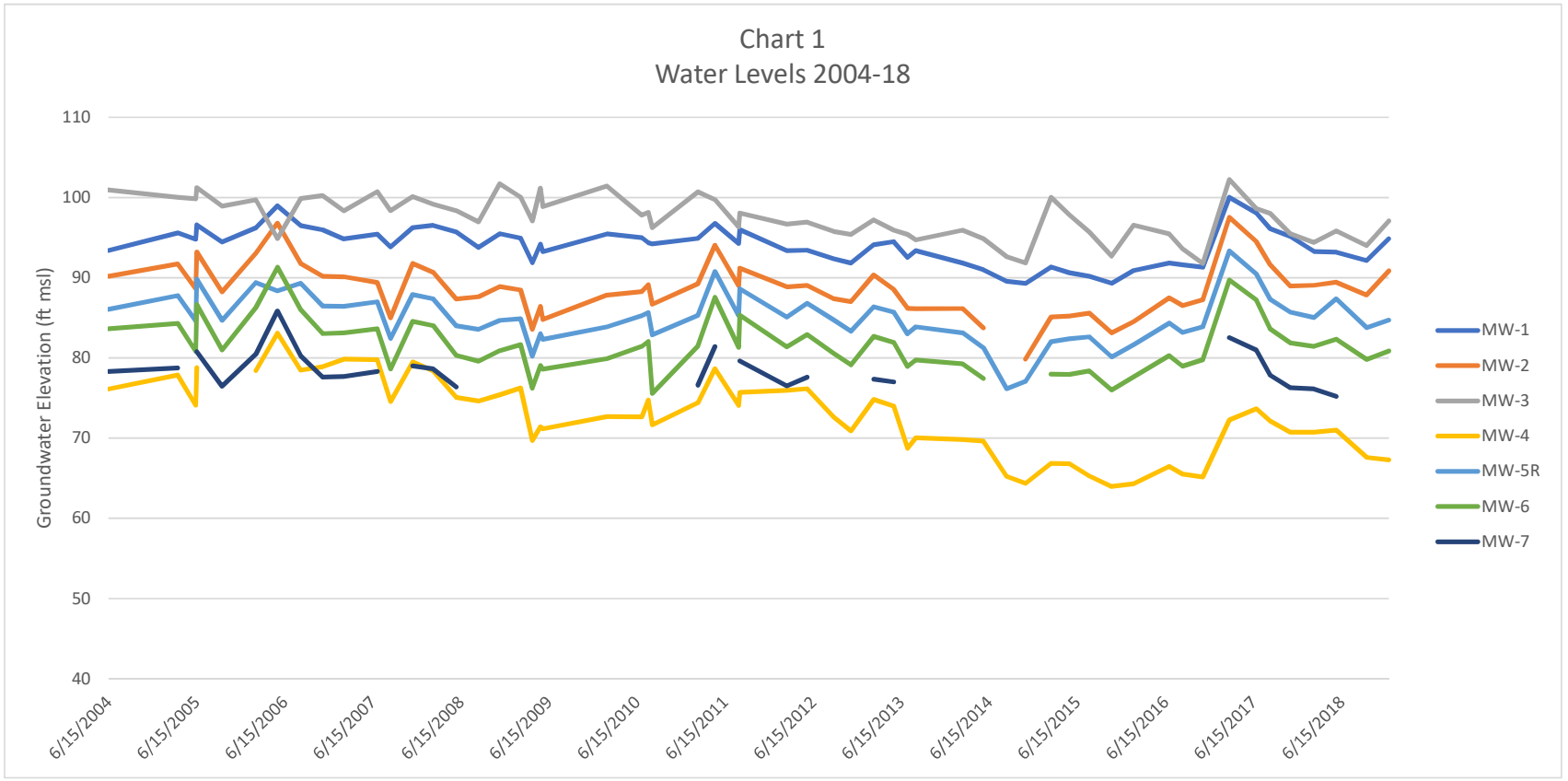


Chart 1
Water Levels 2004-18
Groundwater Elevation (ft msl)
110
100
90
80
70
60
50
40
6/15/2004
6/15/2005
6/15/2006
6/15/2007
6/15/2008
6/15/2009
6/15/2010
6/15/2011
6/15/2012
6/15/2013
6/15/2014
6/15/2015
6/15/2016
6/15/2017
6/15/2018
MW-1
MW-2
MW-3
MW-4
MW-5R
MW-6
MW-7

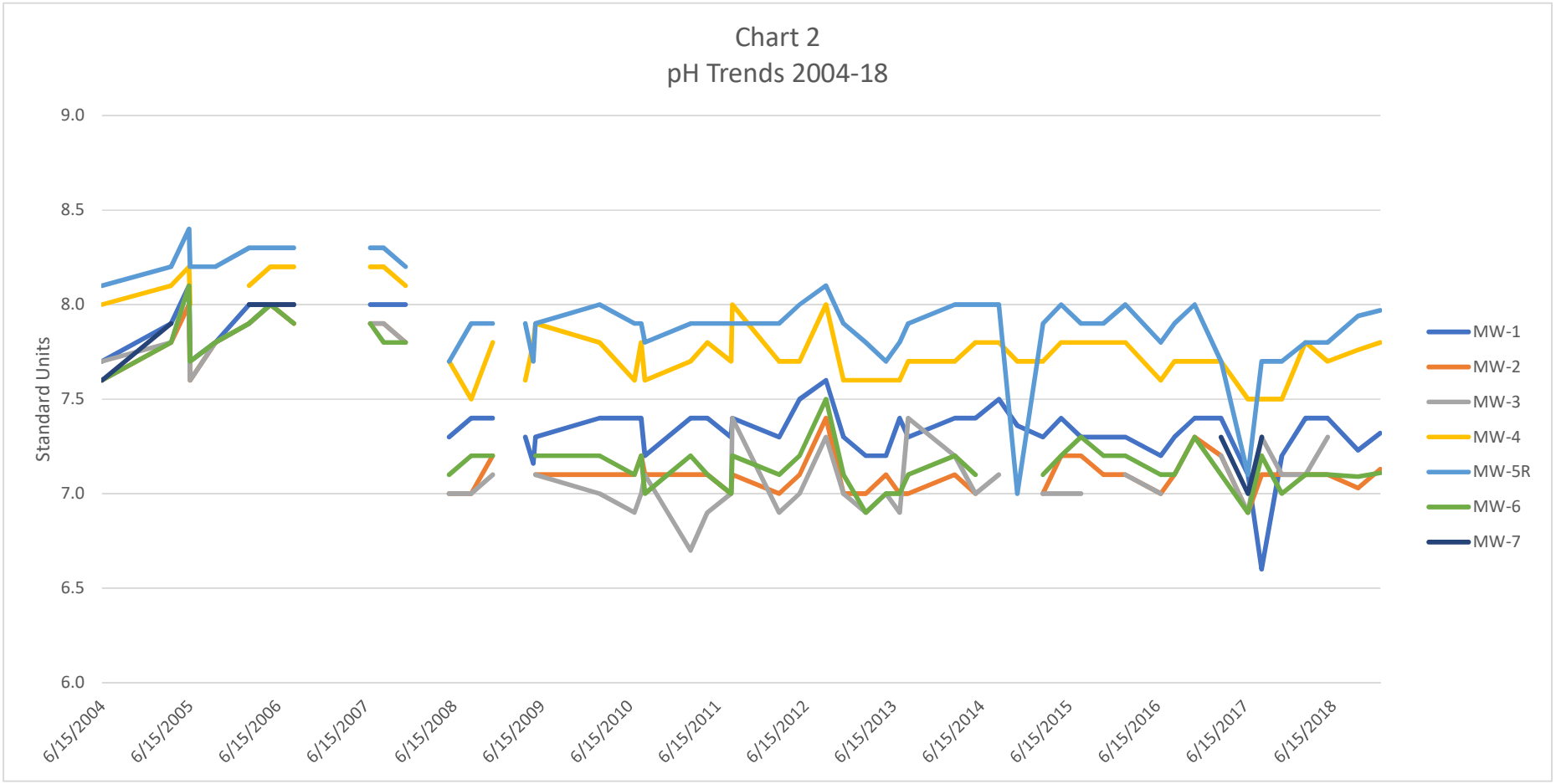
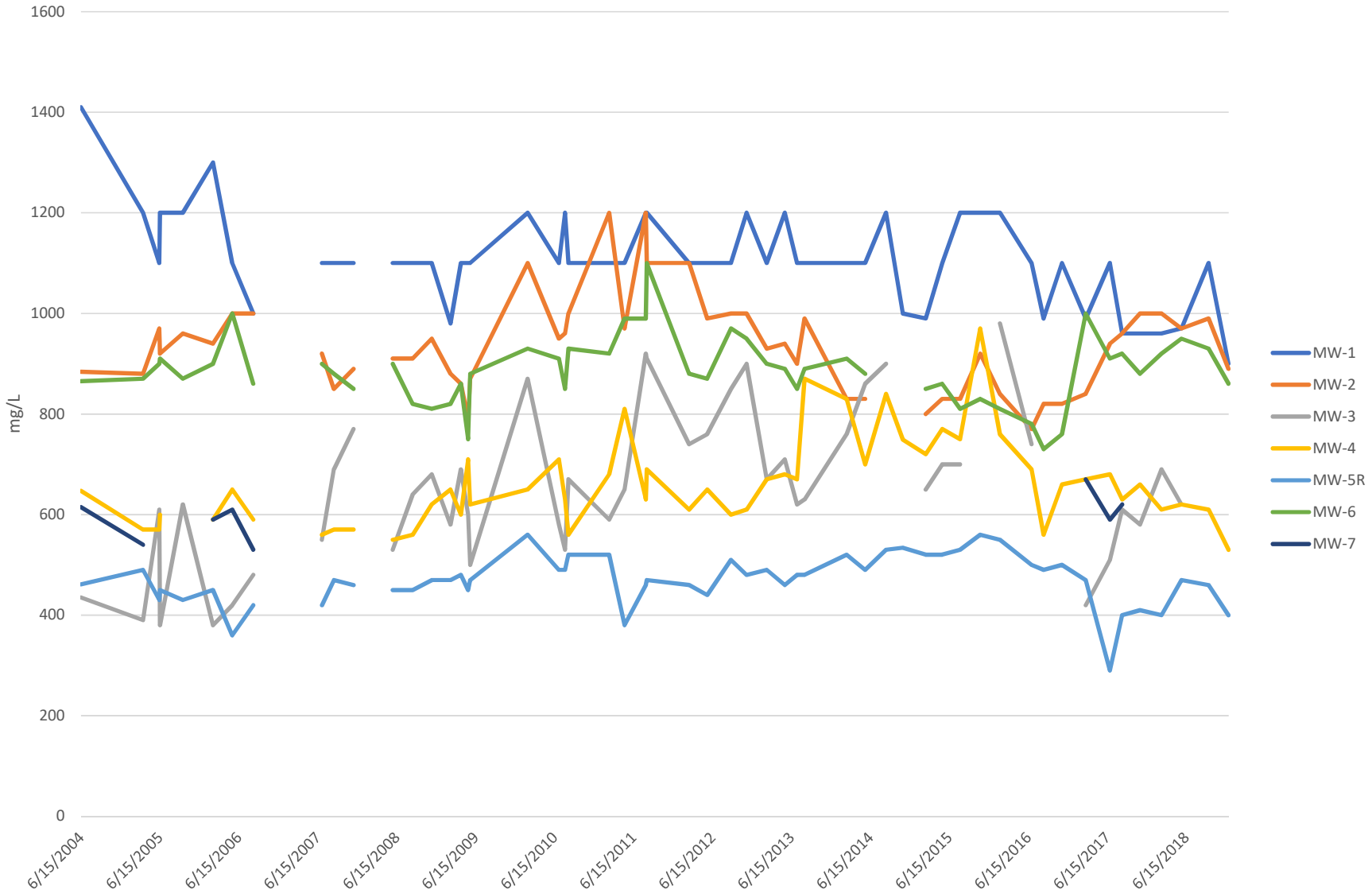


Chart 2
pH Trends 2004-18
Standard Units
9.0
8.5
8.0
7.5
7.0
6.5
6.0
6/15/2004
6/15/2005
6/15/2006
6/15/2007
6/15/2008
6/15/2009
6/15/2010
6/15/2011
6/15/2012
6/15/2013
6/15/2014
6/15/2015
6/15/2016
6/15/2017
6/15/2018
MW-1
MW-2
MW-3
MW-4
MW-5R
MW-6
MW-7

Chart 3
TDS Trends 2004-18



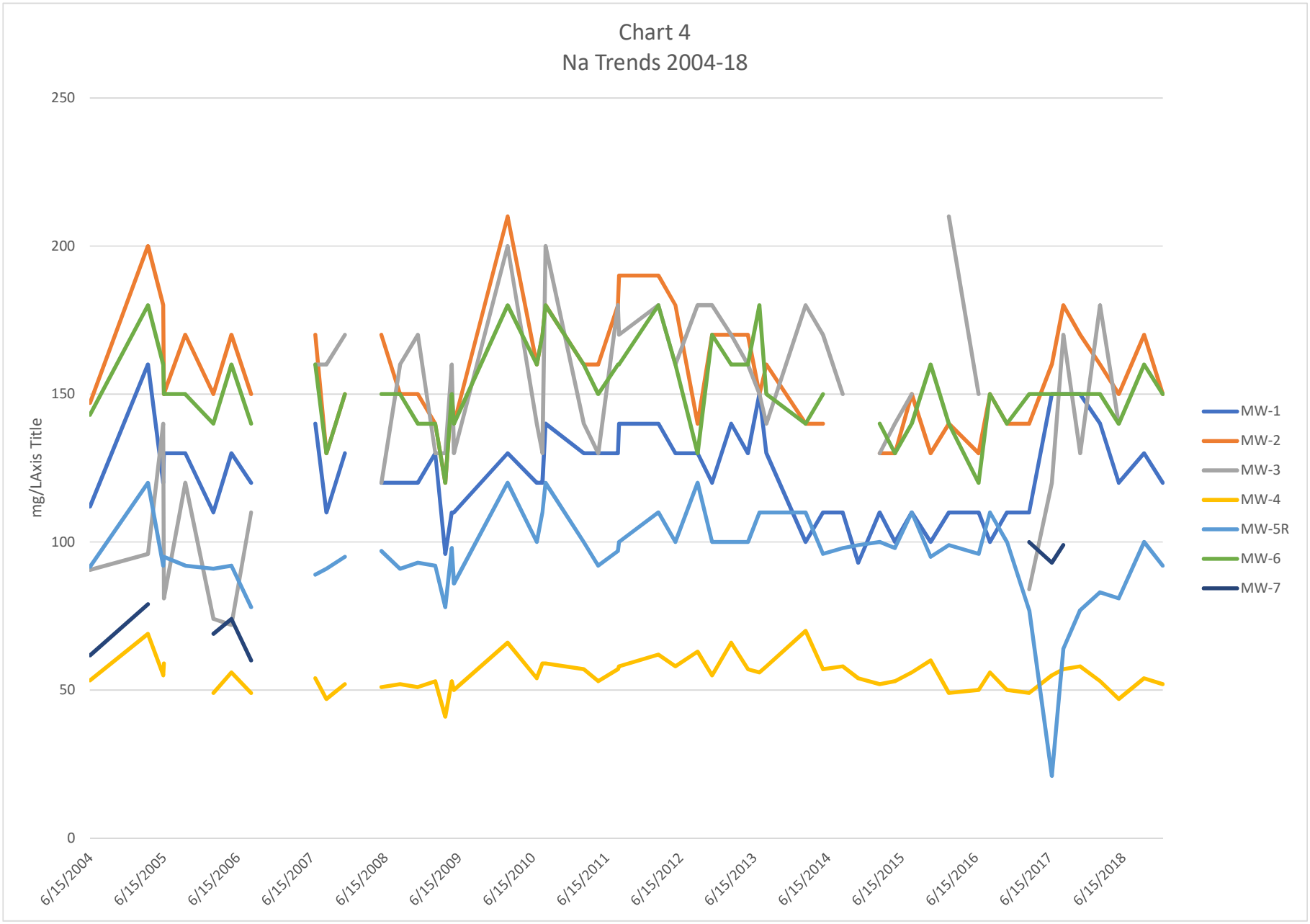


Chart 4
Na Trends 2004-18
250
200
150
100
50
0
mg/LAxis Title
6/15/2004
6/15/2005
6/15/2006
6/15/2007
6/15/2008
6/15/2009
6/15/2010
6/15/2011
6/15/2012
6/15/2013
6/15/2014
6/15/2015
6/15/2016
6/15/2017
6/15/2018
MW-1
MW-2
MW-3
MW-4
MW-5R
MW-6
MW-7

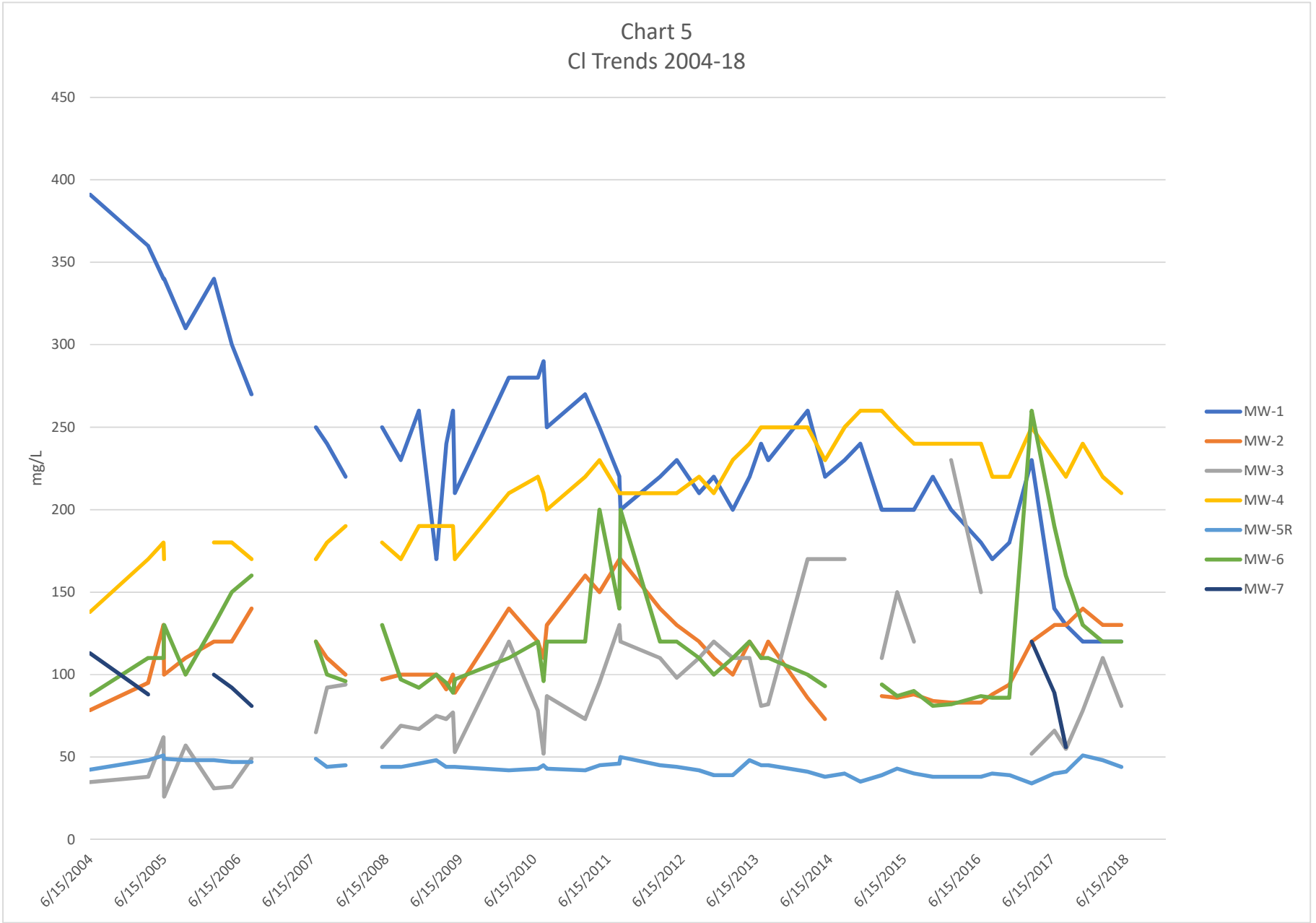


Chart 5
Cl Trends 2004-18
mg/L
450
400
350
300
250
200
150
100
50
0
6/15/2004
6/15/2005
6/15/2006
6/15/2007
6/15/2008
6/15/2009
6/15/2010
6/15/2011
6/15/2012
6/15/2013
6/15/2014
6/15/2015
6/15/2016
6/15/2017
6/15/2018
MW-1
MW-2
MW-3
MW-4
MW-5R
MW-6
MW-7

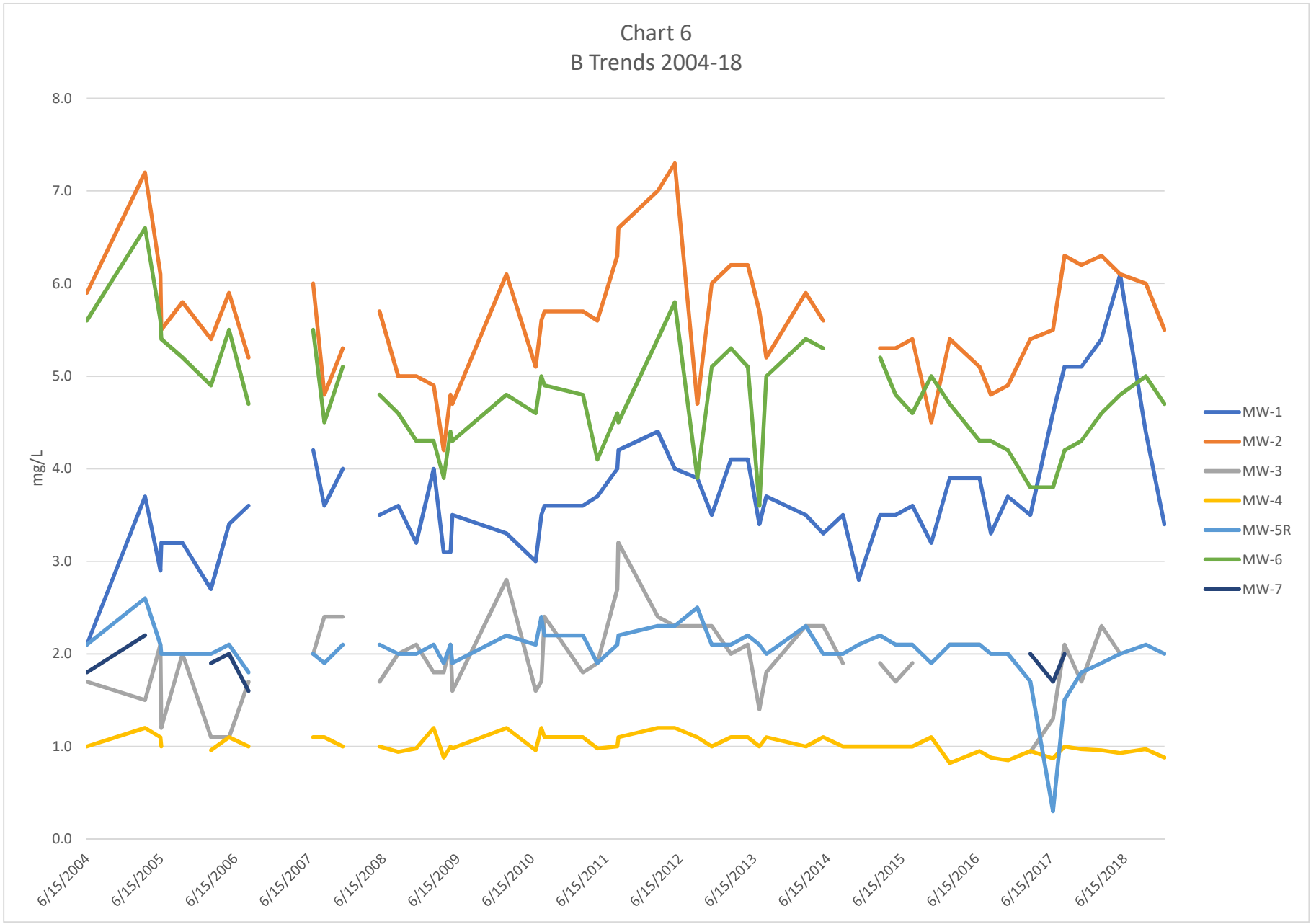


Chart 6
B Trends 2004-18
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
mg/L
6/15/2004
6/15/2005
6/15/2006
6/15/2007
6/15/2008
6/15/2009
6/15/2010
6/15/2011
6/15/2012
6/15/2013
6/15/2014
6/15/2015
6/15/2016
6/15/2017
6/15/2018
MW-1
MW-2
MW-3
MW-4
MW-5R
MW-6
MW-7

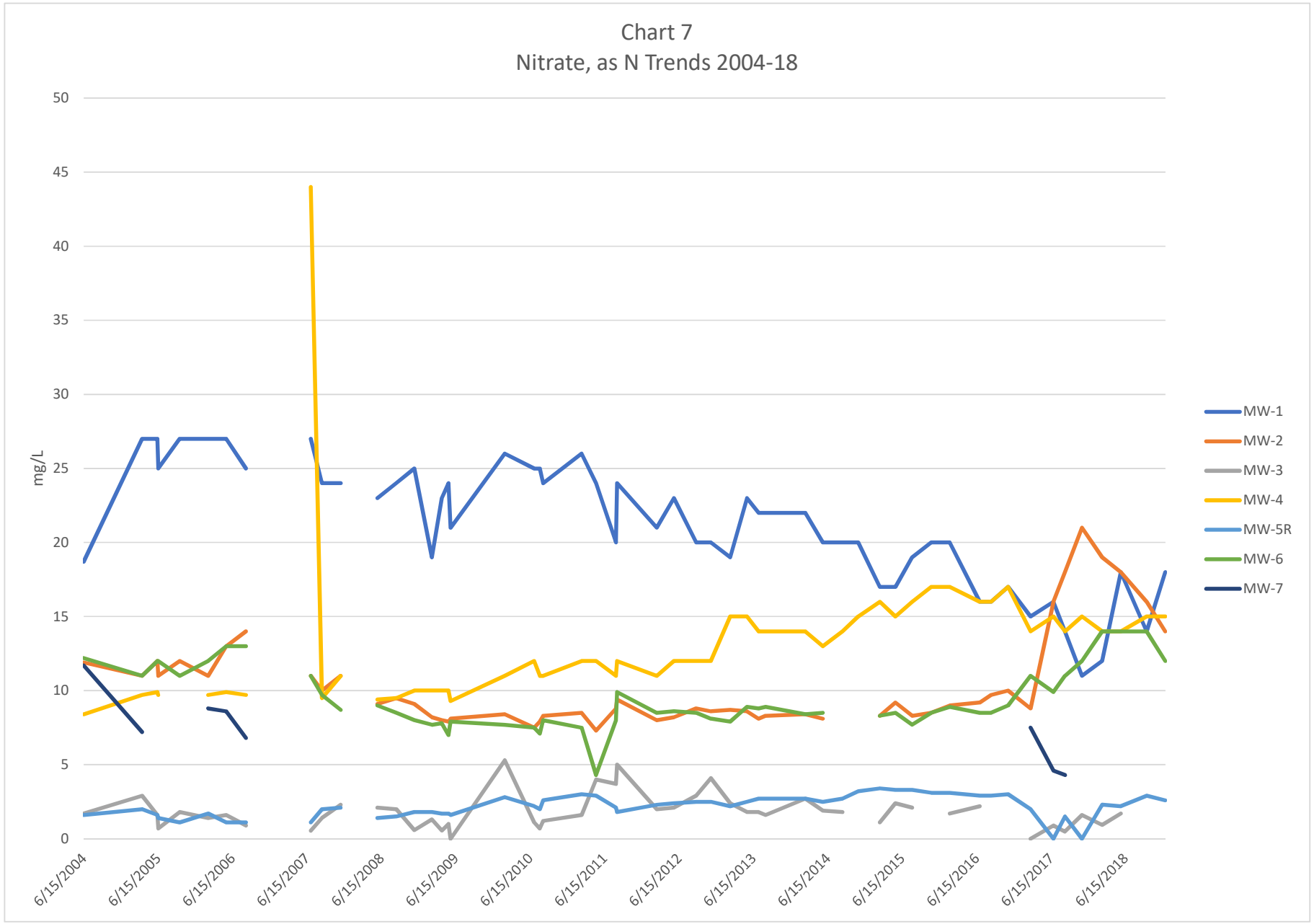


Chart 7
Nitrate, as N Trends 2004-18
mg/L
50
45
40
35
30
25
20
15
10
5
0
6/15/2004
6/15/2005
6/15/2006
6/15/2007
6/15/2008
6/15/2009
6/15/2010
6/15/2011
6/15/2012
6/15/2013
6/15/2014
6/15/2015
6/15/2016
6/15/2017
6/15/2018
MW-1
MW-2
MW-3
MW-4
MW-5R
MW-6
MW-7

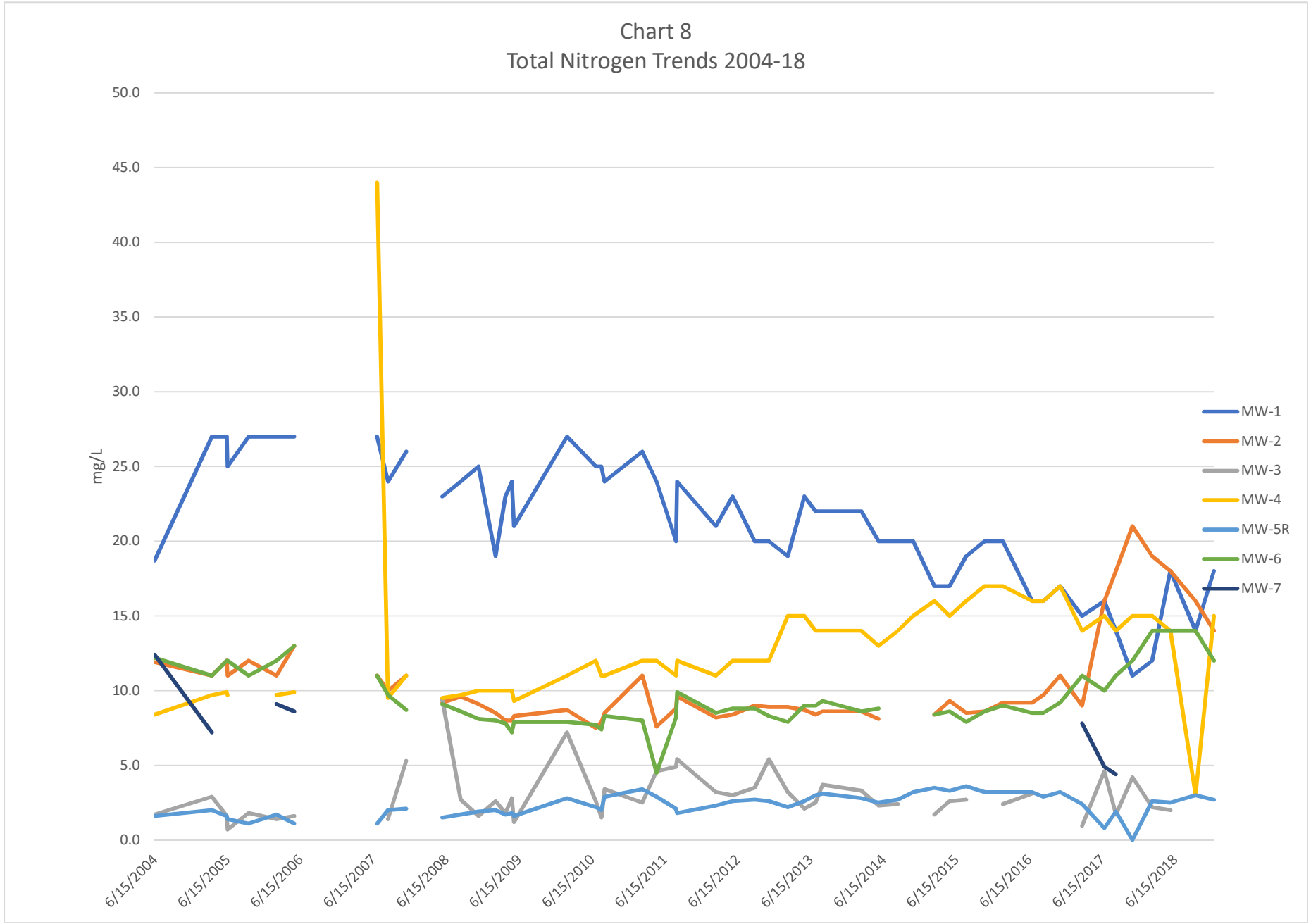


Chart 8
Total Nitrogen Trends 2004-18
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
mg/L
6/15/2004
6/15/2005
6/15/2006
6/15/2007
6/15/2008
6/15/2009
6/15/2010
6/15/2011
6/15/2012
6/15/2013
6/15/2014
6/15/2015
6/15/2016
6/15/2017
6/15/2018
MW-1
MW-2
MW-3
MW-4
MW-5R
MW-6
MW-7

# APPENDIX A
# FIELD DATA FORMS

QTR Mon. WELLS

CALIFORNIA LABORATORY SERVICES
Committed. Responsive. Flexible.

# CHAIN OF CUSTODY

CLS ID No.: _____ LOG № 194627

**REPORT TO:**

NAME AND ADDRESS: CRWA
1234 N. Market Blvd
Sacramento Ca.
PROJECT MANAGER: Dan Demoss PHONE# 916 616 7761
PROJECT NAME: Wildwings
SAMPLED BY: Dayton Bushell
JOB DESCRIPTION: Ground Water
GW - Monitoring
SITE LOCATION: WILD WINGS

CLIENT JOB NUMBER:

DESTINATION LABORATORY:
☑ CLS (916) 638-7301
3249 FITZGERALD RD.
RANCHO CORDOVA, CA.
95742
☐ OTHER

GEOTHRACKER:
EDF REPORT ☐ YES ☐ NO
GLOBAL ID: _____

CDPH WRITE ON EDT TRANSMISSION? ☐ YES ☐ NO
STATE SYSTEM NUMBER _____
IF "YES" PLEASE ENTER THE SOURCE NUMBER(S).

~~COMPOSITE:~~
WinDy, COLD. NO RAIN

| DATE | TIME | SAMPLE IDENTIFICATION | MATRIX | CONTAINER NO. | CONTAINER TYPE | PRESERVATIVES | Total Coliform | Ammonia as N | THMs | pH, TDS, Total N, Nitrate as N | Nitrate as N, Nitrite as N | B, Fe, Mn, Na, Cl |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12/28/18 | 0955 | MW-3 | GW | 6 | VOA 40Lx | 5/6 | X | X | X | X | X | X |
| 12/28/18 | 1010 | MW-4 | GW | 6 | VOA 40Lx | 5/6 | | | | | | |
| 12/28/18 | 1030 | MW-6 | GW | 6 | VOA 40Lx | 5/6 | | | | | | |
| | | ~~MW-7~~ | | | | | | | | | | |
| 12/28/18 | 1145 | MW-5R | GW | 6 | VOA 40Lx | 5/6 | | | | | | |
| 12/28/18 | 1115 | MW-2 | GW | 6 | VOA 40Lx | 5/6 | | | | | | |
| 12/28/18 | 1130 | MW-1 | GW | 6 | VOA 40Lx | 5/6 | X | X | X | X | X | X |

**TURN AROUND TIME**

| 1 DAY | 2 DAY | 3 DAY | 5 DAY |
|---|---|---|---|
| | | | X |
| | | | X |
| | | | X |
| | | | |
| | | | X |
| | | | X |
| | | | X |

**SPECIAL INSTRUCTIONS**

OR
ALT. ID:

Not Sampled

INVOICE TO:

P.O. #

QUOTE #

PRESERVATIVES: (1) HCL (2) $HNO_3$ (3) = COLD (4) = NaOH (5) = $H_2SO_4$ (6) = $Na_2S_2O_3$ (7) =

SUSPECTED CONSTITUENTS

| RELINQUISHED BY (SIGN) | PRINT NAME / COMPANY | DATE / TIME | RECEIVED BY (SIGN) | PRINT NAME / COMPANY |
|---|---|---|---|---|
| Dayton Bushell | Dayton Bushell | 12/28/18 | | |

RECD AT LAB BY: DATE / TIME: CONDITIONS / COMMENTS:

SHIPPED BY: ☐ FED X ☐ UPS ☐ OTHER _____ AIR BILL #

# GROUNDWATER SAMPLING LOG

Well Number: ~~MW-1~~
Date: 12/27/18

Samplers Name: D. Busch
Site: Wild Winds
Project Number: —

Total well depth (ft): 41.4
Well Diameter (in): 2"
Borehole Diameter (in): —

Gauging Date: 12/27/18
Bailer ID: —
Sample Date: 12/28/18

Static water level (ft): 31.34
Previous static water level (ft): 34.07
Standing water column (ft): 10.06

Development method: —
Purging method: Pump
Sampling method: Bailer

All Measurements Taken From:
Top of Casing X
Protective Casing —
Ground Level —

| TIME | AMOUNT PURGED (gal) | EC (___S/cm) | pH | TEMP (C) | COMMENTS | WATER LEVEL (ft bgs) |
|---|---|---|---|---|---|---|
| 1100 | 2 | 1972 | 7.60 | 18.3 | D.O 5.07 TURBID | TOO NARROW |
| 1105 | 4 | 1581 | 7.50 | 18.7 | 5.10 | TO MEASURE |
| 1110 | 6 | 1578 | 7.50 | 18.6 | 5.05 CLEARING | |
| | | pump Dry | | | | |
| | | | | | 9.84 Gal per 1.636al. Vol | |
| | | | | | SAMPLED - | |
| | | | | | BY - DB | |
| | | | | | TIME 1130 | |
| | | | | | DATE 12/28/18 | |
| | | | | | MW - 31.30 | |
| ~~12/28/18~~ | | | | | | |
| ~~1130~~ | — | 1980 | 7.55 | 18.8 | ~~SAMPLE PARAMETERS~~ DO | |
| 12/28/18 | Sample | | | | | |
| 1130 | | 1980 | 7.55 | 18.8 | | |
| | | | | | | |

# GROUNDWATER SAMPLING LOG

Well Number: MW-2
Date: 12/27/18
Samplers Name: D. Busch
Site: Wild Winds
Project Number: —
Total well depth (ft): 46.61
Well Diameter (in): 2"
Borehole Diameter (in): —

Gauging Date: 12/27/18
Bailer ID: —
Sample Date: 12/28/18
Static water level (ft): 34.06
Previous static water level (ft): 37.08
Standing water column (ft): 10.55'
Development method: —
Purging method: Pump
Sampling method: Bailer

All Measurements Taken From:
Top of Casing X
Protective Casing
Ground Level

| TIME | AMOUNT PURGED (gal) | EC (___S/cm) | pH | TEMP (C) | COMMENTS | WATER LEVEL (ft bgs) |
|---|---|---|---|---|---|---|
| 1255 | 1 | 1683 | 7.65 | 17.9 | D.O 7.93 NO ODOR, TURBID | TOO |
| 1257 | 2 | 1691 | 7.54 | 18.7 | 7.59 LT. BRN, TURBID | NARROW |
| 1259 | 3 | 1694 | 7.51 | 18.8 | 7.75 | TO |
| 1302 | 4 | 1692 | 7.49 | 18.7 | 7.70 | MEASURE |
| 1306 | 5 | 1690 | 7.47 | 18.8 | 7.71 | W/PUMP |
| | | | | | | IN WELL |
| | | | | | | |
| | | | | | 1 VOL = 1.7 GAL | |
| | | | | | | |
| | | | | | SAMPLED | |
| | | | | | BY - DD | |
| | | | | | DATE - 12/28/18 | |
| | | | | | TIME - 1115 | |
| | | | | | DTW - 36.21 | |
| 12/28/18 1115 | — | 1688 | 7.55 | 18.0 | SAMPLE PARAMETERS | 36.21 |
| | | | | | | |
| | | | | | | |

# GROUNDWATER SAMPLING LOG

Well Number: MW-3
Date: 12/27/18

Samplers Name: D. Busch
Site: W Winds
Project Number: —

Total well depth (ft): 30.80
Well Diameter (in): 2"
Borehole Diameter (in): —

Gauging Date: 12/27/18
Bailer ID: —
Sample Date: 12/28/18

Static water level (ft): 24.25
Previous static water level (ft): 27.37
Standing water column (ft): 6.55

Development method: ~~Pump~~
Purging method: Pump
Sampling method: Bailer

All Measurements Taken From:

Top of Casing X
Protective Casing —
Ground Level —

| TIME | AMOUNT PURGED (gal) | EC (___S/cm) | pH | TEMP (C) | COMMENTS | WATER LEVEL (ft bgs) |
|---|---|---|---|---|---|---|
| 1015 | 0.5 | 1564 | 7.16 | 16.6 | D.O - 7.92 Pumped Dry | Dry |
| | 3.0 | | | | D.O - Brown Turb. | Dry (Pumped) |
| | 5.0 | | | | D.O - ~~7.88~~ | Too Narrow |
| | | | | | D.O | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | 1.067 Gal per Volume | |
| | | | | | | |
| | | | | | SAMPLED BY | |
| | | | | | DATE = 12/28/18 | |
| | | | | | Time = 0955 | |
| | | | | | DTW = 24.06' | |
| | | | | | | |
| | | | | | | |
| ~~1000~~ | — | | | | | |
| 0955 | — | 1600 | 7.17 | 16.5 | Sample Parameters | 24.06 |
| | | | | | | |

.163 Gal p

# GROUNDWATER SAMPLING LOG

Well Number: MW-4
Date: 12/27/18
Samplers Name: D. Bosch
Site: Wildwinds
Project Number:
Total well depth (ft): 70.30
Well Diameter (in): 2
Borehole Diameter (in): —

Gauging Date: 12/27/18
Bailer ID: Disposable
Sample Date: 12/28/18
Static water level (ft): 53.42
Previous static water level (ft): 53.11
Standing water column (ft): 16.88
Development method: —
Purging method: Pump
Sampling method: Bailer

All Measurements Taken From:
Top of Casing X
Protective Casing
Ground Level

| TIME | AMOUNT PURGED (gal) | EC (µS/cm) | pH | TEMP (C) | COMMENTS | WATER LEVEL (ft bgs) |
|---|---|---|---|---|---|---|
| | | | | | | — |
| 1030 | 1 | 1254 | 7.68 | 12.5 | D.O. 8.13 Turbid. Lt. Brown | |
| 1033 | 2.9 | 1262 | 7.70 | 18.0 | " 7.57 Clear no odor | Too narrow |
| 1037 | 5.0 | 1263 | 7.67 | 18.3 | 7.96 | to measure |
| 1045 | 7.5 | 1260 | 7.68 | 17.5 | 7.82 | |
| 1055 | 9.1 | 1254 | 7.71 | 18.1 | 7.82 Pump Off | |
| | | | | | 2.75 Gal per Volume | |
| | | | | | Sampled | |
| | | | | | By - DB | |
| | | | | | Date - 12/28/18 | |
| | | | | | Time - 1010 | |
| | | | | | DTW - 53.53' | |
| 1010 | — | 1255 | 7.71 | 18.0 | Sample parameters | 53.53 |

# GROUNDWATER SAMPLING LOG

Well Number: MW 5R
Date: 12/27/18

Samplers Name: D. Busch
Site: W.L.D Winds
Project Number:

Total well depth (ft): 73.20
Well Diameter (in): 2"
Borehole Diameter (in): —

Gauging Date: 12/27/18
Bailer ID: —
Sample Date: 12/28/18

Static water level (ft): 40.70
Previous static water level (ft): 41.65
Standing water column (ft): 32.50

Development method: —
Purging method: Pump
Sampling method: Bailer

All Measurements Taken From:
Top of Casing X
Protective Casing
Ground Level

| TIME | AMOUNT PURGED (gal) | EC (__S/cm) | pH | TEMP (C) | COMMENTS | WATER LEVEL (ft bgs) |
|---|---|---|---|---|---|---|
| 1230 | 3 | 828.7 | 8.24 | 11.4 | D.O. 4.91 | Too narrow |
| | 5 | 835.6 | 8.16 | 18.1 | 3.12 | To measure |
| | 7 | 879.9 | 8.14 | 18.0 | 3.10 | . |
| | 8 | 882.7 | 8.13 | 18.1 | 3.12 pumped Dry | |
| | | pumped Dry | | | | |
| | | | | | 1 VOL = 5.29 Gal | |
| | | | | | Sampled: | |
| | | | | | By DB | |
| | | | | | Date: 12/28/18 | |
| | | | | | Time: 1145 | |
| | | | | | DTW - 40.65 | |
| 12/28/18 | | | | | | |
| 1145 | — | 880.1 | 8.14 | 17.5 | Sample parameters | 40.65 |
| | | | | | | |
| | | | | | | |

# GROUNDWATER SAMPLING LOG

Well Number: MW6
Date: 12/27/18

Samplers Name: D. Busch
Site: Wildwings
Project Number:

Total well depth (ft): 48.8
Well Diameter (in): 2
Borehole Diameter (in): —

Gauging Date: 12/27/18
Bailer ID: —
Sample Date: 12/28/18

Static water level (ft): 40.71
Previous static water level (ft): 41.78
Standing water column (ft): 8.09

Development method: —
Purging method: Pump
Sampling method: Bailer

All Measurements Taken From:

op of Casing X  Protective Casing ____  Ground Level ____

| TIME | AMOUNT PURGED (gal) | EC (__S/cm) | pH | TEMP (C) | COMMENTS | WATER LEVEL (ft bgs) |
|---|---|---|---|---|---|---|
| 1230 | 1 | 1612 | 7.90 | 18.0 | D.O 7.15 Clear | Too |
| 1232 | 2 | 1604 | 7.60 | 18.6 | D.O Turbid | Narrow |
| 1234 | 3 | 1661 | 7.86 | 18.7 | D.O 7.06 Clearing | To Measure |
| 1237 | 4 | pumped | Dnt | | D.O | |
| | | | | | | |
| | | | | | | |
| | | | | | 1 VOL = 1.3 GAL | |
| | | | | | | |
| | | | | | | |
| | | | | | Sampled | |
| | | | | | | |
| | | | | | By - DB | |
| | | | | | Date - 12.28.18 | |
| | | | | | Time - 1030 | |
| | | | | | DTW - 46.61' | |
| 12/28/18 1030 | — | 1600 | 7.77 | 17.9 | Sampled Parameters | 46.61' |
| | | | | | | |

# GROUNDWATER SAMPLING LOG

Well Number: MW-7
Date: 12/27/18

Samplers Name: D. Busch
Site: Wild Winds
Project Number: —

Total well depth (ft): 38.65
Well Diameter (in): 2
Borehole Diameter (in): —

Gauging Date: 12/27/18
Bailer ID: —
Sample Date: N/A

Static water level (ft): Dry 38.01
Previous static water level (ft): 38.59
Standing water column (ft): 38.64

Development method: —
Purging method: Pump
Sampling method: ~~Bailer~~ DD

All Measurements Taken From:

op of Casing X
Protective Casing —
Ground Level —

| TIME | AMOUNT PURGED (gal) | EC (__S/cm) | pH | TEMP (C) | COMMENTS | WATER LEVEL (ft bgs) |
|---|---|---|---|---|---|---|
| 1245 | 0 | — | — | — | D.O - NOT COLLECTED | Dry |
| | | | | | NOT ENOUGH WATER TO BAIL | |
| | | | | | / SAMPLE. | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

# APPENDIX B
# LABORATORY ANALYTICAL RESULTS
# &
# CHAIN OF CUSTODY

CALIFORNIA LABORATORY SERVICES
*Committed. Responsive. Flexible.*

January 07, 2019

**CLS Work Order #: 18L1457**
**COC #: 194627**

Dan Demoss
California Rural Water Association
1234 N. Market Blvd.
Sacramento, CA 95834

**Project Name: Wild Wings**

Enclosed are the results of analyses for samples received by the laboratory on 12/28/18 13:20. Samples were analyzed pursuant to client request utilizing EPA or other ELAP approved methodologies. I certify that the results are in compliance both technically and for completeness.

Analytical results are attached to this letter. Please call if we can provide additional assistance.

Sincerely,

James Liang, Ph.D.
Laboratory Director

CA SWRCB ELAP Accreditation/Registration number 1233

CALIFORNIA LABORATORY SERVICES
Committed Responsive Flexible

QTR Mon. WELLS

# CHAIN OF CUSTODY

CLS ID No.: 18L1457

LOG № 194627

**REPORT TO:**

NAME AND ADDRESS: CRWA
1234 N. Market Blvd
Sacramento Ca.

PROJECT MANAGER: Dan Demers PHONE# 916 616 7761

PROJECT NAME: Wildwings

SAMPLED BY: Dayton Bussell

JOB DESCRIPTION: Ground water
GW - Monitoring

SITE LOCATION: Wild Wings

CLIENT JOB NUMBER:

DESTINATION LABORATORY:

☑ CLS (916) 638-7301
3249 FITZGERALD RD.
RANCHO CORDOVA, CA.
95742

☐ OTHER

PRESERVATIVES

ANALYSIS REQUESTED

GEOTHRACKER:
EDF REPORT ☐ YES ☐ NO
GLOBAL ID:

CDPH WRITE ON EDT TRANSMISSION? ☐ YES ☐ NO
STATE SYSTEM NUMBER
IF "YES" PLEASE ENTER THE SOURCE NUMBER(S).

~~COMPOSITE~~

WinOx, COLD. NO RAIN

| DATE | TIME | SAMPLE IDENTIFICATION | MATRIX | CONTAINER NO. | CONTAINER TYPE | PRESERVATIVES | Total Coliform | Ammonia as N | THMs | pH, TDS, Total N, Tot | N, Tot N, Nitrate as | B, Fe, Mn, Na, Cl, S | TURN AROUND TIME 1 DAY | 2 DAY | 3 DAY | 5 DAY | SPECIAL INSTRUCTIONS OR ALT. ID: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12/28/18 | 0955 | MW-3 | GW | 6 | VOA 500 | 5/6 | X | X | X | X | X | X | | | | X | |
| 12/28/18 | 1010 | MW-4 | GW | 6 | VOA 500 | 5/6 | | | | | | | | | | X | |
| 12/28/18 | 1030 | MW-6 | GW | 6 | VOA 500 | 5/6 | | | | | | | | | | X | |
| | | ~~MW-7~~ | | | | | | | | | | | | | | | Not Sampled |
| 12/28/18 | 1145 | MW-5R | GW | 6 | VOA 500 | 5/6 | | | | | | | | | | X | |
| 12/28/18 | 1115 | MW-2 | GW | 6 | VOA 500 | 5/6 | | | | | | | | | | X | |
| 12/28/18 | 1130 | MW-1 | GW | 6 | VOA 500 | 5/6 | X | X | X | X | X | X | | | | X | |

INVOICE TO:

P.O. #

QUOTE #

SUSPECTED CONSTITUENTS

PRESERVATIVES: (1) HCL (2) $HNO_3$ (3) = COLD (4) = NaOH (5) = $H_2SO_4$ (6) = $Na_2S_2O_3$ (7) =

| RELINQUISHED BY (SIGN) | PRINT NAME / COMPANY | DATE / TIME | RECEIVED BY (SIGN) | PRINT NAME / COMPANY |
|---|---|---|---|---|
| Dayton Bussell | Dayton Bussell | 12/28/18 | Michael J. Bennett | Michael J. Bennett |
| Michael J. Bennett | Michael J. Bennett | 12/28/18 1320 | | |

RECD AT LAB BY: MM

DATE / TIME: 12/29/18 1520

CONDITIONS / COMMENTS: 3.7

SHIPPED BY: ☐ FED X ☐ UPS ☐ OTHER AIR BILL #

White/ ab/Terms and conditions Yellow/ lab file /now/Terms and Conditions Pink - Client/Terms and Conditions Gold-Project Mgr /Field Samples/Terms and conditions

# CLS LABS
## SAMPLE RECEIVING EXCEPTION REPORTS

**CLS Labs Job #** 181457

**Problem discovered by:** SMITH **Date:** 12/28/18

**Nature of problem**

Client requesting "CI" - unknown analysis

**Client contacted? Yes** X **No** ____ **Spoke With:** Dayton Buskirk

**By whom:** SMITH **Date:** 12/31/18 **Time:** 0930 HRS

**Client instructions:**

Should be chloride.

**Resolution of problem:**

Logged accordingly.

12/31/18

# CLS LABS

## SAMPLE RECEIVING EXCEPTION REPORTS

**CLS Labs Job #** 184457

**Problem discovered by:** CO. **Date:** 12/28/18

**Nature of problem**

**Sulfite** **Chlorine, Total** **Chlorine, Residual** **Ph** **Dissolved O2**

(Circle analysis above) **Received out of HOLD time.**

**Client contacted? Yes** _____ **No** _____ **Spoke With:** _____

**By whom:** _____ **Date:** ___/___/___ **Time:** _____ **HRS**

**Client instructions:**

**Resolution of problem:**

**Logged in regardless and will be ran for analysis requested.**

| | | | |
|---|---|---|---|
| California Rural Water Association | Project: | Wild Wings | |
| 1234 N. Market Blvd. | Project Number: | [none] | **CLS Work Order #: 18L1457** |
| Sacramento, CA 95834 | Project Manager: | Dan Demoss | COC #: 194627 |

## Conventional Chemistry Parameters by APHA/EPA Methods

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **MW-3 (18L1457-01) GW Sampled: 12/28/18 09:55 Received: 12/28/18 13:20** | | | | | | | | | |
| Ammonia as N | ND | 0.10 | mg/L | 1 | 1900019 | 01/02/19 | 01/02/19 | SM4500-NH3F-1997 | |
| **Chloride** | **170** | 5.0 | " | 10 | 1811006 | 12/28/18 | 12/31/18 | EPA 300.0 | |
| **Nitrate as N** | **2.6** | 0.40 | " | 1 | " | " | 12/28/18 | " | |
| **Nitrate/Nitrite as N** | **2.6** | 0.40 | " | " | " | " | " | " | |
| Nitrite as N | ND | 0.40 | " | " | " | " | " | " | |
| **pH** | **6.91** | 0.01 | pH Units | " | 1811005 | 12/28/18 | 12/28/18 | SM4500-H B | HT-F |
| **Total Dissolved Solids** | **690** | 10 | mg/L | " | 1811021 | 12/31/18 | 01/02/19 | SM2540C | |
| **Total Kjeldahl Nitrogen** | **0.47** | 0.20 | " | " | 1900026 | 01/02/19 | 01/02/19 | SM4500-NH3F-1997 | |
| **Total Nitrogen** | **3.1** | 0.40 | " | " | 1900029 | 01/02/19 | 01/02/19 | EPA 351.3/300 | |
| **MW-4 (18L1457-02) GW Sampled: 12/28/18 10:10 Received: 12/28/18 13:20** | | | | | | | | | |
| Ammonia as N | ND | 0.10 | mg/L | 1 | 1900019 | 01/02/19 | 01/02/19 | SM4500-NH3F-1997 | |
| **Chloride** | **220** | 5.0 | " | 10 | 1811006 | 12/28/18 | 12/31/18 | EPA 300.0 | |
| **Nitrate as N** | **15** | 2.0 | " | 5 | " | " | 12/28/18 | " | |
| **Nitrate/Nitrite as N** | **15** | 2.0 | " | " | " | " | 12/28/18 | " | |
| Nitrite as N | ND | 0.40 | " | 1 | " | " | 12/28/18 | " | |
| **pH** | **7.80** | 0.01 | pH Units | " | 1811005 | 12/28/18 | 12/28/18 | SM4500-H B | HT-F |
| **Total Dissolved Solids** | **530** | 10 | mg/L | " | 1811021 | 12/31/18 | 01/02/19 | SM2540C | |
| Total Kjeldahl Nitrogen | ND | 0.20 | " | " | 1900026 | 01/02/19 | 01/02/19 | SM4500-NH3F-1997 | |
| **Total Nitrogen** | **15** | 0.40 | " | " | 1900029 | 01/02/19 | 01/02/19 | EPA 351.3/300 | |
| **MW-6 (18L1457-03) GW Sampled: 12/28/18 10:30 Received: 12/28/18 13:20** | | | | | | | | | |
| Ammonia as N | ND | 0.10 | mg/L | 1 | 1900019 | 01/02/19 | 01/02/19 | SM4500-NH3F-1997 | |
| **Chloride** | **120** | 2.5 | " | 5 | 1811006 | 12/28/18 | 12/31/18 | EPA 300.0 | |
| **Nitrate as N** | **12** | 2.0 | " | " | " | " | 12/28/18 | " | |
| **Nitrate/Nitrite as N** | **12** | 2.0 | " | " | " | " | " | " | |
| Nitrite as N | ND | 0.40 | " | 1 | " | " | 12/28/18 | " | |
| **pH** | **7.11** | 0.01 | pH Units | " | 1811005 | 12/28/18 | 12/28/18 | SM4500-H B | HT-F |
| **Total Dissolved Solids** | **860** | 10 | mg/L | " | 1811021 | 12/31/18 | 01/02/19 | SM2540C | |

| | | | |
|---|---|---|---|
| California Rural Water Association | Project: | Wild Wings | |
| 1234 N. Market Blvd. | Project Number: | [none] | **CLS Work Order #: 18L1457** |
| Sacramento, CA 95834 | Project Manager: | Dan Demoss | COC #: 194627 |

## Conventional Chemistry Parameters by APHA/EPA Methods

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **MW-6 (18L1457-03) GW Sampled: 12/28/18 10:30 Received: 12/28/18 13:20** | | | | | | | | | |
| Total Kjeldahl Nitrogen | ND | 0.20 | mg/L | 1 | 1900026 | 01/02/19 | 01/02/19 | SM4500-NH3F-1997 | |
| **Total Nitrogen** | **12** | 0.40 | " | " | 1900029 | 01/02/19 | 01/02/19 | EPA 351.3/300 | |
| **MW-5R (18L1457-04) GW Sampled: 12/28/18 11:45 Received: 12/28/18 13:20** | | | | | | | | | |
| Ammonia as N | ND | 0.10 | mg/L | 1 | 1900019 | 01/02/19 | 01/02/19 | SM4500-NH3F-1997 | |
| **Chloride** | **44** | 2.5 | " | 5 | 1811006 | 12/28/18 | 12/31/18 | EPA 300.0 | |
| **Nitrate as N** | **2.6** | 2.0 | " | " | " | " | 12/28/18 | " | |
| **Nitrate/Nitrite as N** | **2.6** | 2.0 | " | " | " | " | 12/28/18 | " | |
| Nitrite as N | ND | 0.40 | " | 1 | " | " | " | " | |
| **pH** | **7.97** | 0.01 | pH Units | " | 1811005 | 12/28/18 | 12/28/18 | SM4500-H B | HT-F |
| **Total Dissolved Solids** | **400** | 10 | mg/L | " | 1811021 | 12/31/18 | 01/02/19 | SM2540C | |
| Total Kjeldahl Nitrogen | ND | 0.20 | " | " | 1900026 | 01/02/19 | 01/02/19 | SM4500-NH3F-1997 | |
| **Total Nitrogen** | **2.7** | 0.40 | " | " | 1900029 | 01/02/19 | 01/02/19 | EPA 351.3/300 | |
| **MW-2 (18L1457-05) GW Sampled: 12/28/18 11:15 Received: 12/28/18 13:20** | | | | | | | | | |
| Ammonia as N | ND | 0.10 | mg/L | 1 | 1900019 | 01/02/19 | 01/02/19 | SM4500-NH3F-1997 | |
| **Chloride** | **120** | 2.5 | " | 5 | 1811006 | 12/28/18 | 12/31/18 | EPA 300.0 | |
| **Nitrate as N** | **14** | 2.0 | " | " | " | " | 12/28/18 | " | |
| **Nitrate/Nitrite as N** | **14** | 2.0 | " | " | " | " | " | " | |
| Nitrite as N | ND | 0.40 | " | 1 | " | " | 12/28/18 | " | |
| **pH** | **7.13** | 0.01 | pH Units | " | 1811005 | 12/28/18 | 12/28/18 | SM4500-H B | HT-F |
| **Total Dissolved Solids** | **890** | 10 | mg/L | " | 1811021 | 12/31/18 | 01/02/19 | SM2540C | |
| Total Kjeldahl Nitrogen | ND | 0.20 | " | " | 1900026 | 01/02/19 | 01/02/19 | SM4500-NH3F-1997 | |
| **Total Nitrogen** | **14** | 0.40 | " | " | 1900029 | 01/02/19 | 01/02/19 | EPA 351.3/300 | |

| | | | |
|---|---|---|---|
| California Rural Water Association | Project: | Wild Wings | |
| 1234 N. Market Blvd. | Project Number: | [none] | **CLS Work Order #: 18L1457** |
| Sacramento, CA 95834 | Project Manager: | Dan Demoss | COC #: 194627 |

## Conventional Chemistry Parameters by APHA/EPA Methods

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **MW-1 (18L1457-06) GW Sampled: 12/28/18 11:30 Received: 12/28/18 13:20** | | | | | | | | | |
| Ammonia as N | ND | 0.10 | mg/L | 1 | 1900019 | 01/02/19 | 01/02/19 | SM4500-NH3F-1997 | |
| **Chloride** | **230** | 5.0 | " | 10 | 1811006 | 12/28/18 | 12/31/18 | EPA 300.0 | |
| **Nitrate as N** | **18** | 2.0 | " | 5 | " | " | 12/28/18 | " | |
| **Nitrate/Nitrite as N** | **18** | 2.0 | " | " | " | " | " | " | |
| Nitrite as N | ND | 0.40 | " | 1 | " | " | 12/28/18 | " | |
| **pH** | **7.32** | 0.01 | pH Units | " | 1811005 | 12/28/18 | 12/28/18 | SM4500-H B | HT-F |
| **Total Dissolved Solids** | **900** | 10 | mg/L | " | 1811021 | 12/31/18 | 01/02/19 | SM2540C | |
| Total Kjeldahl Nitrogen | ND | 0.20 | " | " | 1900026 | 01/02/19 | 01/02/19 | SM4500-NH3F-1997 | |
| **Total Nitrogen** | **18** | 0.40 | " | " | 1900029 | 01/02/19 | 01/02/19 | EPA 351.3/300 | |

| | | |
|---|---|---|
| California Rural Water Association | Project: | Wild Wings |
| 1234 N. Market Blvd. | Project Number: | [none] |
| Sacramento, CA 95834 | Project Manager: | Dan Demoss |

**CLS Work Order #: 18L1457**
COC #: 194627

## Metals (Dissolved) by EPA 200 Series Methods

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **MW-3 (18L1457-01) GW Sampled: 12/28/18 09:55 Received: 12/28/18 13:20** | | | | | | | | | |
| **Boron** | **2500** | 50 | µg/L | 1 | 1900096 | 01/04/19 | 01/04/19 | EPA 200.7 | |
| Iron | ND | 100 | " | " | " | " | " | " | |
| Manganese | ND | 20 | " | " | " | " | " | " | |
| **Sodium** | **220000** | 1000 | " | " | " | " | " | " | |
| **MW-4 (18L1457-02) GW Sampled: 12/28/18 10:10 Received: 12/28/18 13:20** | | | | | | | | | |
| **Boron** | **880** | 50 | µg/L | 1 | 1900096 | 01/04/19 | 01/04/19 | EPA 200.7 | |
| Iron | ND | 100 | " | " | " | " | " | " | |
| Manganese | ND | 20 | " | " | " | " | " | " | |
| **Sodium** | **52000** | 1000 | " | " | " | " | " | " | |
| **MW-6 (18L1457-03) GW Sampled: 12/28/18 10:30 Received: 12/28/18 13:20** | | | | | | | | | |
| **Boron** | **4700** | 50 | µg/L | 1 | 1900096 | 01/04/19 | 01/04/19 | EPA 200.7 | |
| Iron | ND | 100 | " | " | " | " | " | " | |
| Manganese | ND | 20 | " | " | " | " | " | " | |
| **Sodium** | **150000** | 1000 | " | " | " | " | " | " | |
| **MW-5R (18L1457-04) GW Sampled: 12/28/18 11:45 Received: 12/28/18 13:20** | | | | | | | | | |
| **Boron** | **2000** | 50 | µg/L | 1 | 1900096 | 01/04/19 | 01/04/19 | EPA 200.7 | |
| Iron | ND | 100 | " | " | " | " | " | " | |
| Manganese | ND | 20 | " | " | " | " | " | " | |
| **Sodium** | **92000** | 1000 | " | " | " | " | " | " | |
| **MW-2 (18L1457-05) GW Sampled: 12/28/18 11:15 Received: 12/28/18 13:20** | | | | | | | | | |
| **Boron** | **5500** | 50 | µg/L | 1 | 1900096 | 01/04/19 | 01/04/19 | EPA 200.7 | |
| Iron | ND | 100 | " | " | " | " | " | " | |
| Manganese | ND | 20 | " | " | " | " | " | " | |
| **Sodium** | **150000** | 1000 | " | " | " | " | " | " | |

| | | | |
|---|---|---|---|
| California Rural Water Association | Project: | Wild Wings | |
| 1234 N. Market Blvd. | Project Number: | [none] | **CLS Work Order #: 18L1457** |
| Sacramento, CA 95834 | Project Manager: | Dan Demoss | COC #: 194627 |

## Metals (Dissolved) by EPA 200 Series Methods

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **MW-1 (18L1457-06) GW Sampled: 12/28/18 11:30 Received: 12/28/18 13:20** | | | | | | | | | |
| **Boron** | **3400** | 50 | µg/L | 1 | 1900096 | 01/04/19 | 01/04/19 | EPA 200.7 | |
| Iron | ND | 100 | " | " | " | " | " | " | |
| Manganese | ND | 20 | " | " | " | " | " | " | |
| **Sodium** | **120000** | 1000 | " | " | " | " | " | " | |

| | | | |
|---|---|---|---|
| California Rural Water Association | Project: | Wild Wings | |
| 1234 N. Market Blvd. | Project Number: | [none] | **CLS Work Order #: 18L1457** |
| Sacramento, CA 95834 | Project Manager: | Dan Demoss | COC #: 194627 |

## Microbiological Parameters by APHA Standard Methods

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **MW-3 (18L1457-01) GW Sampled: 12/28/18 09:55 Received: 12/28/18 13:20** | | | | | | | | | |
| Total Coliforms | <1.8 | 1.8 | MPN/100 mL | 1 | 1811000 | 12/28/18 | 12/30/18 | SM 9221 | |
| **MW-4 (18L1457-02) GW Sampled: 12/28/18 10:10 Received: 12/28/18 13:20** | | | | | | | | | |
| Total Coliforms | <1.8 | 1.8 | MPN/100 mL | 1 | 1811000 | 12/28/18 | 12/30/18 | SM 9221 | |
| **MW-6 (18L1457-03) GW Sampled: 12/28/18 10:30 Received: 12/28/18 13:20** | | | | | | | | | |
| Total Coliforms | <1.8 | 1.8 | MPN/100 mL | 1 | 1811000 | 12/28/18 | 12/30/18 | SM 9221 | |
| **MW-5R (18L1457-04) GW Sampled: 12/28/18 11:45 Received: 12/28/18 13:20** | | | | | | | | | |
| Total Coliforms | <1.8 | 1.8 | MPN/100 mL | 1 | 1811000 | 12/28/18 | 01/01/19 | SM 9221 | |
| **MW-2 (18L1457-05) GW Sampled: 12/28/18 11:15 Received: 12/28/18 13:20** | | | | | | | | | |
| Total Coliforms | <1.8 | 1.8 | MPN/100 mL | 1 | 1811000 | 12/28/18 | 01/01/19 | SM 9221 | |
| **MW-1 (18L1457-06) GW Sampled: 12/28/18 11:30 Received: 12/28/18 13:20** | | | | | | | | | |
| Total Coliforms | <1.8 | 1.8 | MPN/100 mL | 1 | 1811000 | 12/28/18 | 01/01/19 | SM 9221 | |

| | | | |
|---|---|---|---|
| California Rural Water Association | Project: | Wild Wings | |
| 1234 N. Market Blvd. | Project Number: | [none] | **CLS Work Order #: 18L1457** |
| Sacramento, CA 95834 | Project Manager: | Dan Demoss | COC #: 194627 |

## Trihalomethanes by EPA Method 524.2

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **MW-3 (18L1457-01) GW Sampled: 12/28/18 09:55 Received: 12/28/18 13:20** | | | | | | | | | |
| **Bromodichloromethane** | **5.3** | 0.50 | µg/L | 1 | 1900049 | 01/02/19 | 01/02/19 | EPA 524.2 | |
| Bromoform | ND | 0.50 | " | " | " | " | " | " | |
| **Chloroform** | **26** | 0.50 | " | " | " | " | " | " | |
| **Dibromochloromethane** | **2.3** | 0.50 | " | " | " | " | " | " | |
| **Total Trihalomethanes (THM)** | **33** | 0.50 | " | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | | *123 %* | | *70-130* | | " | " | " | " |
| *Surrogate: Toluene-d8* | | *98 %* | | *70-130* | | " | " | " | " |
| **MW-4 (18L1457-02) GW Sampled: 12/28/18 10:10 Received: 12/28/18 13:20** | | | | | | | | | |
| Bromodichloromethane | ND | 0.50 | µg/L | 1 | 1900049 | 01/02/19 | 01/02/19 | EPA 524.2 | |
| **Bromoform** | **2.0** | 0.50 | " | " | " | " | " | " | |
| Chloroform | ND | 0.50 | " | " | " | " | " | " | |
| Dibromochloromethane | ND | 0.50 | " | " | " | " | " | " | |
| **Total Trihalomethanes (THM)** | **2.0** | 0.50 | " | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | | *123 %* | | *70-130* | | " | " | " | " |
| *Surrogate: Toluene-d8* | | *88 %* | | *70-130* | | " | " | " | " |
| **MW-6 (18L1457-03) GW Sampled: 12/28/18 10:30 Received: 12/28/18 13:20** | | | | | | | | | |
| Bromodichloromethane | ND | 0.50 | µg/L | 1 | 1900049 | 01/02/19 | 01/02/19 | EPA 524.2 | |
| **Bromoform** | **2.0** | 0.50 | " | " | " | " | " | " | |
| **Chloroform** | **0.99** | 0.50 | " | " | " | " | " | " | |
| Dibromochloromethane | ND | 0.50 | " | " | " | " | " | " | |
| **Total Trihalomethanes (THM)** | **3.0** | 0.50 | " | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | | *120 %* | | *70-130* | | " | " | " | " |
| *Surrogate: Toluene-d8* | | *99 %* | | *70-130* | | " | " | " | " |

| | | | |
|---|---|---|---|
| California Rural Water Association | Project: | Wild Wings | |
| 1234 N. Market Blvd. | Project Number: | [none] | **CLS Work Order #: 18L1457** |
| Sacramento, CA 95834 | Project Manager: | Dan Demoss | COC #: 194627 |

## Trihalomethanes by EPA Method 524.2

| Analyte | Result | Reporting Limit | Units | Dilution | Batch | Prepared | Analyzed | Method | Notes |
|---|---|---|---|---|---|---|---|---|---|
| **MW-5R (18L1457-04) GW Sampled: 12/28/18 11:45 Received: 12/28/18 13:20** | | | | | | | | | |
| Bromodichloromethane | ND | 0.50 | µg/L | 1 | 1900049 | 01/02/19 | 01/02/19 | EPA 524.2 | |
| Bromoform | ND | 0.50 | " | " | " | " | " | " | |
| Chloroform | ND | 0.50 | " | " | " | " | " | " | |
| Dibromochloromethane | ND | 0.50 | " | " | " | " | " | " | |
| Total Trihalomethanes (THM) | ND | 0.50 | " | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | | *124 %* | | *70-130* | | " | " | " | " |
| *Surrogate: Toluene-d8* | | *99 %* | | *70-130* | | " | " | " | " |
| **MW-2 (18L1457-05) GW Sampled: 12/28/18 11:15 Received: 12/28/18 13:20** | | | | | | | | | |
| Bromodichloromethane | ND | 0.50 | µg/L | 1 | 1900049 | 01/02/19 | 01/02/19 | EPA 524.2 | |
| Bromoform | ND | 0.50 | " | " | " | " | " | " | |
| Chloroform | ND | 0.50 | " | " | " | " | " | " | |
| Dibromochloromethane | ND | 0.50 | " | " | " | " | " | " | |
| Total Trihalomethanes (THM) | ND | 0.50 | " | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | | *124 %* | | *70-130* | | " | " | " | " |
| *Surrogate: Toluene-d8* | | *100 %* | | *70-130* | | " | " | " | " |
| **MW-1 (18L1457-06) GW Sampled: 12/28/18 11:30 Received: 12/28/18 13:20** | | | | | | | | | |
| Bromodichloromethane | ND | 0.50 | µg/L | 1 | 1900049 | 01/02/19 | 01/02/19 | EPA 524.2 | |
| Bromoform | ND | 0.50 | " | " | " | " | " | " | |
| Chloroform | ND | 0.50 | " | " | " | " | " | " | |
| Dibromochloromethane | ND | 0.50 | " | " | " | " | " | " | |
| Total Trihalomethanes (THM) | ND | 0.50 | " | " | " | " | " | " | |
| *Surrogate: 1,2-Dichloroethane-d4* | | *120 %* | | *70-130* | | " | " | " | " |
| *Surrogate: Toluene-d8* | | *100 %* | | *70-130* | | " | " | " | " |

| | | | |
|---|---|---|---|
| California Rural Water Association | Project: | Wild Wings | |
| 1234 N. Market Blvd. | Project Number: | [none] | **CLS Work Order #: 18L1457** |
| Sacramento, CA 95834 | Project Manager: | Dan Demoss | COC #: 194627 |

## Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 1811005 - General Prep** | | | | | | | | | | |
| **Duplicate (1811005-DUP1)** | | **Source: 18L1456-01** | | Prepared & Analyzed: 12/28/18 | | | | | | |
| pH | 6.69 | 0.01 | pH Units | | 6.71 | | | 0.299 | 20 | |
| **Batch 1811006 - General Prep** | | | | | | | | | | |
| **Blank (1811006-BLK1)** | | | | Prepared: 12/28/18 Analyzed: 12/31/18 | | | | | | |
| Chloride | ND | 0.50 | mg/L | | | | | | | |
| Nitrate/Nitrite as N | ND | 0.40 | " | | | | | | | |
| Nitrite as N | ND | 0.40 | " | | | | | | | |
| Nitrate as N | ND | 0.40 | " | | | | | | | |
| **LCS (1811006-BS1)** | | | | Prepared: 12/28/18 Analyzed: 12/31/18 | | | | | | |
| Chloride | 4.70 | 0.50 | mg/L | 5.00 | | 94 | 80-120 | | | |
| Nitrate/Nitrite as N | 3.77 | 0.40 | " | 4.00 | | 94 | 80-120 | | | |
| Nitrite as N | 1.85 | 0.40 | " | 2.00 | | 92 | 80-120 | | | |
| Nitrate as N | 1.92 | 0.40 | " | 2.00 | | 96 | 80-120 | | | |
| **LCS Dup (1811006-BSD1)** | | | | Prepared: 12/28/18 Analyzed: 12/31/18 | | | | | | |
| Chloride | 4.74 | 0.50 | mg/L | 5.00 | | 95 | 80-120 | 1 | 20 | |
| Nitrate as N | 1.94 | 0.40 | " | 2.00 | | 97 | 80-120 | 1 | 20 | |
| Nitrite as N | 1.87 | 0.40 | " | 2.00 | | 94 | 80-120 | 1 | 20 | |
| Nitrate/Nitrite as N | 3.81 | 0.40 | " | 4.00 | | 95 | 80-120 | 1 | 20 | |
| **Matrix Spike (1811006-MS1)** | | **Source: 18L1459-02** | | Prepared: 12/28/18 Analyzed: 12/31/18 | | | | | | |
| Chloride | 46.4 | 1.0 | mg/L | 10.0 | 38.3 | 81 | 80-120 | | | |
| Nitrite as N | 3.47 | 0.80 | " | 4.00 | 0.0652 | 85 | 80-120 | | | |
| Nitrate as N | 11.1 | 0.80 | " | 4.00 | 7.52 | 88 | 80-120 | | | |
| Nitrate/Nitrite as N | 14.5 | 0.80 | " | 8.00 | 7.59 | 87 | 80-120 | | | |

| | | |
|---|---|---|
| California Rural Water Association | Project: | Wild Wings |
| 1234 N. Market Blvd. | Project Number: | [none] |
| Sacramento, CA 95834 | Project Manager: | Dan Demoss |

**CLS Work Order #: 18L1457**
COC #: 194627

## Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 1811006 - General Prep** | | | | | | | | | | |
| **Matrix Spike Dup (1811006-MSD1)** | **Source: 18L1459-02** | | | Prepared: 12/28/18 Analyzed: 12/31/18 | | | | | | |
| Chloride | 46.2 | 1.0 | mg/L | 10.0 | 38.3 | 79 | 80-120 | 0.4 | 20 | QM-7 |
| Nitrate/Nitrite as N | 14.4 | 0.80 | " | 8.00 | 7.59 | 86 | 80-120 | 0.6 | 20 | |
| Nitrite as N | 3.42 | 0.80 | " | 4.00 | 0.0652 | 84 | 80-120 | 1 | 20 | |
| Nitrate as N | 11.0 | 0.80 | " | 4.00 | 7.52 | 87 | 80-120 | 0.4 | 20 | |
| **Batch 1811021 - General Preparation** | | | | | | | | | | |
| **Blank (1811021-BLK1)** | | | | Prepared: 12/31/18 Analyzed: 01/02/19 | | | | | | |
| Total Dissolved Solids | ND | 10 | mg/L | | | | | | | |
| **Duplicate (1811021-DUP1)** | **Source: 18L1443-04** | | | Prepared: 12/31/18 Analyzed: 01/02/19 | | | | | | |
| Total Dissolved Solids | 300 | 10 | mg/L | | 283 | | | 6 | 20 | |
| **Batch 1900019 - General Preparation** | | | | | | | | | | |
| **Blank (1900019-BLK1)** | | | | Prepared & Analyzed: 01/02/19 | | | | | | |
| Ammonia as N | ND | 0.10 | mg/L | | | | | | | |
| **LCS (1900019-BS1)** | | | | Prepared & Analyzed: 01/02/19 | | | | | | |
| Ammonia as N | 0.494 | 0.10 | mg/L | 0.500 | | 99 | 80-120 | | | |
| **LCS Dup (1900019-BSD1)** | | | | Prepared & Analyzed: 01/02/19 | | | | | | |
| Ammonia as N | 0.490 | 0.10 | mg/L | 0.500 | | 98 | 80-120 | 0.8 | 25 | |
| **Matrix Spike (1900019-MS1)** | **Source: 18L1428-01** | | | Prepared & Analyzed: 01/02/19 | | | | | | |
| Ammonia as N | 0.499 | 0.10 | mg/L | 0.500 | 0.0490 | 90 | 75-125 | | | |

| | | |
|---|---|---|
| California Rural Water Association | Project: | Wild Wings |
| 1234 N. Market Blvd. | Project Number: | [none] |
| Sacramento, CA 95834 | Project Manager: | Dan Demoss |

**CLS Work Order #: 18L1457**
COC #: 194627

## Conventional Chemistry Parameters by APHA/EPA Methods - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 1900019 - General Preparation** | | | | | | | | | | |
| **Matrix Spike Dup (1900019-MSD1)** | **Source: 18L1428-01** | | | Prepared & Analyzed: 01/02/19 | | | | | | |
| Ammonia as N | 0.485 | 0.10 | mg/L | 0.500 | 0.0490 | 87 | 75-125 | 3 | 25 | |
| **Batch 1900026 - General Preparation** | | | | | | | | | | |
| **Blank (1900026-BLK1)** | | | | Prepared & Analyzed: 01/02/19 | | | | | | |
| Total Kjeldahl Nitrogen | ND | 0.20 | mg/L | | | | | | | |
| **LCS (1900026-BS1)** | | | | Prepared & Analyzed: 01/02/19 | | | | | | |
| Total Kjeldahl Nitrogen | 0.439 | 0.20 | mg/L | 0.500 | | 88 | 80-120 | | | |
| **LCS Dup (1900026-BSD1)** | | | | Prepared & Analyzed: 01/02/19 | | | | | | |
| Total Kjeldahl Nitrogen | 0.416 | 0.20 | mg/L | 0.500 | | 83 | 80-120 | 5 | 20 | |
| **Matrix Spike (1900026-MS1)** | **Source: 18L1429-02** | | | Prepared & Analyzed: 01/02/19 | | | | | | |
| Total Kjeldahl Nitrogen | 0.959 | 0.20 | mg/L | 0.500 | 0.304 | 131 | 75-125 | | | QM-7 |
| **Matrix Spike Dup (1900026-MSD1)** | **Source: 18L1429-02** | | | Prepared & Analyzed: 01/02/19 | | | | | | |
| Total Kjeldahl Nitrogen | 0.954 | 0.20 | mg/L | 0.500 | 0.304 | 130 | 75-125 | 0.5 | 25 | QM-7 |

| | | | |
|---|---|---|---|
| California Rural Water Association | Project: | Wild Wings | |
| 1234 N. Market Blvd. | Project Number: | [none] | **CLS Work Order #: 18L1457** |
| Sacramento, CA 95834 | Project Manager: | Dan Demoss | COC #: 194627 |

## Metals (Dissolved) by EPA 200 Series Methods - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 1900096 - 6010A/No Digestion** | | | | | | | | | | |
| **Blank (1900096-BLK1)** | | | | Prepared & Analyzed: 01/04/19 | | | | | | |
| Boron | ND | 50 | µg/L | | | | | | | |
| Iron | ND | 100 | " | | | | | | | |
| Manganese | ND | 20 | " | | | | | | | |
| Sodium | ND | 1000 | " | | | | | | | |
| **LCS (1900096-BS1)** | | | | Prepared & Analyzed: 01/04/19 | | | | | | |
| Boron | 1020 | 50 | µg/L | 1000 | | 102 | 85-115 | | | |
| Iron | 974 | 100 | " | 1000 | | 97 | 85-115 | | | |
| Manganese | 1060 | 20 | " | 1000 | | 106 | 85-115 | | | |
| Sodium | 5120 | 1000 | " | 5000 | | 102 | 85-115 | | | |
| **Matrix Spike (1900096-MS1)** | **Source: 18L1461-01** | | | Prepared & Analyzed: 01/04/19 | | | | | | |
| Boron | 998 | 50 | µg/L | 1000 | 14.2 | 98 | 70-130 | | | |
| Iron | 968 | 100 | " | 1000 | ND | 97 | 70-130 | | | |
| Manganese | 1040 | 20 | " | 1000 | 4.78 | 103 | 70-130 | | | |
| Sodium | 9530 | 1000 | " | 5000 | 4520 | 100 | 70-130 | | | |
| **Matrix Spike (1900096-MS2)** | **Source: 18L1457-01** | | | Prepared & Analyzed: 01/04/19 | | | | | | |
| Boron | 3480 | 50 | µg/L | 1000 | 2520 | 96 | 70-130 | | | |
| Iron | 1030 | 100 | " | 1000 | ND | 103 | 70-130 | | | |
| Manganese | 1050 | 20 | " | 1000 | 4.61 | 104 | 70-130 | | | |
| Sodium | 217000 | 1000 | " | 5000 | 218000 | NR | 70-130 | | | QM-4X |

| | | | |
|---|---|---|---|
| California Rural Water Association | Project: | Wild Wings | |
| 1234 N. Market Blvd. | Project Number: | [none] | **CLS Work Order #: 18L1457** |
| Sacramento, CA 95834 | Project Manager: | Dan Demoss | COC #: 194627 |

## Trihalomethanes by EPA Method 524.2 - Quality Control

| Analyte | Result | Reporting Limit | Units | Spike Level | Source Result | %REC | %REC Limits | RPD | RPD Limit | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| **Batch 1900049 - EPA 5030 Water MS** | | | | | | | | | | |
| **Blank (1900049-BLK1)** | | | | Prepared & Analyzed: 01/02/19 | | | | | | |
| Bromodichloromethane | ND | 0.50 | µg/L | | | | | | | |
| Bromoform | ND | 0.50 | " | | | | | | | |
| Chloroform | ND | 0.50 | " | | | | | | | |
| Dibromochloromethane | ND | 0.50 | " | | | | | | | |
| Total Trihalomethanes (THM) | ND | 0.50 | " | | | | | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *11.9* | | *"* | *10.0* | | *119* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *9.74* | | *"* | *10.0* | | *97* | *70-130* | | | |
| **LCS (1900049-BS1)** | | | | Prepared & Analyzed: 01/02/19 | | | | | | |
| Bromodichloromethane | 24.2 | 0.50 | µg/L | 20.0 | | 121 | 70-130 | | | |
| Bromoform | 25.1 | 0.50 | " | 20.0 | | 126 | 70-130 | | | |
| Chloroform | 19.5 | 0.50 | " | 20.0 | | 98 | 70-130 | | | |
| Dibromochloromethane | 25.4 | 0.50 | " | 20.0 | | 127 | 70-130 | | | |
| *Surrogate: 1,2-Dichloroethane-d4* | *10.4* | | *"* | *10.0* | | *104* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *10.3* | | *"* | *10.0* | | *103* | *70-130* | | | |
| **LCS Dup (1900049-BSD1)** | | | | Prepared & Analyzed: 01/02/19 | | | | | | |
| Bromodichloromethane | 25.7 | 0.50 | µg/L | 20.0 | | 129 | 70-130 | 6 | 30 | |
| Bromoform | 25.3 | 0.50 | " | 20.0 | | 127 | 70-130 | 0.9 | 30 | |
| Chloroform | 23.0 | 0.50 | " | 20.0 | | 115 | 70-130 | 17 | 30 | |
| Dibromochloromethane | 25.7 | 0.50 | " | 20.0 | | 128 | 70-130 | 1 | 30 | |
| *Surrogate: 1,2-Dichloroethane-d4* | *10.5* | | *"* | *10.0* | | *105* | *70-130* | | | |
| *Surrogate: Toluene-d8* | *11.2* | | *"* | *10.0* | | *112* | *70-130* | | | |

| | | | |
|---|---|---|---|
| California Rural Water Association | Project: | Wild Wings | |
| 1234 N. Market Blvd. | Project Number: | [none] | **CLS Work Order #: 18L1457** |
| Sacramento, CA 95834 | Project Manager: | Dan Demoss | COC #: 194627 |

## Notes and Definitions

| | |
|---|---|
| QM-7 | The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS and/or LCSD recovery. |
| QM-4X | The spike recovery was outside of QC acceptance limits for the MS and/or MSD due to analyte concentration at 4 times or greater the spike concentration. The QC batch was accepted based on LCS and/or LCSD recoveries within the acceptance limits. |
| HT-F | This is a field test method and it is performed in the lab outside holding time. |
| BT-4 | <1.8 |
| DET | Analyte DETECTED |
| ND | Analyte NOT DETECTED at or above the reporting limit (or method detection limit when specified) |
| NR | Not Reported |
| dry | Sample results reported on a dry weight basis |
| RPD | Relative Percent Difference |