



**DEPARTMENT OF FISH AND GAME
FISH AND WILDLIFE
WATER POLLUTION CONTROL LABORATORY**

2005 NIMBUS ROAD
RANCHO CORDOVA, CA 95670
PHONE (916) 358-2858 ATSS 8-434-2858 FAX (916) 985-4301

LABORATORY REPORT

Name: Stafford Lehr
Agency: Dept Fish and Game
Address: 1701 Nimbus Rd.
City: Rancho Cordova CA 95670

Lab Number: L-073-98
Other Number:
Date Sampled:
Date Received: 02-24-98
Date Completed: 02-27-98
Index-PCA Code:

RE: Union Mine Land Fill

RESULTS OF CHEMICAL ANALYSIS:

Laboratory Number	Sample Identification	Hardness as CaCO ₃ , mg/L	Dissolved Metals, µg/L (ppb)			
			Copper*	Cadmium*	Lead**	Zinc**
L-073-98-1	#1 U/S 1st Outfall Union Mine Landfill (Martinez Cr.)	43.2	2.9	ND	ND	20
L-073-98-2	#2 1st Outfall Union Mine Landfill (North)	83.5	7.2	ND	ND	32
L-073-98-3	#3 2nd Outfall Union Mine Landfill (South)	32.6	4.8	ND	ND	20
L-073-98-4	#4 Martinez Cr. d/s of 2nd Outfall 100' d/s @ Bridge	40.4	<RL	ND	ND	ND
Reporting Limit		1.0	2.0	0.2	100	20

ND - Not Detected

METHOD REFERENCES:

* Standard Methods for the Examination of Water and Wastewater, 17th edition, 1989, American Public Health Association, American Water Works Association, Water Pollution Control Federation, Method 3113 Electrothermal AAS.

** Standard Methods for the Examination of Water and Wastewater, 17th edition, 1989, American Public Health Association, American Water Works Association, Water Pollution Control Federation, Method 3111B Flame AAS.

COST OF ANALYSIS: \$480.00

POLLUTION ACTION KIT (IF USED): \$110.00 AND HAZMAT SHIPPER (IF USED): \$25.00

Deposit recovery costs to the Fish and Wildlife Pollution Account with "cost of analysis:" identified separately.

Mailda Martin
Analyst
DBCrane
Chemistry Laboratory Supervisor

3-2-98
Date
3-2-98
Date

DBCrane
Supervisor
3-2-98
Date

Exhibit B

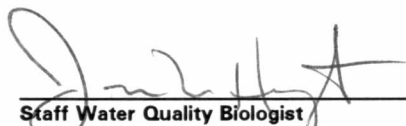
BIOLOGICAL SIGNIFICANCE

The sensitivity of fish to copper and zinc varies with species, age and condition of fish, as well as with the physical and chemical characteristics of the water. The hardness of the water is most critical. Copper induced lethality in trout spans a large range from 0.09 to 232 ppb in soft water and hard water, respectively (Sorensen 1991). The toxic level for zinc to young trout fingerling ranges from 10 to 400 ppb in soft water and as high as 4,000 ppb in hard water (McKee and Wolf 1971). In addition, the presence of copper and zinc together can have a significant synergistic toxic effect (McKee and Wolf 1971).

Samples L-073-98-1 through L-073-98-3 contained detectable levels of copper and zinc in relatively soft water. It is my opinion that the copper and zinc concentrations in Samples L-073-98-1 through L-073-98-3 were deleterious to aquatic life but probably not toxic to some fish and other aquatic organisms.

REFERENCES:

- McKee J.E. and H.W. Wolf. 1963. Water Quality Criteria. Publication 3-A. California State Water Resources Control Board. Sacramento, Ca.
- Sorensen E.M. 1991. Metal Poisoning in Fish. CRC Press. Boca Raton, Fl.



Staff Water Quality Biologist
3/2/98

Date