

Report 6
**LAKE ELSINORE
TOXICS TMDL MONITORING
PROGRAM REPORT**

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**Lake Elsinore Toxics TMDL Monitoring Program Report
for the Year 2000/2001**

Results of First Year of Regional Board TMDL Study Implementation

A. Water Column Chemistry

Water column samples were collected on three dates for chemical analyses. Table 10 shows the dates and locations of samples.

Table 1: LOCATION AND DATE OF WATER CHEMISTRY SAMPLES (2000-2001)

Station ID	Location	11/29/00	1/12/01	2/15/01	4/9/01	4/11/01	5/9/01
0101	Four Corners surface						
0102	Four Corners bottom						
0201	Elsinore West Marina surface						X _c
0202	Elsinore West Marina bottom	X		X			X _c
0301	Lakeland Village @ Maiden Lane surface			X _c			
0302	Lakeland Village @ Maiden Lane bottom			X _c			
0401	Middle of Lake (west) surface						
0402	Middle of Lake (west) bottom						
0501	Middle of Lake (east) surface						
0502	Middle of Lake (east) bottom						
0601	City Boat Launch surface						
0602	City Boat Launch bottom						
0701	San Jacinto Inlet (north) surface			X _c			
0702	San Jacinto Inlet (north) bottom			X _c			
0801	San Jacinto Inlet (south) surface			X _c			
0802	San Jacinto Inlet (south) bottom			X _c			
0901	Four Corners Flood Control Channel						
1001	San Jacinto River @ Lakeshore Drive						

X_c Composite sample of surface and bottom

Samples for dissolved trace metal analyses (Cadmium, Chromium, Copper, Nickel, and Zinc) were collected from two locations on May 9, 2001. The average water hardness measured during the pre-2000 samplings was used to calculate the acute toxicity criteria from the CTR. No results exceeded the calculated criteria.

On November 29, 2000, a single sample was collected from the bottom of the Lake at Elsinore West Marina and analyzed for several types of pesticides including carbamate, organophosphate, and triazine. None were detected. On February 15, 2001, samples from four locations were analyzed for organochlorine pesticides and PCBs. None of these analytes were found above the detection limit of the laboratory.

B. Fish Tissue Analyses

Several carp and bass were collected throughout the lake and submitted to the DF&G laboratory for analyses. The laboratory prepared 6 composite samples from filets of 29 bass, and 5 composite samples from filets of 28 carp. Six composite samples were also prepared from the livers of the 29 bass. The filet composite samples were analyzed for trace elements and organic compounds and the liver composites were analyzed for just trace elements.

Of the ten trace elements (Arsenic, Cadmium, Chromium, Copper, Lead, Mercury, Nickel, Selenium, Silver, and Zinc) that were analyzed, only **arsenic** was found above the MTRL for arsenic (3 of 11 samples). The bass composite data show a higher incidence of exceeding the MTRL for arsenic (3 of 6) than the combined bass and carp data. A summary of the findings can be found in the appendix to this report.

With respect to analyses for organic compounds, the concentration of **p'p' DDE** exceeded the MTRL in 3 of 11 samples. In 5 of 11 samples the concentration of **total PCBs** exceeded the MTRL and the OEHHA screening value. The carp composite data show a higher incidence of exceeding the MTRL (2 of 5 for p'p' DDE and 5 of 5 for total PCBs) and a higher incidence of exceeding the OEHHA screening value (5 of 5 for total PCBs). Total PCB concentrations far exceed the MTRL and OEHHA screening value. A summary of the findings can be found in the appendix to this report.

C. Water Column Bioassays

Water column samples for bioassay testing were collected during two dry weather events and three wet-weather events in the lake. The number of sample locations and collection point in the water column (surface, bottom, or composite) was not consistent from date to date during the first year¹. Samples from the tributaries (Four Corners Flood Control Channel and San Jacinto River at Lakeshore Drive) were collected during two wet weather events.

Toxicity testing using *Ceriodaphnia* showed 100% survival during both wet and dry events at all locations in the lake. However reproduction rates showed significant reduction in 7 of 15 samples during wet events and 6 of 13 samples during dry events. In the tributaries, 2 of 4 samples showed 100% mortality during wet events. Reproduction showed significant reduction in 3 of 4 samples collected from the tributaries.

¹ The number of sample locations varied from one sample event to another due to the difficulty the sample crew had in reaching all of the sample locations. After two monitoring events it was determined that collecting water samples at two depths in the water column per location was not practical. Fortunately, data showed that the lake was well mixed and therefore one composite sample at each location would be satisfactory.

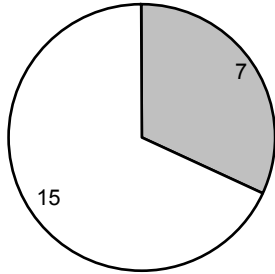
Significant reduction in *Selenastrum* growth was seen in 4 of 18 lake samples collected from the lake during wet events, while 1 of 19 samples showed significant reduction in growth during dry events. *Selenastrum* growth was reduced in 1 of 4 wet weather samples from the tributaries. For most sample dates algal growth was enhanced in comparison to the control; this is not surprising given the known nutrient problem in Lake Elsinore.

The in-lake and tributary data show no toxic effects on fathead minnow (*Pimephales*) during dry or wet weather events.

APPENDICES

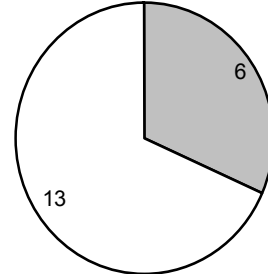
**WATER COLUMN BIOASSAYS
LAKE SAMPLES**

**Wet Weather
Number of Samples with Reduced
Reproduction**



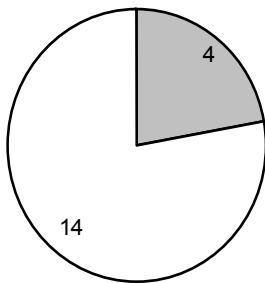
■ Significant □ Not Significant

**Dry Weather
Number of Samples with
Reduced Reproduction**



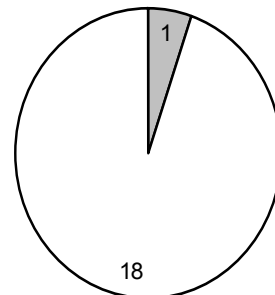
■ Significant □ Not Significant

**Wet Weather
Samples with
Reduced *Selenastrum* Growth**



■ Significant □ Not Significant

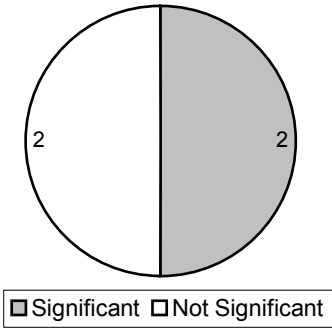
**Dry Weather
Samples with
Reduced *Selenastrum* Growth**



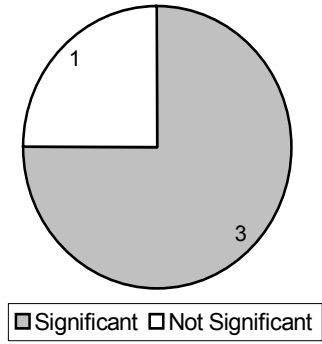
■ Significant □ Not Significant

**WATER COLUMN BIOASSAYS
TRIBUTARY (WET ONLY)**

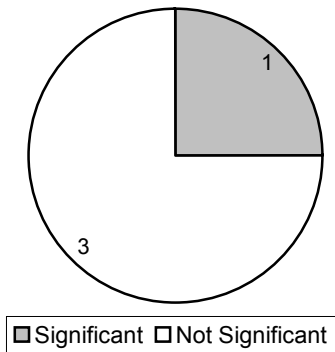
**Mortality of Ceriodaphnia
during Wet Events**



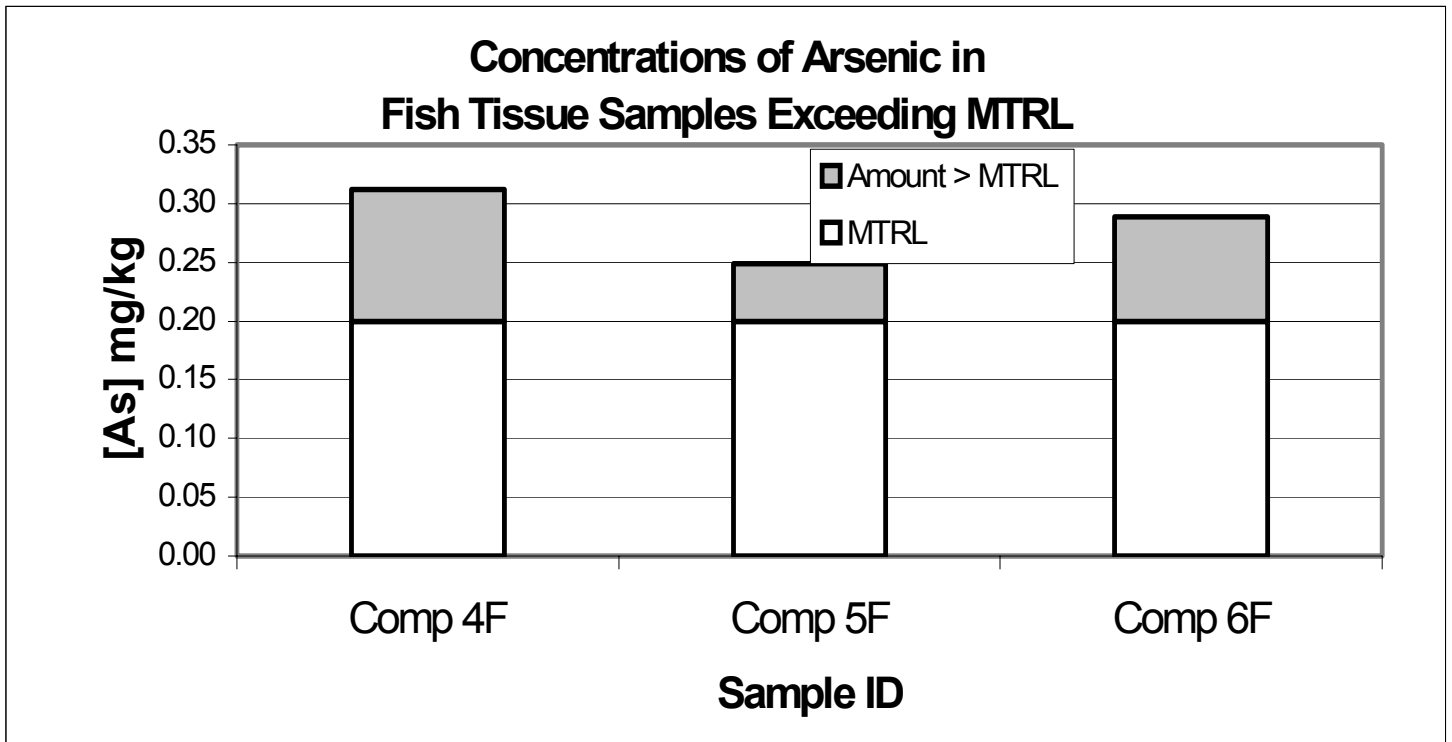
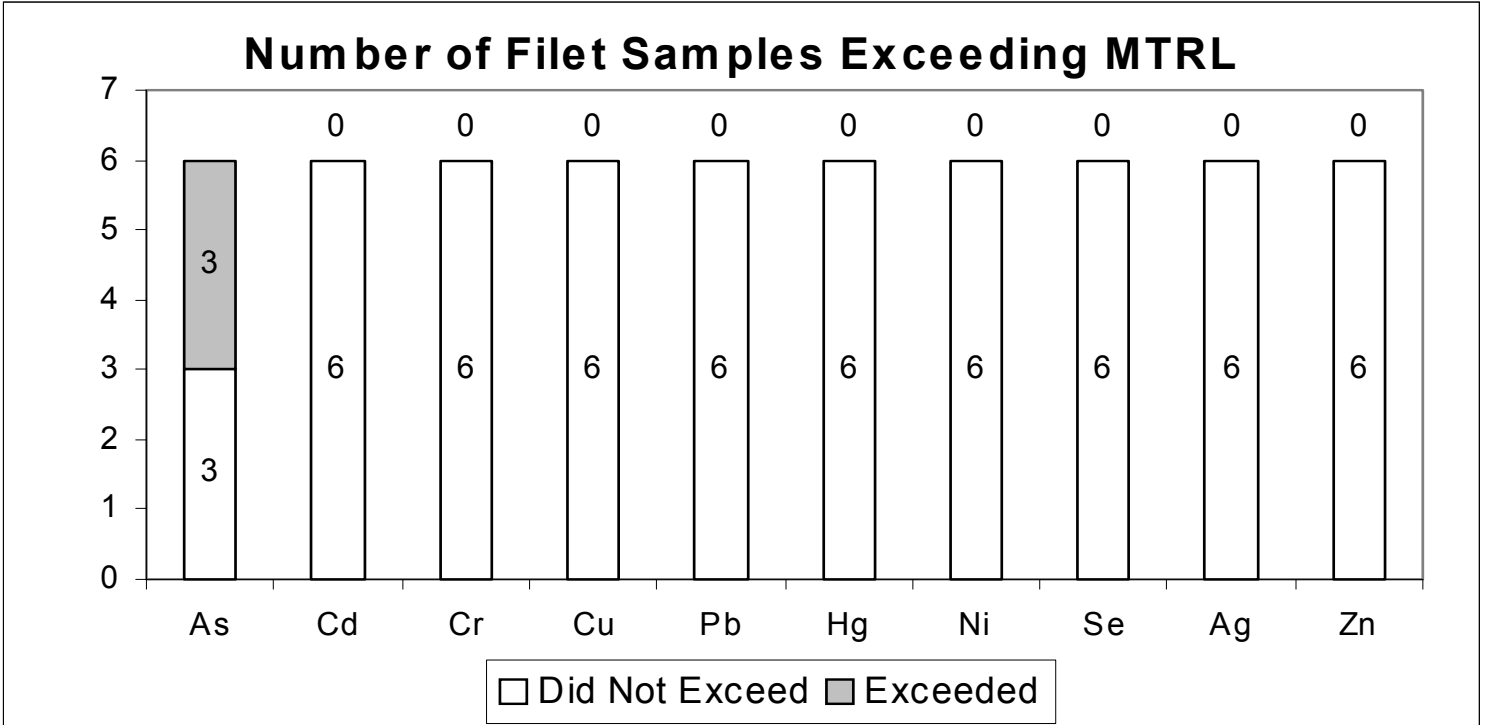
**Reduction in Reproduction of
Ceriodaphnia during Wet Events**



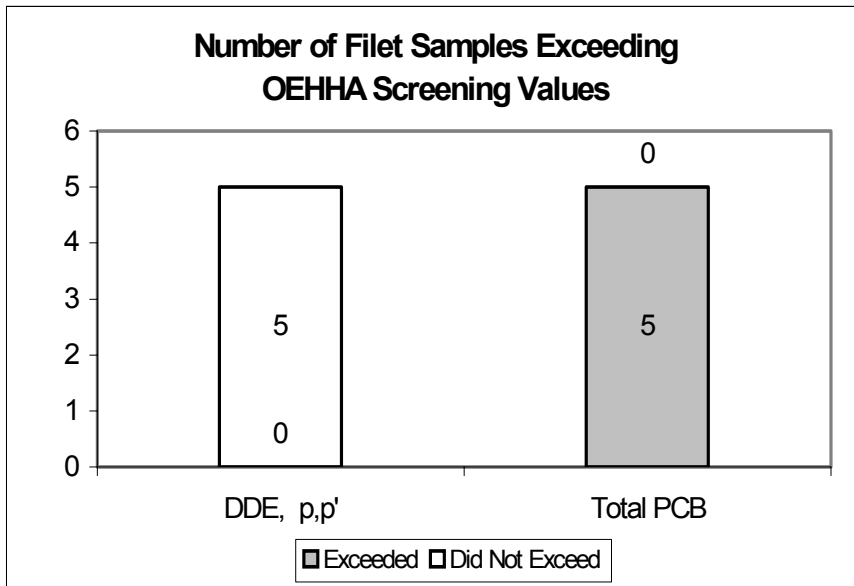
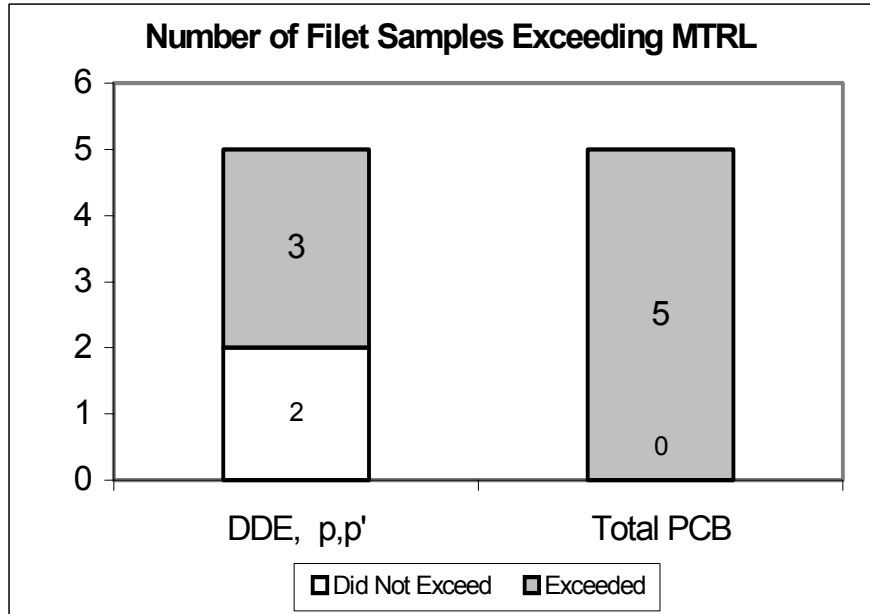
**Samples with
Reduced *Selenastrum* Growth**



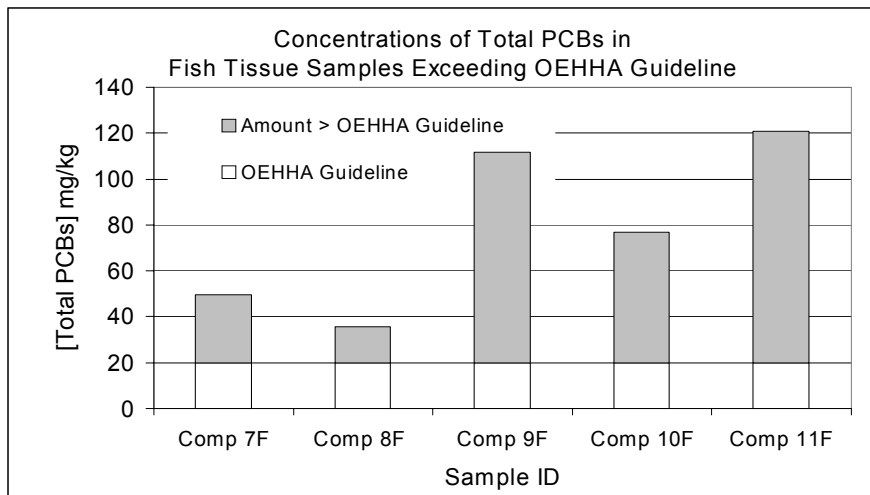
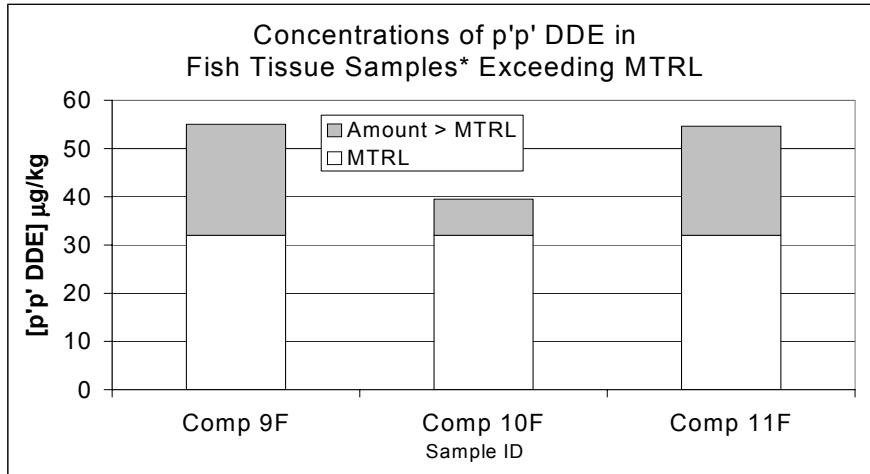
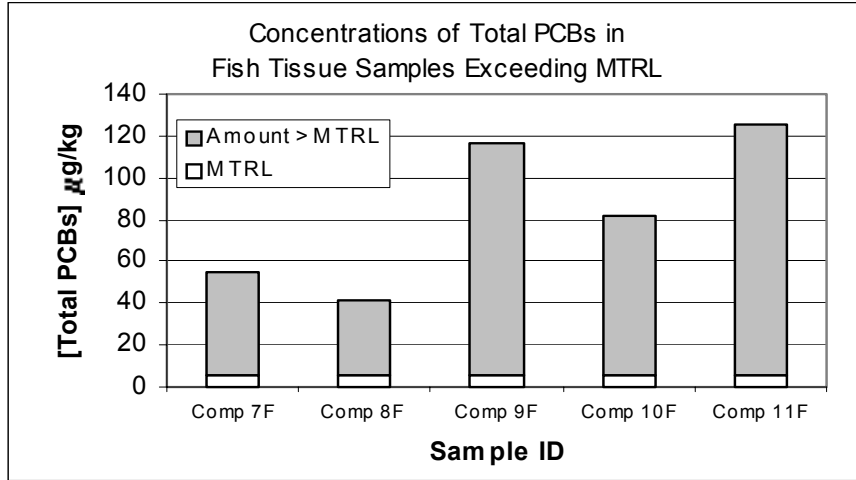
**FISH TISSUE ANALYSIS
TRACE METALS**



FISH TISSUE ANALYSIS ORGANICS



FISH TISSUE ANALYSIS ORGANICS



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