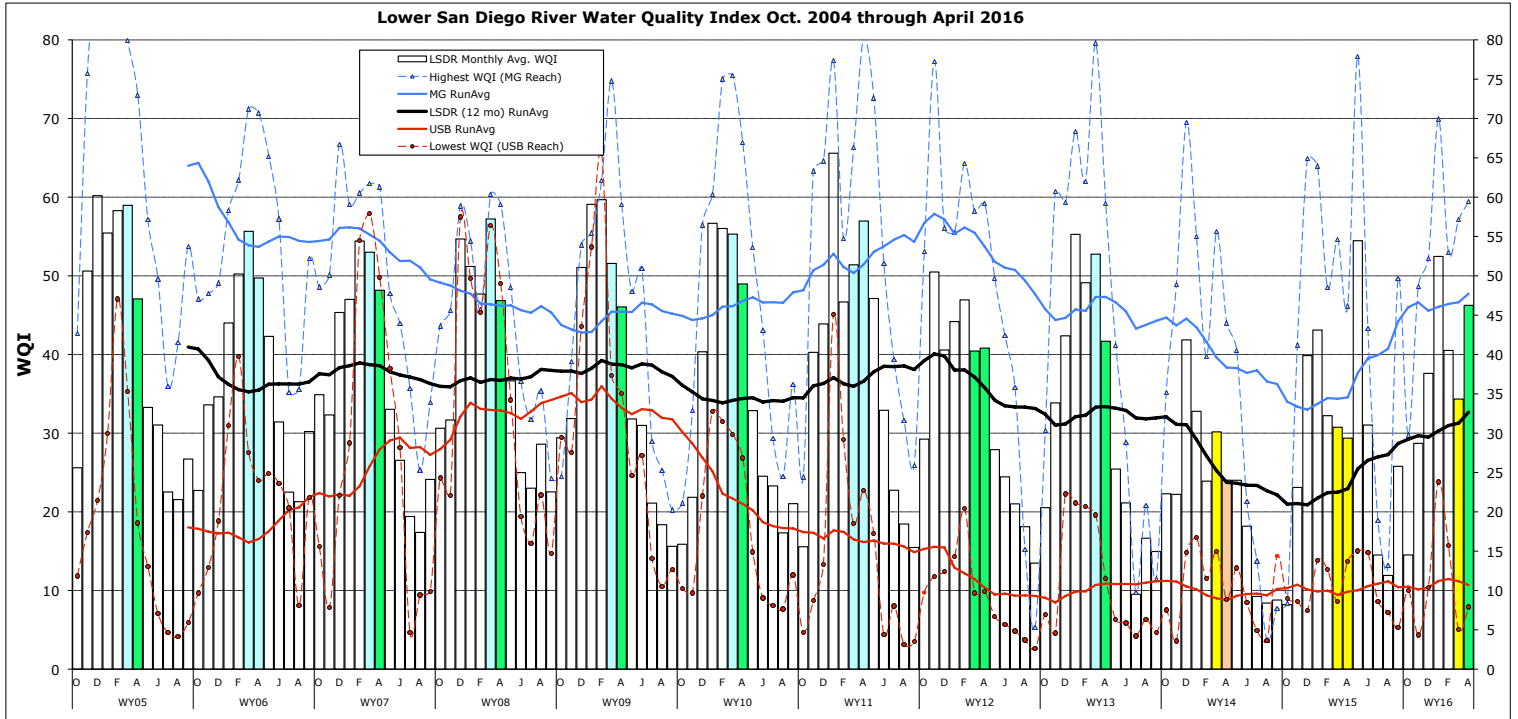


# Monthly WQM Report

## Lower San Diego River - April 2016



## Lower SDR WQ Monitoring Data Summary

**Table 1** presents a summary of water quality data monitored by SDRPF's RiverWatch Team within the Lower San Diego River watershed over the past two months. February and March represent the last two months of the WY16 winter or 'wet' season. This month's water quality index values are down from last month. The results are comparable to March values from last two years (WY15/WY14) and well below those for the previous nine years (WY05-WY13).

<b>Table 1 - March/April 2016 WQM Data Summary</b>							
	West - MV	Mid - MG	East - SB	<b>LSDR</b>	Percent Variance from		
[Sites]	[1-7] Mar/April	[8-10] Mar/April	[11-15] Mar/Apr	<b>[1-15] Mar/April</b>	Last Mo (3/2016)	Last Yr (4/2015)	11-Yr Avg (April)
Temperature, oC	19.3/19.6	17.1/17.5	17.9/18.2	<b>18.3/18.6</b>	2%	5%	5%
Sp.Cond., mS/cm	1.67/1.83	1.53/1.43	1.68/1.64	<b>1.66/1.65</b>	-1%	-33%	-18%
DO, mg/L	<b>3.98/6.42</b>	8.20/8.82	4.25/ <b>3.86</b>	<b>5.11/6.92</b>	36%	30%	12%
DO, % of Sat.	44/71	85/91	46/ <b>41</b>	<b>55/75</b>			
pH	7.12/7.40	7.74/7.71	7.11/7.03	<b>7.14/7.23</b>	1%	-6%	-7%
ADF, cfs	12/10	8/8	7/7	<b>9/8</b>	-7%	255%	-49%
WQ Index	32/63	57/59	25/26	<b>34/47</b>	36%	59%	6%
Grade(Mar/Apr)	D/B	B/B	D-/D-	<b>D/C</b>			
<b>April Grade</b>	Good	Good	Marginal	<b>Fair</b>	<b>Up 13 pts from last mo.</b>		

DO values in red indicate general hypoxic (DO < 4 mg/L) conditions.

Overall, LSDR **water temperatures** are up 0.3 degree Celsius (2%) from last month, slightly above (5%) last April and the 12-yr monthly norm of 17.7o C. **Specific conductivities** are down (-1%) from last month and -33% from last April at -18% below the 12-yr monthly norm. **Dissolved oxygen** levels are up 36% from last month at 30% above last April and 12% above the 12-yr monthly norm. **Streamflow** is down 7% from last month at 255% of last April but below (-49%) the 12-yr April norm. This month's LSDR **water quality index** (WQI) of 47(C) is up 13 points (36%) from last month's value of 34(D) and 59% greater than a year ago near (+6%) the 12-yr norm of 44. Conclusion:

**The LSDR water quality index improved 13 points, rising from 34 (Marginal) to 47 (Fair), over the past 30 days.**

A summary of WQI values occurring over the past two years of record for the three main sections of the lower river system as well as the overall average are listed in **Table 2** along with average daily flow and total monthly rainfall.

<b>Table 2 - WQI Values, Average Daily Flow and Monthly Rainfall (April 2014 - April 2016)</b>							
	Mission Valley	Mission Gorge	Santee Basin	LSDR		ADF, cfs	Rf, in
April '14	19(E)	44(C)	19(E)	24(E+)		5.9	0.4
May	16(E)	41(C)	24(E+)	24(E+)	DW	1.4	0.01
June	17(E)	21(E)	18(E)	18(E)	DW	0.7	0.0
July	8(F)	14(E)	8(F)	9(F)	DW	0.6	0.0
Aug	11(F)	4(F)	8(F)	8(F)	DW	0.7	0.01
Sept	5(F)	8(F)	13(E-)	9(F)	DW	1.2	0.05
Oct	7(F)	8(F)	9(F)	8(F)	DW	0.4	0.01
Nov	12(F+)	41(C)	24(E+)	23(E)		3.2	0.37
Dec '14	35(D)	65(B)	32(D)	40(C)	WW	34.6	4.5
Jan.'15	37(D+)	64(B)	39(C-)	43(C)		10.8	0.38
Feb.	28(D)	48(C+)	29(D)	32(D)		6.4	0.18
March	24(E+)	55(B)	26(D-)	31(D)		14.4	0.93
April	24(E+)	46(C)	27(D-)	29(D)	DW	2.3	0.02
May	55(B)	78(A-)	41(C)	54(B)	rs	14	2.4
June	26(D-)	43(C)	31(D)	31(D)	DW	2.2	0.01
July	12(F)	19(E)	15(E)	15(E)	rs	20.2	1.71
Aug	8(F)	13(E-)	15(E)	12(F+)	DW	1.6	0.0
Sept	8(F)	50(B-)	32(D)	26(D-)	rs	6.5	1.25
Oct	5(F)	30(D)	17(E)	15(E)		4.8	0.42
Nov	28(D)	49(C+)	20(E)	29(D)	rs	9.9	1.53
Dec. '15	40(C)	52(B)	29(D)	38(C-)		14.0	0.45
Jan.'16	54(B)	70(B)	42(C)	53(B)	WW	90.0	3.21
Feb.	40(C)	53(B)	35(D)	41(C)		10.0	0.05
March	32(D)	57(B)	25(D-)	34(D)		14.4	0.72
April '16	63(B)	59(B)	26(D-)	47(C)		14.6	0.55

WQI values are expected to decline at most monitoring sites over the next 30 days.

The **cover page** chart presents monthly WQI values and range (high-low) for the Lower San Diego River determined over the past 140 months of monitoring. The winter-to-spring transition (March/April) values for each of the past 12 years are shown as colored-shaded bars. Running

average index values for LSDR (flow-weighted for all 15 sites) are shown as a heavy black line. Monthly values for the consistently highest/best quality reach (Mission Gorge) are shown as a blue line while the consistently lowest/poorest reach (Upper Santee Basin) is shown in red. This month's values are up from last month (March) and slightly above the previous two year April results. Depending on the amount of rainfall received over the next 30 days; WY16 spring period is expected to be in the Fair range (normal) in terms of water quality.

Monthly WQI values extending from Oct. 2005 through April 2016 are presented in **Chart 1** (next page) together with 12-month running averages (trend-lines) for each of the five individual reaches and overall (i.e., LSDR). The current overall running average WQI for the LSDR of **32** is 6% below the 11-yr norm of **34.3**. Although there are notable improvements in water quality for many reaches of the lower river watershed over the last 5-6 months very poor-to-poor water quality conditions persist in upper (eastern) reach of the Santee Basin segment.

Monthly and 12-mo. running average WQI values for the poorest site (13-Mast Park) and best Mission Gorge reach (Sites 8-10) are presented in **Chart 2** (also on next page). Water quality at Sites 13 and 14 are Very Poor (F). Excessive growth of the invasive non-native aquatic plant, floating primrose-willow (*Ludwigia hexapetala*/L. *peplodes*) observed throughout much of the slower-moving reaches of the river, are considered a major contributor of recurrent dissolved oxygen deficits (DO < 4.0 mg/L) and resultant low water quality index values over the past four and a half years of drought.

Spatial WQI results for the last two months of monitoring are shown in **Charts 3 and 4** on page 6. WQI values (color bars w/index values in black) have changed most noticeably in the Mission Valley and Lower Santee Basin reaches. The percentage of sites in the Poor-to-Very Poor range (E/F) declined from 20% (3 of 15) to 13% (2 of 15) over the past month. The number of sites in the Good-to-Very Good (A/B) range has increased from two (13%) in March to seven (47%) in April. Of the remaining sites in the intermediate quality range (Fair-C and Marginal-D), the percentage has decreased from 67% (10 sites) in Feb. to 40% (6 sites) in March.

Water quality index values can be expected to decrease over the next month at most monitoring sites assuming streamflow declines, water temperatures rise and invasive plant growth continues at a high rate. However, should well above normal rainfall occur, May water quality monitoring results could show further improvement or at least minimal change from present conditions.

JCK (4/19/2016)

