San Luis Rey Watershed – Water Quality Status

Three water bodies are currently listed or recommended for listing on the Clean Water Act Section 303(d) list of water quality limited segments. These water bodies, the stressor and the year of listing are:

- Pacific Ocean Shoreline (at the San Luis Rey River Mouth)
  - Stressor: Bacterial Indicators
  - Year of Listing: 1998
  - Distance: 0.4 miles

- Lake Guajome
  - Stressor: Eutrophic
  - Year of Listing: 1998
  - Area: 25 acres

- San Luis Rey River
  - Stressor: Chloride
  - Year of Listing: 2002
  - Distance: lower 13 miles
  - Stressor: TDS
  - Year of Listing: 2002
  - Distance: lower 17 miles

It is anticipated that the San Luis Rey River will be added to the 303(d) list later this year after State Board and USEPA approval. None of these water bodies currently have a TMDL under development. No TMDL-related activities are planned for the remainder of the 02-03 fiscal year.

Additionally, there is some data that indicates that manganese and phosphorus may be exceeding Basin Plan Objectives in the San Luis Rey River. Regional Board Staff also believe eutrophication to be a problem in this river, but data is lacking to corroborate visual observations.
## San Luis Rey River - City of Oceanside Water Utilities Laboratory

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(-) = either not evaluated or not detected  
ND = non detect, NF = no flow, NM = not measured, NS = not sampled

Chloride Basin Plan Water Quality Objective = 250 mg/L is not to be exceeded more than 10% of the time in any one year

Sulfate Basin Plan Water Quality Objective = 250 mg/L is not to be exceeded more than 10% of the time in any one year

TDS Basin Plan Water Quality Objective = 500 mg/L is not to be exceeded more than 10% of the time in any one year

---

(last updated 1/25/02
S:\WQS\303dlist\Fact Sheets-2002 listing\903\SLR-tables)
NEW 303(d) LISTINGS
Chloride, Sulfate and Total Dissolved Solids (TDS)

PREVIOUS 303(d) LISTINGS
None

WATERSHED CHARACTERISTICS
The San Luis Rey River is located in the San Luis Rey Watershed in the north end of San Diego County, California. The San Luis Rey River originates from Lake Henshaw. In the lower segment, it runs parallel to Highway 76 all the way to the pacific coastline.

The San Luis Rey River is classified an inland surface water. It is designated with the following beneficial uses: MUN, AGR, IND, REC1, REC2, WARM, WILD and RARE1.

WATER QUALITY OBJECTIVES NOT ATTAINED
Chloride The Basin Plan1 objective is 250 mg/L.
Sulfate The Basin Plan1 objective is 250 mg/L.
TDS The Basin Plan1 objective is 500 mg/L.

EVIDENCE OF IMPAIRMENT
Chloride Data collected in October 1997 to November 2000 by the City of Oceanside Water Utilities Laboratory2 showed 3 locations along the San Luis Rey River to exceed 250 mg/L. Three locations in the City of Oceanside were sampled quarterly for chloride. At Bonsall Bridge, 8 of 11 (73%) samples exceeded the Basin Plan objective, with a mean concentration of 306.9 mg/L and a median of 297.0 mg/L. At Douglas Bridge, 7 of 10 (70%) samples exceeded the Basin Plan objective, with a mean concentration of 296.1 mg/L and a median of 306.0 mg/L. At Benet Road, 8 of 10 (80%) samples exceeded the Basin Plan objective, with a mean concentration of 413.5 mg/L and a median of 346.0 mg/L. See graph below for trend.

Chlorides may impart a salty taste to drinking water in concentrations between 100 – 700 mg/L. The secondary drinking water standard for chlorides is 500 mg/L. The measured values may be impairing the MUN beneficial use.

Elevated concentrations in waters used for industrial process and supply can significantly increase the corrosion rate of steel and aluminum. The observed concentrations may be impairing the IND beneficial use.

High chloride concentrations can be toxic to plant life. A safe concentration of chloride of irrigation waters is considered to be in the range of 100 – 140 mg/L. Irrigation with water containing 140 – 350 mg/L of chloride may cause slight to moderate plant injury.1 The measured concentrations can be expected to impair the AGR beneficial use. Damage to native flora could also impair the WARM, WILD and RARE beneficial uses.

Sulfate Data collected in October 1997 to November 2000 by the City of Oceanside Water Utilities Laboratory2 showed 3 locations along the San Luis Rey River...
to exceed 250 mg/L. Three locations in the City of Oceanside were sampled quarterly. At Bonsall Bridge, 10 of 10 samples exceeded the Basin Plan objective, with a mean concentration of 426.2 mg/L and a median of 450.0 mg/L. At Douglas Bridge, 9 of 9 samples exceeded the Basin Plan objective, with a mean concentration of 366.7 mg/L and a median of 361.9 mg/L. At Benet Road, 10 of 10 samples exceeded the Basin Plan objective, with a mean concentration of 424.2 mg/L and a median of 420.0 mg/L. See graph below for trend.

High concentrations of sulfate in drinking water can cause laxative effects and would impair the MUN beneficial use.

**TDS** Data collected in October 1997 to November 2000 by the City of Oceanside Water Utilities Laboratory showed 3 locations along the San Luis Rey River to exceed 500 mg/L. Three locations in the City of Oceanside were sampled quarterly. At Bonsall Bridge, 11 of 11 samples exceeded the Basin Plan objective, with a mean concentration of 1612.5 mg/L and a median of 1680.0 mg/L. At Douglas Bridge, 10 of 10 samples exceeded the Basin Plan objective, with a mean concentration of 1469.2 mg/L and a median of 1515.0 mg/L. At Benet Road, 10 of 10 samples exceeded the Basin Plan objective, with a mean concentration of 1701.7 mg/L and a median of 1670.0 mg/L. See graph below for trend.

Sampling by the Regional Water Quality Control Board, San Diego Region in May and June of 1998 also contain evidence of elevated concentrations of TDS. One sample at Foussat Rd had a concentration of 850 mg/L and one sample at Old Highway 395 had a concentration of 970 mg/L.

Total Dissolved Solids may consist of carbonates, bicarbonates, chlorides, sulfates, phosphates, nitrates, magnesium, sodium, iron and manganese. The most frequent constituents are usually salts (sodium, chloride, boron, etc.) Most of the problem can be traced to human impacts, and therefore, can be mitigated. Geologic conditions help to define the natural levels of many of these constituents. High concentrations of TDS are expected to impact the AGR beneficial use directly through irrigation waters or indirectly through adverse effects on soil permeability. TDS values between 450 to 2000 mg/L are expected to have a slight to moderate restriction on use of waters for irrigation of crops.

**EXTENT OF IMPAIRMENT**

**Chloride** Sampling occurred at 3 locations on the San Luis Rey River: at Bonsall Bridge, at Douglas Bridge and at Benet Road. All 3 locations are in or near the City of Oceanside, in the lower section of the river. The entire lower extent of the river is impaired for chloride.

**Sulfate** Sampling occurred at 3 locations on the San Luis Rey River: at Bonsall Bridge, at Douglas Bridge and at Benet Road. All 3 locations are in or near the City of Oceanside, in the lower section of the river. The entire lower extent of the river is impaired for sulfate.

**TDS** Sampling occurred at 3 locations on the San Luis Rey River: at Bonsall Bridge, at Douglas Bridge and at Benet Road. All 3 locations are in or near the City of Oceanside, in the lower section of the river. Sampling also occurred at Foussat Rd and at Old Highway 395. The entire lower extent of the river is impaired for TDS.
Chloride

Bonsall: Avg = 306.9, Median = 297.0, 8 of 11 (73%)
Douglas: Avg = 296.1, Median = 306.0; 7 of 10 (70%)
Benet: Avg = 13.5, Median = 346.0, 8 of 10 (80%)

Basin Plan Objective = 250 mg/L

Date

Sulfate

Bonsall: Avg = 306.9, Median = 297.0, 8 of 11 (73%)
Douglas: Avg = 296.1, Median = 306.0, 7 of 10 (70%)
Benet: Avg = 13.5, Median = 346.0, 8 of 10 (80%)

Basin Plan Objective = 250 mg/L
Total Dissolved Solids

- Bonsall: Avg = 306.9, Median = 297.0, 8 of 11 (73%)
- Douglas: Avg = 296.1, Median = 306.0, 7 of 10 (70%)
- Benet: Avg = 413.5, Median = 346.0, 8 of 10 (80%)

Basin Plan Objective = 500 mg/L
POTENTIAL SOURCES
Chloride Urban runoff, other point sources and non-point sources
Sulfate Urban runoff, other point sources and non-point sources
TDS Urban runoff, other point sources and non-point sources

TMDL PRIORITY
Chloride Medium
Sulfate Medium
TDS Medium

INFORMATION SOURCES
Water Quality Objectives and Watershed Characteristics

Data Sources

### San Luis Rey River - City of Oceanside Water Utilities Laboratory

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| Douglas       |                |               |            |             |                  |                |                        |
| October 27, 1997 | 342            | 347           | 1500       | 0.039       | 0.083            | 147            | NM                     |
| March 16, 1998  | 230            | 305           | 1180       | 0.163       | 0.058            | 128            | NM                     |
| June 1, 1998    | 216            | 326           | 1150       | 0.149       | 0.095            | 118            | NM                     |
| September 21, 1998 | 302           | 361           | 1480       | 0.151       | 0.099            | 149            | NM                     |
| March 8, 1999   | 301            | 431           | 1372       | 0.534       | 0.106            | 154            | NM                     |
| September 13, 1999 | 320            | 420           | 1560       | 0.32        | 0.06             | 150            | NM                     |
| December 13, 1999 | NF            | NF            | NF         | NF          | NF               | NF             | NF                     |
| April 27, 2000  | 310            | 450           | 1530       | 0.06        | 0.04             | 160            | NM                     |
| July 6, 2000    | 360            | 390           | 1660       | ND          | 0.02             | 180            | NM                     |
| September 19, 2000 | 340            | NM            | 1680       | 2           | 1.3              | 180            | 0.18                   |
| November 27, 2000 | 240            | 270           | 1580       | 0.93        | 1.7              | 160            | 0.32                   |
| **Avg**        | 296.1          | 366.7         | 1469.2     | 0.483       | 0.352            | 152.6          |                        |
| **Median**     | 306.0          | 361.0         | 1515.0     | 0.163       | 0.072            | 152.0          |                        |

| Benet         |                |               |            |             |                  |                |                        |
| October 27, 1997 | 805            | 541           | 2660       | 0.099       | 0.085            | 212            | NM                     |
| March 16, 1998  | 233            | 330           | 1187       | 0.116       | 0.07             | 128            | NM                     |
| June 1, 1998    | 226            | 330           | 1090       | 0.284       | 0.141            | 126            | NM                     |
| September 21, 1998 | 342           | 391           | 1350       | 0.556       | 0.308            | 170            | NM                     |
| March 8, 1999   | 329            | 420           | 1400       | 0.159       | 0.07             | 155            | NM                     |
| September 13, 1999 | NS            | NS            | NS         | NS          | NS               | NS             | NS                     |
| December 13, 1999 | 560            | 520           | 1990       | 0.17        | 0.15             | 200            | NM                     |
| April 27, 2000  | 320            | 430           | 1540       | 0.06        | 0.05             | 160            | NM                     |
| July 6, 2000    | 410            | 420           | 1800       | 0.21        | 0.52             | 190            | NM                     |
| September 19, 2000 | 560            | 510           | 2100       | 0.42        | 0.75             | 230            | 0.18                   |
| November 27, 2000 | 350            | 350           | 1900       | 0.44        | 0.98             | 210            | 0.12                   |
| **Avg**        | 413.5          | 424.2         | 1701.7     | 0.251       | 0.312            | 178.1          |                        |
| **Median**     | 346.0          | 420.0         | 1670.0     | 0.190       | 0.146            | 180.0          |                        |

(ND) = either not evaluated or not detected
(ND) = non detect, NF = no flow, NM = not measured, NS = not sampled
### R9 In House Monitoring

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San Luie Rey River - Chloride

Bonsall: Avg = 306.9, Median = 297.0, 8 of 11 (73%)
Douglas: Avg = 296.1, Median = 306.0, 7 of 10 (70%)
Benet: Avg = 413.5, Median = 346.0, 8 of 10 (80%)

Basin Plan Objective = 250 mg/L
San Luie Rey River - Sulfate

**Basin Plan Objective = 250 mg/L**

- **Bonsall Rd**: Avg = 426.2, Median = 450.0, 10 of 10 (100%)
- **Douglas Rd**: Avg = 366.7, Median = 361.0, 9 of 9 (100%)
- **Benet Rd**: Avg = 424.2, Median = 420.0, 10 of 10 (100%)
San Luie Rey River - TDS

Bonsall: Avg = 1612.5, Median = 1680.0, 11 of 11 (100%)
Douglas: Avg = 1469.2, Median = 1515.0, 10 of 10 (100%)
Benet: Avg = 1701.7, Median = 1670.0, 10 of 10 (100%)

Basin Plan Objective = 500 mg/L
San Luie Rey River - Ca

Basin Plan Objective = 160 mg/L

Bonsall: Avg = 163.7, Median = 162.0, 6 of 11 (55%)
Douglas: Avg = 152.6, Median = 152.0, 2 of 10 (20%)
Benet: Avg = 178.1, Median = 180.0, 6 of 10 (60%)

y = 0.0291x - 893.85
R² = 0.2409

y = 0.0375x - 1209.2
R² = 0.6251

y = 0.0451x - 1460
R² = 0.2736
San Luie Rey River - Mn

Bonsall: Avg = 0.168, Median = 0.120, 3 of 10 (30%)
Douglas: Avg = 0.352, Median = 0.072, 3 of 10 (30%)
Benet: Avg = 0.312, Median = 0.146, 3 of 10 (30%)

Baseline Plan Objective = 0.5 mg/L

y = 0.00009x - 32.584
R^2 = 0.3752

y = 0.0005x - 19.66
R^2 = 0.4856

y = 0.0002x - 6.287
R^2 = 0.1991
San Luis Rey River - Phosphorus

Basin Plan Objective = 0.1 mg/L

Date

1/5/98  7/24/98  2/9/99  8/28/99  3/15/00  10/1/00  4/19/01

Phosphorus (mg/L)
San Luís Rey River - Chloride

- **Bonsall**: Avg = 306.9, Median = 297.0, 8 of 11 (73%)
- **Douglas**: Avg = 296.1, Median = 306.0, 7 of 10 (70%)
- **Benet**: Avg = 413.5, Median = 346.0, 8 of 10 (80%)

**Basin Plan Objective** = 250 mg/L
**Sulfate**

- **Bonsall:** Avg = 306.9, Median = 297.0, 8 of 11 (73%)
- **Douglas:** Avg = 296.1, Median = 306.0, 7 of 10 (70%)
- **Benet:** Avg = 413.5, Median = 346.0, 8 of 10 (80%)

**SO₄²⁻ (mg/L)**

- **Basin Plan Objective:** 250 mg/L
Total Dissolved Solids

- **Bonsall:** Avg = 306.9, Median = 297.0, 8 of 11 (73%)
- **Douglas:** Avg = 296.1, Median = 306.0, 7 of 10 (70%)
- **Benet:** Avg = 413.5, Median = 346.0, 8 of 10 (80%)

**Basin Plan Objective:** 500 mg/L

4th Quarter 1997 Violations

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*units in umho/cm
### 1st Quarter 1998 Violations

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* units in umho/cm

### 2nd Quarter 1998 Violations

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### 3rd Quarter 1998 Violations

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- **only tested for pesticide, all came back ND**

* units in umho/cm

### 4th Quarter 1998 Violations

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** only tested for pesticide, all came back ND
### 1st Quarter 1999 Violations

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3/8/99 Benet Chloride 329
3/8/99 Benet Sulfate 420
3/8/99 Benet Manganese 0.07
3/8/99 Benet Conductivity 2140*
3/8/99 Benet TDS 1400

* units in umho/cm

### 2nd Quarter 1999 Violations

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** Pesticides only at Benet. All in compliance
### 3rd Quarter 1999 Violations

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**No Benet Sample**

* units in umho/cm

### 4th Quarter 1999 Violations

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**No Flow at Douglass**

* units in umho/cm
### 1st Quarter 2000 Violations

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* units = umho/cm
### 3rd Quarter 2000 Violations

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### 4th Quarter 2000 Violations

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* units = umho/cm
### San Luis Rey River

**City of Oceanside**  
**Water Utilities Laboratory**

**Monitoring Area:** San Luis Rey River

**Type of Sampling:** Quarterly Bacteriological

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<th>Enterococcus by Enterolert MPN/100ml</th>
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WATER UTILITIES DEPARTMENT LABORATORY, by:

Valerie Gallwas
Microbiologist
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<td>Enterococcus by Membrane Filtration CFU/100ml</td>
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</tbody>
</table>

WATER UTILITIES DEPARTMENT LABORATORY,

Valerie Gallwas
Microbiologist