

Murrieta

308

From: Brian Kelley
To: Keri Cole
Date: 5/4/01 10:39AM
Subject: Re: EMWD

Keri,

You can check with Adam Laputz for data regarding Eastern MWD/Rancho Calif. WD. We have a lot of data regarding plant effluent quality, but very little (if any) data on upstream and downstream water quality. Rancho's discharge has had some recent violations of permit effluent limits.

The same goes for other POTW discharges to inland surface waters, including Padre Dam and Escondido wet weather discharge. We don't have much water quality data on the water bodies that receive the discharges. You can check with Chiara for the Padre Dam discharge. For the Escondido wet weather discharge, Chiara may also have information and David Hanson may also have some info.

Sorry our unit can't be of more help to you as far as the quality of the surface waters for determining 303(d) listings.

Brian

>>> Keri Cole 05/04/01 10:20AM >>>

Hi Brian

Dave Gibson suggested asking you for information/data re: EMWD/Rancho Cal Water District, specifically with respect to TSS, turbidity, nutrient, bacteria monitoring data. John Robertus has asked me to take a hard look at the Santa Margarita River for potential 303d listing for sedimentation and Dave indicated potential for other problems.

I am currently trying to contact Camp Pendleton for their assistance but want to make sure I have looked at what we already have in-house.

Are there any other waterbodies for which you have data that I should be looking into in addition to these?

Any help/guidance you can provide will be helpful.

Thanks.

Keri

Keri Cole, P.E.
 Water Resource Control Engineer
 San Diego RWQCB
 9771 Clairemont Mesa Blvd., Suite A
 San Diego, CA 92124
 (858) 467-2798
colek@rb9.swrcb.ca.gov

CC: Adam Laputz; Chiara Clemente; David Hanson



**Rancho
Water**

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WATER QUALITY
CONTROL BOARD

April 24, 2001

2001 APR 25 A 11:06

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Dear Sir:

Enclosed is the requested information for the Annual Monitoring Report dated January-December 2000.

1. Summary and Analysis of Year 2000 Data Receiving Water Stations 1-4.

If you have any recommendations or questions, please call me at (909) 296-6900, Extension 6951.

Sincerely,

RANCHO CALIFORNIA WATER DISTRICT


Kenneth C. Dealy
Director of Operations and Maintenance

File: 01-0601.01

Technical. Part of January - Dec. 2000 Annual Rpt.

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SUMMARY AND ANALYSIS OF YEAR 2000 DATA RECEIVING WATER STATIONS 1 - 4

STATION NO. 1

Station Location

Receiving Water Station No. 1 is located on Murrieta Creek immediately upstream from the Rancho California Water District (RCWD) Santa Rosa Water Reclamation Facility (SRWRF).

Summary and Analysis of 2000 Data

Monitoring and Reporting Program No. 96-54 requires RCWD to record visual observations at Station No. 1 and to collect samples when Murrieta Creek flow is observed. Monitoring is required on a quarterly basis during November through April, and on a monthly basis during March through December. In accordance with this schedule, visual observations were recorded on the following dates:

March 14, 2000
May 9, 2000
June 20, 2000
July 19, 2000
August 22, 2000
September 19, 2000
October 24, 2000
December 11, 2000

As reported to the Regional Board, no flow in Murrieta Creek was observed at Station No. 1 on any of the above dates. As a result, no water quality samples were collected at Station No. 1 during 2000.

Effect of RCWD Discharge

Receiving Water Station No. 1 is located upstream from the SRWRF recycled water stream discharge point, and is not affected by SRWRF operations.

Recommended Management Actions

No management actions are recommended.

STATION NO. 2

Station Location

Receiving Water Station No. 2 (Willow Glen) is located on the Santa Margarita River near Willow Glen Road. The station is located approximately six miles downstream from the confluence of Murrieta and Temecula Creeks.

Summary and Analysis of 2000 Data

Monitoring and Reporting Program No. 96-54 requires RCWD to record visual observations and collect samples at Station No. 2 on a quarterly basis during November through April, and on a monthly basis during March through December.

Visual Observations. Table 1 summarizes sample dates and visual observations during 2000 at Receiving Water Station No. 2. As shown in Table 1, no unusual visual or aesthetic conditions were observed at Station No. 2 during 2000. Water clarity was described as "clear" on all observation dates. No incidents of excessive biostimulation were recorded. Sandy and rock streambed conditions were observed year-round. Emergent vegetation was noted only in the March observation at the end of the storm flow season.

Table 1
Summary of 2000 Visual Observations¹
Station No. 2 - Santa Margarita River at Willow Glen

2000 Sample Date	Observed Water Velocity (fps)	Observed Percent Algae Cover	Observed Percent Emergent Vegetation	Observed Water Clarity
Mar 14	0.25	0%	20%	"clear"
May 9	0.5	0%	0%	"clear"
Jun 20	0.25	0%	0%	"clear"
Jul 19	0.25	0%	0%	"clear"
Aug 22	0.25	0%	0%	"clear"
Sept 19	0.25	0%	0%	"clear"
Oct 17	0.25	0%	0%	"clear"
Dec 11	0.15	0%	0%	"visibility 100%"

¹ From 2000 monitoring reports submitted to Regional Board.

Nutrients. Table 2 summarizes nutrient concentrations at Station No. 2 during 2000. Several conclusions are evident from the 2000 data:

- ▶ During the period May through October (which represents the period when the SRWRF discharge may most influence downstream conditions), total phosphorus concentrations at Station No. 2 are in compliance with the Basin Plan objective of 0.1 mg/l. The only total phosphorus sample which exceeded 0.1 mg/l was the March sample, which was 0.11 mg/l.
- ▶ Phosphorus appears to be the limiting nutrient at Station No. 2 on a year-round basis. Nitrogen to phosphorus (N:P) ratios exceeded 15:1 for all 2000 samples, and N:P ratios frequently exceed 30:1. Because phosphorus is the limiting nutrient, increased concentrations of nitrogen would appear to represent less a threat to biostimulation than increased concentrations of phosphorus.
- ▶ Nitrogen concentrations in the Santa Margarita River are almost exclusively comprised of organic nitrogen and nitrate.
- ▶ Concentrations of nitrogen and phosphorus are typically lower during summer months (May through October) than during months of probable storm flow (November through April). Since storm flows can be a number of orders of magnitude greater than the SRWRF discharge flow, river conditions during November through April are primarily dependent on hydrologic conditions. The SRWRF discharge would likely have the greatest potential for affecting concentrations during months of little or no storm flow (May through October). Based on the Table 2 data, however, the 2 mgd SRWRF discharge does not appear to have any discernible negative impacts on nutrient concentrations at Station No. 2.

Table 2
Summary of 2000 Nutrient Concentrations¹
Station No. 2 - Santa Margarita River at Willow Glen

2000 Sample Date	Concentration in mg/l				N:P Ratio
	Total phosphorus	Total nitrogen	Organic Nitrogen (as N)	Nitrate Nitrogen (as N)	
Mar 14	0.11	4.4	0.5	3.9	40
May 10	< 0.05	1.4	0.6	0.8	> 28
Jun 20	< 0.05	1.7	0.7	1.0	> 34
Jul 19	0.06	1.0	0.5	0.5	17
Aug 22	< 0.05	0.9	0.6	0.3	> 18
Sept 19	< 0.05	1.1	0.5	0.5	> 22
Oct 17	< 0.05	1.7	0.4	1.3	> 34
Dec 11	0.06	2.8	1.1	1.7	47

¹ From 2000 monitoring reports submitted to Regional Board.
Aug = 0.02875
Med = 0
if < 0.15 = 0.025
 $\bar{x} = 1.0443$
std = 1.025

Dissolved Oxygen. Monitoring and Reporting Program No. 96-54 requires the collection of 24-hour profiles of receiving water dissolved oxygen. Table 3 summarizes minimum observed dissolved oxygen (DO) concentrations observed at Station No. 2 during the year 2000 sampling periods. As shown in the table, minimum hourly average observed DO concentrations remained near saturation at all times. Minimum DO concentrations were typically observed in early morning.

Because of the low concentrations of BOD in the SRWRF effluent (typically less than 5 mg/l) and high observed receiving water DO concentrations, the RCWD discharge does not appear to discernibly affect receiving water DO at Station No. 2.

Bacteriological Parameters. Table 3 also summarizes year 2000 data at Station No. 2 for bacteriological parameters. Detectable concentrations of fecal streptococci, total coliform, and fecal coliform were reported at Station No. 2 throughout 2000. SRWRF is not the source of the bacteriological contamination, however. At all times during 2000, SRWRF 7-day median total and fecal coliform concentrations remained below 2 organisms per 100.

Table 3
Summary of 2000 TDS, DO, and Bacteriological Concentrations¹
Station No. 2 - Santa Margarita River at Willow Glen

2000 Sample Date	TDS Concentration (mg/l)	Minimum Average Hourly DO Concentration (mg/l)	Time of Day for Minimum Hourly DO	Fecal Streptococci (organisms per 100 ml)	Total Coliform (organisms per 100 ml)	Fecal Coliform (organisms per 100 ml)
Mar 14	960	8.75	2 a.m.	130	300	13
May 10	780	7.16	6 a.m.	300	300	50
Jun 20	730	7.23	5 a.m.	300	800	8
Jul 19	660	8.28	1 a.m.	1700	3000	11
Aug 22	670	8.75	2 a.m.	1300	230	<2
Sept 19	640	8.43	6 a.m.	230	240	4
Oct 17	740	10.1	7 a.m.	50	500	13
Dec 11	920	9.28	8 a.m.	80	170	2

\bar{x} 762.5 ¹ From 2000 monitoring reports submitted to Regional Board.

med = 735

TDS. Table 3 also summarizes year 2000 TDS concentrations at Station No. 2. As shown in Table 3, TDS concentrations were lowest during the May through October period (when the SRWRF discharge would be expected to have the highest potential for affecting downstream waters). It is concluded that the SRWRF discharge does not discernibly and adversely affect receiving water TDS concentrations at Station No. 2.

Effect of SRWRF Discharge

As documented above, the SRWRF discharge does not appear to have any observable negative effect on the receiving waters at Station No. 2.

Recommended Management Actions

No additional management actions are recommended.

STATION NO. 3

Station Location

Station No. 3 is located on the Santa Margarita River near De Luz Road. The station is located approximately 10 miles downstream from the confluence of Murrieta and Temecula Creeks.

Summary and Analysis of 2000 Data

Monitoring and Reporting Program No. 96-54 requires RCWD to record visual observations and collect samples at Station No. 3 on a quarterly basis during November through April, and on a monthly basis during March through December.

Visual Observations. Hydraulic conditions at Station No. 3 are, in part, influenced by a Camp Pendleton diversion dam that exists at the site. Table 4 summarizes observation dates and visual observations at Station No. 3 during 2000. Visual observations at Station No. 3 did not indicate any unusual visual or aesthetic conditions. Water clarity was described as "clear" during all 2000 observation dates. No incidents of excessive biostimulation were recorded. Algae was observed only during May at the end of the storm flow season; algae cover was estimated at 5% during this May observation.

Table 4
Summary of 2000 Visual Observations¹
Station No. 3 - Santa Margarita River at De Luz

2000 Sample Date	Observed Water Velocity (fps)	Observed Percent Algae Cover	Observed Percent Emergent Vegetation	Observed Water Clarity
Mar 14	1.5	0%	0%	"clear"
May 9	1.0	5%	0%	"clear"
Jun 20	2.0	0%	0%	"clear"
Jul 19	2.0	0%	0%	"clear"
Aug 22	0	(no flow)	0%	(no flow)
Sept 19	0	(no flow)	0%	(no flow)
Oct 17	1.0	0%	0%	"clear"
Dec 11	1.0	0%	0%	"visibility 100%"

¹ From 2000 monitoring reports submitted to Regional Board.

Nutrients. Table 5 summarizes nutrient concentrations at Station No. 3 during 2000. As shown in Table 5, total phosphorus concentrations at Station No. 3 are in compliance with the Basin Plan objective of 0.1 mg/l during May through October. The only total phosphorus sample which exceeded 0.1 mg/l was the March sample, which was 0.13 mg/l. Other conclusions evident from the Station No. 3 nutrient data include:

- ▶ In general, phosphorus appears to be the limiting nutrient. N:P ratios exceeded 20:1 during the March and May samples, and phosphorus concentrations were below detection limits for the all samples in the latter half of 2000. A N:P ratio of 9:1, however, was observed during June 2000, suggesting (given the accuracy of the tests) that either nitrogen or phosphorus could be limiting during the June sample.
- ▶ Nitrogen concentrations in the river are almost exclusively comprised of organic nitrogen and nitrate.
- ▶ Concentrations of nitrogen and phosphorus are typically lower during summer months (May through October) than during months of probable storm flow (November through April).

Overall, based on the Table 5 data (and data presented for Station No. 2 in Table 2), the 2 mgd SRWRF discharge does not appear to have any discernible negative impacts on nutrient concentrations at Station No. 3.

Table 5
Summary of 2000 Nutrient Concentrations¹
Station No. 3 - Santa Margarita River at De Luz

2000 Sample Date	Concentration in mg/l				N:P Ratio
	Total phosphorus	Total nitrogen	Organic nitrogen (as N)	Nitrate nitrogen (as N)	
Mar 14	0.13	3.6	0.6	3.0	28
May 10	0.05	1.5	0.4	1.1	30
Jun 20	0.08	< 0.7	0.5	< 0.2	< 9
Jul 19	< 0.05	0.4	0.4	< 0.2	> 8
Aug 22	(no flow)	(no flow)	(no flow)	(no flow)	(no flow)
Sept 19	(no flow)	(no flow)	(no flow)	(no flow)	(no flow)
Oct 17	< 0.05	0.3	0.2	< 0.2	> 6
Dec 11	< 0.05	0.7	0.3	0.4	> 14

¹ From 2000 monitoring reports submitted to Regional Board.

$\bar{x} = 1.043$
Med = 0.25

Dissolved Oxygen. Monitoring and Reporting Program No. 96-54 requires the collection of 24-hour profiles of receiving water dissolved oxygen. Table 6 summarizes minimum observed dissolved oxygen (DO) concentrations observed at Station No. 3 during the year 2000 sampling periods. As shown in the table, except during the early morning hours of the June sample, minimum observed DO concentrations remained near saturation at all times. During the June 20 sampling period, DO concentrations decreased from approximately 15 mg/l during midnight to near 3 mg/l during the hours at dawn.

Because of the low concentrations of BOD in the SRWRF effluent (typically less than 5 mg/l), the high concentrations of DO at the upstream Station No. 2, and the typically high observed receiving water DO concentrations at Station No. 3, the RCWD discharge does not appear to discernibly affect receiving water DO at Station No. 3.

Bacteriological Parameters. Table 6 also summarizes year 2000 data at Station No. 3 for bacteriological parameters. As shown in Table 6, detectable concentrations of fecal streptococci, total coliform, and fecal coliform were reported at Station No. 3 throughout 2000. Again, however, SRWRF is not the source of the bacteriological contamination. At all times during 2000, SRWRF 7-day median coliform concentrations remained below 2 organisms per 100 for both fecal coliform and total coliform.

Table 6
Summary of 2000 TDS, DO, and Bacteriological Concentrations¹
Station No. 3 - Santa Margarita River at De Luz

2000 Sample Date	TDS Concentration (mg/l)	Minimum Average Hourly DO Concentration (mg/l)	Time of Day for Minimum Hourly DO	Fecal Streptococci (organisms per 100 ml)	Total Coliform (organisms per 100 ml)	Fecal Coliform (organisms per 100 ml)
Mar 14	780	9.66	5 p.m.	300	9000	50
May 10	870	9.50	12 p.m.	130	800	50
Jun 20	860	3.30	7 a.m.	230	2200	17
Jul 19	840	7.50	2 p.m.	230	2400	500
Aug 22	(no flow)	(no flow)	(no flow)	(no flow)	(no flow)	(no flow)
Sept 19	(no flow)	(no flow)	(no flow)	(no flow)	(no flow)	(no flow)
Oct 17	850	5.38	1 a.m.	230	3000	170
Dec 11	890	9.44	12 a.m.	50	500	7

$\bar{x} = 848.3$ ¹ From 2000 monitoring reports submitted to Regional Board.
Med = 855

TDS. Table 6 also summarizes year 2000 TDS concentrations at Station No. 3. As shown in Table 6, TDS concentrations were relatively consistent throughout the year at Station No. 3. As noted in the discussion regarding Station No. 2 (see Table 3), it does not appear that the SRWRF discharge discernibly and adversely affect receiving water TDS concentrations at either Station Nos. 2 or 3.

Effect of SRWRF Discharge

As documented above, the SRWRF discharge does not appear to have any observable negative effect on the receiving waters at Station No. 3.

Recommended Management Actions

No additional management actions are recommended.

STATION NO. 4

Station Location

Station No. 4 is located at the Santa Margarita River Estuary. The station is downstream from Camp Pendleton's wastewater treatment plant discharges of secondary effluent.

Summary and Analysis of 2000 Data

Monitoring and Reporting Program No. 96-54 requires RCWD to record visual observations and collect samples at Station No. 4 on a quarterly basis during November through April, and on a monthly basis during March through December.

Visual Observations. Station No. 4 is under tidal influence. Table 7 compares visual observations with receiving water TDS for 2000. As shown in the table, visual observations at Station No. 4 during 2000 indicate that water clarity was generally good during the first half of 2000, regardless of whether the estuary water was saline, brackish, or fresh water. Poor water clarity during the latter half of 2000 may have been caused by a spill of Camp Pendleton raw sewage.

Table 7
Summary of 2000 TDS, DO, and Bacteriological Concentrations¹
Station No. 4 - Santa Margarita River Estuary

2000 Sample Date	TDS Concentration (mg/l)	Observed Water Velocity (fps)	Observed Percent Algae Cover	Observed Percent Emergent Vegetation	Observed Water Clarity
Mar 14	780	1.0	0%	0%	"clear"
May 10	1,290	1.0	0%	0%	"clear"
Jun 20	20,800	0	0%	0%	"clear"
Jul 19	17,400	0	0%	0%	"clear"
Aug 22	6,340	0	0%	0%	"clear"
Sept 19	No samples ²	0	0%	0%	"not clear"
Oct 17	12,600	0	0%	0%	"not clear"
Dec 11	9,700	0	0%	0%	"12-inch visibility"

¹ From 2000 monitoring reports submitted to Regional Board.

² No samples collected due to 2.7 million gallon raw sewage spill at Camp Pendleton.

Nutrients. As noted, Station No. 4 is located downstream from Camp Pendleton discharges of secondary treated wastewater. Table 8 summarizes nutrient concentrations at Station No. 4 during 2000. As shown by comparing Table 8 with Table 2 (Station No. 2) and Table 5 (Station No. 3), receiving water nutrient quality at Station No. 4 appears to be influenced by the Camp Pendleton secondary effluent discharges. Total phosphorus concentrations at Station No. 4 varied significantly. Summer concentrations of total phosphorus were typically 1 mg/l, and concentrations in excess of 2 mg/l occurred after a August 2000 spill of raw sewage at Camp Pendleton.

Nitrogen to phosphorus (N:P) ratios were typically less than 10, suggesting nitrogen as the limiting nutrient. N:P ratios at Station No. 4, however, may be highly influenced by the Camp Pendleton secondary effluent discharges; natural N:P ratios in the estuary are unknown.

Table 8
Summary of 2000 Nutrient Concentrations¹
Station No. 4 - Santa Margarita River Estuary

2000 Sample Date	Concentration in mg/l				N:P Ratio
	Total phosphorus	Total nitrogen	Organic nitrogen (as N)	Nitrate nitrogen (as N)	
Mar 14	0.23	1.4	0.6	0.8	6
May 10	0.32	1.3	1.3	< 0.2	4
Jun 20	1.0	8.7	1.2	7.5	9
Jul 19	1.1	5.9	1.9	4.0	5
Aug 22	1.1	1.1	1.1	< 0.2	1
Sept 19	No samples ²	No samples ²	No samples ²	No samples ²	No samples ²
Oct 17	2.1	7.4	1.9	5.5	4
Dec 11	2.2	8.7	1.6	6.0	4

1 From 2000 monitoring reports submitted to Regional Board.

2 No samples collected due to 2.7 million gallon raw sewage spill at Camp Pendleton.

Dissolved Oxygen. Table 9 summarizes minimum observed dissolved oxygen (DO) concentrations observed at Station No. 4 during the year 2000 sampling periods. As shown in the table, minimum hourly DO concentrations varied during the year. Observed DO concentrations at Station No. 4 may be influenced by the Camp Pendleton secondary effluent discharges and by tides.

Bacteriological Parameters. Table 9 also summarizes year 2000 data at Station No. 4 for bacteriological parameters. As discussed above, however, the SRWRF is not believed to influence concentrations of bacteriological parameters anywhere along the Santa Margarita River.

Table 9
Summary of 2000 TDS, DO, and Bacteriological Concentrations¹
Station No. 4 - Santa Margarita River Estuary

2000 Sample Date	TDS Concentration (mg/l)	Minimum Average Hourly DO Concentration (mg/l)	Time of Day for Minimum Hourly DO	Fecal Streptococci (organisms per 100 ml)	Total Coliform (organisms per 100 ml)	Fecal Coliform (organisms per 100 ml)
Mar 14	780	7.93	11 p.m.	230	9000	30
May 10	1,290	5.80	6 a.m.	80	5000	30
Jun 20	20,800	3.30	7 a.m.	230	80	23
Jul 19	17,400	10.8	8 a.m.	300	3000	70
Aug 22	6,340	8.47	9 a.m.	50	130	2
Sept 19	No samples ²	No samples ²	No samples ²	No samples ²	No samples ²	No samples ²
Oct 17	12,600	4.43	7 a.m.	50	300	30
Dec 11	9,700	5.61	7 a.m.	220	300	130

- 1 From 2000 monitoring reports submitted to Regional Board.
2 No samples collected due to 2.7 million gallon raw sewage spill at Camp Pendleton.

TDS. As shown in Table 9, significant variability in TDS occurs at Station No. 4. TDS concentrations at Station No. 4 are most influenced by storm flows and tides.

Effect of SRWRF Discharge

As documented above, the SRWRF discharge does not appear to have any observable negative effect on the receiving waters at Station No. 4.

Recommended Management Actions

No additional management actions (relative to the SRWRF discharge) are recommended.