

Electronic Report Transmittal Form

Attention: Brendan Kenny (916) 464-4635
Central Valley Regional Water Quality Control Board
11020 Sun Center Drive #200
Rancho Cordova, CA 95670-6114

Discharger: Wild Wings County Service Area
Name of Facility: Wild Wings Water Recycling Facility
WDRs Order Number: R5-2002-0077
CIWQS Place ID: 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 Self-Monitoring Report for Wild Wings

Monthly Monitoring Report for the month of _____

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

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

Annual Monitoring Report for the year 2018

Violation Notification:

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

1. The violations were: Coliform (see attached)
2. Have the violations been corrected? (Yes) / No. If no, what will be done to correct the violations:

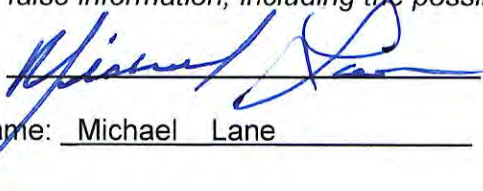
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Certification Statement:

"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 are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Signature: _____



Phone: 707-330-4402

Printed Name: Michael Lane

Date: 2-1-2019

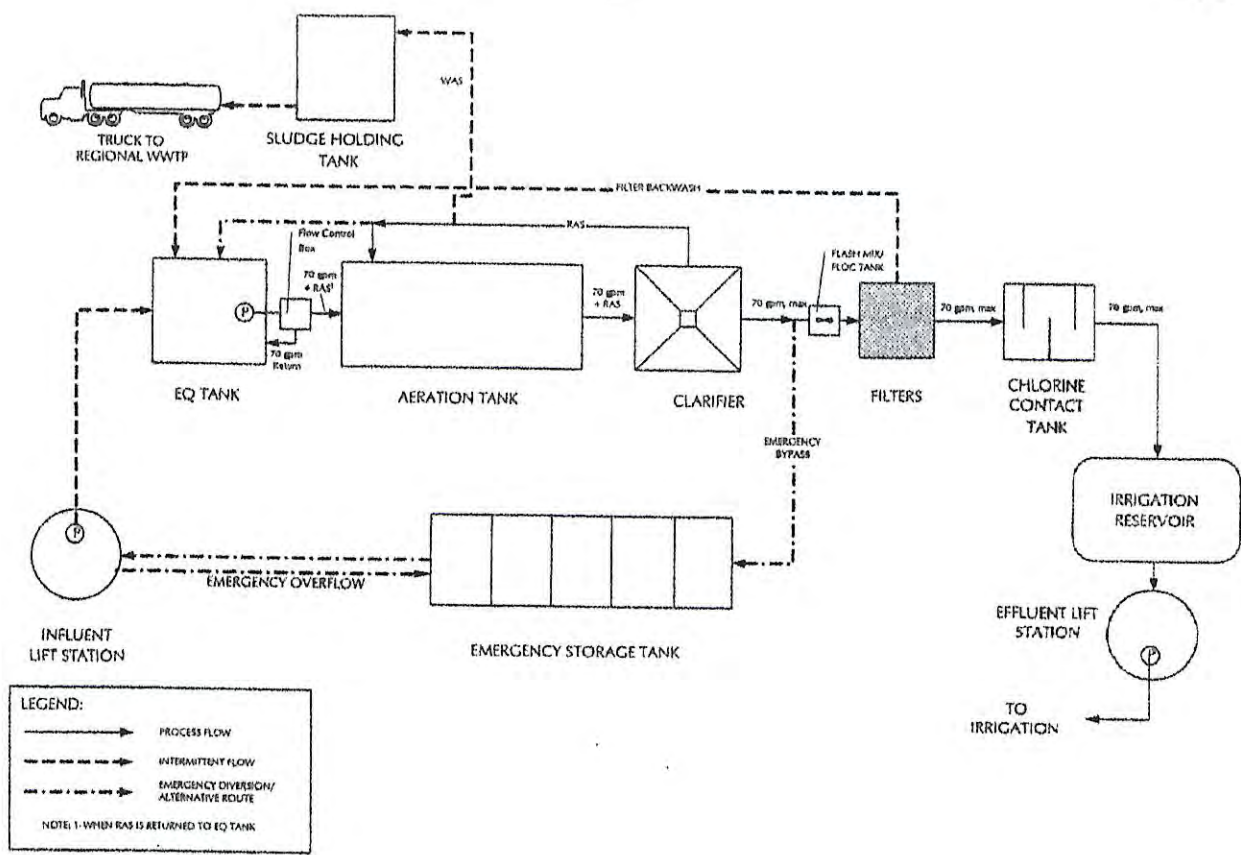
Electronic Report Submittal:

To submit the electronic reports please do the following:

1. First, make a PDF copy of your report and include this *form as the first page of the report.*
2. Attach the PDF file to the email.
3. Send the email and PDF attachment to **centralvalleysacramento@waterboards.ca.gov** (Please note that in order to ensure your reports are cataloged correctly and routed to the appropriate Regional Board staff, only one report/attachment shall be included with each e-mail.)

ATTACHMENT 1

Wild Wings Flow Diagram



FLOW DIAGRAM FOR 101,000 GPD TERTIARY WASTEWATER PLANT, WILD WINGS DEV. YOLO COUNTY

ATTACHMENT 2

Annual Water Supply Monitoring

**WILD WINGS WATER RECYCLING FACILITY
TOTAL TREATED FLOW 2018**

Month	Total Treated (MG)
January	*
February	*
March	1.787
April	1.709
May	1.628
June	1.586
July	1.692
August	1.616
September	1.529
October	1.589
November	1.630
December	1.558
Total	16.324
Min.	1.529
Max.	1.787
Avg.	1.6324

Month	Daily Avg. (MGD)
January	*
February	*
March	0.0576
April	0.0570
May	0.0525
June	0.0529
July	0.0545
August	0.0519
September	0.0510
October	0.0513
November	0.0544
December	0.0555
Total	0.539
Min.	0.051
Max.	0.058
Avg.	0.05386

*** No data or records available by previous contract operator.**

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

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Monthly Monitoring Report for the month of Dec., 2018

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

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

Annual Monitoring Report for the year _____

Violation Notification:

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

1. The violations were: 1600 coliform on 12-6-2018. Chlorine Residual was > 20 mg/L. This is obviously a sampling or testing error. The day before and the day after, the result was <1.8.
2. Have the violations been corrected? **(Yes)** / No. If no, what will be done to correct the violations: we will review sampling and handling procedures.

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Recycle
 Monitoring and Reporting Program No. RS 2002-0077
 Month of **DEC.** **2018**

**WILD WINGS WASTE TREATMENT FACILITY
 RECYCLED WATER MONITORING**

DATE	RECYCLED WATER STORAGE POND MONITORING										RECYCLED WATER AREA MONITORING													
	Freeboard Ft.	D.O. mg/L	pH	EC umhos/cm	TDS mg/L	TSS mg/L	Total Col. MPN	Ammon-N mg/L	BOD mg/L	COD mg/L	Turb. NTU	Nitrate-N mg/L	Ammon-N mg/L	Kjeldsh N mg/L	Total N mg/L	WEEKLY FLOW GPD	RAIN inches	Acreage Applied	App. Rate gal/ac/day	App. Per. Hours	Monthly Total N2 Pounds	TDS Pounds		
1															0									
2															0									
3			8.26	1400	820	ND			10		2	26		0.42	26	0								
4															0									
5															0									
6			8.24	1200	660	ND			3.4		13	10		0.51	11	0								
7															0									
8															0									
9															0									
10			8.28	1200	630	ND			ND		1.5	13		0.11	13	0								
11															0									
12															0									
13			8.25	1400	770	ND			ND		1.7	19		0.25	20	0								
14															0									
15															0									
16															0									
17															0									
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26															0									
27															0									
28															0									
29															0									
30															0									
31															0									

Tot. Gals. _____
 MG 0.00



COUNTY OF YOLO

Office of the County Administrator

County Service Areas
Administrative Support Team

625 Court Street, Room 202 • Woodland, CA 95695
(530) 666-8153 • FAX (530) 668-4029
YoloCSA@yolocounty.org

January 18, 2019

To: Brendan Kenny, Engineering Geologist, Regional Water Board R5s

From: Beth Gabor, Manager of Operations & Strategy

Re: Wild Wings Wastewater Recycling Facility Status Update

-
- There have continued to be set-backs in the effort to empty the recycled water pond and repair the irrigation wet well, including pump issues, rainfall and the holidays. However, a plug is now installed in the wet well inlet and a camera will be put into the wet well to determine the status of the valve that needs to be repaired/replaced. Meanwhile, we continue to whittle away at removing the remaining contents of the pond. If all goes well, the screw press will be cleared for use by the end of next week which will allow for an expedited process. The following week, the remaining contents of the pond should be removed and the liner cleaned. The final step will be the inspection, and repairs if needed, of the liner. As requested, attached to the monthly report you will find information on the water levels in the recycled water pond and the remaining quantity to be discharged, as well as the enhanced testing results.
 - Once the recycled water pond is emptied, the contents of the emergency storage pond will be pumped to the solids handling tank, decanted to the EQ tank and the solids sent to the new screw press until the pond is empty and the integrity of that liner can also be assured.
 - With the installation of the screw press (the final piece of equipment in the rehabilitation effort), work will soon begin on the updated Operations & Maintenance Manual which will include the following sections: Plant Overview, System Description, Design Information, System Component Summary, Electrical System Description, PLC Control System, Equipment O&M Manuals, Instrumentation Equipment and Standard Operation Procedure Forms.

Recycle Pond Tracking

Parameters

Date	Slope Freeboard	Vert. Freeboard	Remaining Gallons	Daily Pumped	Date	Total Coli.	D.O mg/L	E.C.	pH	Irr. Cl ₂ mg/L
1-Dec	493.0	in. 18.36	ft. 2,023,268	724	1-Dec	1.8		1412	8.59	
2-Dec	581.0	in. 21.64	ft. 1,401,101	(1,306)	2-Dec	1.8		1426	8.13	
3-Dec	580.8	in. 21.63	ft. 1,402,407	(7,849)	3-Dec	1.8	10.11			
4-Dec	579.6	in. 21.59	ft. 1,410,256	(7,866)	4-Dec	1.8				
5-Dec	578.4	in. 21.55	ft. 1,418,122	116,202	5-Dec	1.8				
6-Dec	596.4	in. 22.22	ft. 1,301,920	112,415	6-Dec	1.8				
7-Dec	614.4	in. 22.89	ft. 1,189,505	94,417	7-Dec					
8-Dec	630.0	in. 23.47	ft. 1,095,088	70,760	8-Dec					
9-Dec	642.0	in. 23.91	ft. 1,024,328	163,326	9-Dec					
10-Dec	670.8	in. 24.99	ft. 861,002	129,268	10-Dec	1.8				
11-Dec	694.8	in. 25.88	ft. 731,734	92,982	11-Dec		10.99	1473	9.09	
12-Dec	712.8	in. 26.55	ft. 638,752	28,088	12-Dec					
13-Dec		in.	ft.	28,088	13-Dec					
14-Dec	724.0	in. 26.97	ft. 582,577	78,054	14-Dec	1.8				
15-Dec	740.0	in. 27.57	ft. 504,523	(12,059)	15-Dec	1.8				
16-Dec		in.	ft.	12,059	16-Dec					
17-Dec	735.0	in. 27.38	ft. 528,640	(4,853)	17-Dec					
18-Dec	734.0	in. 27.34	ft. 533,493	0.00	18-Dec					
19-Dec		in.	ft.	0.00	19-Dec					
20-Dec	734.0	in. 27.34	ft. 533,493	0.00	20-Dec	1.8				
21-Dec		in.	ft.	0.00	21-Dec	1.8				
22-Dec		in.	ft.	0.00	22-Dec	1.8				
23-Dec		in.	ft.	0.00	23-Dec					
24-Dec		in.	ft.	0.00	24-Dec					
25-Dec		in.	ft.	0.00	25-Dec					
26-Dec		in.	ft.	0.00	26-Dec					
27-Dec		in.	ft.	0.00	27-Dec					
28-Dec		in.	ft.	0.00	28-Dec					
29-Dec		in.	ft.		29-Dec					
30-Dec		in.	ft.		30-Dec					
31-Dec		in.	ft.		31-Dec					

Note: As of Dec. 20th, Water level below intake structure pipe Intake structure opened and inflatable pluginstalled.

ATTACHMENT 3

Annual Biosolids Summary

WILD WINGS WATER RECYCLING FACILITY
BIOSOLIDS HAULED 2018

Month	Pressed Biosolids (Tons)
January	*
February	*
March	0
April	0
May	0
June	0
July	0
August	0
September	0
October	0
November	0
December	0
Total	0
Min.	0
Max.	0
Avg.	0

Month	Liquid Sludge Hauled (Gals.)
January	*
February	*
March	0
April	10,600
May	21,652
June	10,600
July	21,200
August	5,300
September	21,600
October	22,100
November	12,485
December	16,900
Total	142,437
Min.	0
Max.	22,100
Avg.	14,244

* No data or records available by previous contract operator.

Biosolids Narrative

Sludge from the digester was hauled off periodically by vacuum truck. For 2019, the digester sludge will be processed through the new sludge auger press and hauled off by the local solid waste contractor.

Dry tons of solids will be calculated and reported monthly. This will provide a more efficient method of sludge handling.

ATTACHMENT 4

Monitoring Data Summary

Annual Water Supply Monitoring

Not Requested

ATTACHMENT 5

Wastewater Performance & Compliance

Wastewater Performance and Compliance

The Wildwings Wastewater Plant has been in the process of repairs and upgrades since before SUSP took over operations. Replacement of critical components has increased efficiencies and reliability. In addition, repairs to infrastructure has contributed to operational consistency. SCADA has been upgraded and reworked to provide more reliable monitoring of processes alarm conditions.

The only excursions or violations have been in coliform levels. April, May, and June each experienced a Coliform violation. This has been primarily attributed to the piping changes necessitated by the renovations. In most instances, actual chlorine levels were high when samples were taken. Change of pumps and piping seemed to take care of the matter until December when we got a Coliform violation on the 6th. The Coliforms for the days preceding and following the excursion had counts of <1.8. In addition, the chlorine level was in excess of 20 mg/L. We believe that this was an outlier due to sampling or testing error.

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

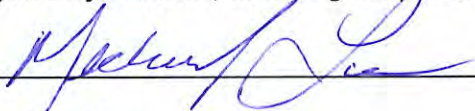
Violation Notification:

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:

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Signature:  Phone: 707-330-4402
Printed Name: MICHAEL LANE Date: 2-1-2019

**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

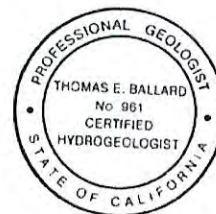


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FIGURES

Figure 1 – Site and Vicinity Map

Figure 2 – Groundwater Contours-September 2018

TABLES

Table 1 – Monitoring Well Construction Details

Table 2 – Static Water Level Measurements in Monitoring Wells

Table 3 – Groundwater Flow Direction and Gradient

Table 4 – Groundwater Quality Monitoring Results

Table 5 – Quality Assurance/Quality Control Samples

CHARTS

Chart 1 – Historical Static Water Trends

Chart 2 – Historical pH Trends

Chart 3 – Historical Total Dissolved Solids Trends

Chart 4 – Historical Sodium Trends

Chart 5 – Historical Chloride Trends

Chart 6 – Historical Boron Trends

Chart 7 – Historical Nitrate (as Nitrogen) Trends

Chart 8 – Historical Total Nitrogen Trends

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 95th 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 this 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 from 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.

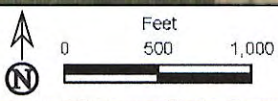
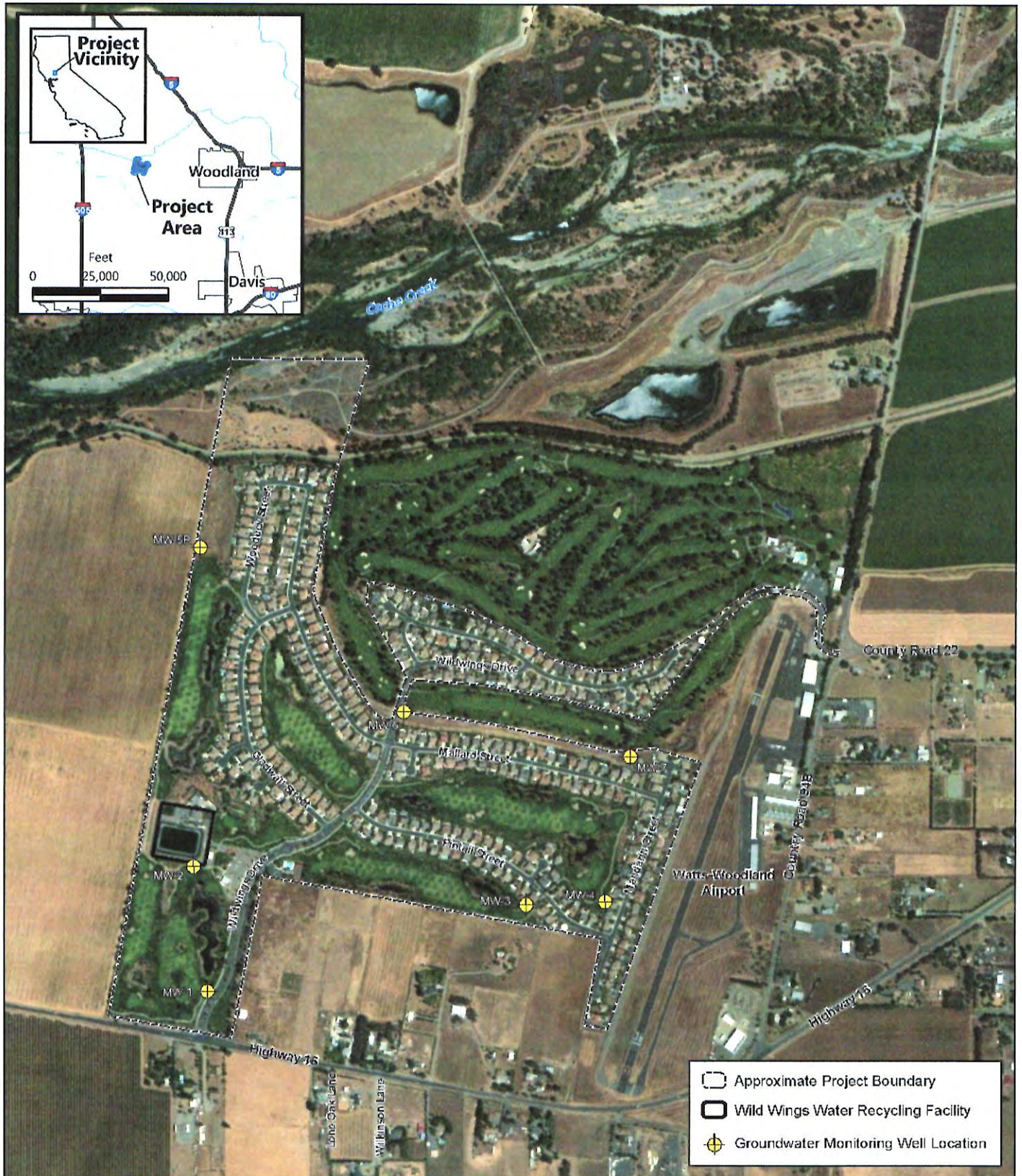
MW-3 showed an increase in sodium compared to recent sample data, with the current concentration at the upper limit of the historical range for this constituent. Chloride concentrations showed an increase this quarter, but are still within historical ranges.

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



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

Figure 1
Site and Vicinity

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



Figure 2
Groundwater Elevation Contours

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



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

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	6/22/2004	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 Ingersoll 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	
11/12/2014		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			Gradient (ft/ft)	Flow Direction (degrees) ²
	MW-1	MW-5R	MW-4		
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	50.4
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	85.26	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	78.16	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

Sampling Point	Sample Date	Lab	pH	TDS	Na (d)	Cl	B (d)	Fe (d)	Mn (d)	NO3-N	NO2-N	NH3-N	Total Nitrogen	Coliform Bacteria			TTHM (1)	Lab Notes
														(total)	(fecal)	(E. coli)		
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	Background		7.6	1100	155	138	-	<0.1	0.64	18	-	0.5	-	<2.0	<2.0	-	-	-
Limitation ²																		
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	590	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	7.6	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	8/15/2004	SKL	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	3/28/2005	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	8/18/2005	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	9/23/2005	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	1.8	<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																	
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	2/11/2011	CLS	8	590	120	42	2.2	<0.10	<0.02	2.6	<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	390	92	45	1.9	<0.10	<0.02	2.9	<0.10	<0.10	2.9	2	-	-	<0.50	
MW-5R	8/18/2011	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	8/8/2012	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	450	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	460	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	TDS	Na (d)	Cl	B (d)	Fe (d)	Mn (d)	NO3-N	NO2-N	NH3-N	Total Nitrogen	Coliform Bacteria			TTHM (1)	Lab Notes	
														(total)	(feca)	(E. coli)			
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	Background		7.6	1100	155	138	-	<0.1	0.64	18	-	0.5	-	<2.0	<2.0	-	-	-	
Limitation ²																			
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	<1.8	-	-	<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	-	-	0.68		
MW-5R	8/30/2016	CLS	7.8	500	96	38	2.1	<0.10	<0.02	2.9	<0.40	<0.10	3.2	<1.8	-	-	2.1		
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	-	-	<0.50		
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	8/27/2017	CLS	7.1	290	21	4	0.3	<0.10	<0.02	<0.40	<0.40	0.12	0.81	170	<0.50	-	<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	7.07	400	92	44	2	<0.10	<0.02	2.6	<0.40	<0.10	2.7	<1.8	-	-	<0.50		
MW-6	8/15/2004	STL	7.8	885	143	87.7	5.8	<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	6/10/2005	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	12/8/2005	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	2/18/2006	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	1000	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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
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	-	-	-	
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	2/9/2010	CLS	7.2	850	170	98	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	160	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	890	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	4.0	<0.10	<0.02	8	<0.10	<0.10	8.2	<1.8	-	-	<0.50		
MW-6	2/27/2012	CLS	7.1	860	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	0.11	7.9	<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	0.18	9.0	<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	<0.10	9.3	<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	TDS	Na (d)	Cl	B (d)	Fe (d)	Mn (d)	NO3-N	NO2-N	NH3-N	Total Nitrogen	Coliform Bacteria			TTHM (1)	Lab Notes
														(total)	(fecal)	(E. coli)		
	WO Objective		Std Unit	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	(MPN/100 mL)	(MPN/100 mL)	(EPA 601)	ug/L	
Recommended Interim Limitation ²	Background		6.5-8.5	450	69	106	0.6	0.3	0.05	10	1	0.5	10	ND	ND	ND	100	
			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	17	<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

Raloc bent 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:

- MW-7 – Data for NO3, and TN for 5/7/2007 is not graphed due to concerns with data
- MW-5R – Data for Chloride for 6/27/2017 is suspect (dilution factor?) but is shown on graph
- 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	Mislabeled 3
	9/27/2018	CLS	<0.50	-

TTHM = total trihalomethanes; nd = nondetect

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

CHARTS

Chart 1
Water Levels 2004-18

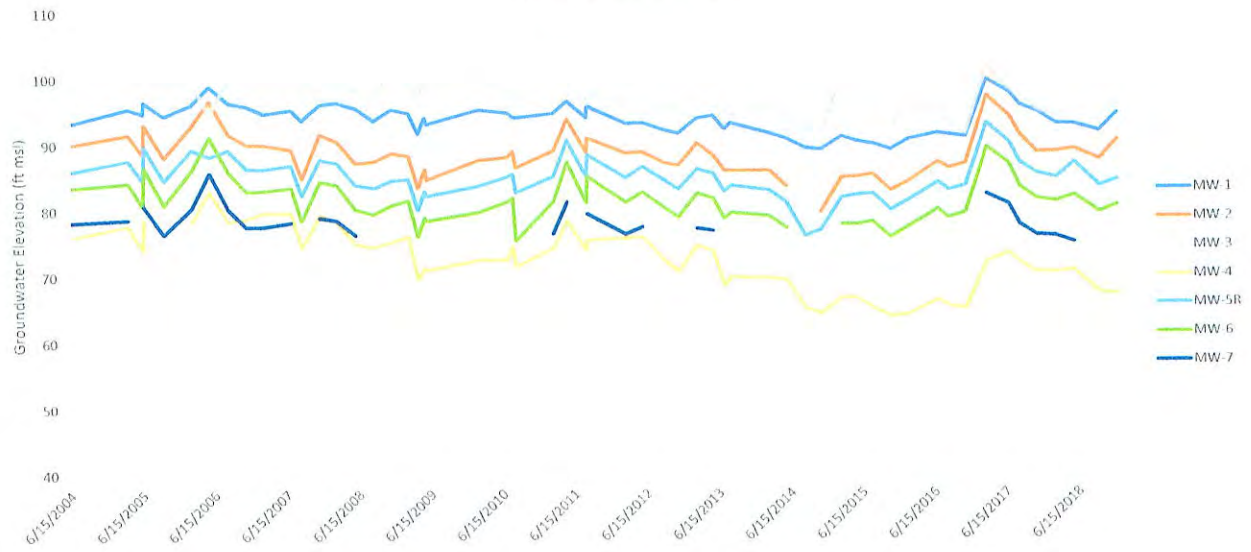


Chart 2
pH Trends 2004-18

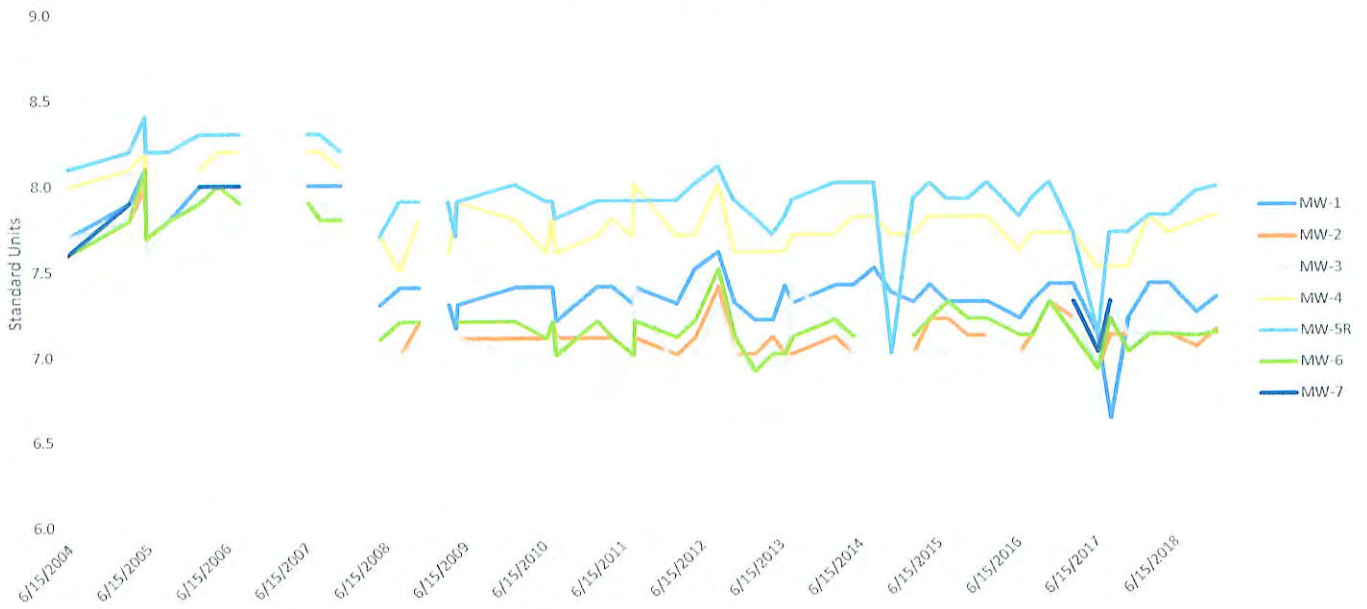


Chart 3
TDS Trends 2004-18

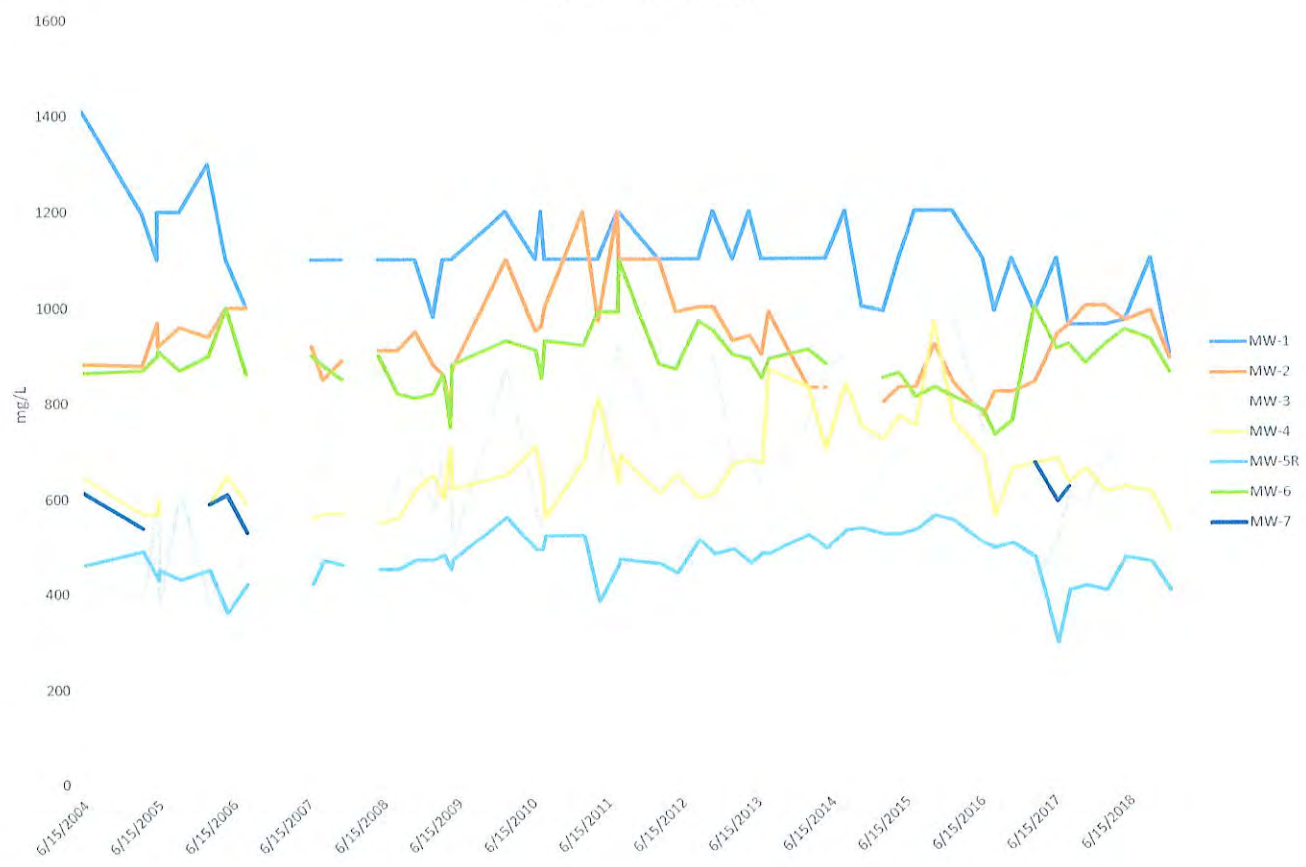


Chart 4
Na Trends 2004-18

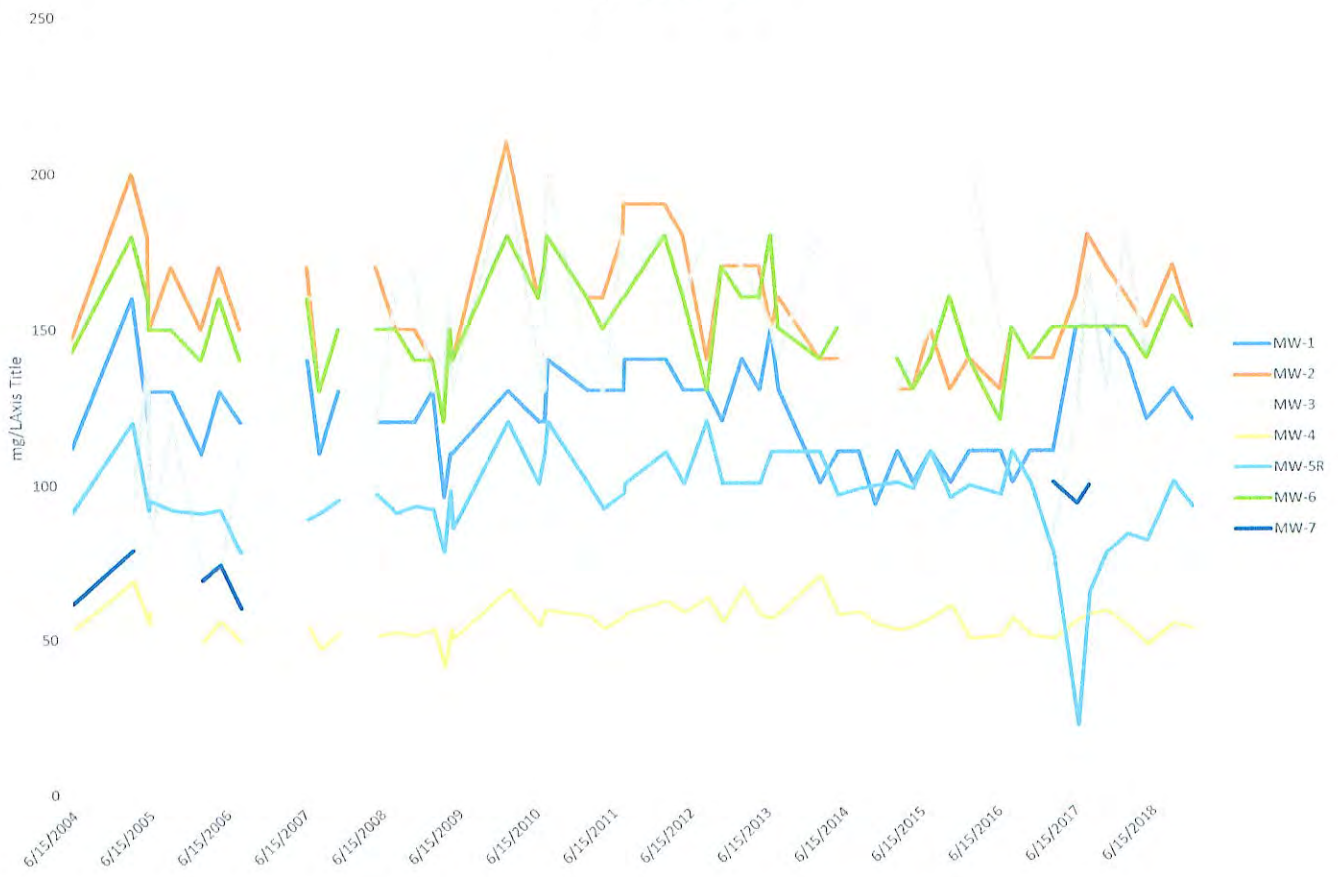


Chart 5
CI Trends 2004-18

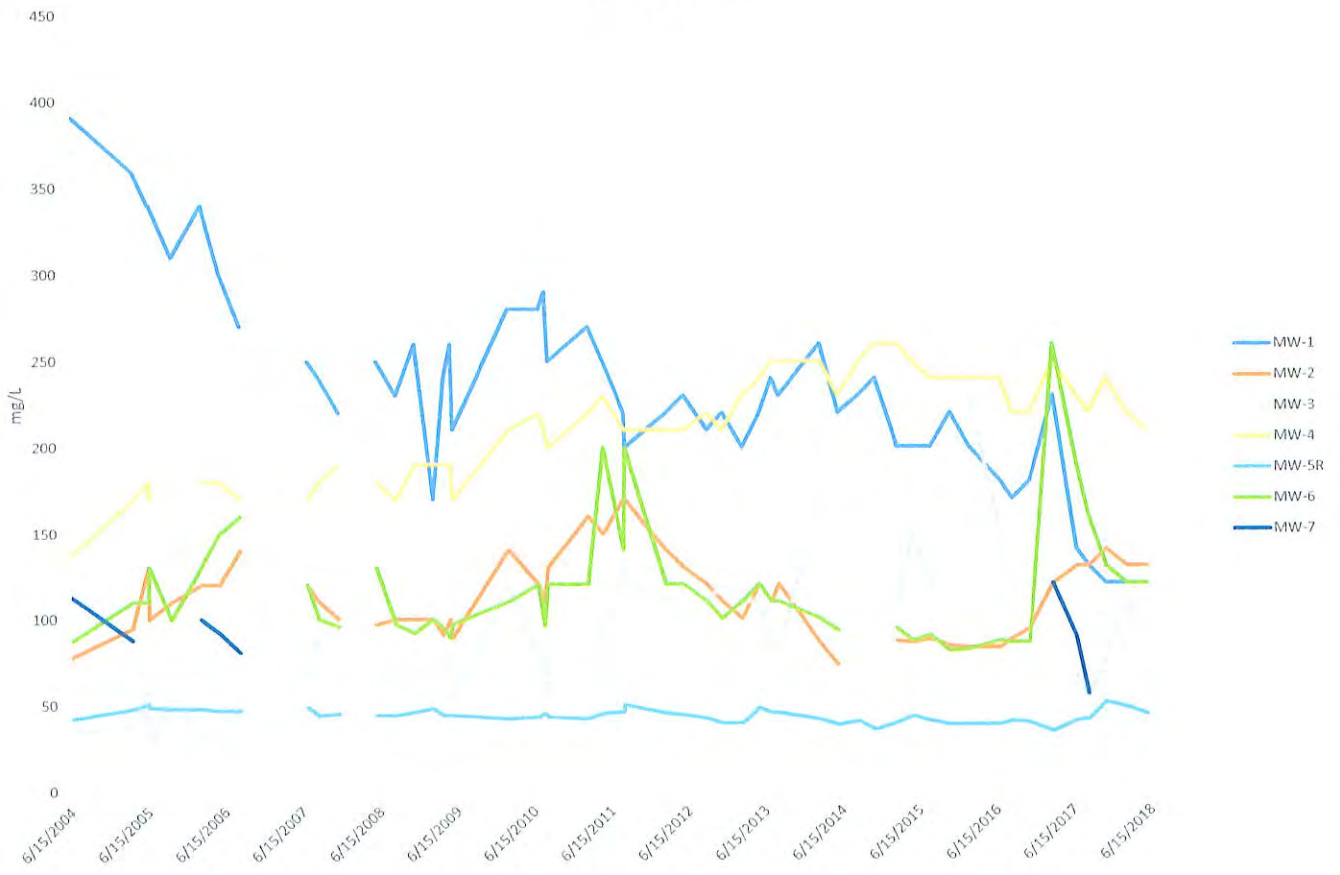


Chart 6
B Trends 2004-18

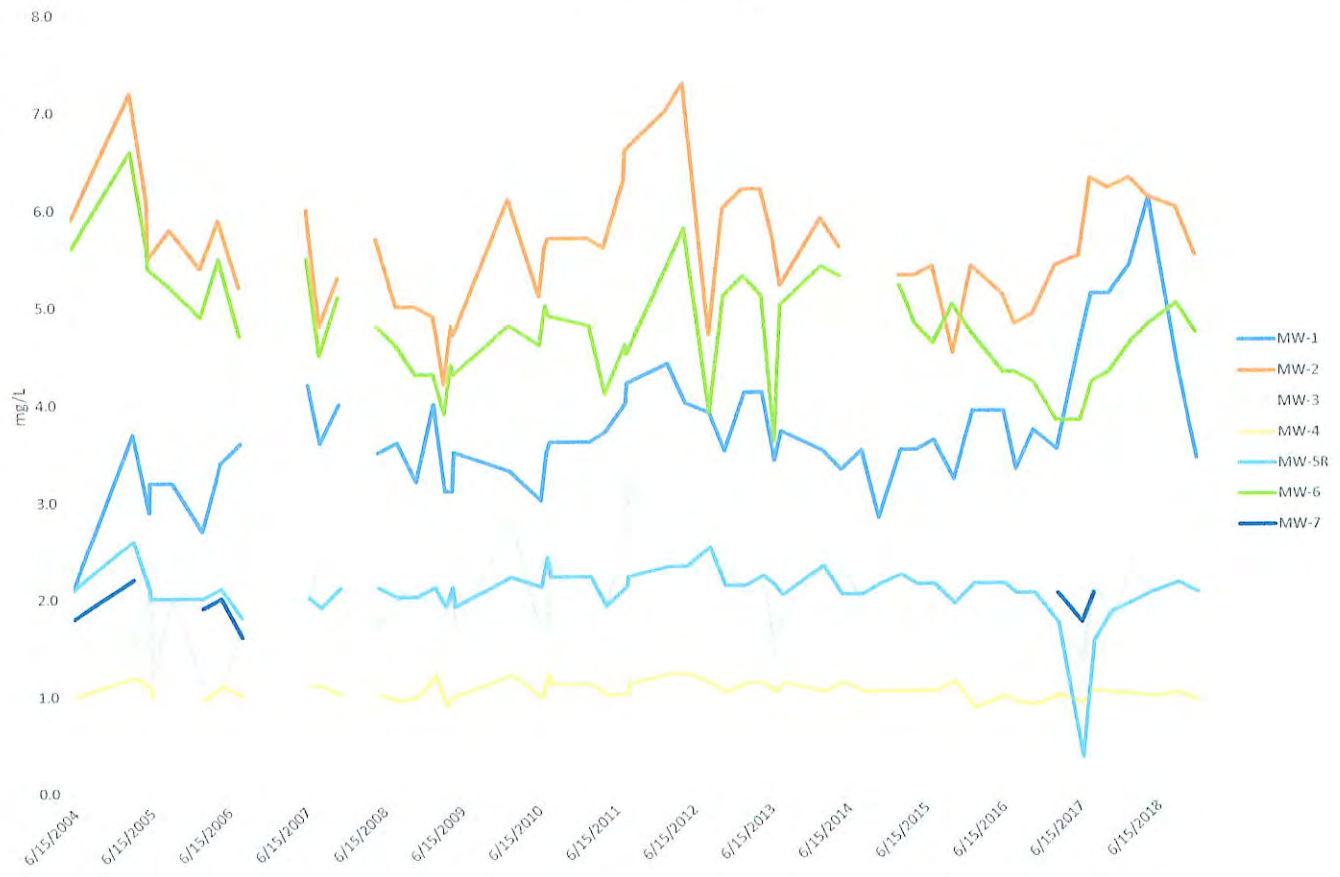


Chart 7
Nitrate, as N Trends 2004-18

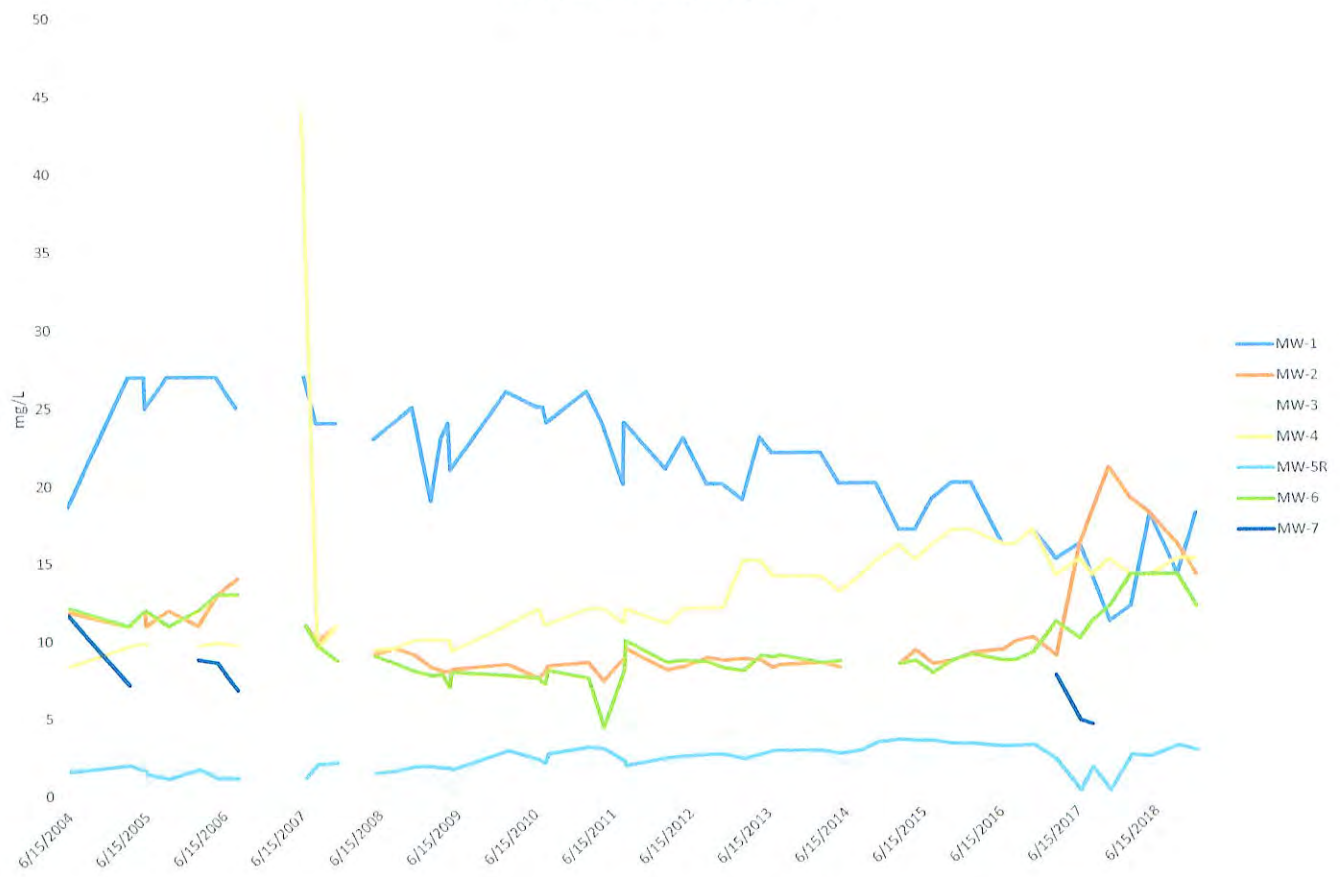
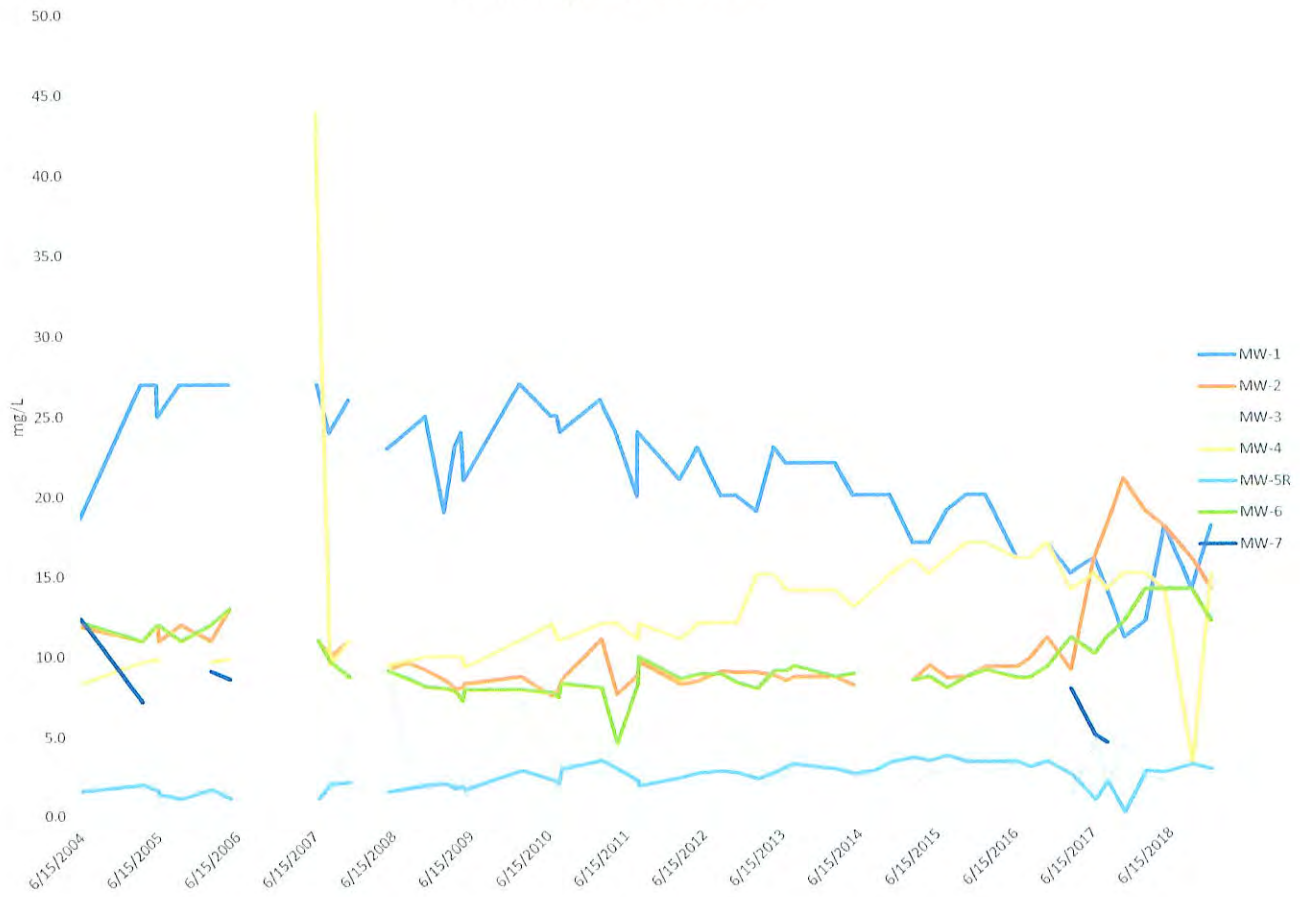


Chart 8
Total Nitrogen Trends 2004-18



APPENDIX A
FIELD DATA FORMS



**CALIFORNIA
LABORATORY
SERVICES**
Committed. Responsive. Flexible.

CHAIN OF CUSTODY

CLS ID No.:

LOG No 194627

QTR Mon. WELLS

REPORT TO:			CLIENT JOB NUMBER			ANALYSIS REQUESTED							GEOTRACKER:	
NAME AND ADDRESS			DESTINATION LABORATORY			PRESERVATIVES	Total Coliform	Ammonia As N	THMS	PH, TOC, Total N, Total P	Nitrate-N, Nitrite-N	D, Fe, Mn, Na, Si	EDF REPORT	
PROJECT MANAGER			CLS (916) 638-7301										GLOBAL ID:	
PROJECT NAME			3249 FITZGERALD RD.										CDPH WRITE ON EDT TRANSMISSION? <input type="checkbox"/> YES <input type="checkbox"/> NO	
SAMPLED BY			RANCHO CORDOVA, CA.										STATE SYSTEM NUMBER	
JOB DESCRIPTION			95742										IF "YES" PLEASE ENTER THE SOURCE NUMBER(S).	
SITE LOCATION			OTHER <input type="checkbox"/>										COMPOSITE:	
DATE			CONTAINER			TURN AROUND TIME					SPECIAL INSTRUCTIONS			
TIME			NO. TYPE			1 DAY					OR			
SAMPLE IDENTIFICATION			MATRIX			2 DAY					ALT. ID:			
			NO.			3 DAY								
			TYPE			5 DAY								
12/28/18	0755	MW-3	GW	6	VQA POL#	1/6	X	X	X	X	X	X		
12/28/18	1010	MW-4	GW	6	VQA POL#	5/6								
12/28/18	1030	MW-6	GW	6	VQA POL#	5/6								
		MW-7												
12/28/18	1145	MW-5R	GW	6	VQA POL#	5/6	X	X	X	X	X	X		
12/28/18	1115	MW-2	GW	6	VQA POL#	5/6	X	X	X	X	X	X		
12/28/18	1130	MW-1	GW	6	VQA POL#	5/6	X	X	X	X	X	X		
SUSPECTED CONSTITUENTS												INVOICE TO:		
RELINQUISHED BY (SIGN)												R.O. #		
PRINT NAME / COMPANY												QUOTE #		
DATE / TIME												PRESERVATIVES: (1) HCL (2) HNO3 (3) COLD (4) NaOH (5) H2SO4 (6) Na2S2O3 (7) =		
RECEIVED BY (SIGN)												PRINT NAME / COMPANY		
RECD AT LAB BY:												CONDITIONS / COMMENTS:		
DATE / TIME:												AIR BILL #		
SHIPPED BY: <input type="checkbox"/> FED X <input type="checkbox"/> UPS <input type="checkbox"/> OTHER														

Windy, COLD. NO RAIN

DOT Sampled

Dayton Busell

DAYTON BUSSELL

12/27/18

GROUNDWATER SAMPLING LOG

Well Number: 7NW-1
 Date: 12/27/18

Samplers Name: D. Dwyer
 Site: W.L.D. Wind
 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 (µS/cm)	pH	TEMP (C)	COMMENTS	WATER LEVEL (ft bgs)
1100	2	1972	7.60	18.3	0.0 5.07 Turbid	Too narrow
1105	4	1981	7.50	18.7	5.10	TO narrow
1110	6	1978	7.50	18.6	8.05 cleaning	
					pump out	
					9.8 Gal per 1.63 Gal. Vol	
					SAMPLE -	
					N1-00	
					Time 1130	
					Date 12/28/18	
					NW - 51.30	
12/28/18						
1130	—	1980	7.55	18.8	sample parameters 00	
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: WLD Wnwb
 Project Number: _____

Total well depth (ft): 4661
 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	N.O 7.93	Too
1257	2	1691	7.54	18.7	7.59	Narrow
1259	3	1694	7.51	18.8	7.25	TO
1302	4	1692	7.49	18.7	7.70	measure
1306	5	1690	7.47	18.8	7.71	w/ pump in well
					4 Vol = 1.7 Gal	
					SAMPLED	
					BY - DD	
					DATE - 12/28/18	
					TIME - 1115	
					RTW - 36.21	
12/28/18 1115	—	1688	7.55	18.0	SAMPLE PARAMETERS	36.21

GROUNDWATER SAMPLING LOG

Well Number: MW-3 Samplers Name: D. Dusch Total well depth (ft): 30.80
 Date: 12/27/18 Site: W winds Well Diameter (in): 2"
 Project Number: _____ Borehole Diameter (in): _____

Gauging Date: 12/27/18 Static water level (ft): 24.25 Development method: Pump
 Bailer ID: _____ Previous static water level (ft): 27.37 Purging method: Pump
 Sample Date: 12/28/18 Standing water column (ft): 6.55 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)
1015	0.5	1564	7.16	16.6	0.0 - 7.92 Pumped Out	0.0
	3.0				0.0 - Brown Turb. ID	0.0 (Pumped)
	5.0				0.0 - 7.88	TOO NARROW
					0.0	
					1.067 Gal per Volume	
					SAMPLED BY	
					DATE = 12/28/18	
					Time = 0955	
					DTW = 24.06'	
100555	—					
0955	—	1600	7.17	16.5	Sample Parameters	24.06

.163 Gal p

GROUNDWATER SAMPLING LOG

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

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

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

TIME	AMOUNT PURGED (gal)	EC (µS/cm)	pH	TEMP (C)	COMMENTS	WATER LEVEL (ft bgs)
1030	1	1254	7.68	12.5	0.0. 8.13 Turbid. Lt. Dark	
1033	2.9	1262	7.70	18.0	" 7.57 Clear no odor	TOO NARROW TO MEASURE
1037	5.0	1263	7.67	18.3	7.96	
1045	7.5	1260	7.68	17.5	7.82	
1055	9.1	1254	7.71	18.1	7.82 Pump On	
					2.75 Gal per Volume	
					Sampled	
					By - DJB	
					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 5A Samplers Name: D. Busch Total well depth (ft): 73.20
 Date: 12/27/18 Site: Wild Wings Well Diameter (in): 2"
 Project Number: _____ Borehole Diameter (in): _____

Gauging Date: 12/27/18 Static water level (ft): 40.70 Development method: _____
 Bailer ID: _____ Previous static water level (ft): 41.65 Purging method: Pump
 Sample Date: 12/28/18 Standing water column (ft): 32.50 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	17.4	D.O. 4.91	100
	5	835.6	8.16	18.1	3.12	NO NARROW
	7	879.9	8.14	18.0	3.10	TO MEASURE
	8	882.7	8.13	18.1	3.12 pumped out	
					pumped out	
					2 VOL = 5.29 Gal	
					SAMPLER:	
					BY RB	
					DATE: 12/28/18	
					Time: 1145	
					DTW = 40.65	
12/28/18	—	880.1	8.14	17.5	SAMPLE PARAMETERS	40.65
1145						

GROUNDWATER SAMPLING LOG

Well Number: mw6
 Date: 12/27/18

Samplers Name: D. Busch
 Site: W.L.O. Wings
 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:

Top of Casing: X

Protective Casing: _____

Ground Level: _____

TIME	AMOUNT PURGED (gal)	EC (µS/cm)	pH	TEMP (C)	COMMENTS	WATER LEVEL (ft bgs)
1230	1	1612	7.90	18.0	0.0 7.15	Clear
1232	2	1604	7.60	18.6	0.0	Narrow
1234	3	1661	7.86	18.7	0.0 7.06	To Measure
1237	4			0.0		
					1 Vol = 13 Gal	
					Sampled	
					By - DB	
					Date - 12/28/18	
					Time - 1030	
					DTW - 46.61'	
12/28/18 1030	—	1600	7.77	17.9	Sample Parameter	46.61'

APPENDIX B
LABORATORY ANALYTICAL RESULTS
&
CHAIN OF CUSTODY



CALIFORNIA LABORATORY SERVICES

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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
Licensed Professional Service

CHAIN OF CUSTODY

CLS ID No.: 18L1457

LOG No. 119177

QTR Mon. WETS

REPORT TO: NAME AND ADDRESS CRWB 1224 N Market Blvd Sacramento CA		CLIENT JOB NUMBER		ANALYSIS REQUESTED			GEOTRACKER EDT REPORT GLOBAL ID		<input type="checkbox"/> YES <input type="checkbox"/> NO	
PROJECT MANAGER Dan Dennis 916 416 7761		DESTINATION LABORATORY <input checked="" type="checkbox"/> CLS (916) 638-7301 3248 FIZZGERALD RD RANCHO CORDOVA CA 95742		PRESERVATIVES Total Coliform Ammonia N THMS pH, TO, TSS, Nitrite Nitrate Nitrate BFE, Mn, Ni, Cu			EDPH WRITE ON EDT TRANSMISSION? <input type="checkbox"/> YES <input type="checkbox"/> NO		STATE SYSTEM NUMBER	
PROJECT NAME Wetland Wages		<input type="checkbox"/> OTHER					3 - "YES" PLEASE ENTER THE SOURCE NUMBER(S)		COMPOSITE-	
SAMPLED BY Daryl Bush						TURN AROUND TIME		SPECIAL INSTRUCTIONS		
JOB DESCRIPTION Ground water GW - Monitor well Site location WLD Wages						DAY 1 DAY 2 DAY 3 DAY 4		OR ALT ID		
DATE	TIME	SAMPLE IDENTIFICATION	MATRIX	CONTAINER NO	TYPE					
12/18/18	0755	MW-3	GW	6	VQA 1/6	X	X	X	X	
12/18/18	1010	MW-4	GW	6	VQA 1/6	X	X	X	X	
12/18/18	1030	MW-6	GW	6	VQA 1/6	X	X	X	X	
		MW-7							Not sampled	
12/18/18	1145	MW-5R	GW	6	VQA 1/6	X	X	X	X	
12/18/18	1115	MW-2	GW	6	VQA 1/6	X	X	X	X	
12/18/18	1130	MW-1	GW	6	VQA 1/6	X	X	X	X	
SUSPECTED CONTAMINANTS		PRESERVATIVES		(1) NO (2) YES		(3) NO (4) YES		(5) NO (6) YES		
RELINQUISHED BY (SIGN) Daryl Bush		PRINT NAME / COMPANY Darryl Bush		DATE / TIME 12/21/18		RECEIVED BY (SIGN) Michael S. Bennett		PRINT NAME / COMPANY Michael S. Bennett		
NEED AT LAB BY 12/21/18		DATE / TIME 12/21/18		1500		CONDITIONS / COMMENTS 33				
SHIPPED BY <input type="checkbox"/> FED X <input type="checkbox"/> UPS <input type="checkbox"/> OTHER						AIR BILL #				

CLS LABS
SAMPLE RECEIVING EXCEPTION REPORTS

CLS Labs Job # 1801457

Problem discovered by: SMITH

Date: 12/29/18

Nature of problem

Client requesting "GI" - unknown ANALYSIS

Client contacted? Yes No _____ Spoke With: DANTON BUSCH

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 # 1861457

Problem discovered by: 

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 LABORATORY SERVICES

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

Project: Wild Wings
Project Number: [none]
Project Manager: Dan Demoss

CLS Work Order #: 18L1457
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 1234 N. Market Blvd. Sacramento, CA 95834	Project: Wild Wings Project Number: [none] Project Manager: Dan Demoss	CLS Work Order #: 18L1457 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
 1234 N. Market Blvd.
 Sacramento, CA 95834

Project: Wild Wings
 Project Number: [none]
 Project Manager: Dan Demoss

CLS Work Order #: 18L1457
 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	



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California Rural Water Association 1234 N. Market Blvd. Sacramento, CA 95834	Project: Wild Wings Project Number: [none] 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	"	"	"	"	"	"	



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



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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	



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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	"	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		123 %	70-130		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		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	"	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		123 %	70-130		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		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	"	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		120 %	70-130		"	"	"	"	
<i>Surrogate: Toluene-d8</i>		99 %	70-130		"	"	"	"	



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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	"	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		124 %		70-130	"	"	"	"	
<i>Surrogate: Toluene-d8</i>		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	"	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		124 %		70-130	"	"	"	"	
<i>Surrogate: Toluene-d8</i>		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	"	"	"	"	"	"	
<i>Surrogate: 1,2-Dichloroethane-d4</i>		120 %		70-130	"	"	"	"	
<i>Surrogate: Toluene-d8</i>		100 %		70-130	"	"	"	"	



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



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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
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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			



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



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Trihalomethanes by EPA Method 524.2 - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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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			



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

Project: Wild Wings
Project Number: [none]
Project Manager: Dan Demoss

CLS Work Order #: 18L1457
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