

Memorandum

To : Environmental Services
Region 3

Date: February 7, 1974

From : **Department of Fish and Game** - Water Quality Laboratory, Yountville

Subject : Atascadero Creek Survey - Sonoma County

A stream survey was conducted on Atascadero and Barlow Creeks near Barlow, Sonoma County, on September 7, 1973. The purpose of the survey was to evaluate the effects of the wastes discharged by Sebastopol Co-op 2 & 3, an apple cannery located near Barlow Creek. Field and laboratory analyses and observations indicate the discharge from this cannery adversely affects the ecological conditions of Atascadero Creek and significantly reduces the creek's spawning and feeding habitat for freshwater game fish.

Samples were taken at five stations along Atascadero Creek and at one station at the origin of Barlow Creek. The results indicate a high runoff of organic wastes into Barlow Creek from the apple cannery's leach fields resulting in the degradation of Atascadero Creek's water quality. Field tests for dissolved oxygen (D.O.), temperature, and pH were made along the visible lengths of Atascadero and Barlow Creeks. Water samples were taken at the origin of Barlow Creek, the confluence of Barlow and Atascadero Creeks, Atascadero Creek just below its confluence with Barlow Creek, and Atascadero Creek one-tenth mile above the confluence. These samples were taken to Brelje and Race Laboratories of Santa Rosa where they were analyzed for specific conductance, total dissolved solids, biochemical oxygen demand (BOD) chemical oxygen demand (COD), and nitrate nitrogen.

Bottom samples were taken from Atascadero Creek one-tenth mile upstream from its confluence with Barlow Creek where the water was visibly clear, and one mile downstream from the confluence, where the water was murky. These samples were taken to the Department of Fish and Game's Yountville Laboratory where they were analyzed for types and diversity of aquatic life present in the samples.

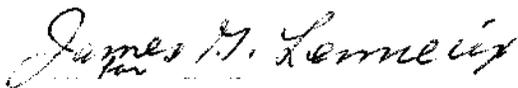
Field tests of temperature, dissolved oxygen and pH were made with a Weston and Stack dissolved oxygen analyzer and a Photovolt pH meter. The identification and distribution of aquatic flora and fauna were determined in both the field and laboratory. Microscopic identifications were made using a compound microscope (Bausch and Lomb DynaZoom Photo Binocular). Reference works used in the identification of organisms included Kimsey and Fisk (1960), Smith (1950), and Unsinger (1963).

The results of this study are summarized in the attached sampling station map, tables of physical and biological data, and oxygen profile graph for Atascadero Creek. These results indicate that several significant changes have taken place in Atascadero Creek as a result of the runoff from the Sebastopol apple cannery spray fields.

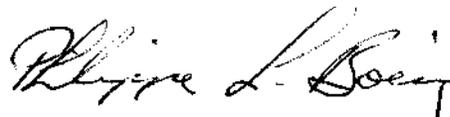
The section of Atascadero Creek upstream from the cannery (Station I) is notably a clean-water environment. Dissolved oxygen levels approach that of saturation. The BOD, COD and TDS, specific conductance, and nitrate levels all indicate clean water, and offer a dramatic comparison to the stream at the junction of Barlow Creek. A considerable rise in COD indicates an increase in total oxidizable suspended and dissolved organic solids such as would be found in a discharge containing sugars and starches.

Analyses results from the samples taken near the origin of Barlow Creek enable one to directly relate the inflow of organic wastes from the leach fields to the confluence of Barlow and Atascadero Creeks. Although the flora and fauna were difficult to observe at Station VI due to low water flow, the differences between the Station VI and Station II data are noticeable. Sewage slime (Sphaerotilus) and tubifex worms became evident at Station II and along Barlow Creek downstream from the leach fields, but were not found at Station I. Mosquitofish (Gambusia Affinis) and stickleback (Gasterosteus aculeatus) were evident in great numbers at Station I. No stickleback were found at any other station, and mosquitofish were found in limited numbers or concentrated to algal areas of higher dissolved oxygen at the other stations sampled.

In conclusion, the results of this survey strongly demonstrate that the Sebastopol Co-op #2 and #3 discharge has significantly altered the ecological conditions of Atascadero Creek to the detriment of its potential value. The displacement of the mosquitofish populations resulting from low dissolved oxygen levels has created a potential hazard in the form of rising mosquito populations. From observations made of the creek above the discharge (Station I), it is evident that this stream could support considerably more clean-water organisms and gamefish should an effort be made to eliminate the apple waste discharges.



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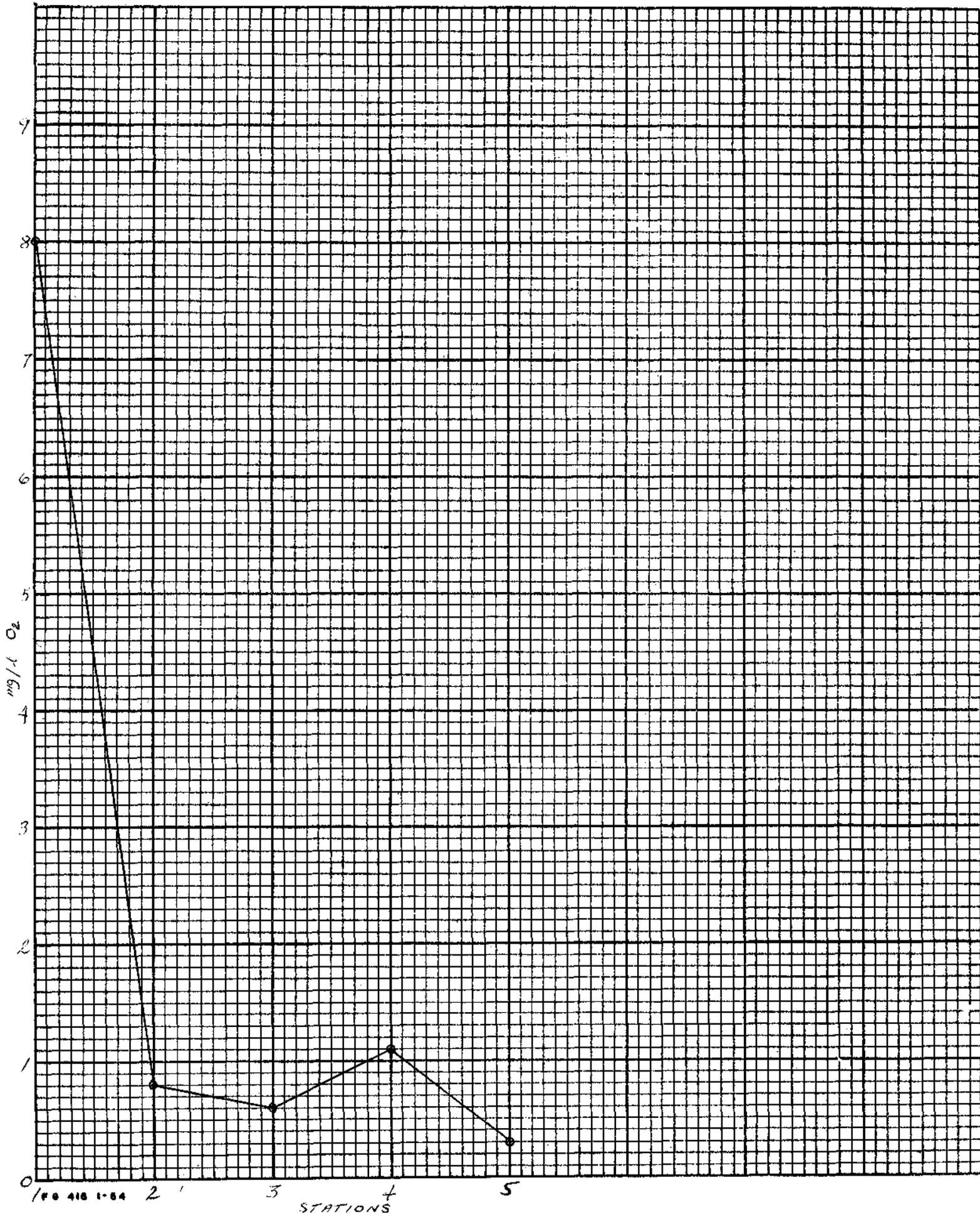


Philippe L. Boeing
Seasonal Aid
Region 3

cc: Regional Water Quality Control Board, North Coast Region

HTASCAERO CREEK D.C. PROFILE

mg/l O₂ vs. STATIONS



ATASCADERO CR.



SAMPLE 5

GREEN VALLEY RD.

SAMPLE 4

FOUNTSVILLE

STATE HIGH 12

GRAYSON RD.

SAMPLE 3

ATASCADERO CREEK

OCCEIDENTAL RD.

SEBASTOPOL

SEBASTOPOL
CO-OP
243
1

SPRAY FIELD
CO-OP SPRING
& DISCHARGE
SAMPLE TAKEN

BARLOW CR.

LEACH
FIELD
POND

SAMPLE 2

VINEYARD

SAMPLE 1

SPRAY FIELD

DAIRY

STATION I - Atascadero Creek One Tenth of a Mile Up From Barlow Creek

Weather Cond.	Time	Temp.(H ₂ O)	pH (field)	D.O. (field)	Specific Conductance	Total Dissolved Solids	BOD	COD	Nitrate
Clear No clouds	1430	20°C	8.2	8.0 mg/l	310 mhos/cm	320 mg/l	3.0 mg/l	99.2 mg/l	0.1 mg/l

Observations: The water is clear and flowing, with an abundance of aquatic organisms not prevalent downstream.

Aquatic Organisms Observed:

Vertebrates

- 1.) Stickleback (Gasterosteus aculeatus)
- 2.) Gambusia affinis, mosquitofish

Mollusca

- 1.) Gastropod mollusc, (snail) genus Physa

Arthropoda

- 1.) Crustacea, Amphipoda - Hyalella azteca
- 2.) Crustacea, Crayfish - Procambarus clarkii

Algae

- 1.) Filamentous green algae - Hormidium, Rhizoclonium

STATION II - Atascadero Creek at Occidental Road, Mouth of Barlow Creek

Weather Cond.	Time	Temp.(H ₂ O)	pH (field)	D.O.(field)	Specific Conductance	Total Dissolved Solids	BOD	COD	Nitrate
Clear No clouds	1100	16°C	7.7	0.8 mg/l	360 mhos/cm	345 mg/l	15.0 mg/l	476 mg/l	0.3 mg/l

Observations: Atascadero Creek at this station was black, with about 3 inches visibility. Gas bubbles were seen rising from the bottom, and a septic odor was noticed. A fine grey sand coming from Barlow into Atascadero Creek was also noted.

Organisms: Mosquitofish, Gambusia affinis (up Barlow Creek but not in Atascadero Creek at that point)

Mosquito larvae

Sewage slime (bacteria), Sphaerotilus

Tubifex worms, Tubifex

No algae observed

STATION III - Atascadero Creek at Graton Road

Weather Cond.	Time	Temp.(H ₂ O)	pH (field)	D.O.(field)	Specific Conductance	Total Dissolved Solids	BOO	COD	Nitrate
Clear No clouds	1015	16°C	9.0	0.6 mg/l	--	--	--	--	--

STATION IV - Atascadero Creek at Green Valley Road

Weather Cond.	Time	Temp.(H ₂ O)	pH (field)	D.O.(field)
Clear	0935	15°C	8.8	1.1 mg/l

STATION V - Atascadero Creek 1/2 mile below Green Valley Road

Weather Cond.	Time	Temp. (H ₂ O)	pH (field)	D.O.(field)
Clear	0945	16°C	8.9	0.3 mg/l

Observations: The observations for Stations III through V were the same. The water was black with near zero visibility.

Aquatic organisms observed:

- 1.) Mosquitofish, Gambusia affinis
- 2.) Water Skeeter, Gerris ; (insect)
- 3.) Water boatman, order Hemiptera
- 4.) Mosquito larvae

Algae

- 1.) Oscillatoria
- 2.) Euglena
- 3.) Pennate diatoms

STATION VI - Sebastapol Apple Cannery Cooling H2O Discharge, Origin of Barlow Creek

Weather Cond.	Time	Temp.(H ₂ O)	pH (field)	D.O. (field)	Specific Conductance	Total Dissolved Solids	BOD	COD	Nitrate
Clear No clouds	1120	20°C	8.6	33 mg/l	305 mhos/cm	385 mg/l	6.0 mg/l	79.5 mg/l	0.8 mg/l

Observations: The canning plant was closed, but the discharge was a sizable trickle. The water was clear and ran directly thru the leach and spray field area. Filamentous green algae of the genus Hormidium rhizoclonium were the only observed organisms.