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THE RESOURCES AGENCY OF CALIFORNIA  
Department of Water Resources

BULLETIN No. 111  
SACRAMENTO RIVER  
WATER POLLUTION SURVEY

APPENDIX B  
WATER QUALITY

AUGUST 1962

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Governor  
State of California

WILLIAM E. WARNE  
Administrator  
The Resources Agency of California  
and Director  
Department of Water Resources



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STATE OF CALIFORNIA  
THE RESOURCES AGENCY OF CALIFORNIA  
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## CHAPTER I. INTRODUCTION

### Objectives and Scope of Investigation

The principal objective of the Sacramento River Water Pollution Survey is to satisfy the requirements of the various agencies responsible for or interested in the field of water quality by establishing a comprehensive knowledge of the many interrelated variables which influence water quality in the Sacramento River. The survey was planned to provide the information necessary to establish suitable guides for use in maintaining adequate levels of water quality in the Sacramento River.

To implement the general objective stated above, the investigation provided for determination of:

1. Present base-line water quality conditions in the Sacramento River from Shasta Dam to Mayberry Slough.
2. Detailed information on present sources of degradation and their influence on water quality.
3. A continuing water quality monitoring program.
4. Recommendations for future studies and for quality management practices which would maintain optimum water quality in the Sacramento River.

### Data Collection Programs

Field programs were conducted during the period April 1960 through June 1961 to provide data on physical conditions, chemical quality, oxygen relationships, and the effect of tributaries and waste discharges on these characteristics.

A number of preliminary water quality studies were made throughout the length of the river in order to establish the type and frequency

of sampling programs. Cross sections were made to insure that sampling stations adequately represented the flow in the river.

This appendix describes the various physical and chemical characteristics of water in the Sacramento River and how this quality is changed by tributary flows and waste discharges. Oxygen relationships are developed in detail. Basic data are listed in tables at the end of the appendix, T-1 through T-17, inclusive.

Plate 1 shows the locations of sampling stations occupied during the various sampling programs. Descriptions of daily and monthly stations from the department's surface water quality monitoring program are included in the Bulletin No. 65 series, "Quality of Surface Waters in California". Stations established for the Sacramento River Water Pollution Survey are identified by mileages from the confluence of the Sacramento and San Joaquin Rivers. Stations on tributary streams are identified by river mile at the confluence and by mileage on the tributary. For example, the designation 302.3R1.0 for the Spring Creek station means that the creek was sampled 1.0 miles upstream from its right bank confluence with the river at mile 302.3. All stations were sampled in the main thread of the stream from either a boat or a bridge; detailed station descriptions are in Appendix D.

Monthly Monitoring Program. Since 1951, the department's state-wide Surface Water Quality Monitoring Program has included eight stations on the Sacramento River and 12 stations on tributaries near their confluence with the river.

Twenty-two temporary monthly sampling stations were established between Shasta Dam and Mayberry Slough. These included seven of the Surface Water Quality Monitoring Program's monthly stations so that biweekly

data were obtained. Additional sampling stations were also located on three tributary streams, three major agricultural drains and six waste discharges.

Monthly sampling stations on the Sacramento River were located upstream from significant tributaries and waste discharges with enough intermediate stations to provide a maximum distance between stations of 27.6 river miles. Above the City of Sacramento, stations were located at bridge crossings wherever possible; otherwise, samples were collected from a boat. The lower reach below Sacramento was sampled exclusively by boat. In addition to the normal sampling from the main thread of the stream, additional samples were taken at quarter points at Rio Vista (mile 12.8) and above Mayberry Slough (mile 4.0) where the river widens.

Physical and chemical characteristics were determined as outlined in Chapter II of this appendix. Laboratory analyses were made at the department's facility at Bryte, near the City of Sacramento. Concentrations of heavy metals were determined monthly at all stations from the uppermost stations above Spring Creek (mile 305.7) to the station at Bend Bridge (mile 256.3). Downstream from Bend Bridge, samples for heavy metals analysis were collected from alternate stations on alternate months.

Tributary sampling stations were established near the mouths of Spring Creek, Butte Slough, Colusa Basin Drain, Sacramento Slough, Feather River, and American River.

To evaluate the effects of acid mine wastes draining into Spring Creek, monthly samples from this stream (mile 302.91.0) were analyzed for heavy metals. Samples were collected for chemical analysis for 10 of the 15 months of the field survey.

The monthly waste discharge sampling program included the Redding, Red Bluff, West Sacramento, and Sacramento sewage treatment plants, American Crystal Sugar Company at Clarksburg, and Redbank Creek which receives waste waters from Diamond National Corporation. Waste water discharges were sampled on the day preceding river sampling in the affected reaches. The sanitary features of waste discharges are discussed in Part 3, Appendix A, "Water Utilization", and in Appendix C, "Public Health Aspects".

Samples from the four sewage treatment plants and the American Crystal Sugar Company were collected hourly by plant personnel. On the day following collection, the samples were composited by flow and delivered to the department's laboratory. Generally, samples from the Redding and Red Bluff plants were collected on Mondays and samples from West Sacramento and Sacramento sewage treatment plants were collected on Wednesdays. Samples from American Crystal Sugar Company were composited on an equal-volume basis.

At the Sacramento sewage treatment plant and the American Crystal Sugar Company, samples were collected over a 24-hour period. Samples were collected from 8 a.m. to 7 p.m. at Redding, 8 a.m. to 4 p.m. at Red Bluff, and 6 a.m. to 10 p.m. at West Sacramento.

Daily Sampling Program. Under a cooperative agreement between the Department of Water Resources and the United States Geological Survey, four daily sampling stations on the Sacramento River and one each on the Feather and American Rivers had previously been established. Three additional stations were established for the present survey. Table 1 lists the locations and the periods of record of the daily stations:

Table 1

## LOCATIONS AND PERIODS OF RECORD OF DAILY SAMPLING STATIONS

Location	: River : Mile	: Period of Record	: Agency
Sacramento River at Bend Bridge	256.3	5/55 - present	USGS-DWR
Sacramento River at Butte City Bridge	168.2	5/55 - present	USGS-DWR
Diversion from Sacramento River to Reclamation District No. 108	118.1R	4/15/60 - 9/16/60	DWR*
Sacramento River at Boyer's Pump	111.6	6/1/60 - present	USGS-DWR
Irrigation Drain, Reclamation District No. 108	100.1R	4/15/60 - 12/31/60	DWR*
Sacramento River at Knights Landing	90.1	3/51 - 6/1/60	USGS-DWR
Feather River at Nicolaus	79.9L/9.8	3/51 - present	USGS
Sacramento River at Bryte	62.6	4/19/60 - present	DWR*
American River at Fair Oaks	60.4L/20.3	3/51 - present	USGS
Sacramento River at Sacramento	59.2	5/51 - 6/1/60	USGS-DWR
Sacramento River at Freeport	46.4	6/1/60 - present	USGS-DWR

\* Established for Sacramento River Water Pollution Survey.

Visual inspection and cross sections of quality in the Sacramento River at Knights Landing and Sacramento indicated that grab samples collected at these stations were probably not representative because of incomplete mixing of upstream tributaries. Therefore, these stations were discontinued and replaced by stations Boyer's Pump and at Freeport.

Under this program, samples were collected by private contractors for the United States Geological Survey. Samples were collected from bridges at each of the stations except at Boyer's Pump and Bryte which were obtained on the right bank from a pump platform and a floating boat dock, respectively.

Samples collected under the USGS-DWR cooperative daily station programs were analyzed at the USGS Sacramento laboratory. Daily samples collected specifically for the Sacramento River Survey were analyzed at the department's laboratory. Conductivity was determined for each daily sample and mineral analyses were made on composites of daily samples. In general, samples collected at the cooperative stations and at Bryte were composited with equal volumes of no more than ten daily samples, and of fewer samples where specific conductance of individual samples varied by more than 15 percent.

Samples from the supply to and the irrigation drainage from Reclamation District No. 108 were composited on the basis of the specific conductance of the daily samples. Mineral analyses were made on single daily samples and on composites containing as many as 15 daily samples.

Continuous Recorders. Table 2 lists the locations and periods of record of continuous conductivity recorders on the river and on the Colusa Basin Drain and the Feather River.

Table 2

## LOCATIONS OF CONDUCTIVITY RECORDERS

Location	River Mile	Period of Record
Sacramento River at Red Bluff	244.1	4/14/60 - 6/30/61
Sacramento River at Colusa	144.1	8/26/60 - 6/30/61
Sacramento River above Colusa Basin Drain	90.5	4/ 7/60 - 6/30/61
Colusa Basin Drain near Mouth	90.2R/0.3	4/ 5/60 - 6/30/61
Feather River near Mouth	79.9L/5.8	3/22/61 - 6/30/61
Sacramento River at Sacramento Weir	63.6	4/12/60 - 6/30/61
Sacramento River at Freeport	46.4	3/22/60 - 6/30/61
Sacramento River at Walnut Grove	26.9	12/ 2/60 - 6/30/61

The recorders at Red Bluff, Colusa, Freeport, and Walnut Grove were located in the main flow of the river while the recorders above Colusa Basin Drain and at Sacramento Weir are located near the right bank.

The probe of the recorder at Colusa Basin Drain was located near the left bank upstream from control gates near the mouth of the drain. Arrangements were made with the gate operator to release water through the gate nearest the probe to allow movement of water past the probe.

The recorders at Red Bluff and Colusa are inspected once every two weeks. The remainder of the recorders were inspected weekly. Conductivity data from the recorders was checked against laboratory analysis of samples collected twice each month through January 1961, and once each month thereafter.

Intensive Four-Day Sampling Surveys. The monthly and daily sampling programs described above permitted an evaluation of seasonal variations in water quality. Detailed information on short-term variations in conductivity was provided by the continuous recorders. Additional data obtained from closely spaced stations at frequent intervals were required to determine the effects of waste discharges and intensive surveys were accordingly planned.

Distances, laboratory facilities, and available personnel required that the river be divided into three reaches. Intensive surveys were conducted within each reach, with some overlapping. Sampling stations were separated by from one to fifteen miles, depending upon the hydrography and the locations of waste discharges. Locations of these stations are shown on Plate 1.

Three periods were selected to correspond to adverse conditions of flow and waste loadings. These are summarized in Table 3.

Table 3

## INTENSIVE SAMPLING SURVEYS

Reach	River Mile	Period	Average: Keswick: Release: cfs	Remarks
Upper	293.9 to 184.5	6/6-10/60	8,000	Snowmelt essentially complete. Nominal irrigation diversions.
		10/3-7/60	6,000	Minimum reservoir release. Maximum irrigation return flows.
Middle	184.5 to 62.6	9/12-16/60	7,000	Maximum effects of rice field drainage.
		5/8-12/61	7,500	Minimal irrigation diversions and returns.
Lower	62.6 to 4.0	6/20-24/60	10,000	Nominal irrigation diversions.
		8/29-9/2/60	9,000	Nominal irrigations diversions and returns. Peak seasonal industrial discharges.
		10/24-28/60	5,500	Minimum reservoir releases and irrigation diversions. Highly mineralized irrigation returns.

The intensive surveys provided detailed data on bacteriological quality and oxygen relationships. These are discussed in Chapter V of Appendix C and Chapter V of this appendix, respectively. Limited data on short-term variations in chemical constituents were obtained; these are discussed in Chapter IV, below.

Agricultural Drainage Sampling Program. Samples were collected twice monthly when the drains were operating during the period May 1960 to March 1961 at the locations listed in Table 4:

Table 4

## LOCATIONS OF MAJOR AGRICULTURAL DRAINS

Agricultural Drain	:	River Mile
Butte Slough		138.9L
Reclamation District No. 70		124.2L
Reclamation District No. 108 (Rough and Ready Pumping Plant)		100.1R
Reclamation District No. 787		93.6R
Colusa Basin Drain		90.2R
Sycamore Slough		90.2R
Sacramento Slough		80.8L
Natomas Cross Canal		79.1L
Reclamation District No. 1000 (Pumping Plant No. 3)		66.3L
Reclamation District No. 1000 (Natomas Main Canal)		61.5L
Natomas East Main Drain		60.6L

Special daily sampling programs were conducted on the supply and drainage waters of Reclamation District No. 108 and the Sopwith rice field during the 1960 irrigation season. The results of these investigations are reported in Appendix A, Part 3.

Miscellaneous Sampling Programs. A number of limited sampling programs provided data which has been used in the appendix. These included a pH recorder on Spring Creek, temperature recorders at Red Bluff and Freeport, and depth sampling of Shasta Lake and Keswick Reservoir. Data from Keswick Reservoir is presented in data tables at the end of this appendix. Results of the other sampling programs are in the department's files.

## Related Investigations and Reports

The following reports, containing information and data pertinent to evaluation of water quality of the Sacramento River, were reviewed in connection with the current investigation. Reference is made to these reports in the text by means of numbers in parenthesis; e.g., (1)

- (1) Academy of Natural Sciences of Philadelphia, Department of Limnology. "Sacramento River, Keswick Reservoir and Vicinity." July 1956.
- (2) Babbitt, H. E. and Doland, J. J. "Water Supply Engineering." Fifth Edition. McGraw-Hill, Inc. New York. 1955.
- (3) California State Department of Fish and Game. "A Preliminary Report on the Upper Sacramento River Copper Pollution, Shasta County." 1953.
- (4) California State Department of Public Health. "A Study of the Sacramento River as Influenced by Waste Discharges from the American Crystal Sugar Corporation, Clarksburg, California." 1950.
- (5) California State Department of Public Works, Division of Engineering and Irrigation. "The Development of the Upper Sacramento River." Bulletin No. 13. 1928.
- (6) California State Department of Public Works, Division of Water Resources. Twenty-Six Reports of Sacramento-San Joaquin Water Supervision Covering the Period 1924 to 1954.
- (7) ----. "Sacramento River Basin." Bulletin No. 26. 1931.
- (8) ----. "Variation and Control of Salinity in Sacramento-San Joaquin Delta and Upper San Francisco Bay." Bulletin No. 27. 1931.
- (9) ----. "San Joaquin River Basin." Bulletin No. 29. 1931.
- (10) ----. "Water Survey of the American River Watershed." February 26, 1931.
- (11) ----. "Quality of Substitute Waters - San Joaquin Valley." Volume 4 of 4. (Unpublished). 1937 and 1938.
- (12) ----. Report to Central Valley Regional Water Pollution Control Board on "Waste Discharge Survey and Pollution Study of Sacramento River, Sacramento Sewer Outfall to Cache Slough." (Project Code No. 52-5-4). June 1952.
- (13) California State Department of Water Resources, Division of Resources Planning. "Quality of Surface Waters in California, 1951-54." Water Quality Investigation Report No. 15. November 1956.

- (14) ----- "Report of Sacramento-San Joaquin Water Supervision for 1955." Bulletin No. 23-55. June 1957.
- (15) ----- "Quality of Surface Waters in California, 1955-1956." Bulletin No. 65. December 1957.
- (16) ----- "Surface Water Flow for 1956." Bulletin No. 23-56. January 1959.
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## CHAPTER II. FIELD AND LABORATORY PROCEDURES

### Field Procedures

Water samples for dissolved oxygen (DO) determinations were taken with a two-liter Kemmerer sampler at a depth of four feet. If the stream was less than four feet deep the 300 ml DO bottle was immersed by hand to mid-depth and allowed to fill. Water from the Kemmerer samplers was drained into a DO bottle through a rubber tube, allowing an overflow of from one to three times the sample volume.

Dissolved oxygen concentrations were determined in the field, within a few minutes of the sampling time, with the Alsterberg (Azide) modification of the Winkler method. Thiosulfate solutions were standardized at the beginning of each survey period. Chloride concentrations in the lower reach were low enough that correction factors were not needed.

The desirability of field titration was indicated by a limited study during the first intensive survey where field DO's were compared with those obtained from duplicate samples which were carried through the acidification stage in the field and titrated after three to six hours delay. Figure 1 shows that time delays between acidification and completion of the analysis generally result in an increase in the indicated DO. Of the 93 paired values shown on the figure, 14 points from one sampling reach are indicated by crosses. These points suggest that the particular burette calibration resulted in consistently high values; if they are neglected, the effect of time delays is even more apparent. Those values in the shaded portion of the figure are of doubtful value because of the inexperience of some of the field crews.

The positive bias shown by samples titrated in the laboratory was confirmed by two additional though smaller series of tests. The

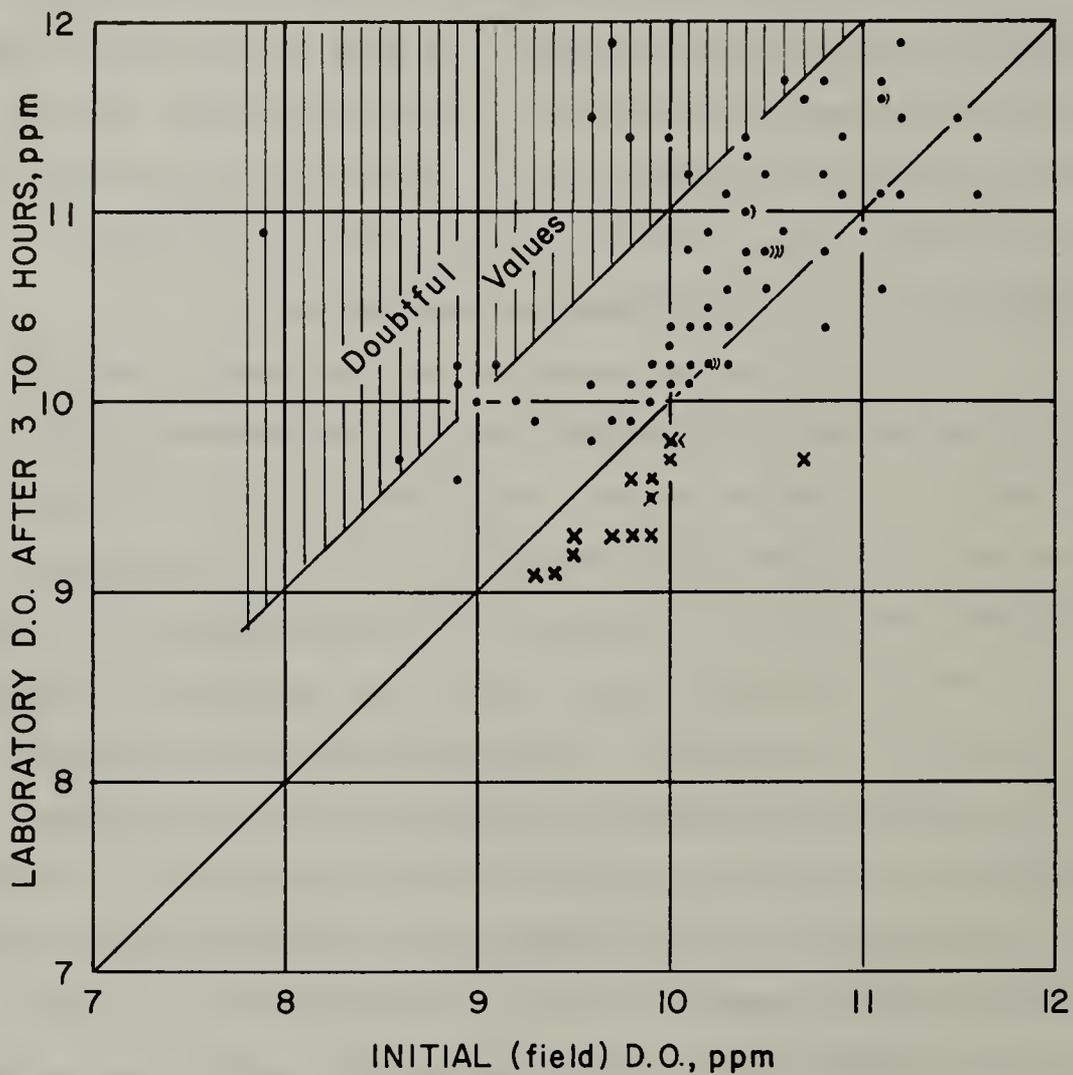


Figure 1. COMPARISON OF FIELD AND LABORATORY DETERMINATIONS OF DISSOLVED OXYGEN

numerical value of the bias is uncertain, but is significantly more than the estimated analytical error of 0.1 ppm.

The importance of adequate training of field crews in analytical procedures is implicit in the foregoing paragraphs. In Chapter V of this appendix, it is shown that erratic results which could be traced to particular crews occasionally had to be neglected in characterizing oxygen relationships.

#### Sampling for Physical and Chemical Analyses

Water samples for physical and chemical analyses were either taken from the Kemmerer sampler after the dissolved oxygen sample had been withdrawn or obtained by immersing the collection bottle in the stream. All sampling equipment was flushed with the stream water at the site before sampling.

Temperatures were read from 5-1/2-inch armored pocket thermometers to the nearest 1/2°F. Field pH was determined by a Hellige pocket comparator generally using Bromthymol Blue D with a range of 6.0 to 7.6.

#### Storage and Transportation of Samples

Half-gallon BOD samples were iced and taken to the laboratory as soon as possible. Standard commercial picnic ice chests large enough to hold eight samples were used. During intensive sampling programs, the time lag between sample collection and delivery of the samples to the laboratory was generally 6 to 12 hours.

During monthly sampling runs, BOD and nitrogen series samples collected in the Redding area were shipped to Sacramento via bus where they were picked up and delivered immediately to the laboratory. The sample bottles were placed inside plastic bags which were filled with cracked ice and placed in plywood shipping cases. River samples generally

arrived at the laboratory 1 to 12 hours after collection. Compositied sewage samples were generally delivered within 2 hours after collection of the last portion.

Nitrogen series samples were collected in half-gallon bottles and acidified with 3 ml of 36N  $N_2SO_4$  to minimize changes during transportation.

The importance of transportation and storage times for nitrate analyses of river water is indicated by Figure 2. Nitrate concentrations from nitrogen series analyses were obtained within 1 to 12 hours after sampling. Concentrations determined in the course of complete mineral analyses in order to check ion balances were obtained after delays of days or weeks. The 132 paired values shown in Figure 2 show that neither the sign nor the magnitude of the changes can be predicted. At the 90 percent confidence level, the ratio of delayed nitrate to immediate nitrate concentrations varied from 0.22 to 2.6.

Samples collected for ether-soluble determinations were also fixed by the addition of 3 ml of 36N  $H_2SO_4$ . Phenol samples were collected in half-gallon bottles and fixed with approximately two grams of copper sulfate.

#### Laboratory Procedures

Methods are those appearing in the 11th edition of Standard Methods for the Examination of Water and Waste Water unless otherwise indicated. Analytical results are reported in parts per million unless otherwise specified. The Beckman Model B spectrophotometer was used for colorimetric procedures.

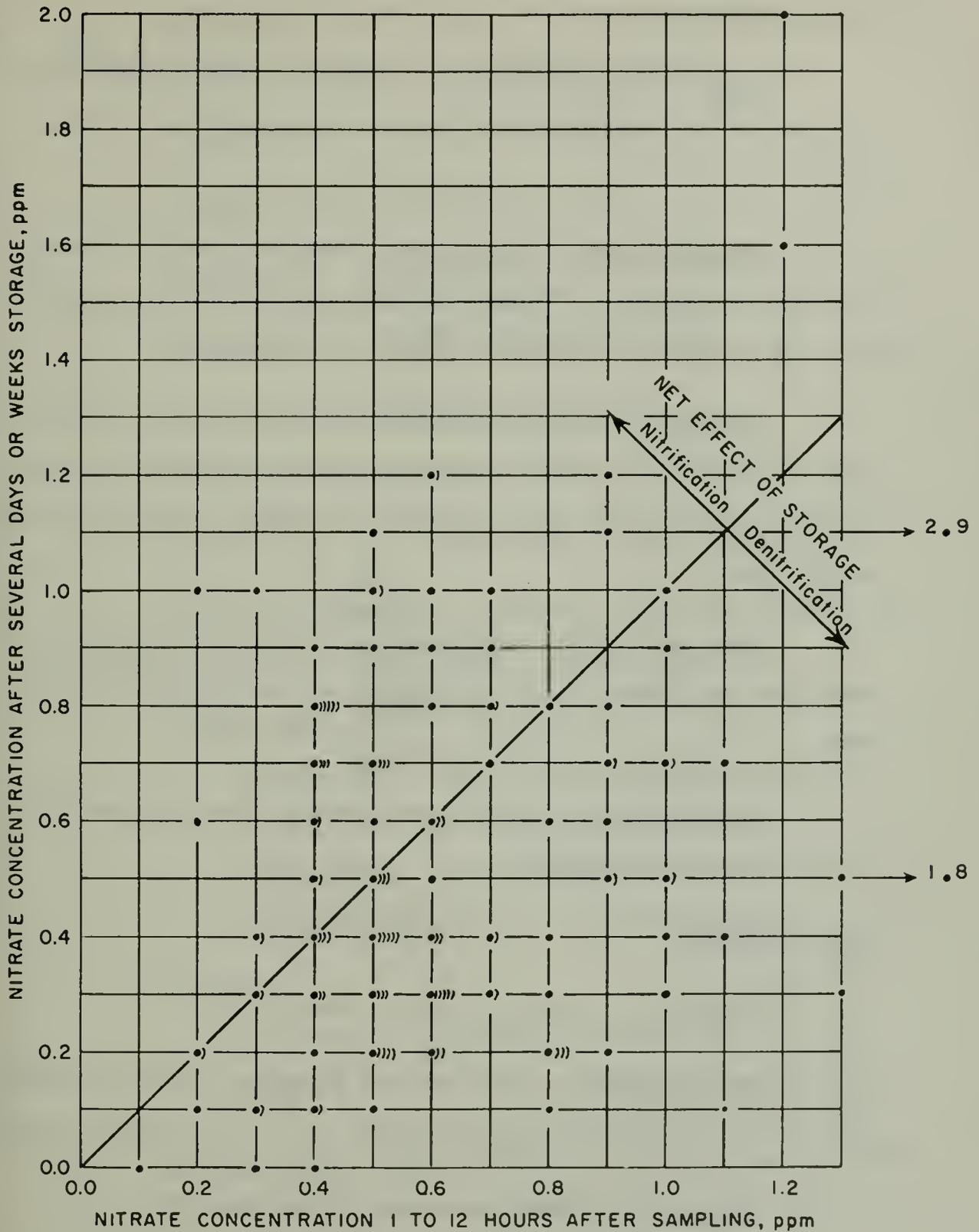


Figure 2. EFFECTS OF STORAGE ON NITRATE CONCENTRATIONS

## Physical Analyses

Color. The method is one of comparison using standard color discs and the Hellige Aqua Tester, with results reported in arbitrary units.

Threshold Odor. Dilution method based on diluting a sample with odor-free water at 60°C until any odor present is barely perceptible. The threshold odor number is reported in dilution units.

Turbidity. A Hellige Turbidimeter was used. This method is based on comparing light from a calibrated source scattered by a standard silica solution with that scattered by the sample. Results reported as ppm silica.

Suspended Solids. Residue method. Sample filtered through a glass fiber mat placed in a Gooch crucible, and dried at 103°C for one hour.

Dissolved Solids. Sample evaporated on steam bath and dried in oven for one hour at 180°C.

## Chemical Analyses

Calcium (Ca). EDTA titrimetric method.

Magnesium (Mg). Calculated from difference between equivalent parts per million EDTA hardness and equivalent parts per million calcium.

Sodium (Na). Flame photometer, Beckman Model DU.

Potassium (K). Flame photometer, Beckman Model DU.

Alkalinity ( $\text{CO}_3$  and  $\text{HCO}_3$ ). Potentiometric method using Beckman Zeromatic pH meter titrating water sample to equivalence points.

Sulfate ( $\text{SO}_4$ ). Gravimetric method.

Chloride ( $\text{Cl}$ ). Mohr method.

Fluoride ( $\text{F}$ ). SPADNS method

Nitrate ( $\text{NO}_3$ ). Phenoldisulfonic acid method.

Silica ( $\text{SiO}_2$ ). Heteropoly blue method.

Boron ( $\text{B}$ ). Carminic acid method.

Hardness ( $\text{Ca} + \text{Mg}$ ). EDTA method. Reported as ppm  $\text{CaCO}_3$ .

Noncarbonate-Hardness. Calculated by subtracting alkalinity (as  $\text{CaCO}_3$ ) from total hardness (EDTA).

#### Nitrogen Series.

Ammonium ( $\text{NH}_4$ ). Distillation and Nesslerization.

Nitrite ( $\text{NO}_2$ ). Diazotization method.

Nitrate ( $\text{NO}_3$ ). Phenoldisulfonic acid method.

Organic Nitrogen (Org. N.). Kjeldahl method.

#### Phosphate

Ortho ( $\text{PO}_4$ ). Phosphomolybdate method.

Total ( $\text{PO}_4$ ). Acid hydrolysis-phosphomolybdate method.

Oil and Grease (ether-soluble). Wet extraction method using diethyl ether. Standard Methods for the Examination of Water and Sewage, 9th Edition (1946), page 42.

Detergents (ABS). Methylene blue method.

Phenolic Material. 4-aminoantipyrene method.

Tannin and Lignin. Molybdophosphoric acid method.

Oxygen Analyses

Dissolved Oxygen (DO) and Biochemical Oxygen Demand (BOD).

Alsterberg (Azide) modification of the Winkler method.

Chemical Oxygen Demand (COD). Dichromate reflux method.

Iron (Fe). o-phenanthroline method.

Aluminum (Al). Ferron-phenanthroline method used for screening.

Aluminon method used for the determination.

Arsenic (As). Heteropoly blue method.

Chromium

Hexavalent (Cr<sup>+6</sup>). Diphenylcarbazide method.

Total (Cr). Permanganate-azide method.

Copper (Cu). 'Cuprethol' method.

Lead (Pb). Dithizone extraction method.

Manganese (Mn). Tetrabase method used for screening. Potassium method used for determination.

Zinc (Zn). Dithizone extraction method.

Cadmium (Cd). Dithizone extraction method.

Specific Conductance (EC). Wheatstone bridge method.

pH. Glass electrode method using Beckman Zeromatic pH meter.  
pH values are recorded as units to nearest one-tenth.

Percent Sodium (%Na). Calculated according to the U. S. Department of Agriculture Handbook No. 60.



### CHAPTER III. WATER QUALITY CRITERIA

Criteria utilized in evaluation of the quality of water of the Sacramento River are presented in two categories: (1) general criteria which are applicable to broad classifications of uses and not associated with any particular source of water supply, and (2) specific criteria related directly to the water quality of Sacramento River.

#### General Criteria

These criteria were used as guides in determination of the suitability of a water supply with respect to the following broad categories of uses: domestic and municipal water supply, industrial water supply, irrigation water supply, and preservation and protection of fish and wildlife.

#### Domestic and Municipal Water Supply

Chapter 7 of the California Health and Safety Code contains laws and standards relating to domestic water supply. Section 4010.5 of this code refers to the drinking water standards promulgated by the United States Public Health Service for water used on interstate carriers. These criteria have been adopted by the State of California. They are set forth in detail in United States Public Health Report, Volume 61, No. 11, March 15, 1946, reissued in March 1956.

According to Section 4.2 of the above-named report, chemical substances in drinking water supplies, either natural or treated, should conform with the limitations presented in Table 5.

Table 5

LIMITING CONCENTRATIONS OF CHEMICAL  
CONSTITUENTS FOR DRINKING WATER

United States Public Health Service  
Drinking Water Standards, 1946

Constituents	:	Parts Per Million
<u>Mandatory</u>		
Fluoride (F)		1.5
Lead (Pb)		0.1
Selenium (Se)		0.05
Hexavalent chromium (Cr <sup>+6</sup> )		0.05
Arsenic (As)		0.05
<u>Nonmandatory but Recommended Values</u>		
Iron (Fe) and Manganese (Mn) together		0.3
Magnesium (Mg)		125
Chloride (Cl)		250
Sulfate (SO <sub>4</sub> )		250
Copper (Cu)		3.0
Zinc (Zn)		15
Phenolic compounds in terms of phenol		0.001
Total solids - desirable		500
- permitted		1,000

In addition to the limits listed in Table 5, the 1946 standards state that turbidity shall not exceed 10 ppm (silica scale), that color shall not exceed 20 (platinum-cobalt scale), and that the water shall have no objectionable taste or odor.

In 1962, the Public Health Service adopted a revised set of drinking water standards. These have not yet been adopted by the State of California. They are presented in Chapter IV, Appendix C.

Interim standards for certain mineral constituents have recently been adopted by the California State Board of Public Health. Based on these standards, temporary permits may be issued for drinking water supplies failing to meet the United States Public Health Service Drinking

Water Standards, provided the mineral constituents in Table 6 are not exceeded.

Table 6

UPPER LIMITS OF TOTAL SOLIDS AND SELECTED MINERALS IN  
DRINKING WATER AS DELIVERED TO THE CONSUMER

California State Board of Public Health

	Permit*	Temporary Permit
Total solids	500 (1000)	1,500 ppm
Sulfates (SO <sub>4</sub> )	250 (500)	600 ppm
Chlorides (Cl)	250 (500)	600 ppm
Magnesium (Mg)	125 (125)	150 ppm

\* Numbers in parentheses are maximum permissible, to be used only where no other more suitable waters are available in sufficient quantity for use in the systems.

The California State Board of Health has defined the maximum safe amounts of fluoride ion in drinking water in relation to mean annual temperature.

Mean annual temperature in °F	Mean monthly maximum fluoride ion concentration in ppm
50	1.5
60	1.0
70 - above	0.7

The relationship of infant methemoglobinemia (a reduction of oxygen content in the blood, constituting a form of asphyxia) to nitrates in the water supply has led to limitation of nitrates in drinking water. The California State Department of Public Health has recommended a tentative limit of 10 ppm nitrogen (44 ppm nitrates) for domestic waters. Water containing higher concentrations of nitrates may be considered to be of questionable quality for domestic and municipal use.

Limits may be established for other organic or mineral substances if their presence in water renders it hazardous, in the judgment of state or local health authorities.

An additional factor with which water users are concerned is the factor of hardness. Hardness is due principally to calcium and magnesium salts and is generally evidenced by inability to develop suds when using soap. The United States Geological Survey considers the four classes of degrees of hardness listed in Table 7.

Table 7

HARDNESS CLASSIFICATION OF WATERS  
U. S. Geological Survey

Range of hardness in ppm	:	Relative classification
0 - 60	:	Soft
61 - 120	:	Moderately hard
121 - 200	:	Hard
Above 200	:	Usually requires softening

Criteria for maximum permissible concentrations (MPC) for discharge of radionuclides into sanitary sewerage systems have been adopted by the Atomic Energy Commission. The waste discharge limits have been published in the Code of Federal Regulations, Title 10, Chapter 1, Part 20, Paragraph 20.303(c), which states:

"The quantity of any licensed or other radioactive material released in any one month, if diluted by the average monthly quantity of water released by the licensee, will not result in an average concentration exceeding the limits specified in Appendix B, Table 1, Column 2, of this part."

The table lists permissible concentrations of radionuclides. For mixtures, where the identity or concentration of any specific radionuclide is unknown, the table gives a limiting value of  $3 \times 10^{-7}$  uc/ml (300 uuc/l).

Criteria for Irrigation Water

Criteria for mineral quality of water have been developed by the Regional Salinity Laboratories of the United States Department of Agriculture in cooperation with the University of California.

Because of the diverse climatological conditions, crops, soils, and irrigation practices in California, criteria which may be set up to evaluate the suitability of water for irrigation use must necessarily be of a general nature, and judgment must be used in their application to individual cases. Suggested limiting values for total dissolved solids, chloride concentration, percent sodium and boron concentration for three general classes of irrigation water are shown in Table 8.

Table 8

QUALITATIVE CLASSIFICATION OF IRRIGATION WATERS

	Class 1	Class 2	Class 3
Chemical properties	Excellent	Good to	Injurious to
	to good	injurious	unsatisfactory
	(Suitable for	(Possibly harm-	(Harmful to
	most plants	ful for some	most crops and
	under any con-	crops under	unsatisfactory
ditions of soil	certain soil	for all but the	
	and climate)	conditions)	most tolerant)
Total dissolved solids:			
In ppm	Less than 700	700 - 2,000	More than 2,000
In conductance micromhos at 25°C	Less than 1,000	1,000 - 3,000	More than 3,000
Chloride in concentration:			
In milliequivalents per liter	Less than 5	5 - 10	More than 10
In ppm	Less than 175	175 - 350	More than 350
Sodium in percent of base constituents	Less than 60	60 - 75	More than 75
Boron in ppm	Less than 0.5	0.5 - 2.0	More than 2.0

## Industrial Water Supply

Water quality criteria for industrial waters are as varied and diversified as industry itself. Food processing, beverage production, pulp and paper manufacturing, and textile industries have exacting requirements, while cooling or metallurgical operations permit use of poor quality waters. In general, where a water supply meets drinking water standards, it is satisfactory for industrial use, either directly or following a limited amount of polishing treatment by the industry.

## Preservation and Protection of Fish and Wildlife

A healthy and diversified aquatic population is indicative of good water quality conditions which in turn permit optimum beneficial uses of the water. For such a population to exist the environment must be suitable for both the fish and the food-chain organisms.

Many mineral and organic substances in low concentrations are harmful to fish and aquatic life. Insecticides, herbicides, ether-soluble materials, and salts of heavy metals are of particular concern.

Tolerances to temperature extremes vary widely between fish species. In general, coldwater fish are found in waters of from 32° to 65°F and warmwater fish require temperatures between 45° and 85°F. The maximum temperature for successful salmon spawning is 58°F. Rapid changes in water temperature may result in fish kills.

The minimum requirements for dissolved oxygen concentrations vary with the location and season. In general, 5 ppm is satisfactory for migrating fish. However, anadromous fish require at least 7 ppm dissolved oxygen in spawning areas and, under some conditions, 9 ppm is needed.

It has been found that pH limits of 6.5 to 8.5 provide satisfactory protection for fish.

The combined effect of many chemical or physical characteristics are not the simple sum of the specific effects. For example, while the hardness of the water does not of itself affect fish, some insecticides are more toxic in soft water and others are more toxic in hard water (Chapter II, Appendix C). These problems of synergistic and antagonistic effects extend through a wide range of materials and conditions. Frequently, determination of the effects of a particular waste discharge is dependent upon biological studies in similar waters receiving similar wastes. In many cases, these requirements for similarity may not be met and laboratory bioassays are necessary.

#### Specific Criteria

Specific criteria which are related directly to water quality of Sacramento River are included in a policy statement adopted by the Central Valley Regional Water Pollution Control Board, recommendations by a board of consultants on water quality, and a contract between the California State Department of Water Resources and the Metropolitan Water District of California.

#### Policy of the Central Valley Regional Water Pollution Control Board (No. 5)

In September 1954, the board adopted Resolution No. 54-35 to provide guidance in preparing quality requirements for wastes to be discharged into Sacramento River. Relevant sections of this resolution are quoted as follows:

"RESOLVED, that as an initial policy the waters of the Sacramento River at the Division of Water Resources sampling station (Station No. 15) at M Street Bridge near the City of Sacramento:

1. Shall not have a sulphate concentration in excess of 4 ppm over the sulphate concentration present in the river at the same sampling station. Maximum observed to date 40 ppm.
2. Shall not have a chloride concentration in excess of 4 ppm over the present chloride concentration at the same sampling station. Maximum observed to date 20 ppm.
3. Shall not have a sodium concentration in excess of 4 ppm over the present sodium concentration at the same sampling station. Maximum observed to date 25 ppm.
4. Shall not have a hardness concentration in excess of 4 ppm over the present. Maximum observed to date 92 ppm.
5. Shall not have a total solids concentration in excess of 25 ppm over present. Maximum observed to date 176 ppm; and be it

RESOLVED further, That

6. The Sacramento River at no point shall have a dissolved oxygen concentration of less than 85 percent saturation.
7. The waters of the Sacramento River at all points shall be bacteriologically safe for its present use.
8. The waters of the Sacramento River shall be free of grease slicks and floating solids of sewage or waste origin.
9. The Sacramento River shall have no substances discharged to it of such character or quantity as to be injurious to humans, plant, animal, fish or aquatic life.
10. The Sacramento River shall have no substances discharged to it of such character or quantity as to be injurious for irrigation use.
11. The Sacramento River shall not have sludge of sewage or waste origin deposited either on its bottom or banks.
12. The Sacramento River shall receive no waste discharges which will cause objectionable discoloration.
13. Waste discharges to the river shall not raise the temperature of the Sacramento River more than 0.5°F at any point.

14. Waste discharges shall not cause the pH of the river to fall below 6.5 nor rise above 8.5 at any point except that no more than 10 percent of the samples shall be less than 7.0 and no more than 10 percent of the samples shall be more than 8.0.
15. The Sacramento River shall have no substances in it of such character or quantity as to be capable of causing detectable tastes or odors in a domestic water supply after conventional and practical treatment."

#### Recommendations by Board of Consultants

A board of consultants was retained by the Department of Water Resources to recommend water quality criteria for water for export at points of diversion at the southern boundary of the Sacramento-San Joaquin Delta under the ultimate pattern of water transfer and use proposed in The California Water Plan. The 1955 recommendations by this board were adopted by the Department of Water Resources as the quality objectives to be met at points of diversion from the Delta for water to be exported to the major areas of deficiency.

Table 9

WATER QUALITY LIMITS FOR WATER FOR EXPORT AT  
POINTS OF DIVERSION AT SOUTHERN BOUNDARY  
OF SACRAMENTO-SAN JOAQUIN DELTA

Recommended by Board of Consultants on Water Quality  
June 1955

Item	:	Limit
Total Dissolved Solids	400	ppm
Electrical Conductance (EC x 10 <sup>6</sup> at 25°C)	600	
Hardness as CaCO <sub>3</sub>	160	ppm
Sodium Percentage	50	
Sulfate	100	ppm
Chloride	100	ppm
Fluoride	1.0	ppm
Boron	0.5	ppm
pH	7.0 - 8.5	
Color	10	ppm
Other constituents as to which the U. S. Public Health Service has or may establish mandatory or recommended standards for drinking water		USPHS Limits

Contract Between the State of California and the Metropolitan Water District

In November 1960, the Department of Water Resources entered into a contract with the Metropolitan Water District for transport of surface waters to southern California for use by the district. The contract sets forth quality objectives to be met by the State at points of delivery to the district. These objectives are presented hereinafter for consideration as a guide for evaluation of the quality of Sacramento River since this river is a principal conveyance channel of the State water resources development system.

"It shall be the objective of the State and the State shall take all reasonable measures to make available, at all delivery structures for delivery of project water to the District, project water of such quality that the following constituents do not exceed the concentrations stated as follows (Table 10):

Table 10

WATER QUALITY OBJECTIVES FOR  
THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Constituent	: Unit	: Monthly : Average for any : : Average : 10-year Period : : Maximum		
Total Dissolved Solids	ppm.	440	220	-
Total Hardness	ppm.	180	110	-
Chlorides	ppm.	110	55	-
Sulfates	ppm.	110	20	-
Sodium Percentage	%	50	40	-
Fluoride	ppm.	-	-	1.5
Lead	ppm.	-	-	0.1
Selenium	ppm.	-	-	0.05
Hexavalent Chromium	ppm.	-	-	0.05
Arsenic	ppm.	-	-	0.05
Iron and Manganese together	ppm.	-	-	0.3
Magnesium	ppm.	-	-	125.
Copper	ppm.	-	-	3.0
Zinc	ppm.	-	-	15.
Phenol	ppm.	-	-	0.001

Subsequent contracts between the Department of Water Resources and local agencies have included water quality objectives consistent with those in Table 10.



## CHAPTER IV. PHYSICAL AND CHEMICAL CHARACTERISTICS

Physical and chemical changes in Sacramento River water are caused by natural phenomena and by activities of man. Changes which occur during beneficial use are discussed in Part 3, Appendix A. This chapter is concerned with the effects of various natural events, water discharges and beneficial uses upon the river itself.

In general, monthly profiles of the river showing concentrations of various constituents are presented in this chapter, together with charts showing historical variations in water quality at selected stations. Basic data are included in a separate section at the end of the appendix.

### Temperature

Water temperatures affect such physical features as density, surface tension, viscosity, and saturation values of solids and gases, and control the rates of chemical and biochemical reactions. Temperature of water is fundamentally important in fish migration and spawning, seed germination and plant growth, and industrial cooling applications.

Data for the calendar year 1960 have been reviewed and evaluated to determine their credibility and to define the present temperature regimen of the Sacramento River. Monthly averages of daily surface samples at four stations from Keswick (mile 300.1) to Freeport (mile 46.4) are listed on Table 11.

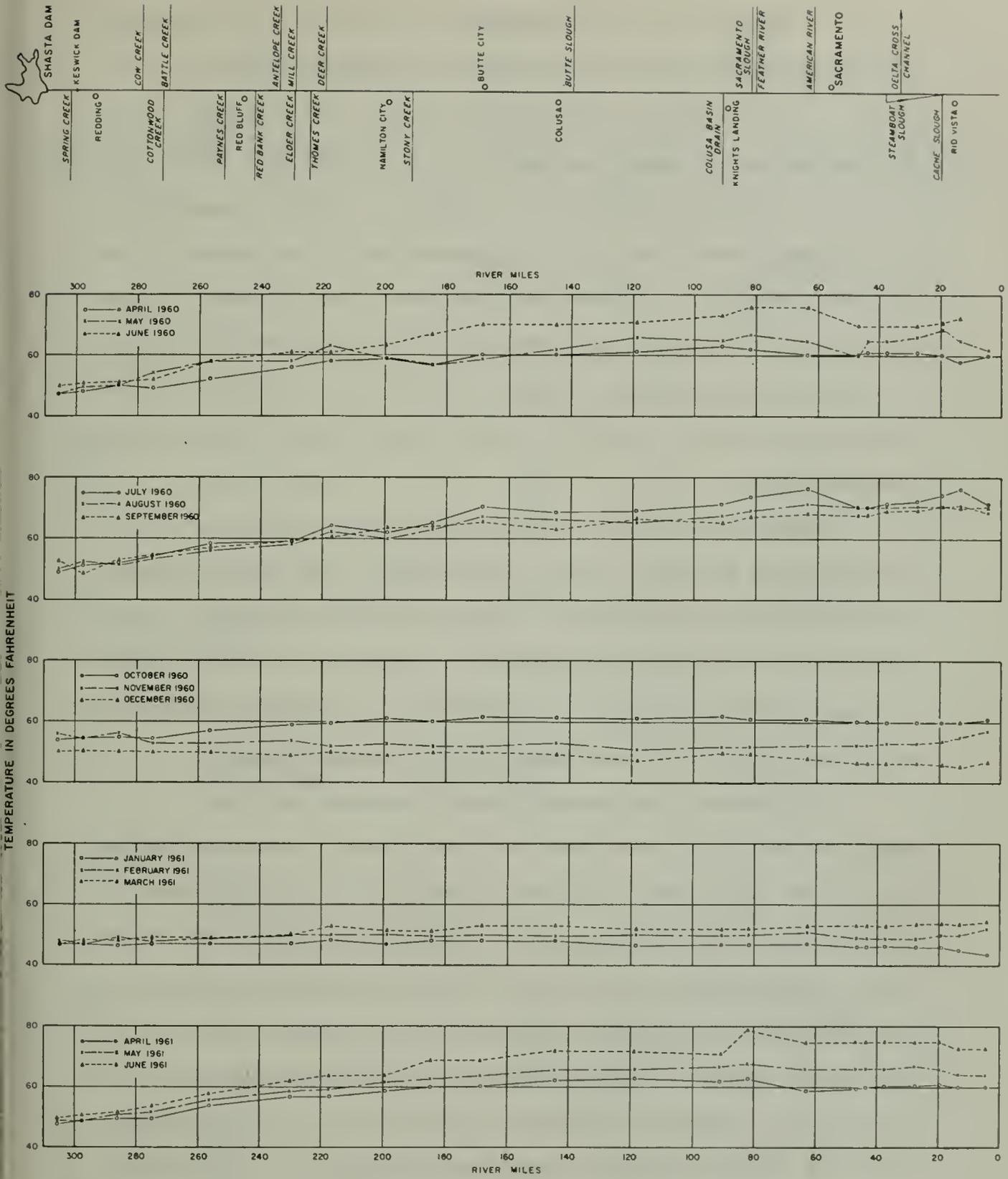
Table 11

## AVERAGE MONTHLY TEMPERATURES OF SACRAMENTO RIVER, 1960

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Bend (256.3)												
Maximum	50	55	59	60	63	64	61	61	62	60	58	54
Average	48	50	54	56	56	59	58	57	60	58	55	52
Minimum	47	47	49	51	53	55	55	54	57	56	52	47
Butte City (168.2)												
Maximum	54	55	62	65	68	75	70	70	70	67	50	54
Average	43	52	56	62	64	72	65	65	67	61	53	48
Minimum	42	59	50	54	54	68	59	58	64	57	48	43
Knights Landing (90.4)												
Maximum	46	50	61	63	65	77	74	73	73	70	59	54
Average	43	47	54	61	62	72	72	70	70	64	55	48
Minimum	41	40	48	60	60	66	70	69	69	56	49	46
Freeport (46.4)												
Maximum	51	52	59	63	69	76	72	72	71	66	58	54
Average	45	49	53	58	65	71	70	69	68	62	56	49
Minimum	41	47	48	55	61	66	66	68	65	54	48	42

Figure 3 presents profiles of river temperature based upon single monthly observations made at the 22 stations established for this survey. Comparison of the figure with Table 11 shows that the data are generally comparable. During the winter months, the river generally loses heat throughout its length. During the rest of the year, river temperatures rise except for local cooling caused by American River flows.

Temperature data are available for about 90 percent of the tributary and irrigation return flows. Temperatures of the remaining accretions were estimated on the basis of similar flow and drainage area characteristics. The values chosen for Keswick were identical with those reported by the Bureau of Reclamation for releases from Shasta Dam except during summer months when Keswick temperatures were one or two degrees higher.



SACRAMENTO RIVER WATER POLLUTION SURVEY  
**Figure 3. TEMPERATURE—SACRAMENTO RIVER**  
 1960-1961

Computations of the heat budget of the river were unsuccessful. Although reasonable estimates for net radiation and for evaporative cooling may be made, available water temperature data are inadequate for calculating the budget. Such data are subject to instrumental and observational errors and to diurnal variations. In addition, surface or near-surface temperatures in many cases are not representative of the average throughout the cross-section. Evidence from intensive survey data for temperature stratification downstream from warm tributary inflows is presented in the following paragraphs. Similar considerations suggest that cooler tributary waters tend to slide and remain under the main flow for considerable distances.

Table 12 lists the average temperatures and diurnal variations observed during four-day intensive surveys made in the upper and middle reaches between May and October. Average temperatures during the intensive surveys are discussed in Chapter V in connection with their effects on oxygen saturation values. The significance of the diurnal temperature variations lies in their relationships to hydrographic features.

In general, the greatest diurnal variations are found in the upper portion of the river. The lower reach exhibits about the same variations as the middle reach. The greater variations in the upper reach are associated with the higher rates of temperature increase and may reflect, to some degree, the effects of rapids which may be more efficient heat exchangers than are the intervening pools. Locally, however, tributary streams exercise a much greater effect upon near-surface temperatures in the river. Inspection of Table 12 shows that the greatest diurnal variations characteristically extend downstream from the confluence of warmer tributary flows for from 5 to 15 miles.

Table 12

## DIURNAL TEMPERATURE VARIATIONS IN SACRAMENTO RIVER

Upper Reach		:	:Average :		:Average :		:Average :		:Average :		
		:	:Tempera-:		:Diurnal :		:Q :		:Tempera-:		
River Mile	Station	:	cfs	: ture	:Variation:	cfs	: ture	:Variation	cfs	: ture	
		:	:	: °F	: °F	:	: °F	: °F	:	: °F	
		:	June 6 - 10, 1960			October 3 - 7, 1960					
300.1	Keswick		8,300	51		6,200					
295.9-295.6	Rapids										
293.9				51.5	3.6			55.5	3.1		
292.7-292.5	Rapids										
291.7				51	3.9			54.5	2		
291.7-291.6	Rapids										
288.3				51.5	3.8			55	1.8		
288.1R	Clear Creek		186	70		34	73				
285.9				53.5	5.8			57.5	3.1		
283.0				56	8.0			57.5	2.8		
280.7-280.6	Rapids										
279.6				56.5	10.0			57.5	2.5		
279.6L	Cow Creek		99	88		35	78				
279.1-278.9	Rapids										
277.7-277.6	Rapids										
276.4L	Bear Creek		0	--		10	57*				
275.0				54.5	6.1			56.5	3.5		
272.4R	Cottonwood Creek		294	83		97	74				
270.1L	Battle Creek		431	68		263	65				
265.5				56.5	6.9			57.5	2.7		
265.0-264.4	Rapids										
262.8-262.6	Rapids										
261.6-261.4	Rapids										
256.3	Bend Bridge		8,900	57	4.0	6,000	58		2.0		
253.8-252.6	China Rapids										
252.8L	Paynes Creek		1	72		0	--				
244.1				59	1.8		58.5		1.9		
238.1				59	3.0		59		2.6		
235.2				59.5	3.8		59		2.8		
233.5L	Antelope Creek		25	76		8	68				
233.1-232.7	Rapids										
231.1-230.7	Rapids										
230.4-230.0	Rapids										
230.0L	N. Fork Mill Creek		0	--		1	69				
229.4R	Elder Creek		5	77		0	--				

Table 12

DIURNAL TEMPERATURE VARIATIONS IN SACRAMENTO RIVER  
(continued)

Upper Reach		:	:Average :		Average :	:Average :		Average
		:	:Q :		Diurnal :	:Q :		Diurnal
River Mile	Station	:	cfs	:	ture	:	ture	:
		:	:	:	°F	:	°F	:
		:	:	:	°F	:	°F	:
		:	:	:	°F	:	°F	:
			<u>June 6 - 10, 1960</u>			<u>October 3 - 7, 1960</u>		
229.0L	Mill Creek	116	62		5	69		
228.4			62.5	8.8		60.5	2.0	
225.9-225.7	Rapids							
224.4			61	4.2		61	2.2	
224.4R	Thomes Creek	50	76		0	--		
219.1L	Deer Creek	67	72*		58	60*		
217.6			63.5	8.2		60.5	2.8	
208.3-207.8	Rapids							
207.1			62.5	3.1		60.5	1.2	
203.2-202.9	Rapids							
201.9-201.5	Rapids							
199.6	Hamilton City	6,800	63.5	1.1	5,600	62	1.8	
197.1-196.4	Rapids							
193.9L	Big Chico Creek	11	74		6	70		
184.8-184.6	Rapids							
184.5			65.5	4.5		62.5	2.5	
			<u>May 8 - 12, 1961</u>			<u>September 12 - 16, 1960</u>		
184.5			58	4.2		64.5	3.5	
180.1			58	4.0		65	3.5	
168.2	Butte City	7,100**	59	3.2		65.5	2.0	
159.0			59	1.8		66.5	3.2	
144.1			60	1.8		67	2.5	
139.0			60	1.8		67.5	1.8	
138.9L	Butte Slough	548**	65	2.0	196	74	2.0	
134.6			60	2.8		67.5	2.0	
125.0			61	1.8		67.5	1.9	
124.2L	R. D. 70 Drain	60**	65	4.8	96	73	4.9	
118.1			61	0.8		68	2.8	
100.2			61	2.2		68	2.4	
100.1R	R. D. 108 Drain	281**	64	2.0	65	70.5	5.0	
95.2	Boyer Pump		--	---	6,000	63		
93.7			62	1.5		68.5	3.4	
93.6R	R. D. 787 Drain	41**	64	4.0	13	70.5	4.2	
90.5			61	0.2		68.5	2.6	
90.2R	Colusa Basin Drain	1,248**	64	1.2	1,529	73	3.6	
90.0	Knights Landing	6,000**	63			--	--	
81.5			62	1.2		69.5	1.8	

Table 12

DIURNAL TEMPERATURE VARIATIONS IN SACRAMENTO RIVER  
(continued)

Middle Reach		:Average : Average :			:Average : Average		
:		Q	Tempera-	Diurnal	Q	Tempera-	Diurnal
River Mile	Station	cfs	ture	Variation:	cfs	ture	Variation
:	:	:	°F	°F	:	°F	°F
		May 8 - 12, 1961			September 12 - 16, 1960		
80.8L	Sacramento Slough	1,004**	66	2.0	1,000	73	3.0
79.9L	Feather River	5,245**	61	3.0	930	75	5.2
77.9		--	62	2.5		70	2.2
71.0			63	2.5		71.5	2.2
62.6			62	1.8		72	1.5
60.8			--	---		72	1.5
60.4L	American River		--	---	1,422	68	4.8
59.8	Sacramento	15,000**	65			--	---
46.4	Freeport		--	---	7,800	63	

\* Estimated.

\*\* Average monthly flow.

The larger diurnal variations may be explained by the presence of a warm tributary flow which floats on top of the main stream. During the day, this temperature stratification is intensified by solar radiation. Nighttime cooling tends to destroy the stratification.

The greatest significance of these observations lies in the large distances which are indicated for vertical mixing of warm tributary or waste water flows. Longitudinal mixing in streams has generally been investigated on the basis of concentrations of dissolved or suspended material and much shorter mixing lengths have generally been computed. The findings of the present investigation indicate that additional work is warranted. Such work may be based upon observations of diurnal temperature variations throughout the depth of the stream at varying distances from warmer or colder tributary flows. Detailed study of stratification

near the surface by means of thermistor readings at close vertical intervals will provide much of the required data.

### pH

Most natural waters are slightly alkaline and the Sacramento River is typical in this respect with median pH values of 7.3. Tributary rivers are similar, irrigation returns are somewhat more alkaline, and Spring Creek is a strongly acid stream. A comparison of historical and current data is presented on Table 13.

Table 13

#### pH IN SACRAMENTO RIVER AND TRIBUTARIES

Station	: River Mile :	: 1951-1961 :			: April 1960-June 1961 :		
		: Maxi-: : Mini-: : Median:	: Maxi-: : Mini-: : Median:	: Maxi-: : Mini-: : Median:			
Keswick	300.9	7.7	6.5	7.2	7.4	6.9	7.3
Redding	297.7	7.9	7.0	7.3	7.4	7.1	7.3
Hamilton City	199.6	8.1	6.8	7.3	7.5	7.1	7.3
Freeport	46.4	-	-	-	7.5	7.3	7.3
Snodgrass Slough	37.2	8.2	6.8	7.3	7.4	7.3	7.3
Rio Vista	12.8	8.2	6.8	7.3	7.6	7.2	7.3
Spring Creek	302.3R/1.0	-	-	-	3.4	3.0	3.1
Butte Slough	138.9L/0.2	-	-	-	7.6	7.2	7.3
Colusa Basin Drain	90.2R/0.3	-	-	-	7.6	7.5	7.6
Sacramento Slough	80.8L/0.7	-	-	-	7.6	7.3	7.5
Feather River	79.9L/0.7	-	-	-	7.6	7.2	7.4
American River	60.4L/0.2	-	-	-	7.5	7.1	7.3

No seasonal variations in pH were noted, although this may be due to the insensitivity of the colorimetric method used (Chapter II). Similarly, diurnal variations in pH could not be measured although they are known to be characteristic of natural waters (39); this feature will be discussed more thoroughly in Chapter V.

The acidic character of mine wastes in Spring Creek is apparent from Table 13. Upon discharge into the Sacramento River, flows from the creek are quickly buffered or neutralized so that no effect on the river was observed. A more detailed discussion of Spring Creek is presented later in this chapter.

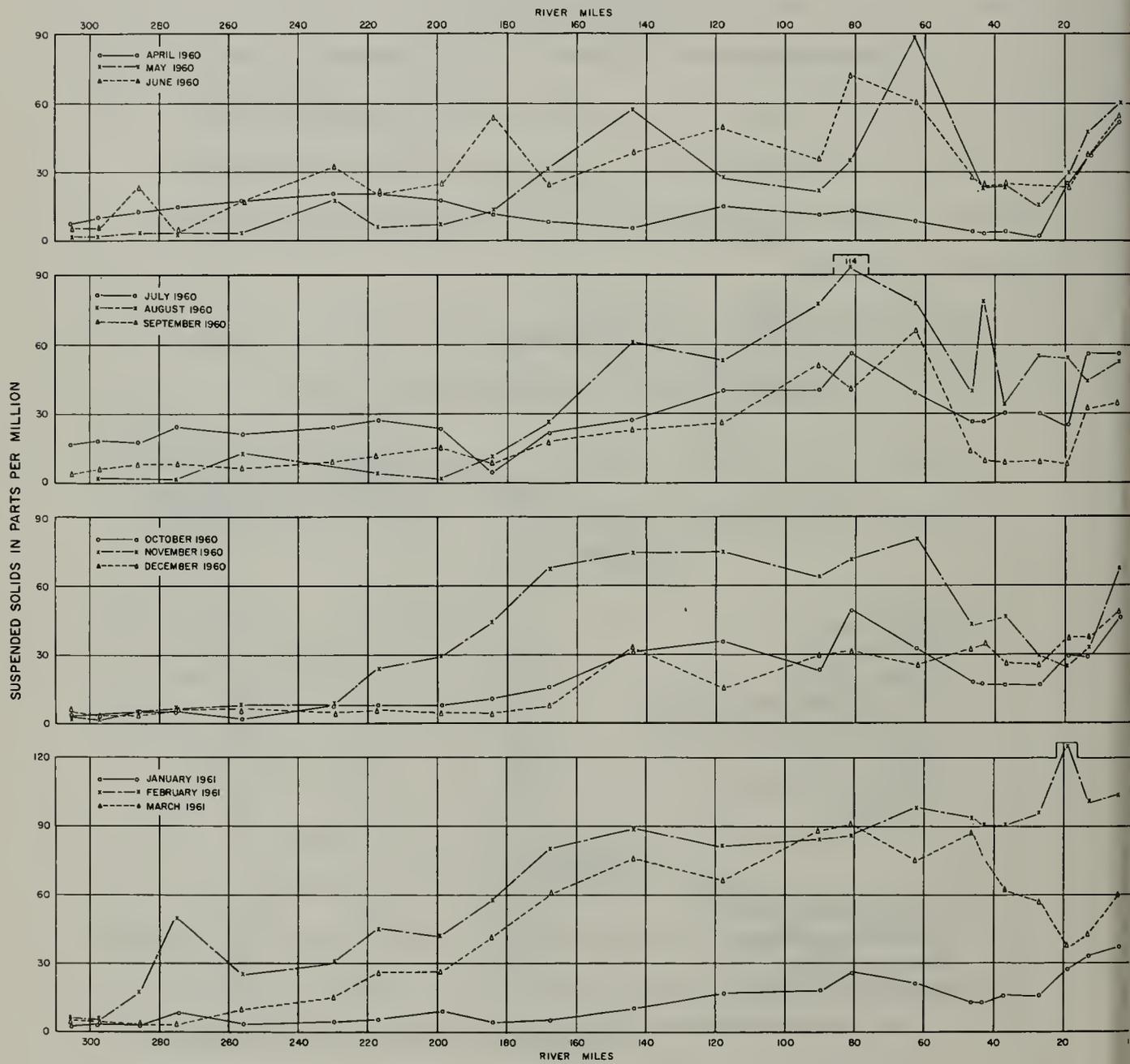
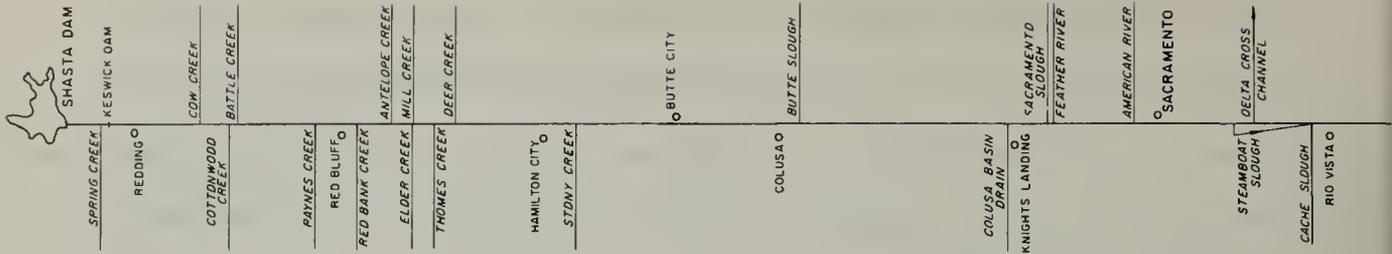
### Suspended Solids

Determinations for suspended solids were made at each of the monthly stations during the period April 1960 through March 1961. Concentrations of suspended solids in the Sacramento River are shown on Figure 4. Table 14 summarizes data collected at nine river and four tributary stations:

Table 14  
SUSPENDED SOLIDS IN SACRAMENTO RIVER, 1960-61

Station	Parts Per Million		
	Maximum	Minimum	Median
<u>Sacramento River</u>			
Redding	18	<1	3.5
Elder Creek	32	2	12
Hamilton City	42	1	16
Colusa Bridge	89	5	36
Above Colusa Basin Drain	88	11	46
Above Sacramento Slough	114	13	64
Bryte	108	8	63
Snodgrass Slough	90	4	26
Rio Vista	118	22	37
<u>Tributaries</u>			
Colusa Basin Drain	223	18	131
Sacramento Slough	93	6	56
Feather River	52	6	20
American River	28	<1	10

Suspended solids concentrations increase with distance from Keswick. Seasonally, these increases reflect increases in plankton



SACRAMENTO RIVER WATER POLLUTION SURVEY  
 Figure 4. SUSPENDED SOLIDS — SACRAMENTO RIVER  
 1960-1961

populations discussed in Chapter VII, Appendix C. The effects of tributary streams and irrigation drains result in local increases shown on Figure 4.

The United States Geological Survey makes daily observations of suspended (mineral) sediment at Red Bluff and Sacramento. Unpublished records for the period October 1957 to September 1959 show that higher concentrations occur at times of higher flows during the winter and early spring months. Average monthly concentrations varied from about 10 ppm during the late summer to over 200 ppm during the heavy runoff season. Suspended solids values obtained on samples from within the upper four feet during this investigation are thus comparable with the average suspended sediment concentrations throughout the depth of the river during low flow periods. However, during high flows, average concentrations are much higher than surface suspended solids.

#### Turbidity and Water Transparency

Turbidity data have been collected monthly from several stations on the Sacramento River since 1951. During the survey, turbidity was determined monthly at 22 stations. In addition, data on water transparency were obtained two weeks later by use of a Secchi disc during the monthly sampling program for the biological phase of the survey. The results of the transparency observations are discussed in Appendix D.

Redding, Hamilton City, and Snodgrass Slough were selected as typical stations to show the historic and seasonal pattern of turbidities in the upper, middle, and lower reaches of the Sacramento River. Turbidities for these stations are plotted on Figure 5. Turbidities at other stations sampled during the Sacramento River Survey are generally consistent with the plotted values.

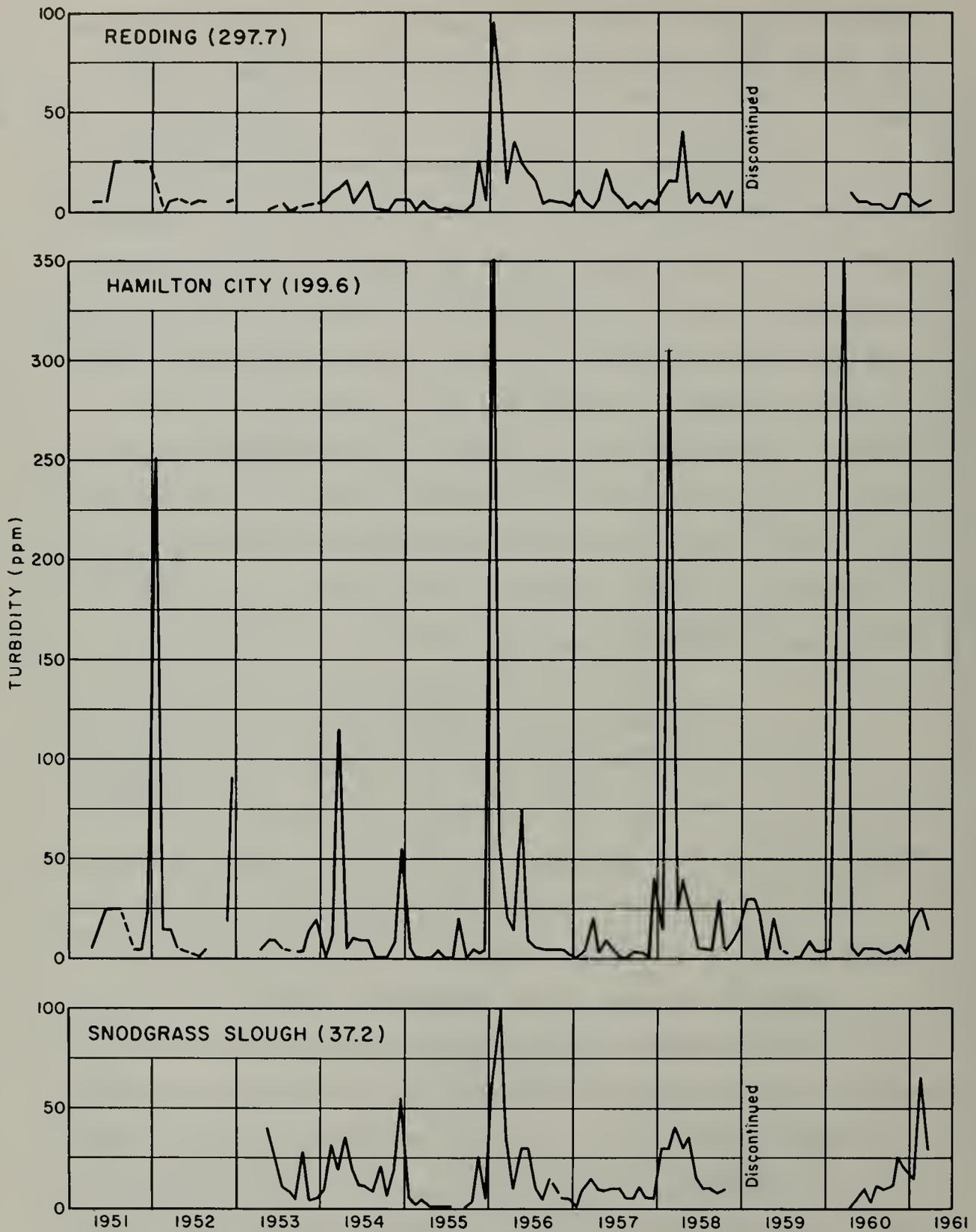


Figure 5. TURBIDITY IN SACRAMENTO RIVER 1951-1961

Turbidity at Redding was generally less than 25 ppm except for periods of high flow in 1955-56 and 1958. At Hamilton City, turbidities were generally less than 25 ppm from 1955 to 1961. In contrast to the station at Redding, maximum values between 250 and 300 ppm during January and February reflect seasonal peaks due to higher turbidities of unregulated tributary discharges.

Seasonal variations of turbidity at Snodgrass Slough are less pronounced than those at Hamilton City. Relatively larger summer variations which appear between the two stations and which are probably related to irrigation return flows are reduced by dilution with waters from the Feather and American Rivers.

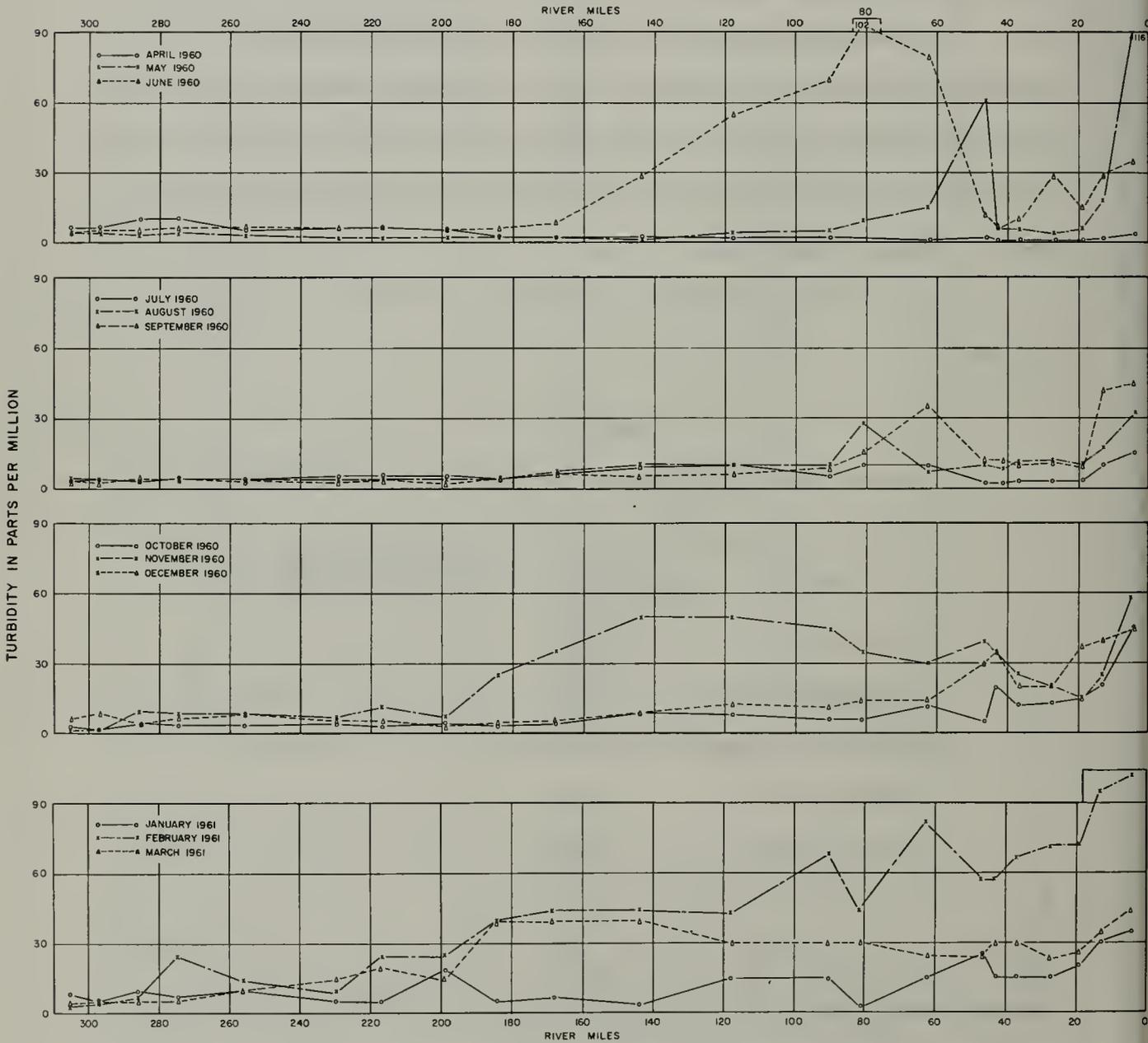
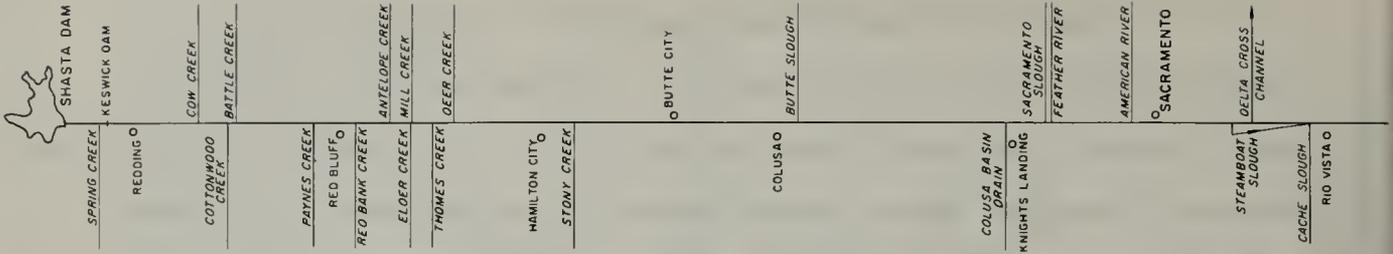
The following tabulation summarizes turbidities in various influents:

Table 15

TURBIDITY IN TRIBUTARIES TO SACRAMENTO RIVER, 1960-61

Station	: Mile	: Turbidity, ppm	
		: Median	: Range
Butte Slough	138.9	30	1 - 150
Colusa Basin Drain	90.2	50	10 - 360
Sacramento Slough	80.8	33	13 - 137
Feather River	80.0	4	2 - 45
American River	60.4	4	1 - 15

The effects of these influents are shown on Figure 6. The summer profiles indicate variations due to flows from irrigation drains, and the winter profiles show the effects of rains.



SACRAMENTO RIVER WATER POLLUTION SURVEY  
Figure 6. TURBIDITY — SACRAMENTO RIVER  
1960-1961

Figure 7 shows the relationship between turbidity and transparency determined by Secchi disc. The scatter of the points is due to limitations of both types of measurements; nevertheless, the general inverse relationship is clear.

A limited number of observations were made in October and November 1960, with a submersible photometer. The depths at which the incident light was reduced by an order of magnitude was determined. It was found that, for each station, the depth for 90 percent reductions in incident light (D-90) was essentially constant. At mile 305.7, for example, the light was reduced by 90 percent every five feet. The constancy of D-90 was noted in both the upper reach and at Rio Vista, indicating a high degree of vertical mixing of those factors which reduce transparency. D-90's from mile 305.7 to mile 249.0 varied from 5.0 to 12.5 feet and were directly proportional to the depth. D-90's at Sacramento and Rio Vista were about 4 and 2.5 feet, respectively. These values are generally consistent with observations of turbidity and transparency discussed previously.

The 1946 Public Health Service drinking water standards set a limit of 10 ppm on turbidity. Figures 5 and 6 both show that, although turbidities are generally within this range, provision for removal of turbidity must be made in domestic water supply systems.

#### Color

Color was determined for each of the monthly samples collected from April 1960 through March 1961, and for the composites of daily samples collected at Bend Bridge, Butte City, Wilkins Slough, and Freeport.

Table 16 summarizes color data collected at six typical river stations and two tributaries.



Table 16

## COLOR IN SACRAMENTO RIVER AND TRIBUTARIES, 1960-61

Station	River Mile	Maximum	Minimum	Median
<u>Sacramento River</u>				
Churn Creek	285.9	15	5	10
Hamilton City	199.6	25	5	10
Colusa Bridge	144.1	30	5	8
Above Colusa Basin Drain	90.5	20	5	5
Bryte	62.6	20	5	6
Snodgrass Slough	37.2	40	5	8
<u>Tributaries</u>				
Colusa Basin Drain	90.2R/0.3	50	5	18
Feather River	79.9L/0.7	25	5	8

In general, variations of color in the Sacramento River correspond with changes in turbidity. Higher values occur throughout the river during periods of heavy runoff, and in the lower reach during summer months.

The 1946 U. S. Public Health Service drinking water standards provide for a maximum of 20 color units on the platinum-cobalt scale. Requirements for color removal in domestic water supplies are less than those for turbidity removal and the two can generally be met simultaneously.

#### Odor

Taste and odor problems in water supplies are typically caused by organic materials in the water. Organic materials concentrations found

during this investigation by the carbon adsorption method and their relation to tastes and odors are discussed in Chapter VIII, Appendix C.

Threshold odors were determined on monthly samples collected from all stations from April 1960 through March 1961. Median odor concentrations increased from about one unit just below Shasta Dam to about four units below Freeport. Maximum odors were found in late spring which were generally two or three times the median concentrations. A lesser peak occurred during the early fall months. Concentrations at the mouths of the Feather and American Rivers were about the same as those in the river at those points. The longitudinal and seasonal variations of odors correspond closely to plankton populations in the river (Chapter VII, Appendix C).

#### Specific Conductance and Dissolved Solids

Figure 8 shows historical variations in specific conductance of Sacramento River waters. At Redding, there is a tendency for higher values in the late fall and early winter and for lower values in the late summer although there are frequent departures from this pattern. Similar conditions occur at Hamilton City except that the maximum values usually occur a month or two later. At Snodgrass Slough, minimum values are found in the winter and early spring and maxima occur during the late summer and early fall months, corresponding with the period when irrigation drainage is returned to the river.

Figures 9 and 10 show monthly profiles of specific conductance and total dissolved solids at 22 river stations in 1960-61. During the spring months, the river typically improves in quality as it flows downstream due to snowmelt in tributary streams. During the balance of the year, water quality in the river degrades below mile 140 because of

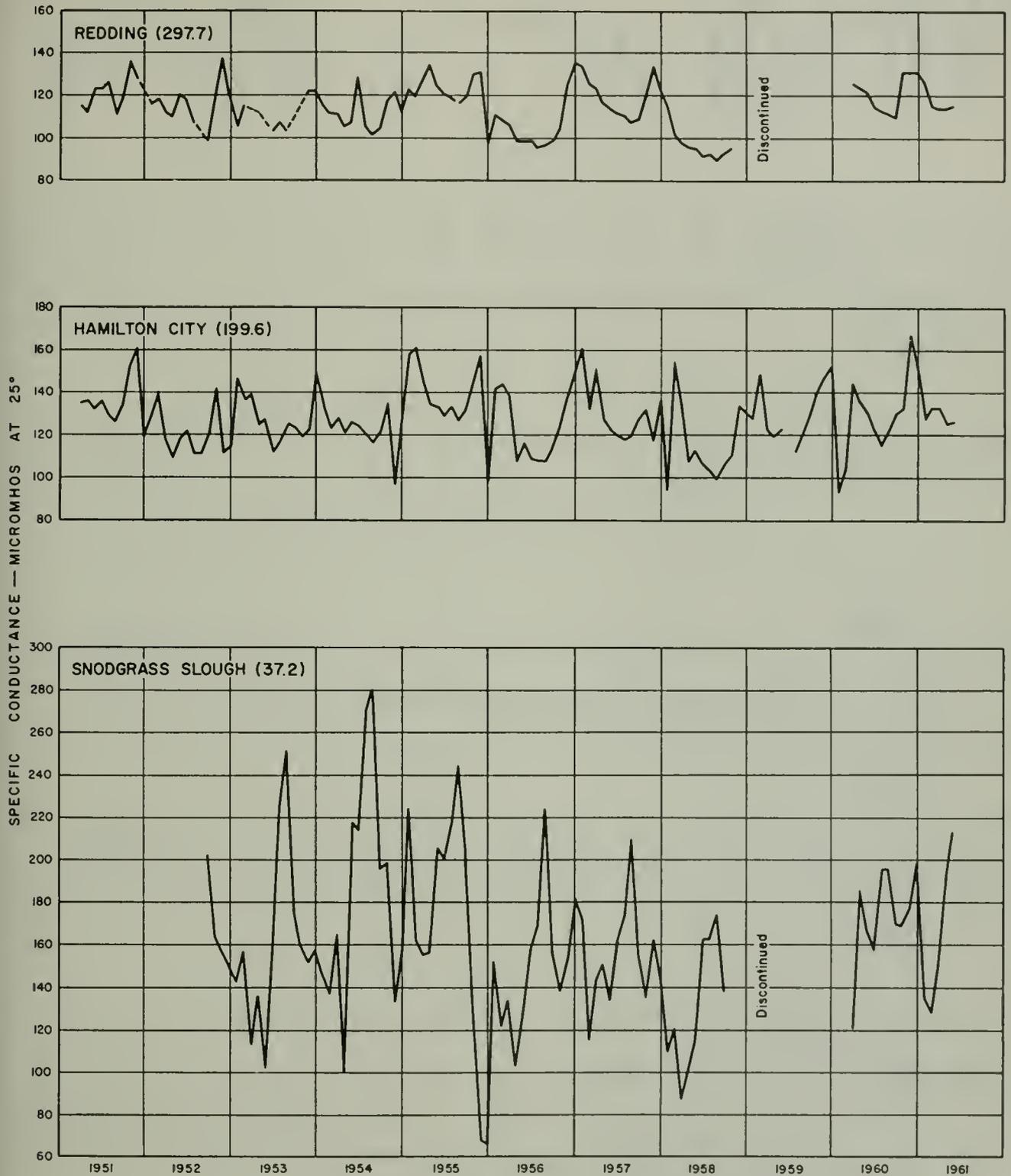
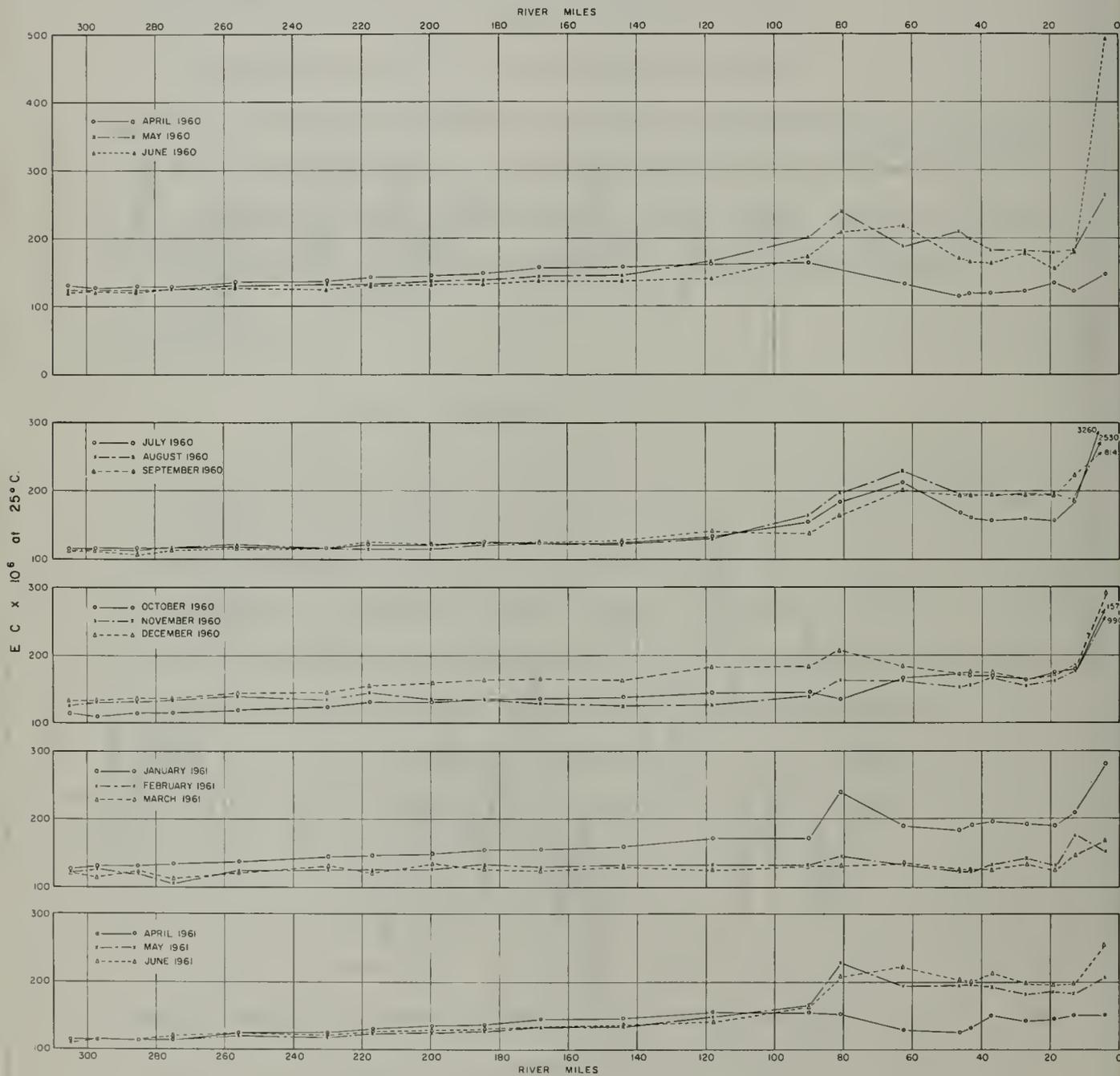
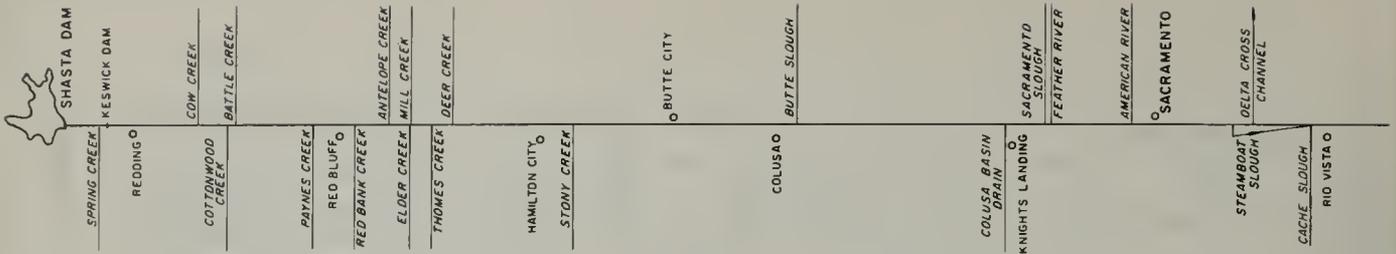
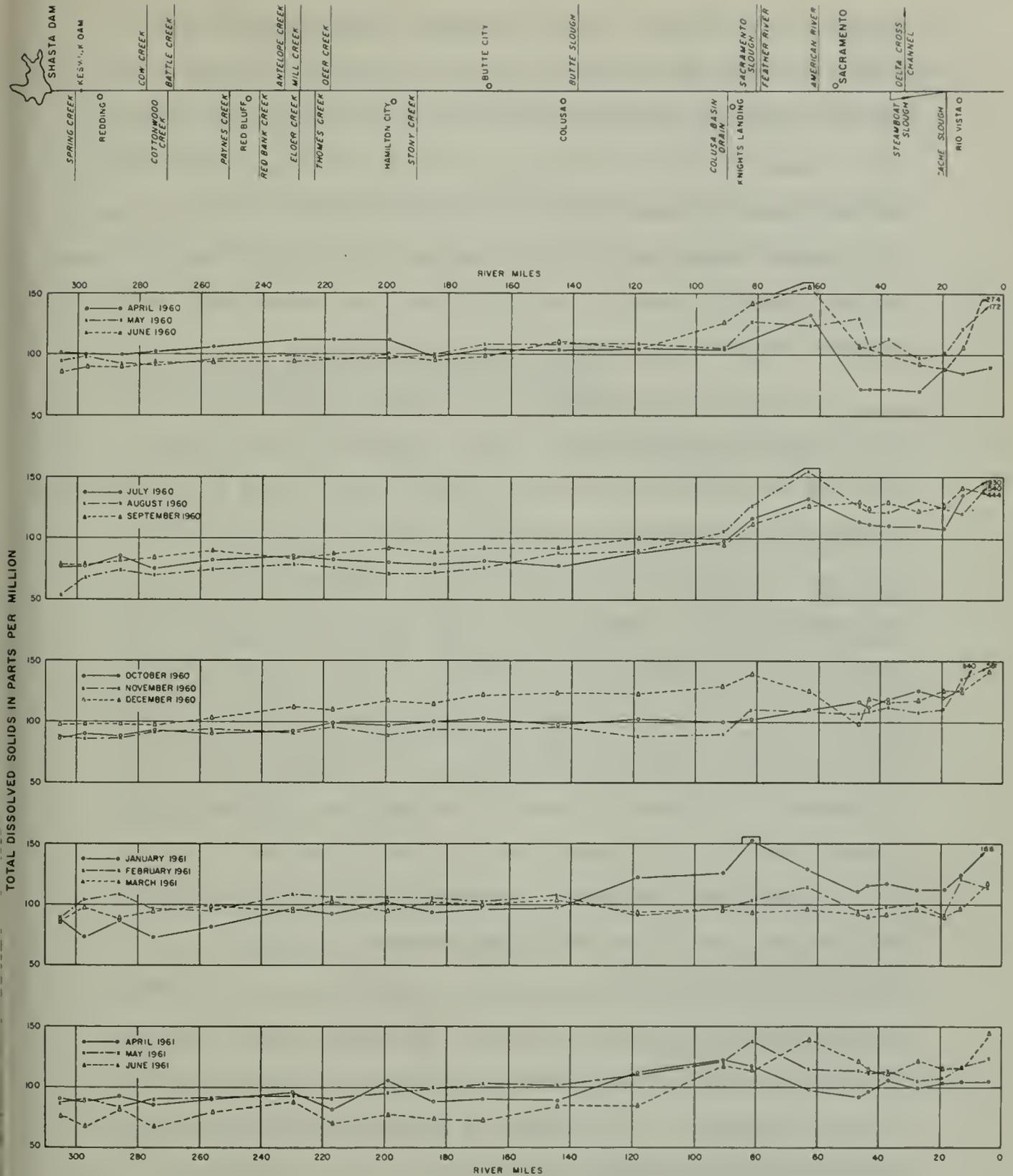


Figure 8. SPECIFIC CONDUCTANCE IN SACRAMENTO RIVER 1951-1961



SACRAMENTO RIVER WATER POLLUTION SURVEY  
 Figure 9. SPECIFIC CONDUCTANCE - SACRAMENTO RIVER  
 1960-1961



SACRAMENTO RIVER WATER POLLUTION SURVEY  
 Figure 10. TOTAL DISSOLVED SOLIDS — SACRAMENTO RIVER  
 1960-1961

irrigation return flows. Below Verona water quality improves due to Feather and American River flows. The high degree of correlation between specific irrigation discharges and rapid increases in mineral constituents is apparent from the figures. In the upper reaches, specific conductance generally varied between 120 and 140 micromhos. At Bryte (mile 62.6), values ranged from 120 in the spring to about 220 during the summer and 260 in early September. American River flows between July and mid-September reduced these values by about 30 micromhos.

Conductivity recorders were located at Red Bluff, Colusa, above Colusa Basin Drain, Sacramento, Freeport, and Walnut Grove (Plate 1). Data from the recorders are shown on Figure T-1 at the end of this appendix. In addition, a recorder was installed at Isleton for a short period in 1961; data from this station are available in departmental files. The two upstream stations showed little change throughout the year except during periods of extreme flow variations. During the irrigation season, discharges from the pumping plant serving Reclamation District No. 108 at mile 100.1R resulted in rapid changes at downstream recorders where the conductance typically increased by several tens of micromhos within an hour, remained at the higher level for varying periods of time, and then dropped to the base level. Comparison of the continuous record with daily sampling station data at Sacramento showed that slugs of high conductivity waters due to pumping during off-peak hours at R. D. 108 were typically missed in the daily sampling. The travel times of slugs can be readily determined from the continuous records. These are discussed in Part 1, Appendix A. Coefficients of longitudinal mixing may also be determined from the continuous records, and it is recommended that a study of the data in Figure T-1 be undertaken for such a determination. The persistence of high conductivity slugs to at least Isleton clearly indicates

the possibility of using conductivity recorders to determine travel times, flow distribution, and mixing coefficients within the Delta itself between the point of diversion at the Delta Cross-Channel and the Tracy Pumping Plant.

Specific conductance and total dissolved solids throughout the river were well within the limits for beneficial uses discussed in Chapter III.

#### Relationship of Specific Conductance to Flow

In a natural stream, specific conductance is typically inversely proportional to flow. Impoundments and waste discharges often modify or eliminate the typical relationship.

Figure 11 shows the relationships of specific conductance to flows at Bend, Butte City, Knights Landing, and Sacramento. The figure indicates that, in the upper reach, conductance is relatively constant over wide ranges of flows. By the time the flow reaches Knights Landing (mile 90.4), the typical inverse relationship begins to appear, although there is a large amount of scatter in the data. At Sacramento, the relationship is better defined.

#### Relationship of Specific Conductance to Dissolved Constituents

The value of specific conductance observations lies in their relationships to concentrations of various dissolved constituents. Where essentially constant relationships are found, continuous conductivity recorders provide the most complete information which is attainable on levels of dissolved minerals in a stream.

Figures 12 and 13 show the relationships between specific conductance and total dissolved solids by residue and by summation of major ions, respectively. The difference between the two cannot be adequately

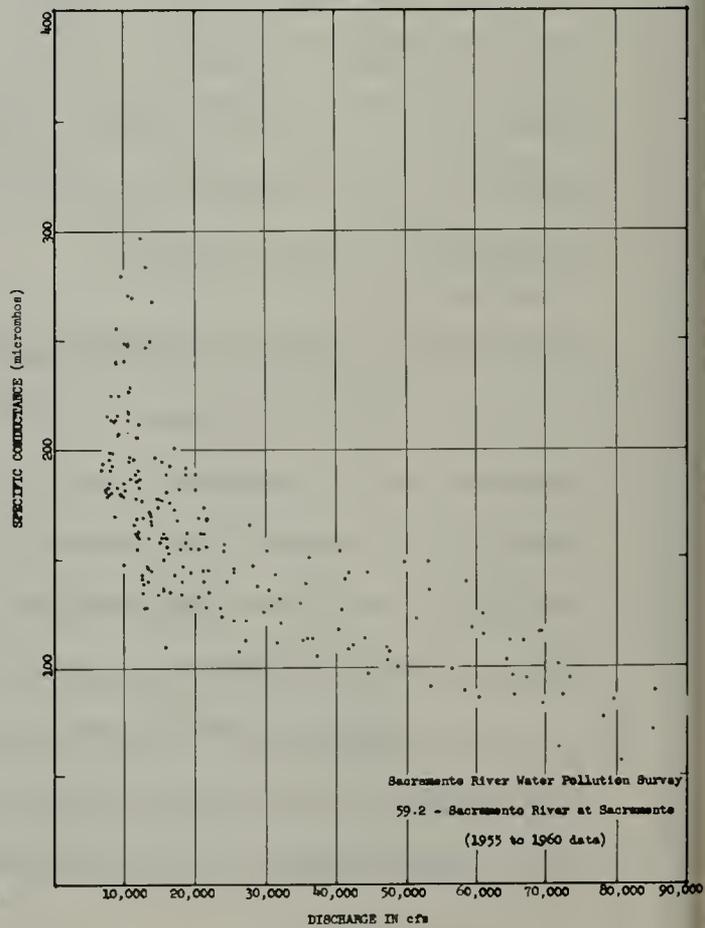
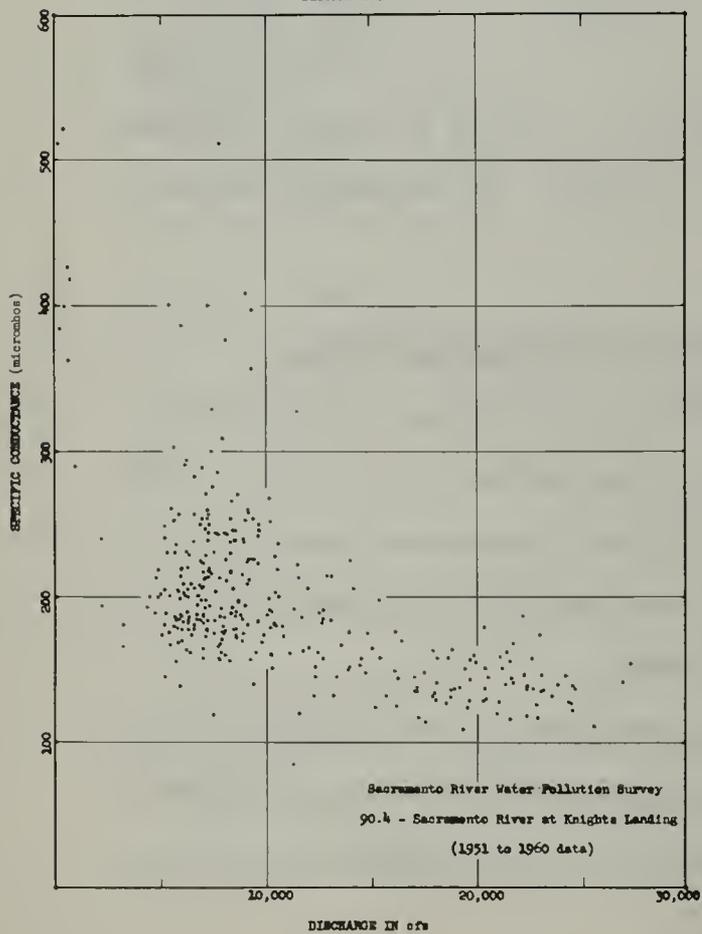
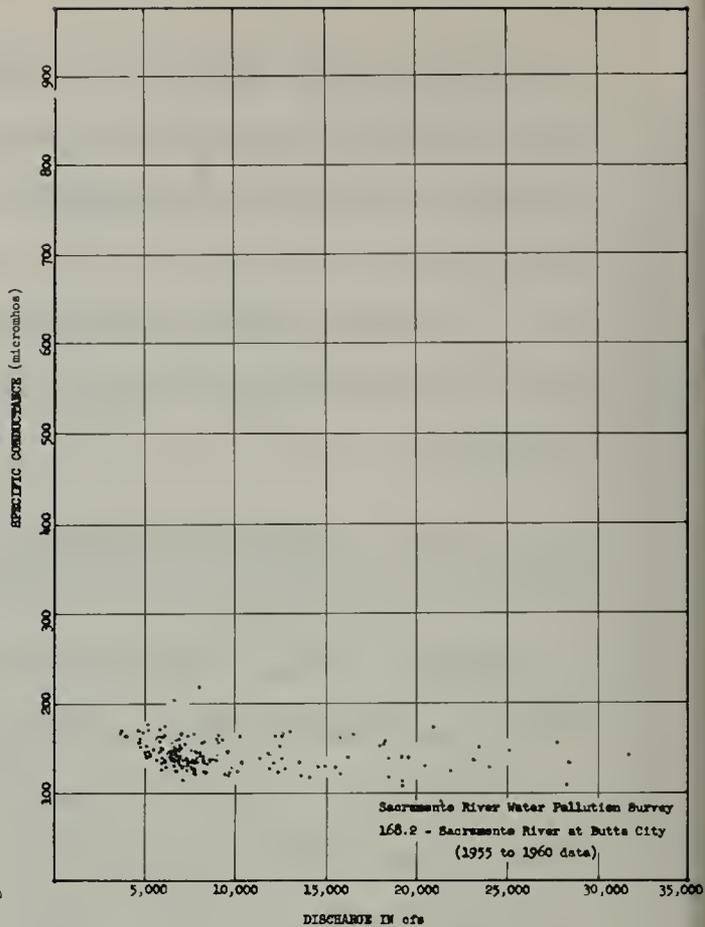
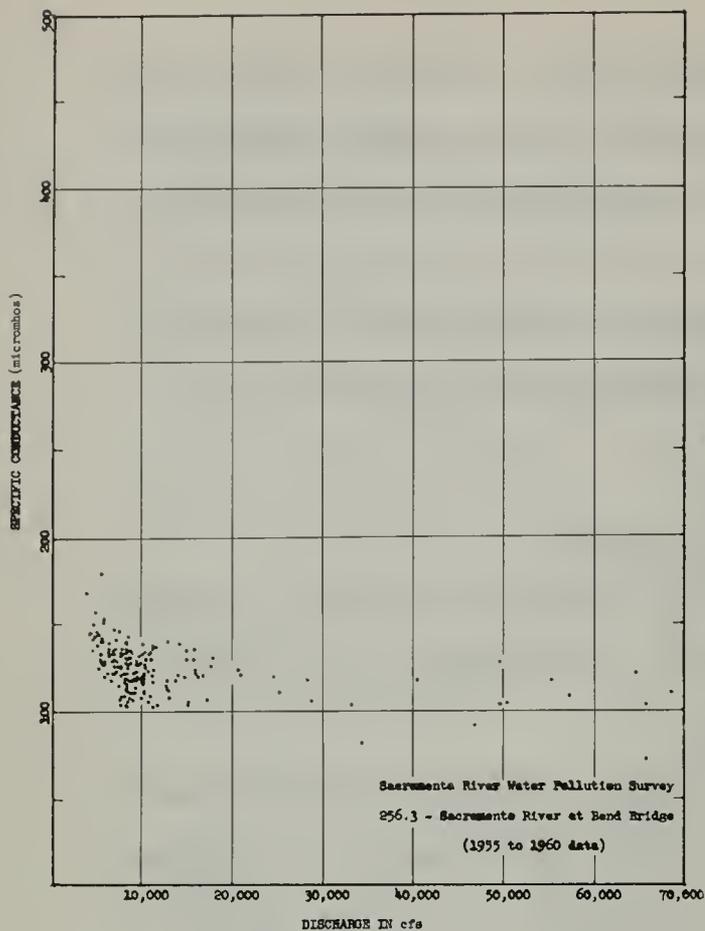


Figure II. CORRELATION OF FLOW AND SPECIFIC CONDUCTANCE

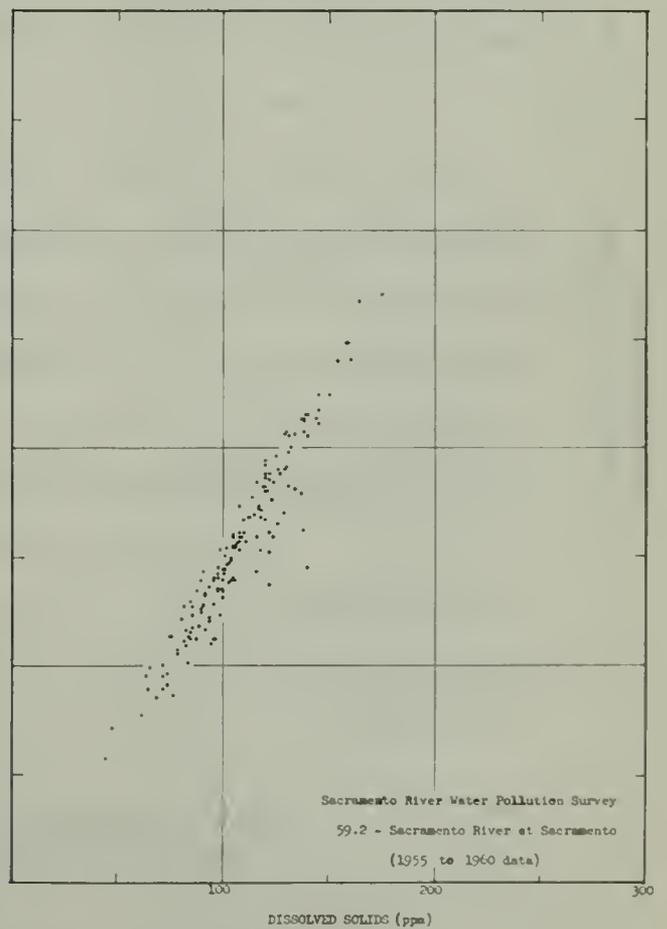
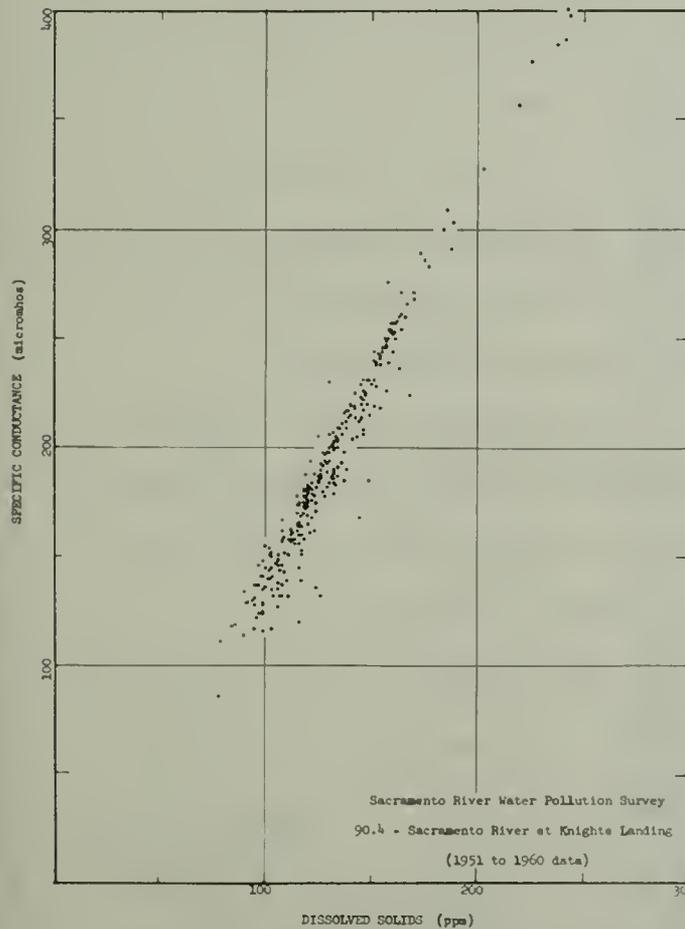
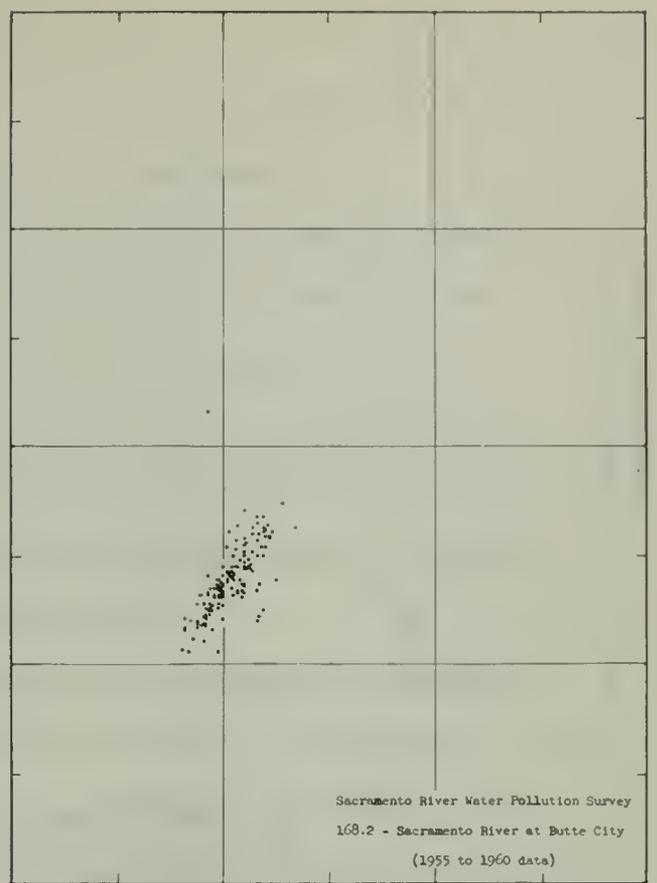
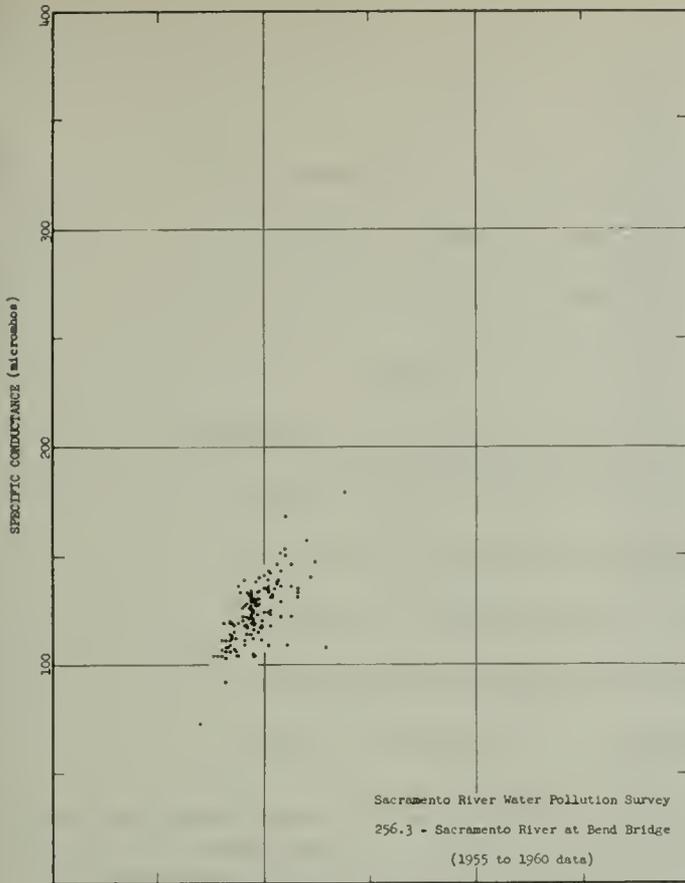


Figure 12. CORRELATION OF SPECIFIC CONDUCTANCE AND TOTAL DISSOLVED SOLIDS BY RESIDUE

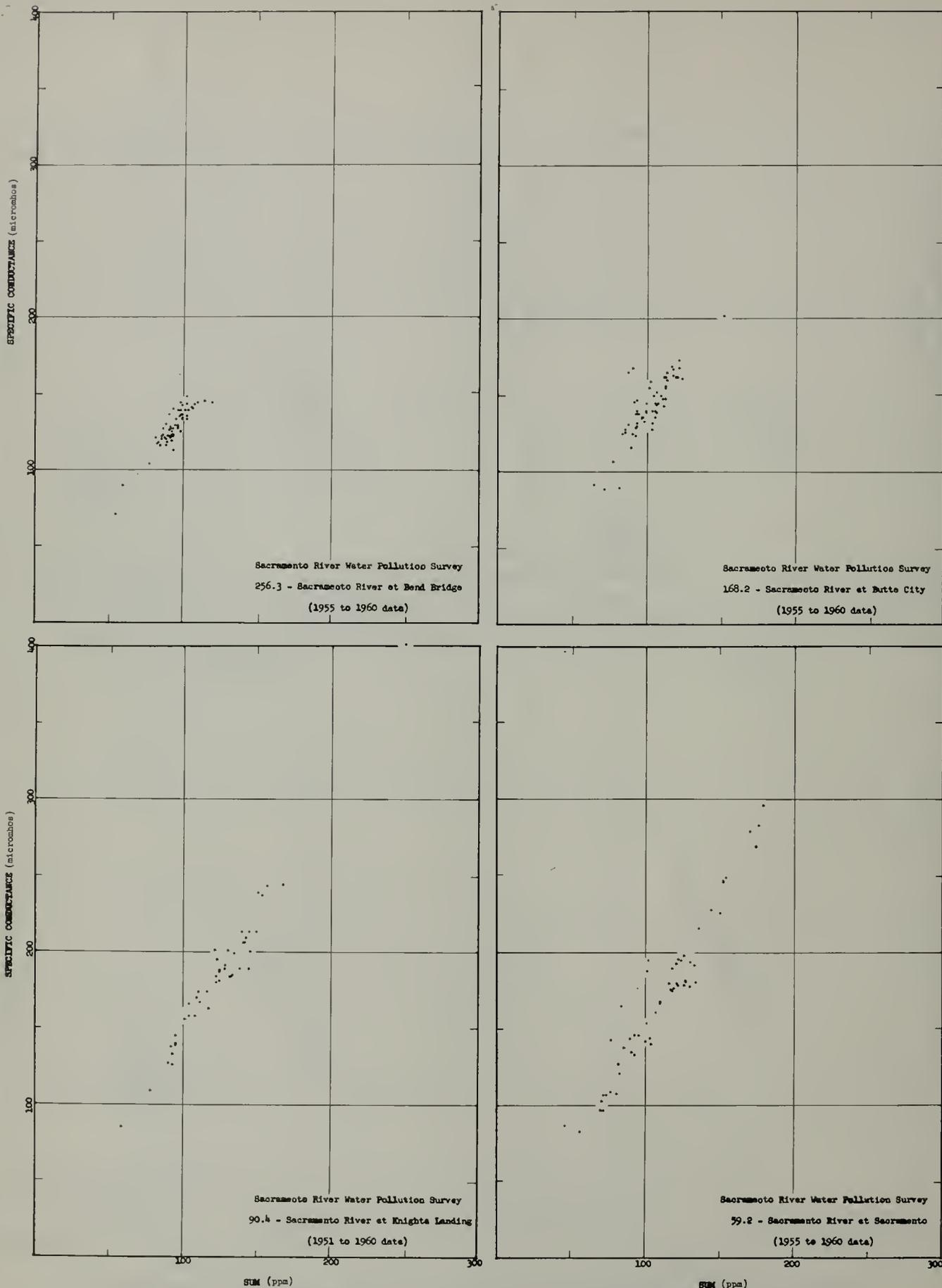


Figure 13. CORRELATION OF SPECIFIC CONDUCTANCE AND TOTAL DISSOLVED SOLIDS BY SUM OF MAJOR IONS

accounted for with present knowledge. The figures indicate that the relationship is essentially constant from Bend to Sacramento.

Figures 14 and 15 show the relatively high degree of correlation between conductance and hardness and bicarbonate concentrations, respectively. Figures 16 and 17, which relate conductance to sulfate and chloride concentrations, respectively show that the relationships vary markedly between different points on the river and at any one station. Figures 18, 19, and 20 show the relationships between conductance and calcium, magnesium, and sodium, respectively.

Although the degree of scatter shown on Figures 14 through 20 can be reduced by making the comparisons on the basis of conductance versus equivalent parts per million, the figures show that conductivity - constituent comparisons are difficult to evaluate. For example, the sodium relationships for Knights Landing shown on Figure 20 strongly indicate two distinct sources of water with different percent sodium values. This can be explained on the basis of seasonal variations of source waters incomplete mixing of irrigation return flows. The Knights Landing station has been moved upstream on the basis of these and similar observations.

Collection of additional samples at the river stations shown in Figures 11 through 20 will result in more data of the sort which is plotted therein, but will not provide any additional knowledge of the factors affecting water quality in the Sacramento River.

It is possible to examine changes in water characteristics, which are not of themselves related to concentrations, by the use of trilinear plots. A typical case is shown on Figure 21. By the addition of points representing mineral characteristics of tributary flows, the effects of these flows upon water quality in the river become apparent. The river changes character in response to natural or man-made discharges

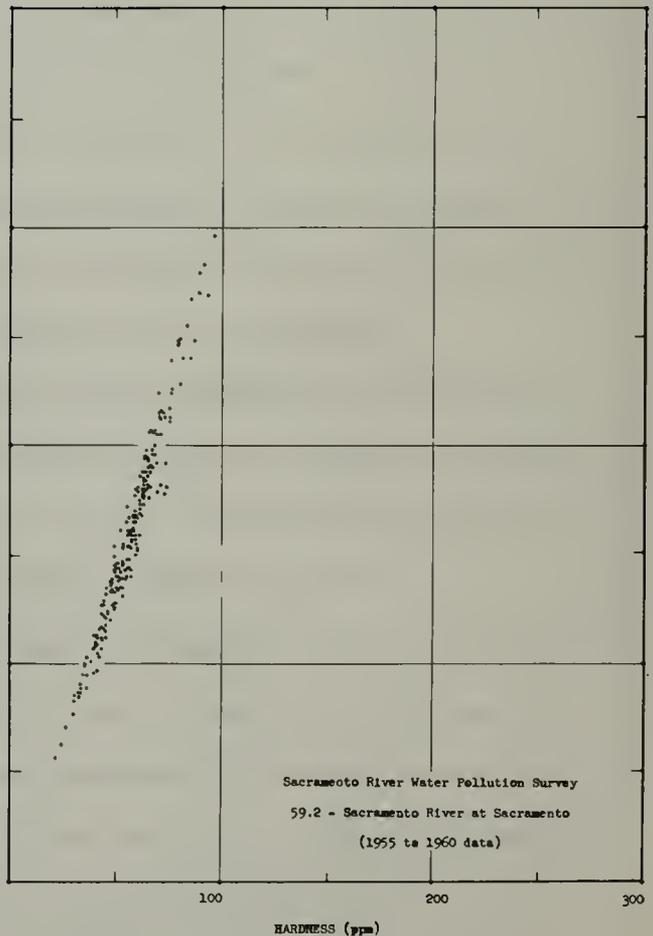
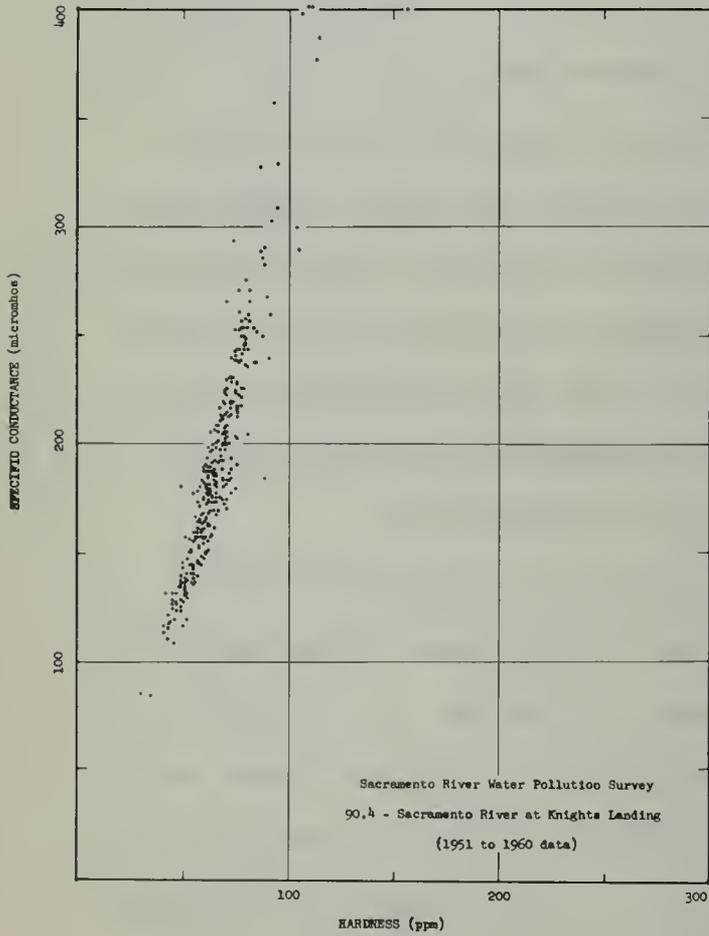
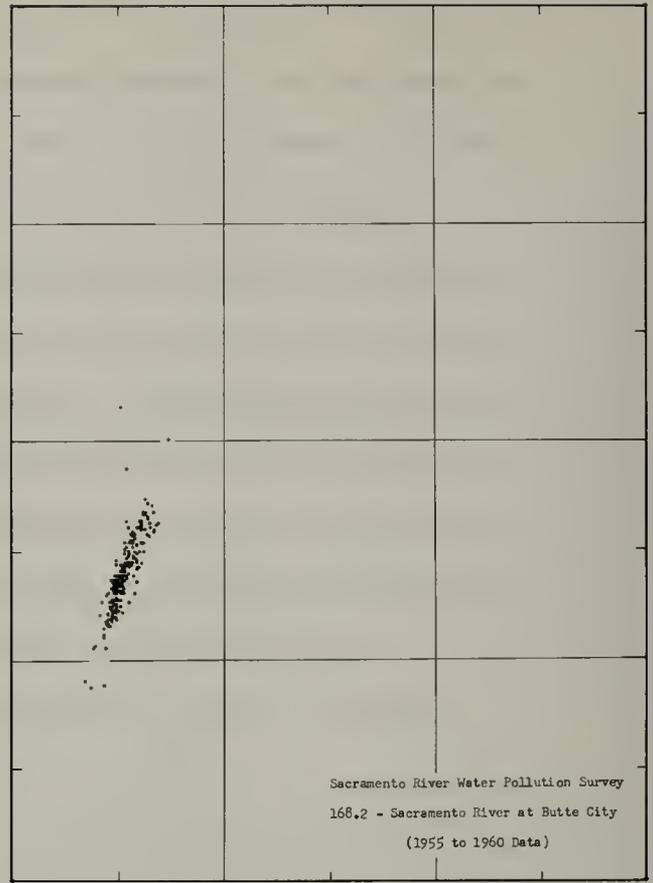
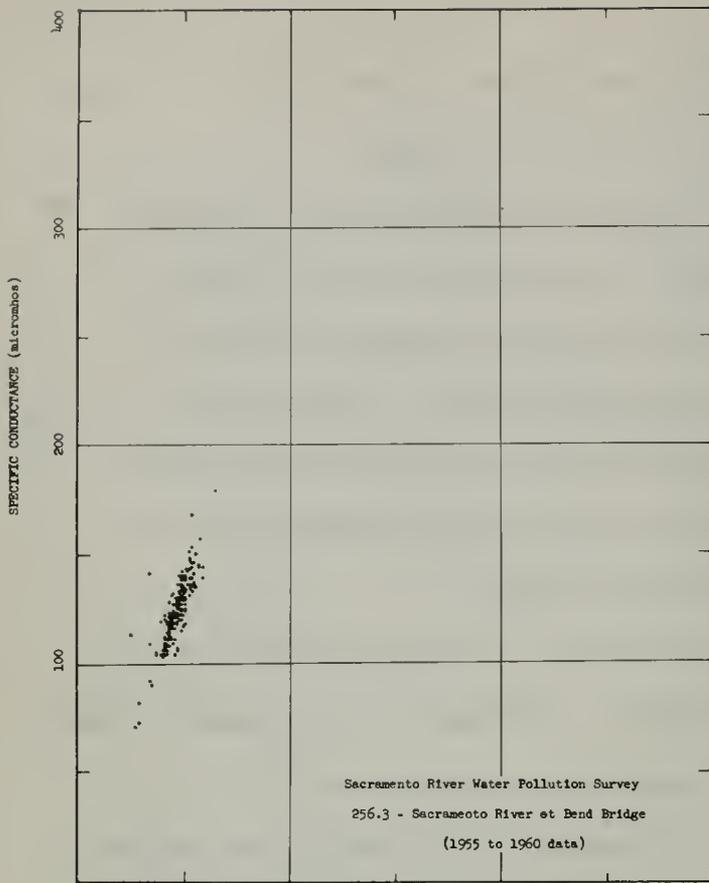


Figure 14. CORRELATION OF SPECIFIC CONDUCTANCE AND HARDNESS

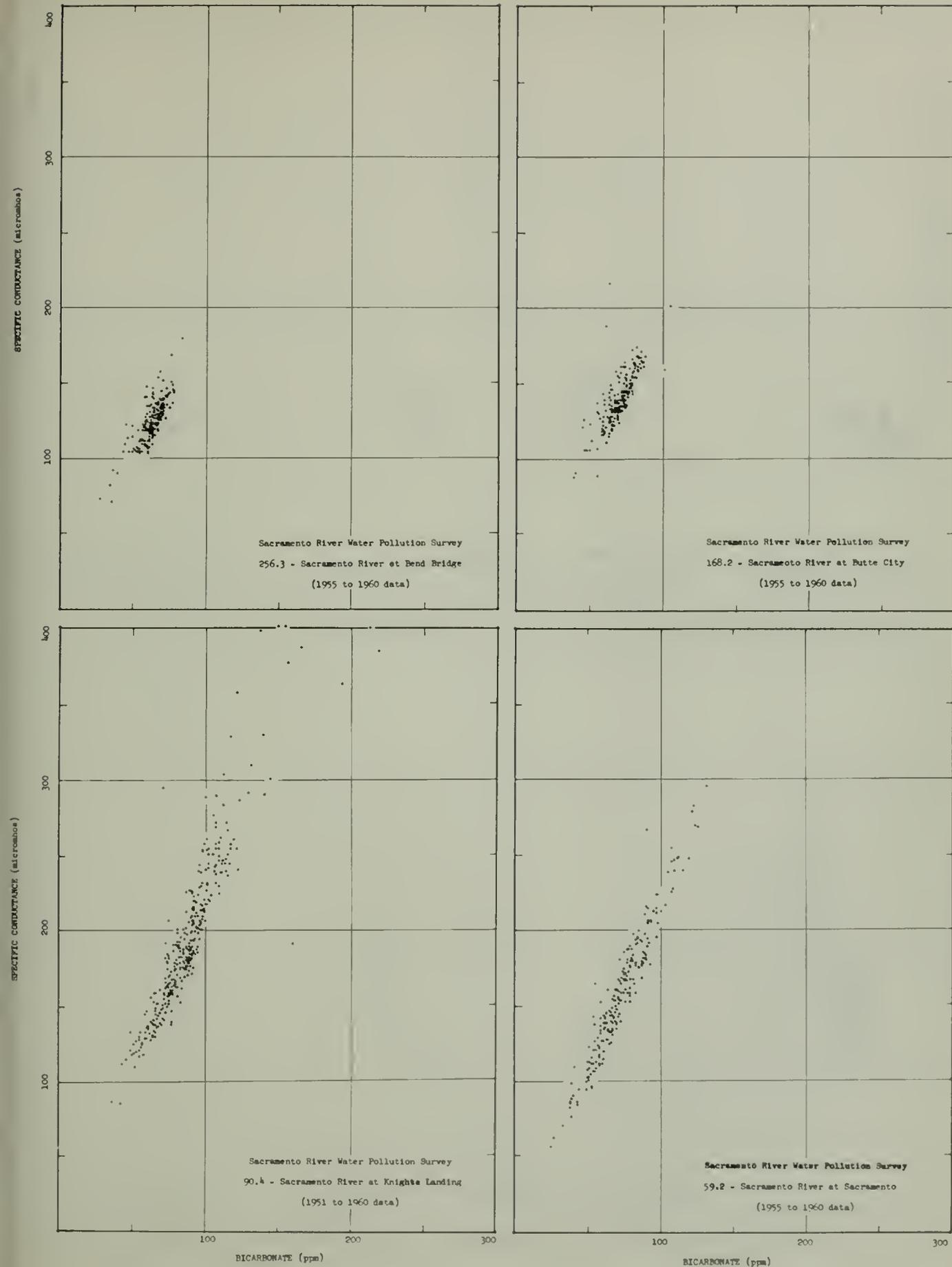


Figure 15. CORRELATION OF SPECIFIC CONDUCTANCE AND BICARBONATE

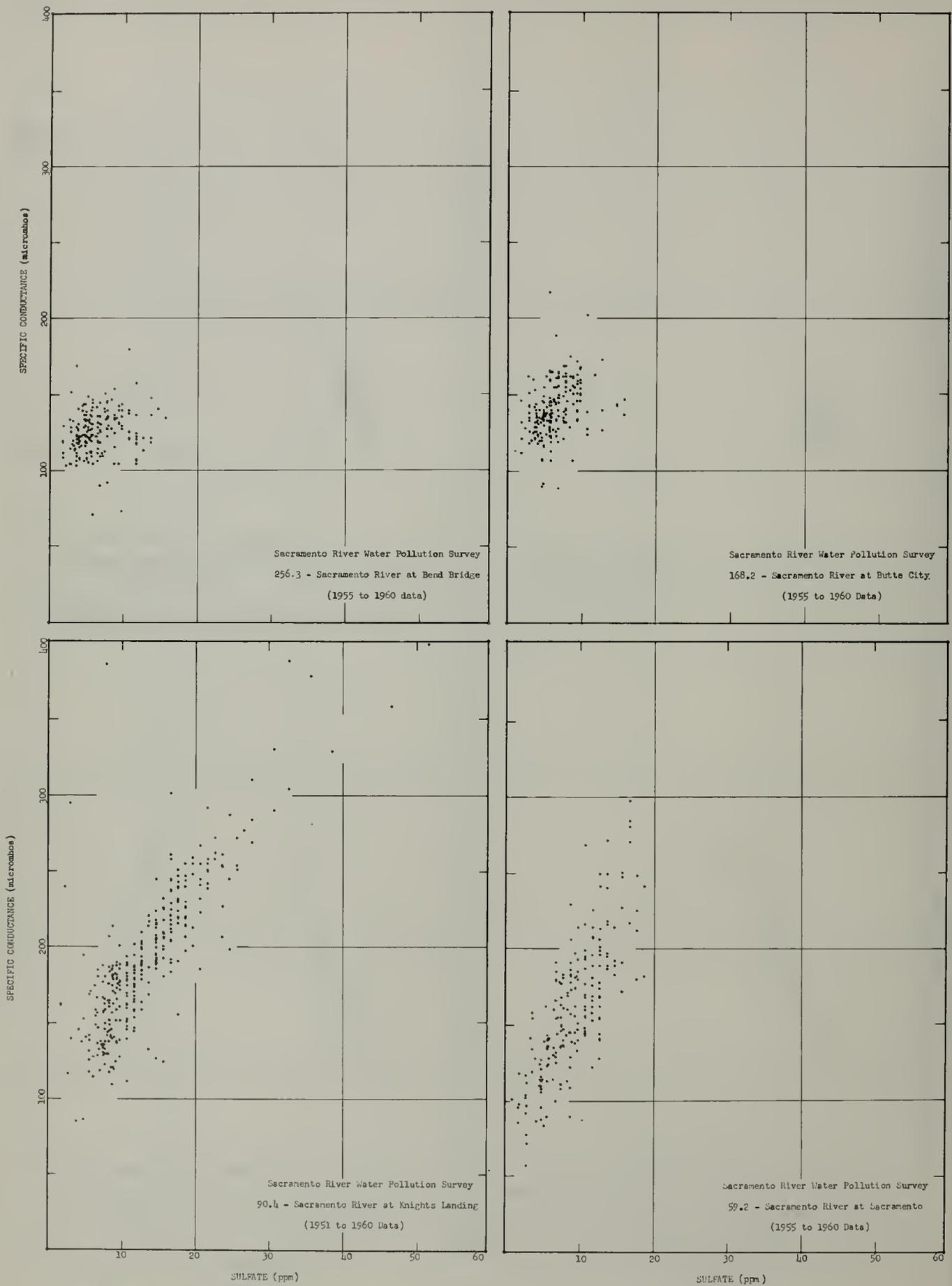


Figure 16. CORRELATION OF SPECIFIC CONDUCTANCE AND SULFATE

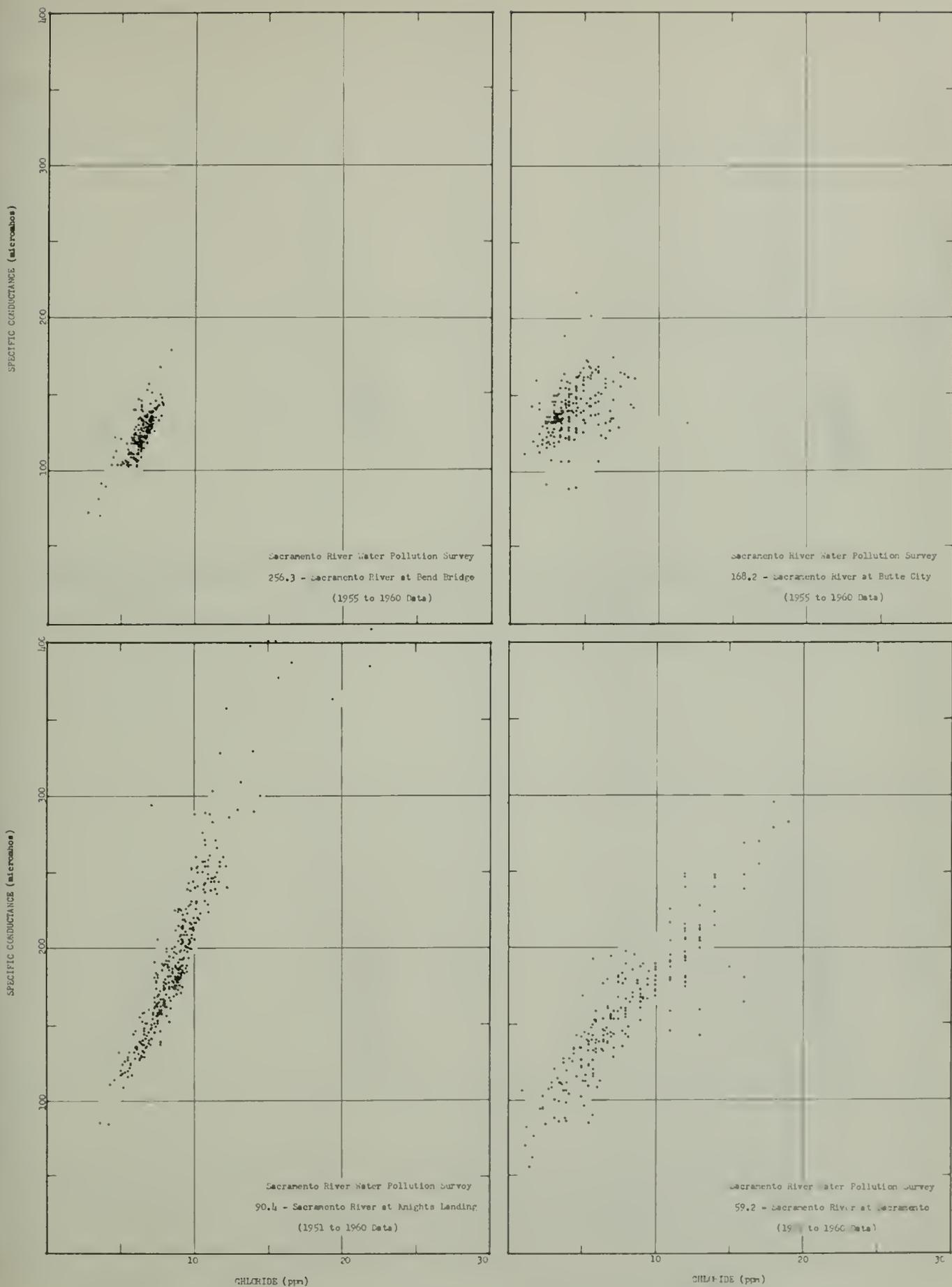


Figure 17. CORRELATION OF SPECIFIC CONDUCTANCE AND CHLORIDE

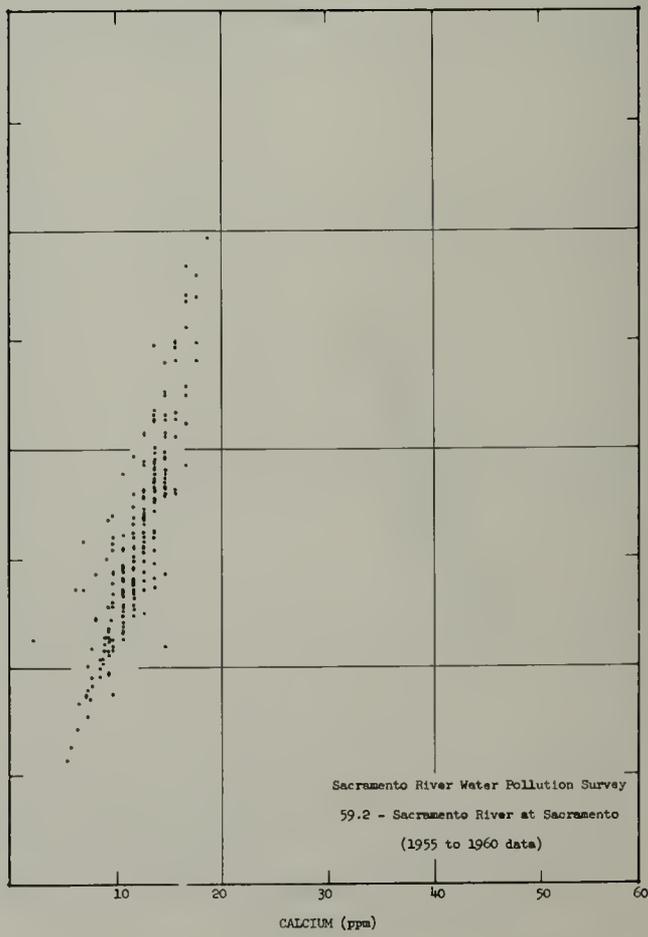
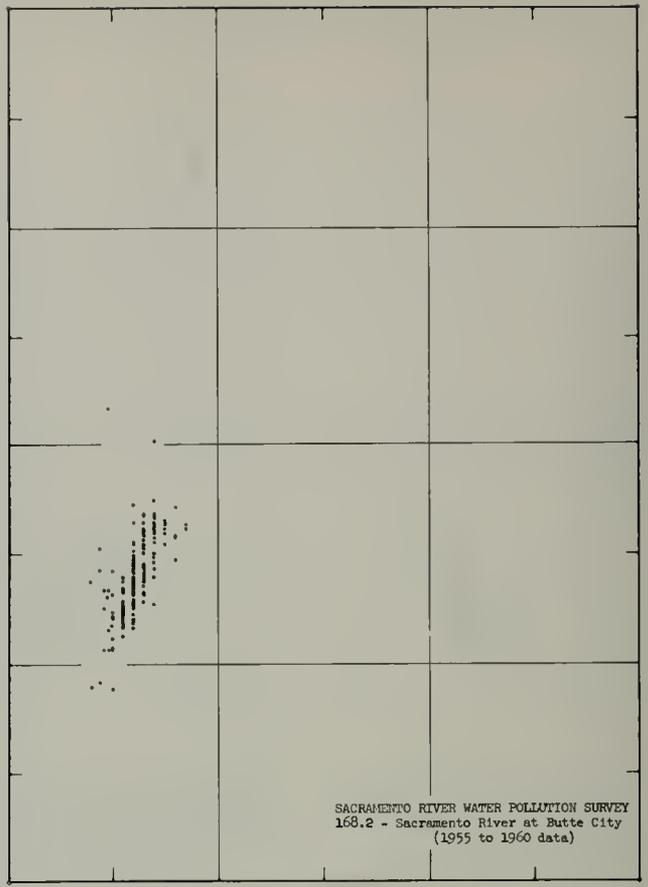
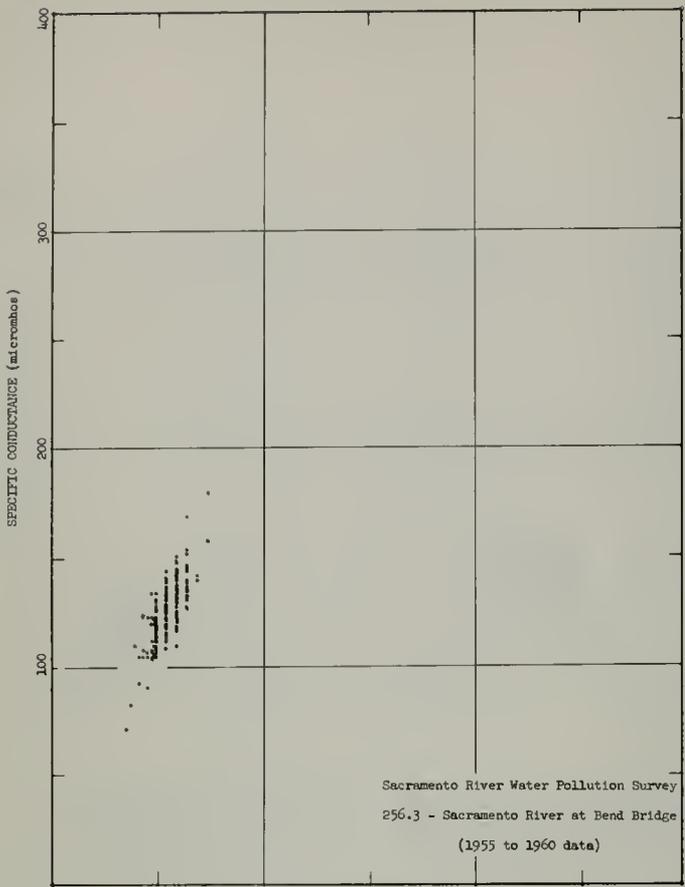


Figure 18. CORRELATION OF SPECIFIC CONDUCTANCE AND CALCIUM

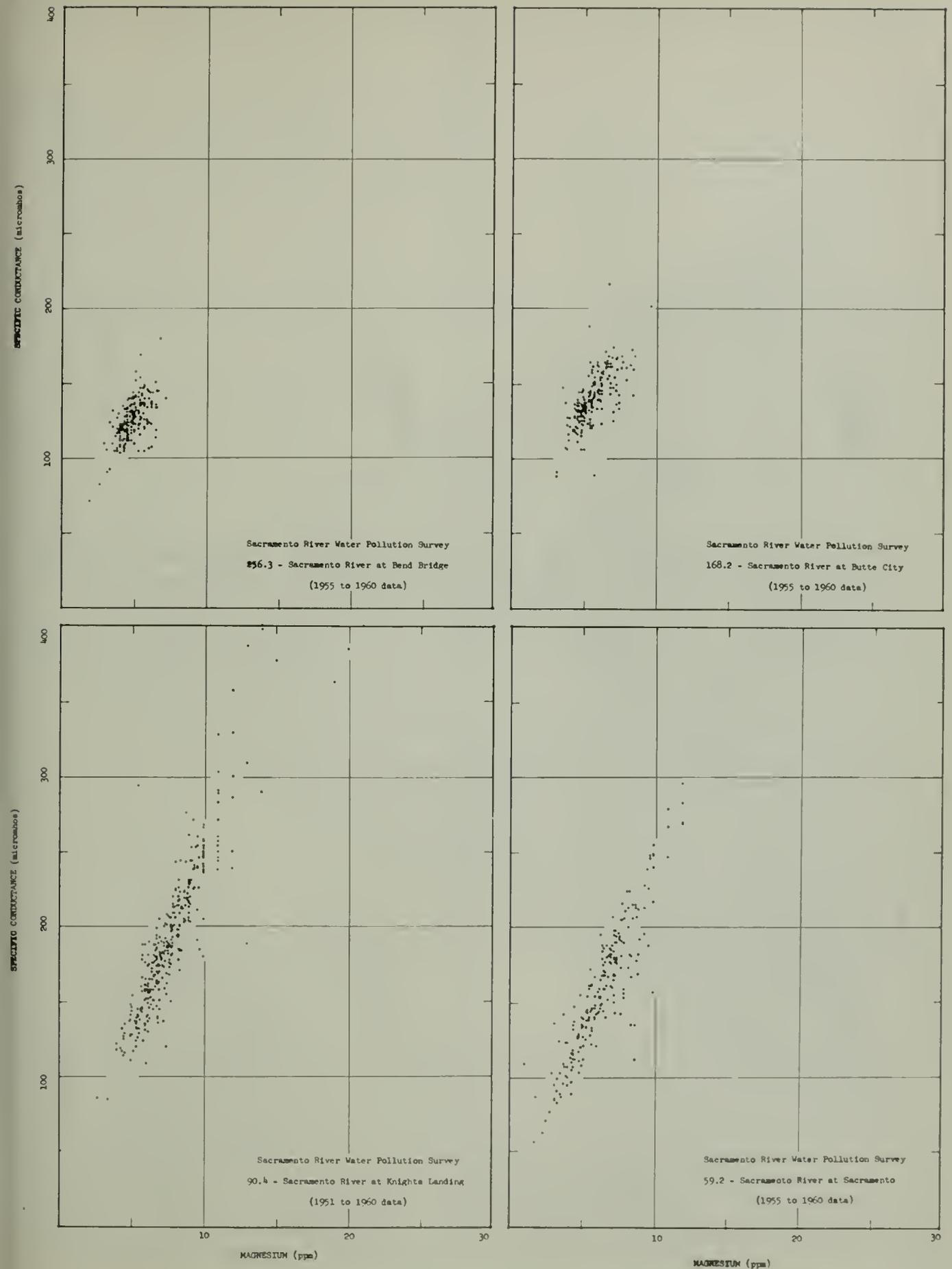


Figure 19. CORRELATION OF SPECIFIC CONDUCTANCE AND MAGNESIUM

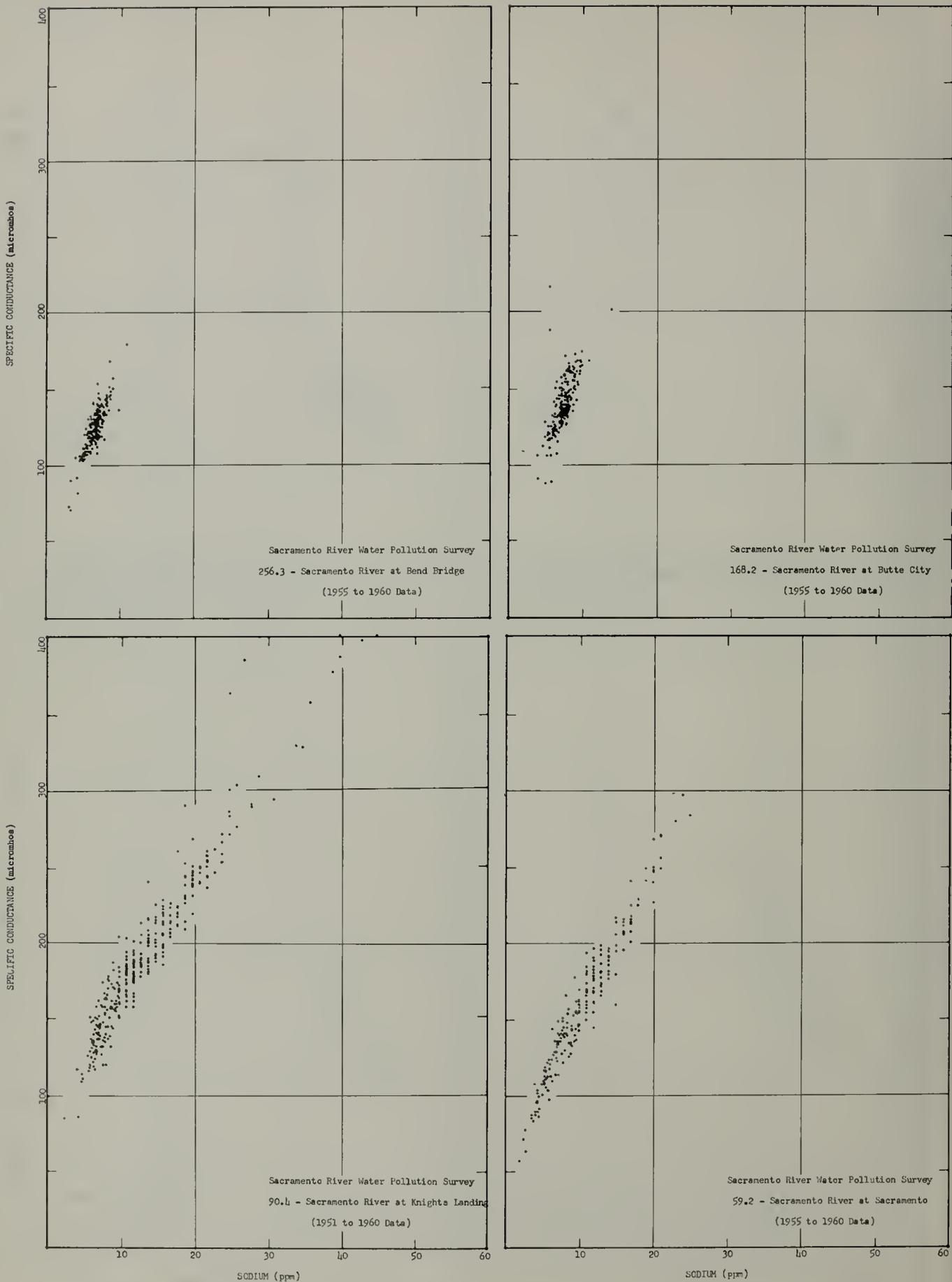


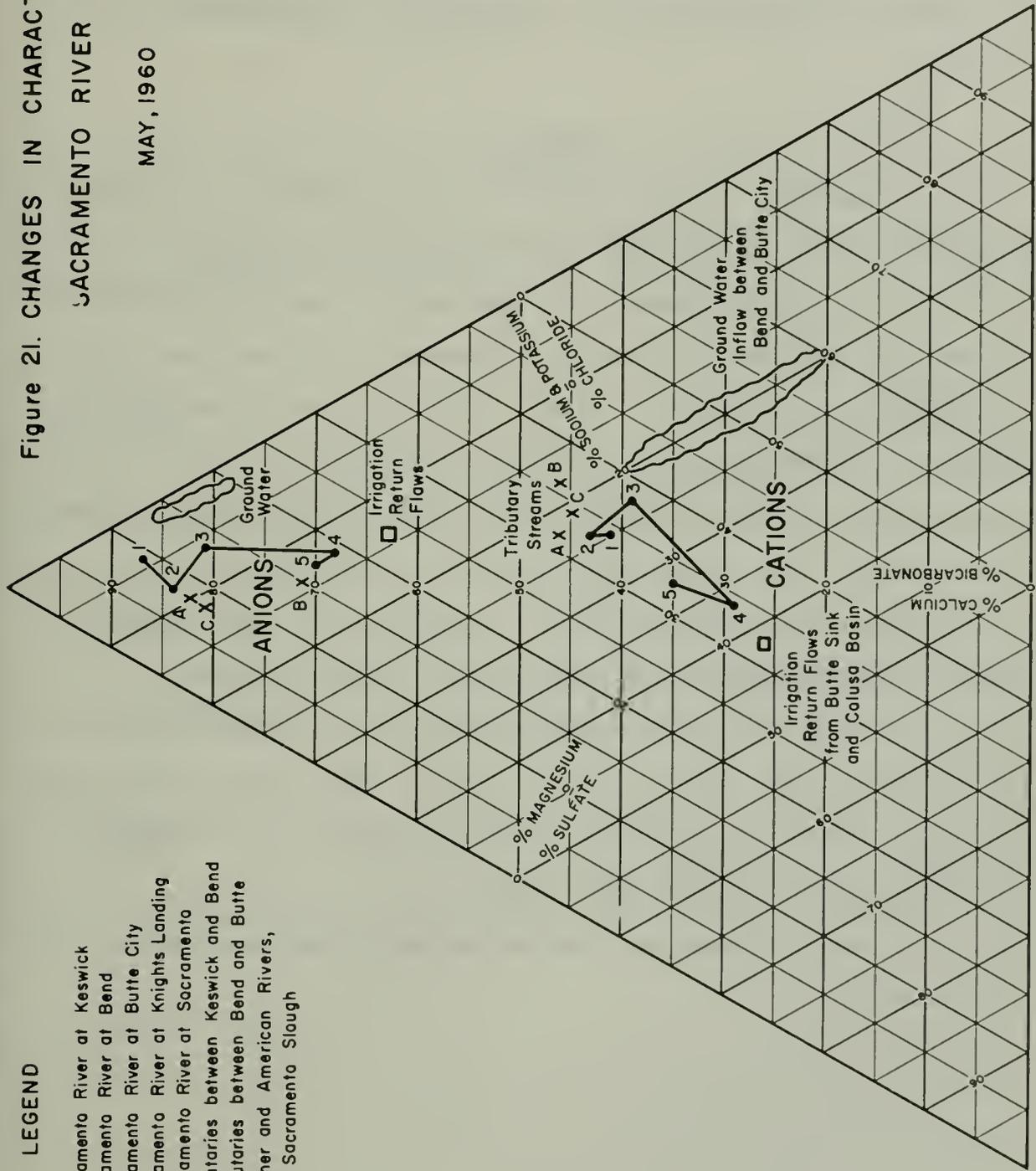
Figure 20. CORRELATION OF SPECIFIC CONDUCTANCE AND SODIUM

LEGEND

- 1-Sacramento River at Keswick
- 2-Sacramento River at Bend
- 3-Sacramento River at Butte City
- 4-Sacramento River at Knights Landing
- 5-Sacramento River at Sacramento
- A-Tributaries between Keswick and Bend
- B-Tributaries between Bend and Butte
- C-Feather and American Rivers, and Sacramento Slough

Figure 2I. CHANGES IN CHARACTER OF SACRAMENTO RIVER WATER

MAY, 1960



and, on the trilinear plot, the point representing the river moves toward a point representing a tributary. Figure 21 shows graphically that the river is the sum of its parts. This feature is demonstrated analytically in Chapter VI in connection with a discussion of requirements for basic data.

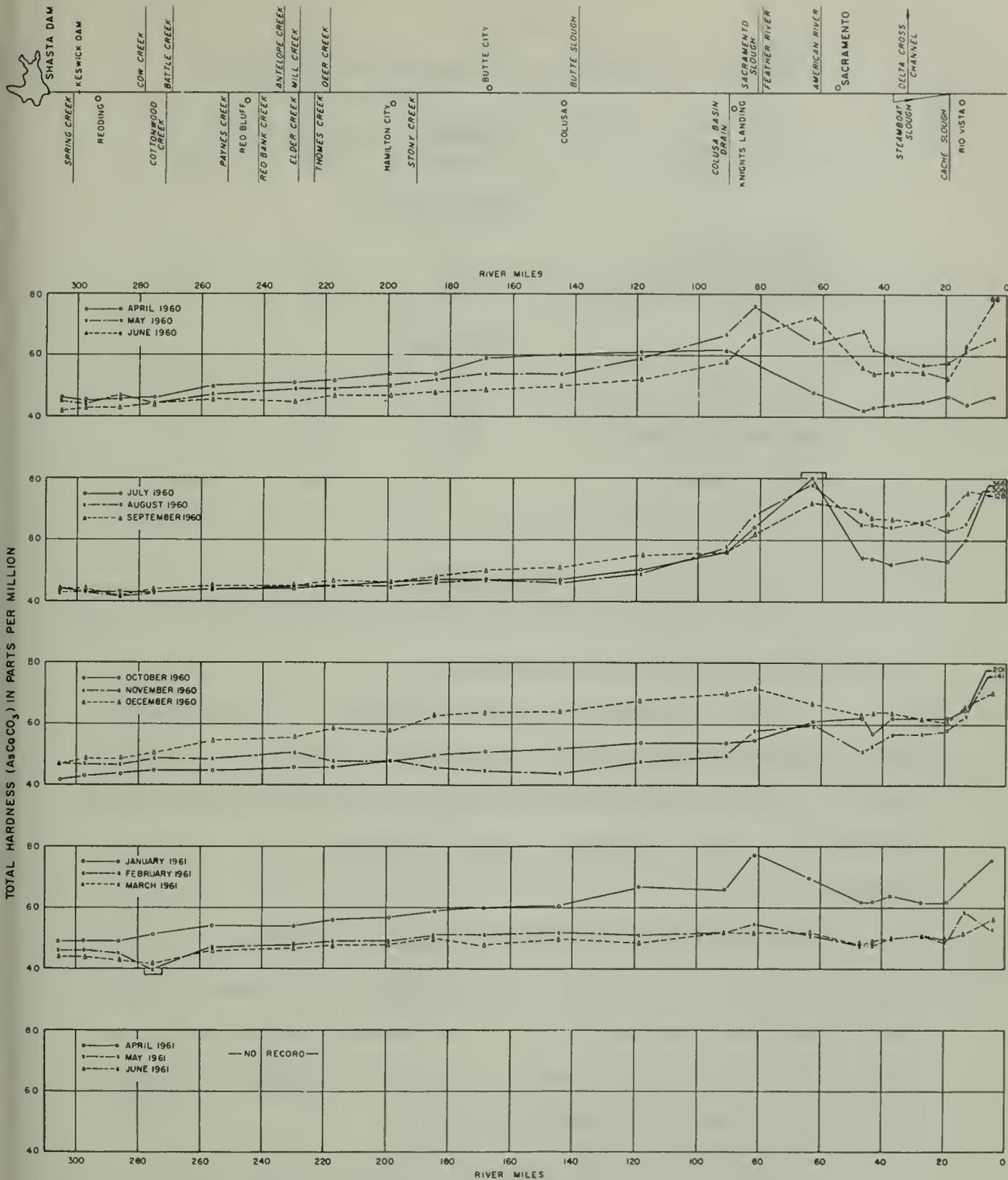
### Hardness

Variations of total hardness in the Sacramento River during 1960-61 are shown on Figure 22. Water in the river is generally soft.

Noncarbonate hardness was consistently found only at Mayberry Slough (mile 4.0) where values varied seasonally from less than 10 ppm during most of the year to as much as 300 ppm between July and October. From 1 to 4 ppm were found at Rio Vista or Clarksburg on three occasions. Spring Creek generally contained about 60 ppm, Sacramento Slough showed about 20 and 75 ppm on two occasions and 1 or 2 ppm were generally reported for the Feather and American Rivers. Accordingly, the term hardness in the following paragraphs will refer only to carbonate hardness.

Figure 22 shows that hardness generally increases from 40 - 50 ppm below Shasta to 50 - 60 ppm at Colusa. Below Colusa, the seasonal effects of irrigation returns are apparent. Hardness was reduced by American River and Feather River flows.

Table 17 summarizes observations made during the present investigation:



SACRAMENTO RIVER WATER POLLUTION SURVEY  
 Figure 22. TOTAL HARDNESS—SACRAMENTO RIVER  
 1960-1961

Table 17

## HARDNESS IN SACRAMENTO RIVER AND TRIBUTARIES, 1960-61

Station	: Maximum : ppm	: Minimum : ppm	: Median : ppm
<u>Sacramento River</u>			
Redding (297.7)	49	42	44
Hamilton City (199.6)	58	46	48
Snodgrass Slough (37.2)	67	44	59
<u>Tributaries</u>			
Butte Slough	163	86	128
Colusa Basin Drain	296	100	136
Sacramento Slough	281	132	174
Feather River	61	31	49
American River	30	18	24

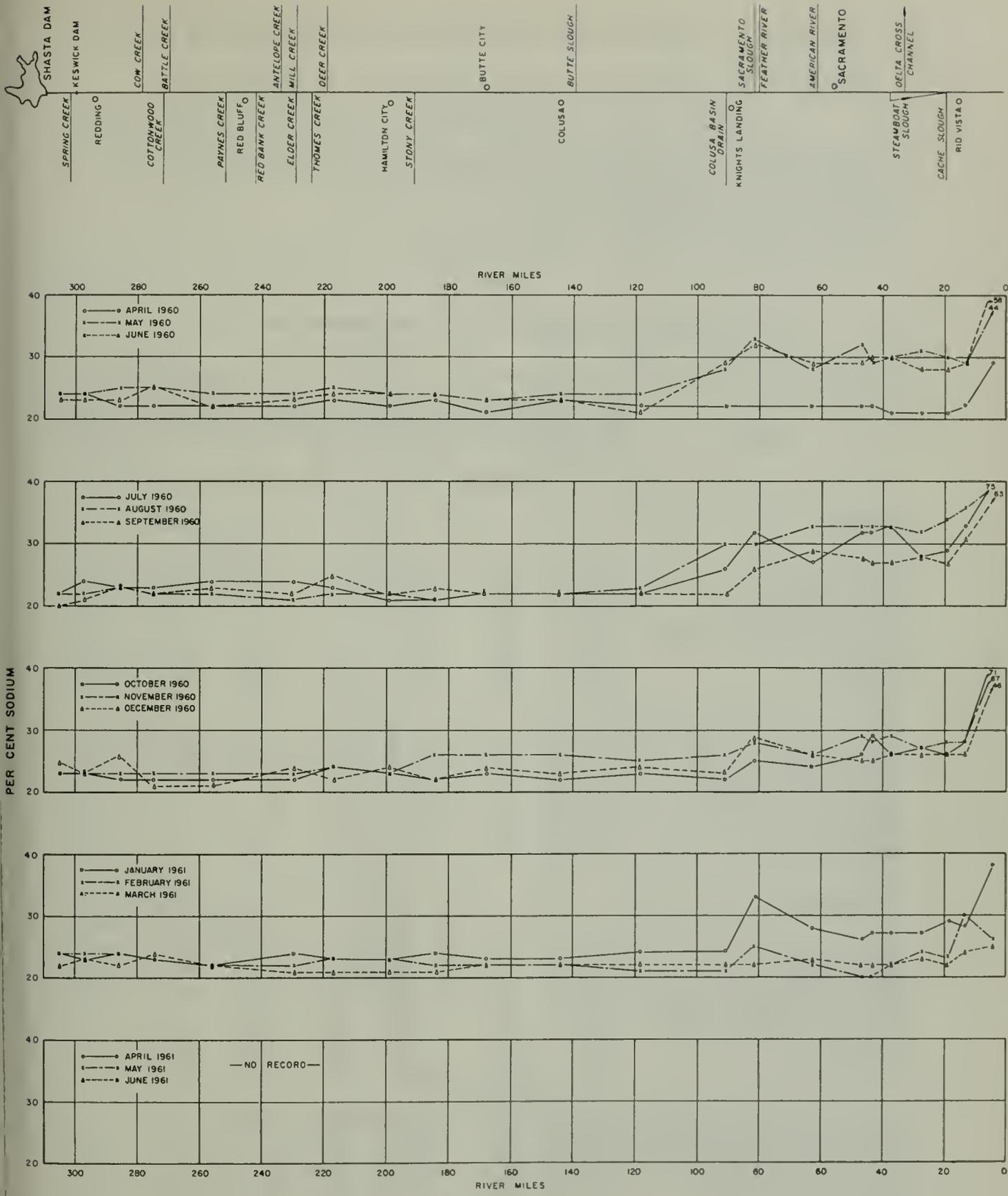
Major Cations

Table 18 summarizes the 1960-61 concentrations of major cations in the Sacramento River and tributaries.

Calcium and magnesium increased throughout the year between Keswick and Butte City because of the effects of influent ground water and several small tributaries, particularly Cottonwood Creek. From August through October 1960, calcium increases below Wilkins Slough were due to irrigation returns.

Sodium generally increased throughout the length of the river. Irrigation return flows between Wilkins Slough and Sacramento caused a significant rise in sodium concentrations. Waters from the Feather and American Rivers reduced the concentrations below Sacramento. Potassium concentrations remained essentially constant.

Figure 23 shows that increases in percent sodium occurred throughout the river below Butte Slough during all but the winter months. The



SACRAMENTO RIVER WATER POLLUTION SURVEY  
 Figure 23. PER CENT SODIUM—SACRAMENTO RIVER

high values at the lower end of the river are due to incursion of tidal waters.

Cation concentrations and percent sodium in river waters down to Rio Vista were within various limiting criteria for beneficial use discussed in Chapter III.

Table 18

MAJOR CATIONS IN SACRAMENTO RIVER AND TRIBUTARIES, 1960-61

Station	River Mile	April 1960 - March 1961				Aug., Sept. and Oct. 1960	
		Number of Samples	Weighted Average ppm	Maxi- mum ppm	Mini- mum ppm	Number of Samples	Weighted Average ppm
<u>Calcium</u>							
Keswick	305.7	24	10.3	12	9.6	6	10.4
Butte Slough	168.2	65	11.9	15	7.9	15	11.4
Wilkins Slough	118.1	28	12.3	15	10	6	12.0
Above Sacramento Slough	81.5	12	12.7	5	12	3	13.0
Bryte	62.6	52	12.5	17	5.7	13	14.7
Freeport	46.4	60	12.5	17	8.8	14	14.2
Rio Vista	12.8	40	12.4	15	9.9	11	14.3
Butte Slough	138.9L	10	20.9	48	14	3	26.9
Reclamation District 108	100.1R	57	24.2	43	21	24	26.3
Colusa Basin Drain	90.2R	12	23.7	48	20	3	24.6
Sacramento Slough	80.8L	23	29.7	50	24	6	31.1
Feather River	79.9L	12	9.5	14	7.7	3	13.5
American River	60.4L	12	9.8	12	5.5	3	6.1
<u>Magnesium</u>							
Keswick	305.7	24	4.6	5.4	2.9	9	4.4
Butte City	168.2	65	5.8	8.5	4.1	15	5.4
Wilkins Slough	118.1	28	5.3	8.5	4.6	6	5.5
Above Sacramento Slough	81.5	12	6.6	9.4	5.4	3	6.8
Bryte	62.6	52	7.4	12	3.2	13	9.3
Freeport	46.4	60	6.9	11	4.2	14	8.1
Rio Vista	12.8	40	7.2	10	4.7	11	8.2
Butte Slough	138.9L	10	13.3	20	6.6	3	16.9
Reclamation District 108	100.1R	57	22.2	48	17	24	23.9
Colusa Basin Drain	90.2R	12	17.2	43	12	3	18.0
Sacramento Slough	80.8L	23	20.8	38	15	6	23.7
Feather River	79.9L	12	4.0	6.9	2.8	3	6.0
American River	60.4L	12	9.7	5.4	0.8	3	1.0

Table 18

MAJOR CATIONS IN SACRAMENTO RIVER AND TRIBUTARIES, 1960-61  
(continued)

Station	: River : Mile	: April 1960 - March 1961				: Aug., Sept. : and Oct. 1960	
		: Number : of : Samples	: Weighted : Average : ppm	: Maxi- : mum : ppm	: Mini- : mum : ppm	: Number : of : Samples	: Weighted : Average : ppm
<u>Sodium</u>							
Keswick	305.7	24	6.5	7.7	5.4	6	6.0
Butte City	168.2	65	7.4	9.8	6.0	15	7.3
Wilkins Slough	118.1	28	8.1	10	6.3	10	8.7
Above Sacramento Slough	81.5	12	10.9	18	7.0	3	11.1
Bryte	62.6	52	10.4	24	5.4	13	16.2
Freeport	46.4	60	10.8	20	5.7	16	14.5
Rio Vista	12.8	40	11.6	19	5.9	11	14.4
Butte Slough	138.9L	10	16.5	26	9.0	3	21.0
Reclamation District 108	100.1R	57	177	196	40	24	70.3
Colusa Basin Drain	90.2R	12	53.5	172	44	3	46.5
Sacramento Slough	80.8L	23	24.8	82	8.6	6	41.5
Feather River	79.9L	12	3.6	7.4	2.7	3	6.0
American River	60.4L	12	4.0	7.4	1.6	3	2.6
<u>Potassium</u>							
Keswick	305.7	24	1.3	1.6	0.8	9	1.1
Butte City	168.2	65	1.4	2.1	0.9	15	1.3
Wilkins Slough	118.1	28	1.4	1.7	1.1	6	1.4
Above Sacramento Slough	81.5	12	1.3	1.8	1.0	3	1.3
Bryte	62.6	52	1.4	1.8	0.9	13	1.5
Freeport	46.4	60	1.2	1.6	0.5	14	1.3
Rio Vista	12.8	40	1.4	1.8	1.0	11	1.4
Butte Slough	138.9L	10	2.1	3.2	1.1	3	2.2
Reclamation District 108	100.1R	57	1.5	2.5	1.0	24	1.7
Colusa Basin Drain	90.2R	12	2.1	6.0	1.3	3	1.7
Sacramento Slough	80.8L	23	1.6	2.8	0.9	6	1.5
Feather River	79.9L	12	0.8	1.6	0.6	3	1.5
American River	60.4L	12	0.9	1.1	0.6	3	0.9

Major Anions

Average concentrations of bicarbonate, sulfate, and chloride  
in the Sacramento River and its tributaries in 1960-61 are listed in

Table 19. Figures 24 and 25 show variations in bicarbonate and chloride concentrations, respectively, in the river during the same period.

The effects of natural tributary streams, seasonal discharges of irrigation return flows, and tidal waters upon the major anion concentrations are consistent with the effects upon the cations discussed above. Similarly, anion concentrations of river waters meet the criteria for various beneficial uses.

Table 19  
MAJOR ANIONS IN SACRAMENTO RIVER AND TRIBUTARIES, 1960-61

Station	: River : Mile :	: April 1960 - March 1961			: Aug., Sept. : and Oct. 1960		
		: Number : : of : : Samples:	: Average : : ppm	: Maxi- : : mum : : ppm	: Mini- : : mum : : ppm	: Number : : of : : Samples:	: Average : : ppm
<u>Bicarbonate</u>							
Keswick	305.7	23	64.6	106	59	6	61.5
Butte City	168.2	64	69.6	102	57	15	69.4
Below Wilkins Slough	118.1	16	70.8	90	60	4	74.1
Above Sacramento Slough	81.5	11	78.7	100	67	3	86.1
Bryte	62.6	57	76.0	111	42	15	89.6
Freeport	46.4	57	74.7	115	43	16	90.4
Rio Vista	12.8	28	74.7	107	54	9	92.7
Cottonwood Creek	272.4R	12	110.0	145	94	3	98.7
Mill Creek	229.0L	12	47.4	94	34	3	69.7
Stony Creek	135.1R	6	135.1	170	126	-	- no flow -
Butte Slough	138.9L	9	148.9	243	126	3	199.5
R. D. 108 Drain	100.1R	9	203.6	403	160	3	238.0
Colusa Basin Drain	90.7R	10	173.5	308	129	3	188.0
Sacramento Slough	80.8L	21	172.8	272	77	6	233.5
Feather River	79.9L	12	50.9	81	40	3	78.5
American River	60.4L	12	33.3	37	24	3	25.0
<u>Sulfate</u>							
Keswick	305.7	12	3.6	5.1	1.8	3	3.0
Butte City	168.2	52	5.9	15	3.1	12	5.1
Below Wilkins Slough	118.1	16	5.9	8.4	3.1	4	4.8
Above Sacramento Slough	81.5	11	9.9	20	4.9	3	9.0
Bryte	62.6	53	9.2	23	4.6	15	10.8
Freeport	46.4	46	9.0	16	3.0	10	10.1
Rio Vista	12.8	28	11.0	14	5.4	9	9.8

Table 19

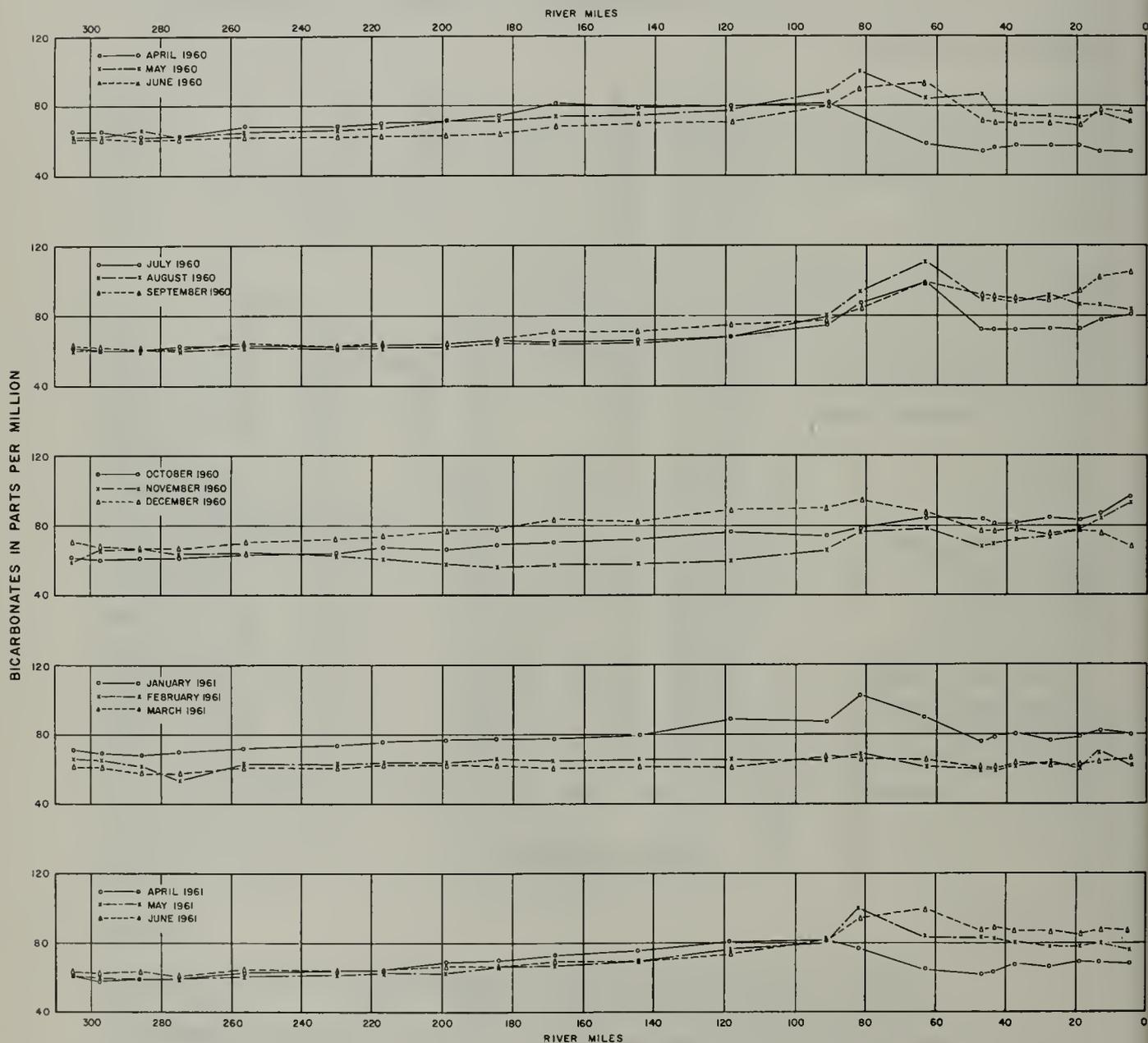
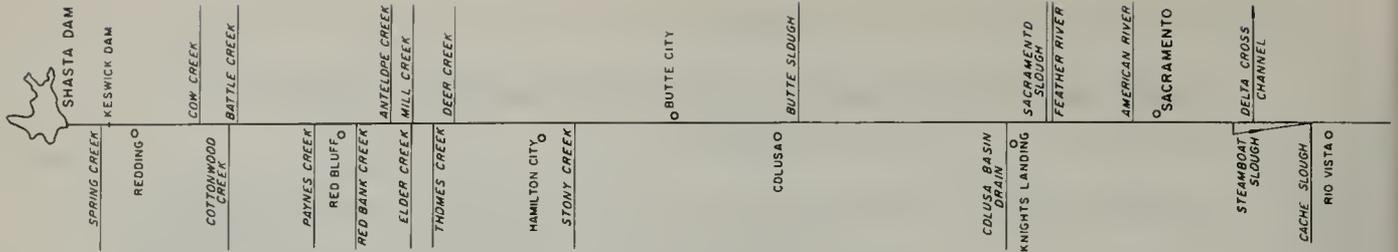
MAJOR ANIONS IN SACRAMENTO RIVER AND TRIBUTARIES, 1960-61  
(continued)

Station	River Mile	April 1960 - March 1961				Aug., Sept. and Oct. 1960	
		Number of Samples	Average ppm	Maxi- mum ppm	Mini- mum ppm	Number of Samples	Average ppm
<u>Sulfate (continued)</u>							
Butte Slough	138.9L	9	7.5	11	4.1	3	6.1
Reclamation District 108	100.1R	8	84.7	210	57	3	89.3
Colusa Basin Drain	90.7R	10	63.1	177	46	3	47.3
Sacramento Slough	80.8L	10	11.7	17	6.1	3	11.8
Feather River	79.9L	12	3.7	6.1	1.6	3	3.7
American River	60.4L	12	1.7	2.8	0.8	3	1.9
<u>Chloride</u>							
Keswick	305.7	23	2.8	5.5	1.5	6	2.3
Butte City	168.2	63	3.6	6.8	0.7	11	3.0
Below Wilkins Slough	118.1	28	4.0	10	2.4	9	3.1
Above Sacramento Slough	81.5	11	6.0	10	3.9	3	5.5
Bryte	62.6	64	7.1	18	2.4	15	9.7
Freeport	46.4	56	7.7	13	3.5	16	10.0
Rio Vista	12.8	54	8.5	12	4.4	9	10.2
Cottonwood Creek	272.4R	12	5.9		3.2	3	4.5
Mill Creek	229.0L	12	9.0		5.0	3	24.5
Stony Creek	135.1R	6	17.9		16	- no flow -	
Butte Slough	138.9L	9	11.5		6.4	3	9.0
R. D. 108 Drain	100.1R	56	36.6		19	24	36.0
Colusa Basin Drain	90.7R	10	28.1		22	3	24.9
Sacramento Slough	80.8L	21	24.1		5.0	6	32.8
Feather River	79.9L	12	1.7		1.2	3	2.0
American River	60.4L	12	3.1		1.1	3	1.6

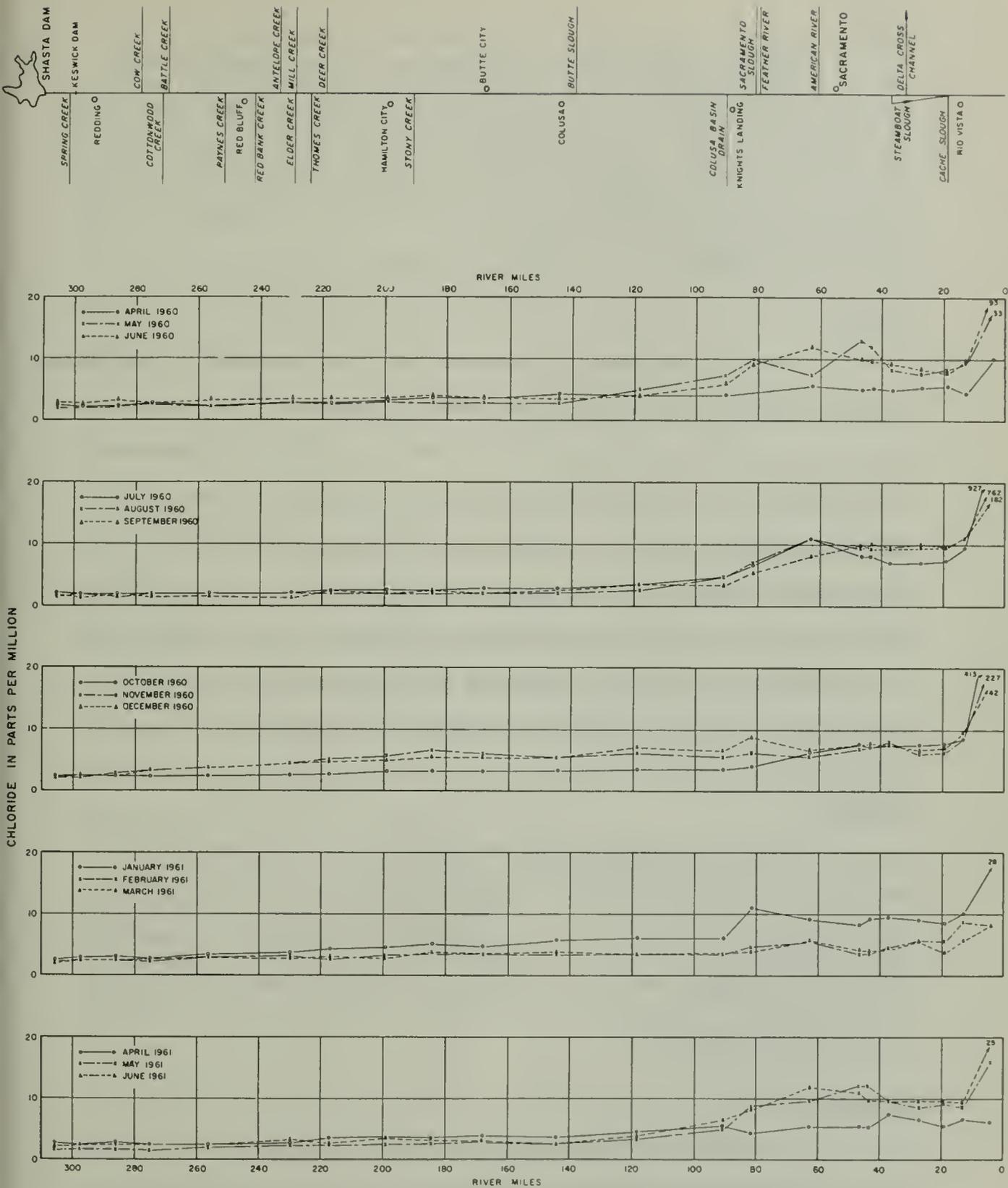
Minor Constituents

Fluoride

Fluoride concentrations in the Sacramento River during 1960-61 varied from 0.0 to 0.3 ppm and were accordingly well within the maximum levels specified by the California Department of Public Health (Chapter III).



SACRAMENTO RIVER WATER POLLUTION SURVEY  
 Figure 24. BICARBONATES — SACRAMENTO RIVER  
 1960-1961



SACRAMENTO RIVER WATER POLLUTION SURVEY  
 Figure 25. CHLORIDE — SACRAMENTO RIVER  
 1960-1961

### Silica

Median concentrations of silica in the river ranged from 24 ppm above Redding (mile 297.7) to 20 ppm at Snodgrass Slough (mile 37.2) during 1960-61. The decrease reflected the lower concentrations in irrigation returns and tributary flows, particularly the American River with an average concentration of about 10 ppm.

### Boron

Boron concentrations throughout the river averaged 0.1 ppm during 1961-62. Irrigation drainage showed somewhat higher content, especially return waters from Reclamation Districts No. 70, 108, and 787 with concentrations of a few tenths of a part per million where connate ground water is considered the most likely source of the boron (see Part 3, Appendix A). Water in the Natomas East Main Drain, which receives irrigation, domestic, and industrial wastes, averaged 0.4 ppm. All of the river water and most of the irrigation return waters had boron concentrations within the limits for Class 1 irrigation supply water.

### Phosphate

Both orthophosphate and total phosphate concentrations were determined and reported as  $PO_4$ . Total phosphate was generally 0.1 ppm above Sacramento and from 0.2 to 0.4 ppm below Sacramento. Essentially all of the phosphate was in the ortho form, although some polyphosphate occurred below Sacramento.

### Nitrogen

Concentrations of ammonium, nitrite, and nitrate ions and of organic nitrogen were determined throughout the river during the survey period.

Median values of ammonium were 0.0 ppm above Sacramento, about 0.05 ppm from Sacramento to Walnut Grove, and 0.1 ppm from Walnut Grove to Rio Vista. Maximum concentration of from 0.3 to 0.8 ppm occurred in the upper reach in October 1960. Below Butte City, maxima of 0.2 or 0.3 ppm were found at various times of the year. Concentrations in irrigation drainage from Butte Slough, Colusa Basin Drain, and Sacramento Slough averaged about 0.1 ppm. Ammonium was almost always absent in Feather and American River waters.

Nitrite was found rarely, and then in concentrations of 0.01 or 0.02 ppm.

Nitrate concentrations were generally between 0.5 and 1.0 ppm with a tendency for the higher values in the river below Sacramento and in irrigation drainage. The lowest concentrations, which averaged 0.2 and 0.3 ppm, were found in the Feather and American Rivers, respectively.

Organic nitrogen in the river averaged about 0.1 ppm above Sacramento and between 0.1 and 0.2 below Sacramento. Irrigation drainage typically contained 0.2 and 0.5 ppm organic nitrogen. About 0.1 ppm was found in the Feather and American Rivers.

The months of June, August, and September 1960 and January and February 1961, were arbitrarily selected to compare summer and winter nitrogen relationships. Total nitrogen in the river during both seasons generally varied from 0.1 to 0.4 ppm above Sacramento and from 0.35 to 0.55 ppm below Sacramento. Inorganic nitrogen was relatively constant while organic nitrogen concentrations approximately followed the plankton populations. Inorganic nitrogen to phosphorus ratios showed a wide variation with typical summer values of 6:1 and 2:1 above and below Sacramento, respectively. Comparable winter figures are 4:1 and 3:1.

## Heavy Metals

Concentrations of heavy metals in the Sacramento River found since 1952 in the department's surface water quality monitoring program have varied rather markedly but within the limiting U. S. Public Health Service standards for drinking water (see Chapter III).

However, toxic metals in acid mine wastes from Spring Creek (mile 302.3R) have long been suspected of contributing to fish mortality in the river during the winter when high flows occur in the creek and minimum flows are being released from Shasta Dam (1). In order that this threat be removed from the river, a dam has been constructed by the Bureau of Reclamation about one-half mile from the mouth of the creek. When filled, in 1962-63, Spring Creek Reservoir will hold 6,500 acre-feet of water which can be released at rates which will provide for adequate dilution by flows in the Sacramento River.

During the present investigation, concentrations of heavy metals were determined monthly on Spring Creek and on the upper reach of the river. The results of the determinations are compared with historical data in Table 20.

Table 20

## HEAVY METALS IN THE UPPER SACRAMENTO RIVER AND IN SPRING CREEK

Constituent	Sacramento River*			Spring Creek	
	Maximum	Maximum	Median	Maximum	Median
	(1952-60)	(1960-61)	(1960-61)	(1960-61)	(1960-61)
Iron (Total)	----	----	----	438	---
Iron (Dissolved)	0.34	0.80	0.05	308	116
Aluminum	0.31	0.49	0.0	133	33
Arsenic	0.01	0.04	0.00	0.32	0.00
Chromium (Hexavalent)	0.1	0.1	0.00	0.00	---
Chromium (Total)	----	----	----	0.04	---
Copper	0.07	0.13	0.00	15	3.4
Lead	0.09	0.03	0.00	0.66	0.03
Manganese	0.01	0.29	0.00	2.6	0.79
Zinc	0.09	0.10	0.2	136	26

\* Redding to Bend Bridge.

Table 20 shows the effects of Spring Creek upon heavy metals in the river. Concentrations in the creek begin to increase in late spring or early summer, remain at a high level for about five months, and then decrease rapidly when winter rains begin. Large quantities of heavy metals are typically discharged to the river during the first rains of the winter season (1). Concentrations of heavy metals in the river in part reflect Spring Creek but mostly they show variations caused by operation of Shasta Dam. The effects of Spring Creek, although they are small, extend for at least 46 miles.

## Detergents

Analyses for alkylbenzenesulfonate (ABS) detergents in waste discharges to the Sacramento River are summarized in Table 21.

Table 21

### CONCENTRATIONS OF ABS IN WASTE DISCHARGES TO SACRAMENTO RIVER, 1960-61

Waste Discharge	: No. of : :Analyses:	: Median : (ppm) :	: Range (ppm)
Redding Sewage Treatment Plant	33	5	1.7 - 8.9
Red Bluff Sewage Treatment Plant	33	5.4	2.0 - 8.8
West Sacramento Sewage Treatment Plant	36	8.2	4.8 - 15
Sacramento Sewage Treatment Plant	16	4.0	2.0 - 8.0
Meadowview Sewage Treatment Plant	4	14.0	10 - 24
Isleton Sewage Treatment Plant	19	4.8	0.2 - 5.9
Rio Vista Sewage Treatment Plant	21	6.1	0.1 - 14.0
American Crystal Sugar Company	16	0.2	0.1 - 0.6

ABS concentrations in the river were determined throughout the year on the monthly program and during the first upper reach and first and second lower reach intensive sampling program.

One-tenth ppm ABS was found in the river downstream from the Redding Sewage Treatment Plant discharge about six percent of the time. Downstream from the Sacramento Sewage Treatment Plant (mile 54.11), 0.1 ppm occurred about half the time at Freeport (mile 46.4) and about one fifth the time at Rio Vista (mile 12.5). Detergent was reported about 65 percent of the time at Mayberry Slough (mile 4.0) where concentrations of 0.3 ppm were reported on five occasions, but the lack of significant sources in this area suggest that there was some interference with the test.

## Miscellaneous Organic Materials

The occurrence of organic material collected by the carbon adsorption method is discussed in Chapter VIII, Appendix C.

Ether solubles generally ranged from zero to five ppm throughout the river with no marked seasonal or geographic trends. The consistently high values found in June 1960 throughout the river and in the discharges are anomalous and may be due to contamination of the sampling equipment or to analytical error.

Of 292 monthly determinations of phenols in the river, 256 were reported as zero parts per billion (ppb) and 20 were reported as 1 ppb. From 2 to 4 ppb were found in 13 samples with no apparent seasonal or geographical trends. Ten ppb were reported for April 1960 at Clarksburg (mile 43.4) and Walnut Grove (mile 27.4) and for May 1960 at Snodgrass Slough (mile 37.2).

Three samples were analyzed for hydroxylated aromatic compounds by the tannin and lignin method. At Redding (mile 297.7), 0.0 and 0.1 ppm were reported for December 7 and 13, 1960, respectively. Below Red Bluff (mile 241.0), 0.1 ppm was found in December 8, 1960.



## CHAPTER V. OXYGEN RELATIONSHIPS

The level of the dissolved oxygen concentration in a stream is one of the indications of its suitability for use. Dissolved oxygen contributes to the potability of a domestic supply and it assists in stabilization of organic material with the result that the water is pleasing to look at, sustains desirable fish and aquatic life, and promotes recreational activities. Discharges of organic wastes and certain chemical pollutants lower the dissolved oxygen levels in streams. The Sacramento River provides for multiple uses and maintenance of adequate concentrations of dissolved oxygen is according essential.

### Sources of Pollution

The locations of waste discharges are shown on Plate 1. Part 3, Appendix A contains a discussion of municipal, industrial, and agricultural discharges and presents, for each discharge, the types of waste received, type and size of facility, quantity and quality of discharge, and, where applicable, population and area served.

The following paragraphs deal with the flows and organic loadings discharged by the various facilities to the Sacramento River.

### Municipal Wastes

Table 22 summarizes the flows and 5-day biochemical oxygen demand (BOD) loadings from the eight sewage treatment plants that discharged directly into the Sacramento River. The 1-day figures were obtained during the monthly sampling program and 4-day averages are for the periods of the intensive sampling surveys.

Table 22

BOD LOADINGS FROM MUNICIPAL SEWAGE TREATMENT PLANTS DISCHARGING TO THE SACRAMENTO RIVER  
1960-61

	Red Bluff			Corning			West Sacramento			Sacramento			Meadowview			Tuleton			Rio Vista				
	Flow	BOD	BOD	Flow	BOD	BOD	Flow	BOD	BOD	Flow	BOD	BOD	Flow	BOD	BOD	Flow	BOD	BOD	Flow	BOD	BOD		
	in ppm	lb/day	lb/day	in ppm	lb/day	lb/day	in ppm	lb/day	lb/day	in ppm	lb/day	lb/day	in ppm	lb/day	lb/day	in ppm	lb/day	lb/day	in ppm	lb/day	lb/day		
	MGD	lb/day	MGD	lb/day	MGD	lb/day	MGD	lb/day	MGD	lb/day	MGD	lb/day	MGD	lb/day	MGD	lb/day	MGD	lb/day	MGD	lb/day	MGD	lb/day	
Apr. 1-day 1.2	167	1,671	0.9	141	1,058					1.54	128	1,644	48.9	126	51,386								
month 1.5		0.9			0.25 <sup>c</sup>					1.62	46.3	126	48,654	0.2-0.3 <sup>c</sup>							0.13		0.18
May 1-day 1.2	168	1,681	0.95	150	1,188					1.6	117	1,561	49.4	174	71,687								
month 1.6		0.9			0.25 <sup>c</sup>					1.62	47.0	111.8	46,254	0.2-0.3 <sup>c</sup>							0.13		0.19
June 1-day 6-10	169	1,685	1.51	84	1,152					2.15	154	2,717	55.36	89	41,140								
20-24										1.96	53.7	94	42,099	0.2-0.3 <sup>c</sup>	144	300					0.13	60	65
month 1.9		1.2			d					2.06	85	1,460	61.3	92	47,034								
July 1-day 1.72	96	1,377	1.23	76	780					2.00			43,368	0.2-0.3 <sup>c</sup>							0.13		0.34
month 1.9		1.2			d					1.76	70	1,027	41.3	104	35,822								
Aug. 1-day 1.72	100	1,434	1.25	150	1,564					2.01	116	1,970	68.46	179	99,135								
8/29-9/2										1.87			60.2	166	83,343	0.2-0.3 <sup>c</sup>	108	225			0.13	64	69
month 1.7		1.2			d					1.79	95	1,418	53.6	99	44,255								
Sep. 1-day 1.56	98	1,275	1.02	83	706					1.91			65.3	199	108,376	0.2-0.3 <sup>c</sup>					0.13		0.27
12-16										1.80	152	2,282	57.88	146	70,477								
month 1.5		1.1			d					2.03	146	2,182	53.94	146	65,000								
Oct. 1-day 2.11	106	1,865	1.03	142	1,220					1.71			54.5	159	72,270	0.2-0.3 <sup>c</sup>	169	352			0.12	87	87
3-7										1.67	145	2,020	50.00	164	68,388								
24-28										1.63			45.9	161	61,632	0.2-0.3 <sup>c</sup>					0.12		0.20
month 1.2		1.0			0.25 <sup>c</sup>					1.58			43.20	168	60,528	0.2-0.3 <sup>c</sup>					0.15		0.17
Nov. 1-day 1.49	150	1,864	1.17	102	995					1.6	194	2,589	44.1	186	68,410								
month 1.4		1.0			0.25 <sup>c</sup>					1.61			41.8	124	43,228	0.2-0.3 <sup>c</sup>					0.15		0.13
Dec. 1-day 1.62	138	1,853	1.13	109	1,027					1.62	166	2,243	41.37	193	66,590								
month 2.8		1.1			0.25 <sup>c</sup>					1.49			44.1	123	45,239	0.2-0.3 <sup>c</sup>					0.15		0.15
Jan. 1-day 2.34	164	3,201	0.98	166	1,357					1.53	197	2,514	51.4	176	75,447								
month 1.8		1.0			0.25 <sup>c</sup>					1.60			45.5	162	61,474	0.2-0.3 <sup>c</sup>					0.13		0.17
Feb. 1-day 4.20	63	2,207	1.29	140	1,506					1.62	202	2,729	51.6	192	82,686								
month 3.4		1.2			0.25 <sup>c</sup>					1.60			49.8	139	57,731	0.2-0.3 <sup>c</sup>					0.13		0.17
Mar. 1-day 2.74	124	2,834	1.21	134	1,352					1.71	211	3,009	52.7	186	81,750								
month 2.6		1.0			0.25 <sup>c</sup>					1.60			48.4	127	51,264	0.2-0.3 <sup>c</sup>					0.13		0.19
Apr. 1-day 1.91	323	5,145	1.00	179	1,493					2.00	163	2,719	61.7	146	75,128								
month 2.0		1.0			0.25 <sup>c</sup>					1.92			55.8		0.2-0.3 <sup>c</sup>						0.13		0.28
May 1-day 1.73	127	1,832	1.02	169	1,438					1.53	70	1,027	41.3	89	35,822								
8-12										1.49			41.0	94	42,099								
month					d					2.15	211	3,009	68.46	193	99,135						0.12		0.13
June 1-day 1.37	175	2,000	0.98	148	1,210					2.00			65.3	199	108,376								
month										1.77	148	2,148	52.13	151	64,988						0.15		0.34
July 1-day 1.2	63	1,275	0.9	76	706					1.77	148	2,148	52.13	151	64,988								
month 1.2		0.9								1.77	148	2,148	52.13	151	64,988								
Aug. 1-day 4.20	323	5,145	1.51	179	1,564					1.77	148	2,148	52.13	151	64,988								
month 3.4		1.2								1.77	148	2,148	52.13	151	64,988								
Average	1.87	139	2,092	1.11	130	1,193				1.77	148	2,148	52.13	151	64,988								

NOTE: a - Figure derived from either monthly sampling program or 4-day intensive sampling program data.  
b - Figure developed from both monthly and intensive data and adopted as best value.  
c - Estimated flow.  
d - Discharge to land irrigation.  
e - Daily values computed from BOD analysis of composite samples and average flow for composite period; intensive values computed from average of BOD analyses on grab samples and each hourly flow throughout four-day period.

In general, the daily discharges of BOD from each plant varied from 50 to 150 percent of the overall average and the total highest loading on the river occurred during the late summer and early fall.

Figure 26 presents diurnal variations in hourly BOD loadings from the four largest sewage plants. The ratios of maximum and minimum hourly loadings varied from about 12:1 at Red Bluff to 1.5:1 at Sacramento, indicating the inverse relationship of the variations to the size of the plant.

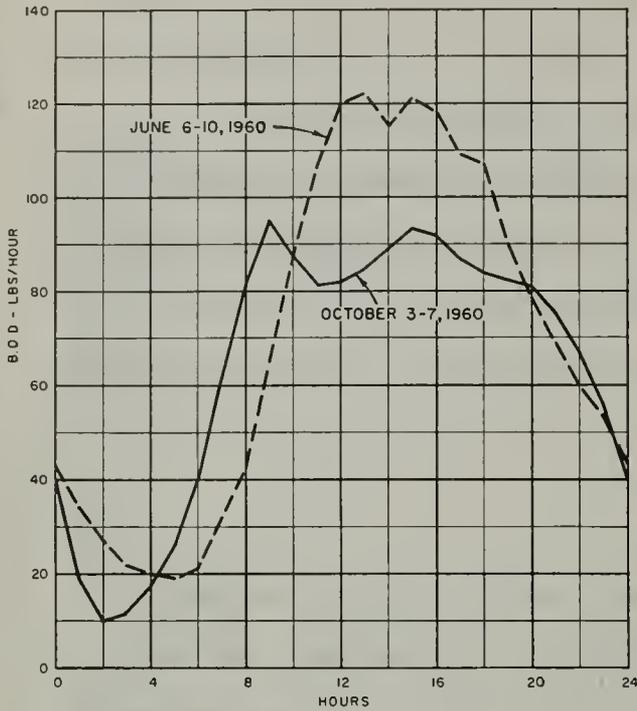
### Industrial Wastes

Most of the industrial wastes produced along the Sacramento River are discharged to community sewerage systems and cause the large seasonal loadings to the river. There are only two significant industries which discharge directly to the river.

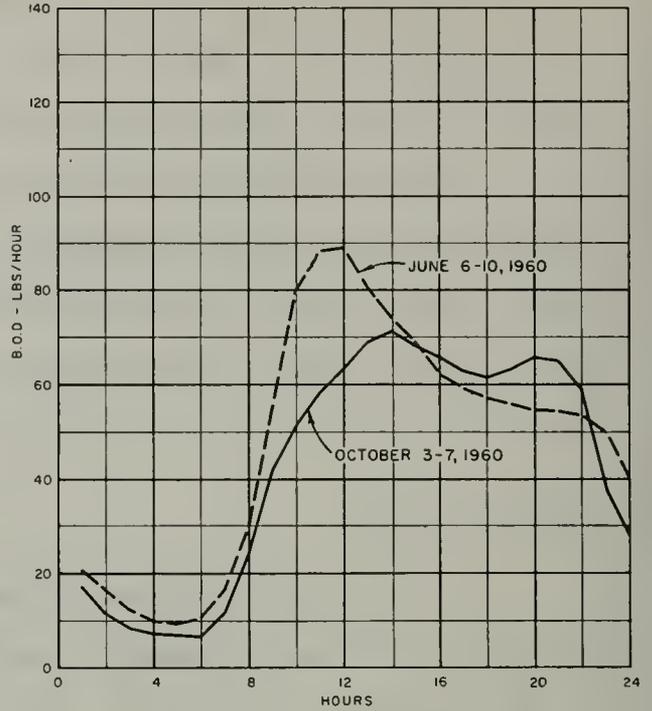
The Diamond National Corporation, producer of molded paper products, is located two miles south of the City of Red Bluff. Waste water discharged from the plant comes from a 26-acre log pond and a double baffled three-chamber settling pond. All of the wastes eventually reach Red Bank Creek which enters the river at mile 241.9R. The monthly sampling of Red Bank Creek showed variations in BOD of from 4 to 107 ppm and in flow of from 0.6 to 12 MGD. The average organic loading was 925 pounds per day and the maximum was 2,200 pounds per day in April 1960.

The American Crystal Sugar Company beet sugar processing plant discharges wastes from a 5-acre pond into the river at mile 43.3R. Monthly sampling indicated an average flow of 3.27 MGD, an average BOD of 438 ppm, and an average of 11,960 pounds per day of BOD discharged into the river during the period of operation from August 9 to December 1, 1960.

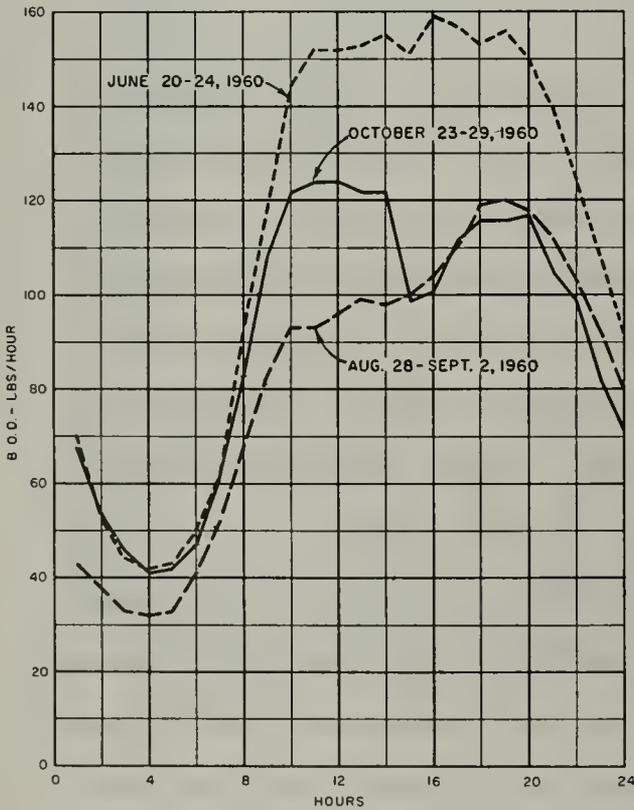
REDDING SEWAGE TREATMENT PLANT



RED BLUFF SEWAGE TREATMENT PLANT



WEST SACRAMENTO SEWAGE TREATMENT PLANT



SACRAMENTO SEWAGE TREATMENT PLANT

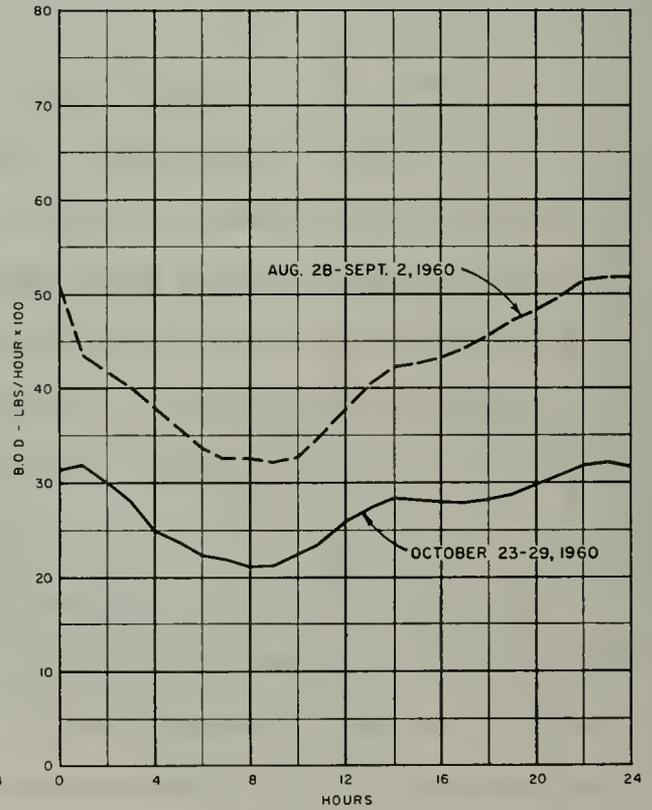


Figure 26. DIURNAL VARIATIONS IN B. O. D. LOADINGS DISCHARGED BY SEWAGE TREATMENT PLANTS

Data were collected from American Crystal Sugar Company on two intensive surveys. During the period August 29 - September 2, 1960, the average flow was 3.39 MGD, the maximum BOD was 555 ppm, and the maximum BOD loading was 14,832 pounds per day. During October 24 - 28, 1960, average flow was 3.80 MGD, maximum BOD was 532 ppm, and the maximum loading was 13,440 pounds BOD per day.

### Irrigation Drainage

Irrigated agriculture presently comprises the greatest demand upon the total water supply in the Sacramento Valley. Irrigation return flows characteristically have lower dissolved oxygen and higher BOD concentrations than waters in the Sacramento River. This means that, although there is always a surplus of oxygen over BOD in the drainage waters, the net effect is to reduce oxygen levels in the river.

During the process of irrigating farm lands, a number of factors change the oxygen relationships that originally existed in the diverted river water. The important factors are increases in water temperature, increases in suspended and dissolved material, increases in the number of aquatic plants, and changes in the plant metabolic activities. It will be shown later in this chapter that these changes in plant metabolism can be quantitatively related to the changes in oxygen levels in the drainage water and qualitatively related to the effects of drainage waters in the river.

The drains that discharge agricultural return water into the Sacramento River are shown in the following tabulation.

Table 23

BOD IN IRRIGATION RETURNS TO SACRAMENTO RIVER,  
1960-61

Discharge	: River : Mile	: Mean Yearly: : Flow (cfs)	5-Day BOD, ppm		
			: Minimum	: Maximum	: Average
Butte Slough	138.9L	253	0.43	2.80	1.80
R. D. No. 70	124.2L	24	1.15	3.22	2.35
R. D. No. 108	100.1R	150	1.13	4.10	2.78
R. D. No. 787	93.6R	30	1.70	4.53	2.53
Colusa Basin Drain	90.2R	565	0.35	3.30	2.47
Sacramento Slough	80.8L	505	0.54	2.44	1.69
R. D. No. 1000	66.3L	gravity	4.65	7.37	5.78
Natomas Main Canal	61.5L	18	0.90	7.50	3.48
Natomas East Main Drain	60.6L	gravity	1.29	16.00	6.62

The largest irrigation return to the Sacramento River is Colusa Basin Drain which discharged an average of 7,520 pounds BOD per day. The maximum organic load observed was 27,340 pounds per day on May 2, 1960.

Sacramento Slough and Butte Slough discharged average BOD loadings of 4,600 and 1,910 pounds per day, respectively, and maximum loadings of 10,080 and 8,180 pounds per day.

The remaining drains are less significant, with a combined maximum loading of 6,450 pounds of BOD per day.

#### Tributaries

Tributary streams, although carrying both natural BOD and some wastes, are an asset to the oxygen resources of the Sacramento River.

The Feather and American Rivers are the major tributaries and both at times have flows in excess of those in the Sacramento.

Table 24

DISSOLVED OXYGEN, BOD, AND TEMPERATURE  
IN FEATHER AND AMERICAN RIVERS, 1960-61

	: Feather River (79.9L/0.7)			: American River (60.4L/0.2)		
	: Maximum	: Minimum	: Average	: Maximum	: Minimum	: Average
Flow, cfs	20,900	495	4,110	4,560	510	1,831
Dissolved Oxygen, ppm	12.6	7.7	9.1	13.5	8.4	9.9
% Saturation	110	91	98	132	86	102
BOD, ppm	2.09	0.35	1.13	6.70	0.44	2.46
Temperature, °F	88	46	68	72	48	62

Dissolved Oxygen

Concentrations of dissolved oxygen were determined by the procedures described in Chapter II of this appendix. Percent saturation values were computed from oxygen solubility tables in the eleventh edition of Standard Methods for the Examination of Water and Wastewater.

Longitudinal Variations

Dissolved oxygen concentrations were determined monthly at each of the 22 river stations from April 1960 to June 1961. Throughout the period, oxygen concentrations typically increased by one or two ppm between Keswick Reservoir (mile 300.9) and mile 285.9, corresponding to increases from 80 or 90 percent saturation to about 100 percent saturation. From mile 285.9 to mile 4.0 oxygen levels decreased; however, differences in the time of day samples were taken made the monthly data of limited values for detailed analysis.

The best data on longitudinal variations were obtained during the intensive surveys. Figure 27 shows the average temperature and dissolved oxygen in the Sacramento River observed on the seven intensive surveys. These surveys covered the period May through October and gross seasonal differences are apparent on the figure. The data are nevertheless consistent and clearly show the overall pattern of oxygen levels in the river.

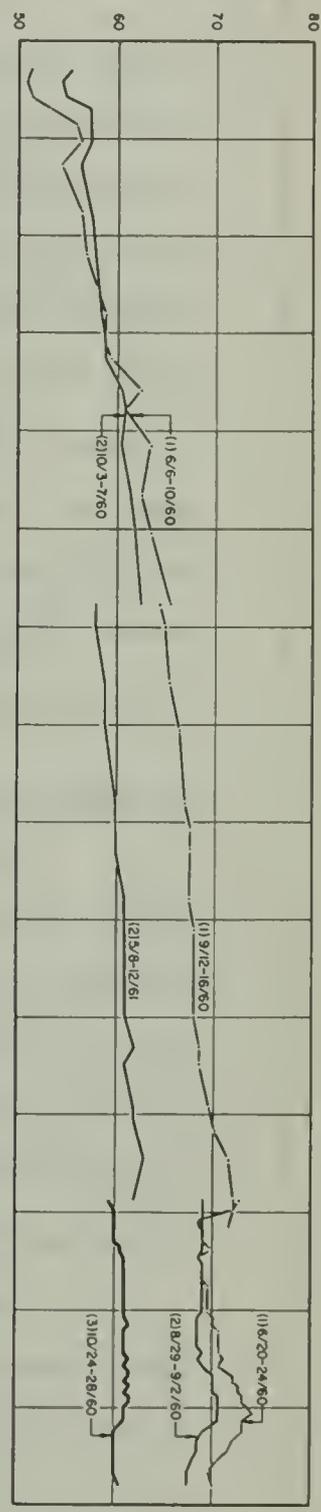
Temperatures rose at a decreasing rate from about 55° at Redding (mile 297.7) to some 60° or 70° at Sacramento (mile 62.6), depending on the season. After being cooled by American River inflows at mile 60.4, temperatures remained essentially constant for 20 or 30 miles, and then increased locally during the summer months in the area of maximum current reversals due to tides.

Dissolved oxygen concentrations were between 10 and 11 ppm near Redding and decreased more or less uniformly throughout the river. The sag below Sacramento is apparent, with averages between 7 and 8 ppm and minima (which are not shown) between 5.2 and 6.5 ppm. The minimum of 5.2 ppm is close to the 5 ppm stated in Chapter III as limiting for fish migration. The recovery below the sag was generally to a level less than the initial concentration.

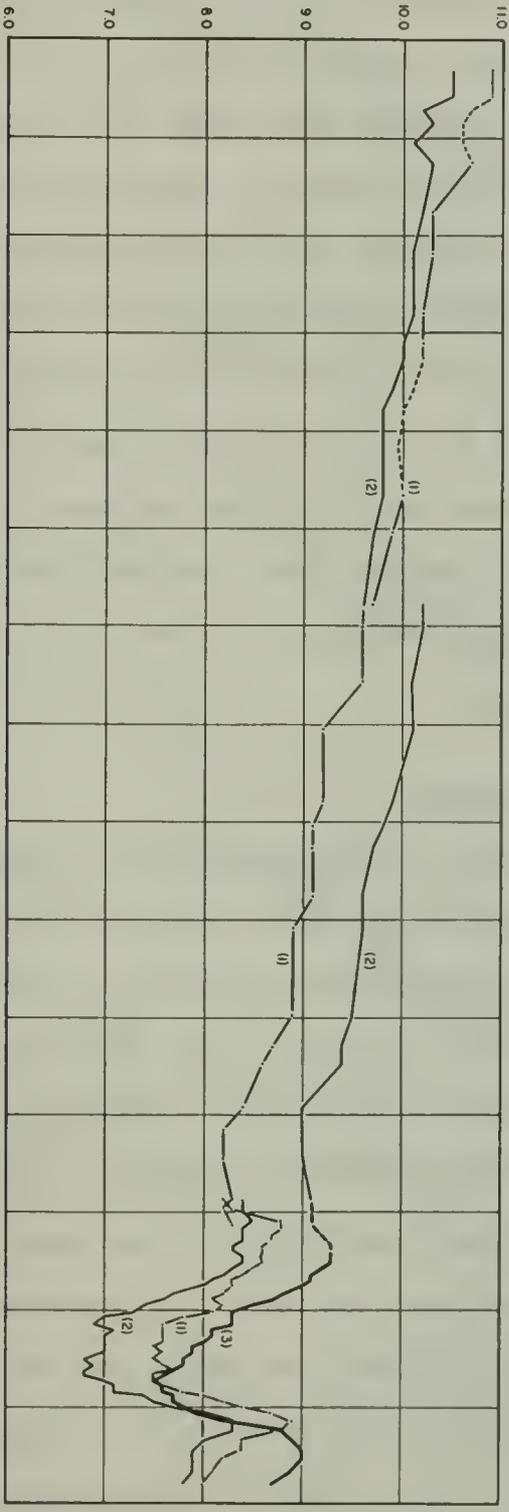
Figure 27 shows that oxygen saturation values started out at 98 or 99 percent, rose somewhat while the effects of heating were dominant, and then began a steady decline to the mouth. Again, the sag below Sacramento is apparent. In general, the river loses oxygen from Redding to mile 4 at the confluence with the San Joaquin River.

Below Sacramento, the oxygen relationships are complicated by tidal action which results in flow retardation throughout the reach and

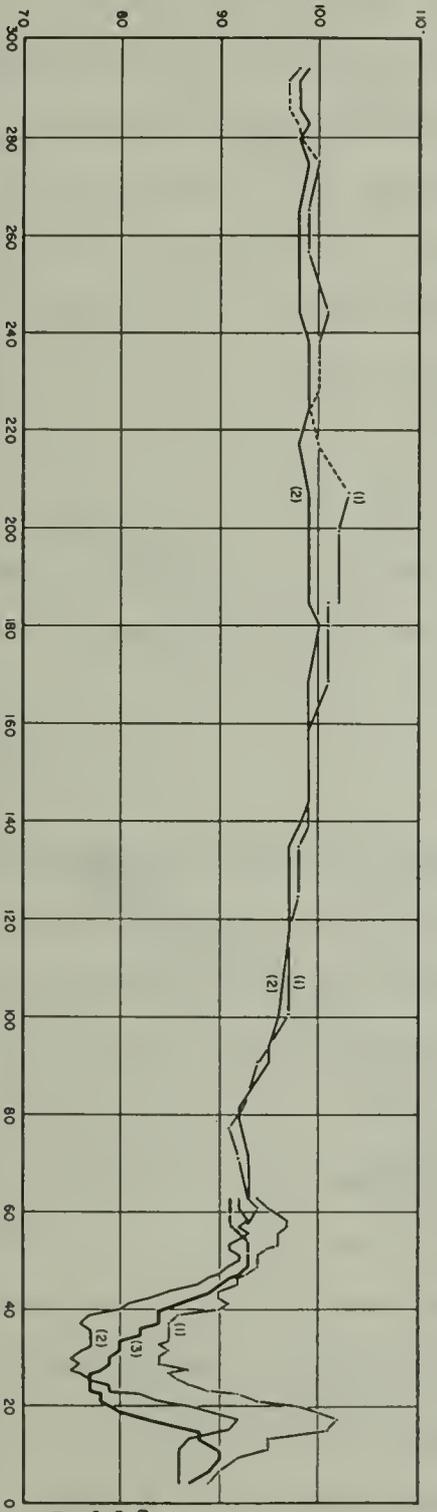
TEMPERATURE (in degrees Fahrenheit)



DISSOLVED OXYGEN (in parts per million)



DISSOLVED OXYGEN (per cent saturation)



Based on 32 observations made at 3-hour intervals over 4-day periods  
 Dashed lines - Estimated

Figure 27. AVERAGE WATER TEMPERATURE AND DISSOLVED OXYGEN IN SACRAMENTO RIVER  
 LATE SPRING TO FALL

flow reversals throughout the lower  $44 \pm 3$  miles. The maximum extent of flow reversal occurs at about Isleton (Part 1, Appendix A).

The oxygen sag below Sacramento is shown in more detail on Figure 28 which presents slack-water profiles of dissolved oxygen concentrations at high high water (HHW) and low low water (LLW) for each of the three intensive surveys. The times of slack water were determined from times of HHW and LLW listed in Table 25. The tabulated values were smoothed graphically, and corrected for the 30 minutes by which slack water follows the tidal stages (8). Dissolved oxygen concentrations which occurred within 30 or 45 minutes of slack water are plotted on Figure 28. The figure shows how the sag is shortened during HHW slack and lengthened at LLW slack, and that lower concentrations are associated with the HHW slack. The scatter of points tends to be greatest just upstream from the sag point.

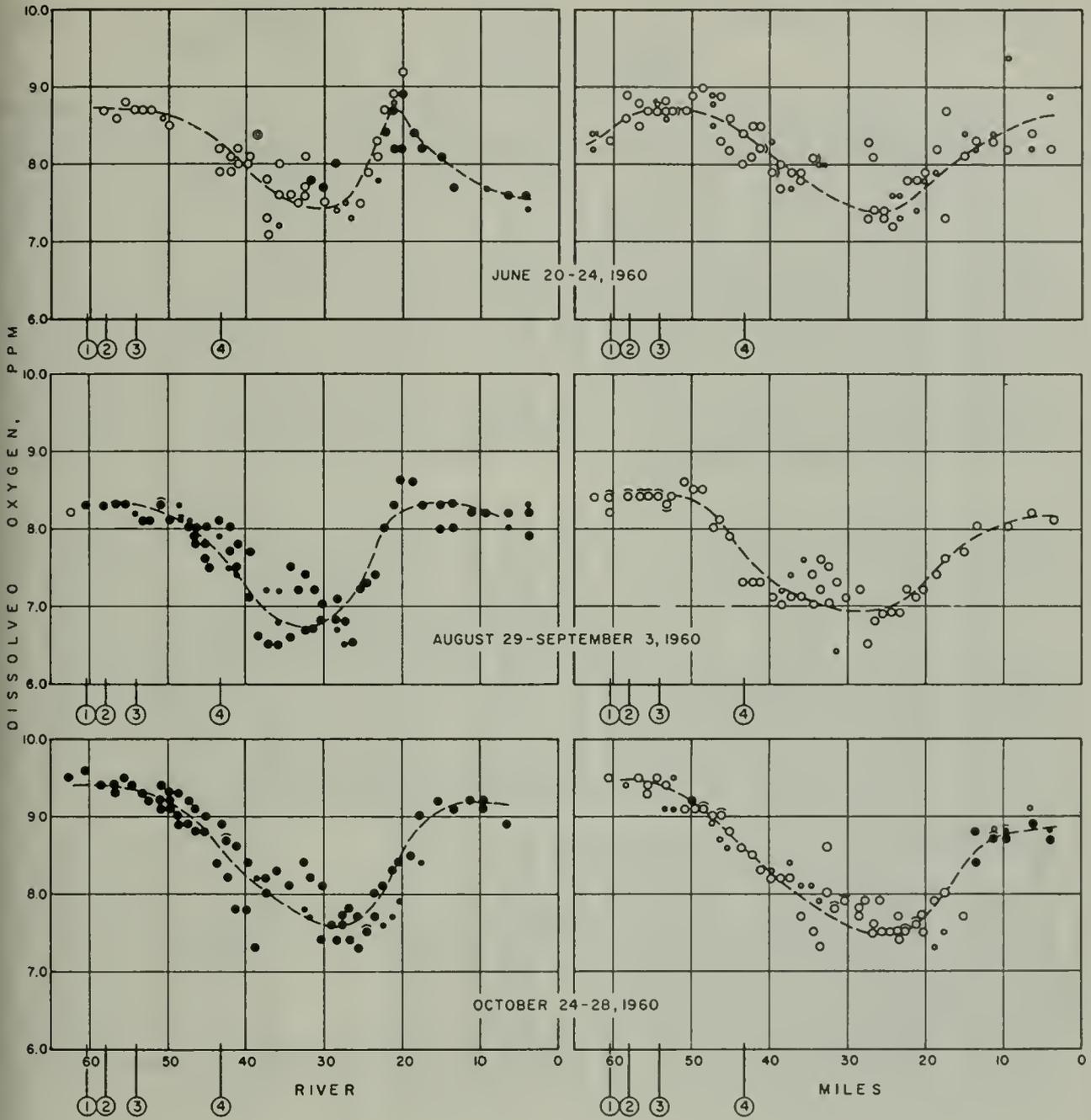
#### Diurnal Variations

Figure 29 shows saturations of dissolved oxygen throughout the river observed on the seven intensive surveys. Data from four days are combined into a single 24-hour period. Field crews were changed at about noon and midnight and some of the data from these 12-hour shifts was rejected as shown on the figure. On some occasions, the values obtained were considered adequate for purposes of averaging but were uncertain on an individual basis and are so indicated on the figure.

The classical pattern of dissolved oxygen variations in natural waters shows a minimum just before dawn and a maximum in mid-afternoon. Figure 29 shows that frequent departures from this pattern occur in the river and that these departures are associated with particular groups of stations during individual intensive survey periods. The usable diurnal

HIGH HIGH WATER

LOW LOW WATER



- ① (60.4) American River
- ② (58.0) West Sacramento S.T.P.
- ③ (54.1) Sacramento S.T.P.
- ④ (43.3) American Crystal Sugar Co.

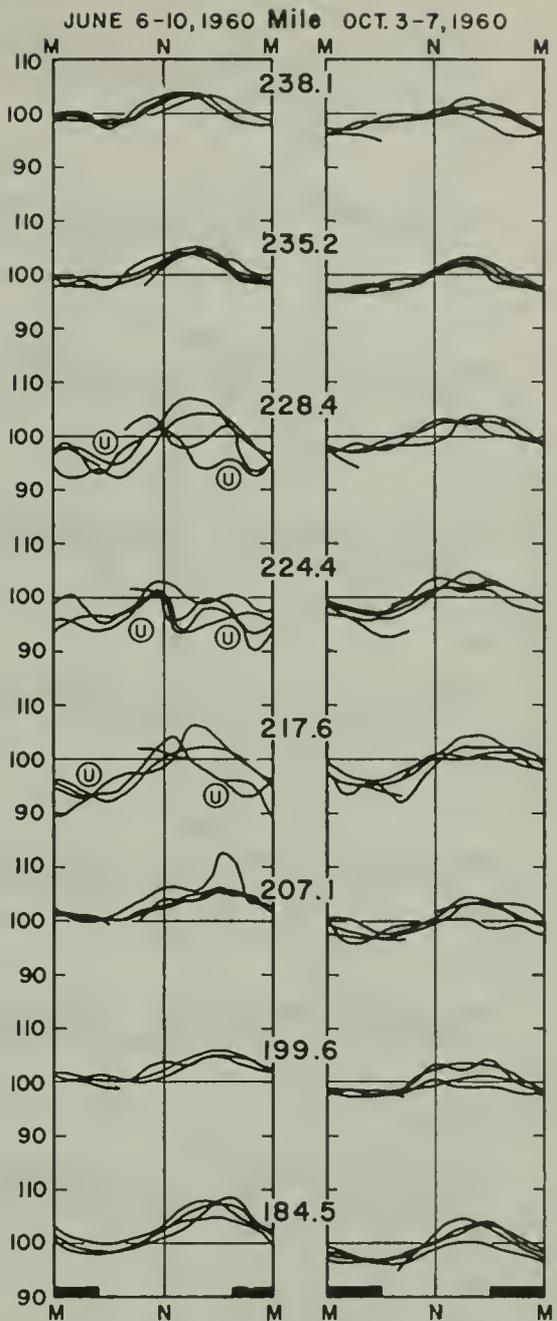
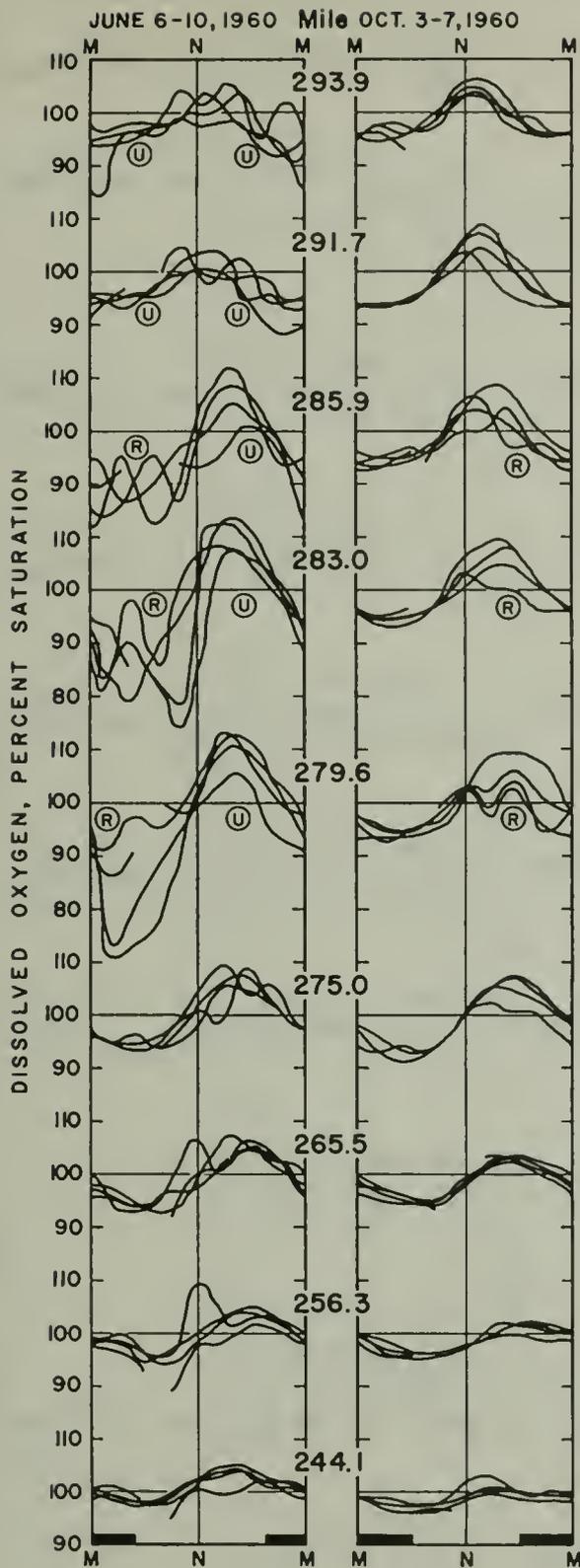
- ± 30 Min.
- ± 45 Min.
- Hours Of Darkness

Figure 28. SLACK WATER PROFILES OF DISSOLVED OXYGEN BELOW SACRAMENTO

Table 25

OBSERVED TIDES IN SACRAMENTO RIVER  
DURING INTENSIVE SURVEYS, 1960  
(Elevations Based on USGS Datum)

Date (Average flow at Sacramento)	Stage	Collinsville (Mile -0.2)	Threemile Slough (Mile 9.2)	Rio Vista (Mile 11.8)	Isleton (Mile 17.5)	Walnut Grove (Mile 26.7)	Snodgrass Slough (Mile 37.1)	Clarksburg (Mile 42.9)	Freeport (Mile 48.9)	Sacramento (Mile 59.6)	Sacramento Weir (Mile 63.6)										
		P.S.T.:Elev.	P.S.T.:Elev.	P.S.T.:Elev.	P.S.T.:Elev.	P.S.T.:Elev.	P.S.T.:Elev.	P.S.T.:Elev.	P.S.T.:Elev.	P.S.T.:Elev.	P.S.T.:Elev.										
6/20 (9,400)	HHW	0040	3.40	0120	3.38	0120	4.03	0030	3.50	0340	3.70	0300	3.58	0250	4.08	0320	3.90	0420	4.40	0430	4.80
	LLW	0820	-1.00	0900	-1.33	0910	-0.90	0920	-0.98	1040	0.30	1200	0.61	1210	1.32	1220	1.48	1440	2.47	1420	3.43
	HLW	1420	2.00	1420	1.88	1440	1.44	1320	1.91	1540	2.26	1620	2.11	1630	2.54	1700	2.40	1840	3.15	1920	3.80
6/21 (10,400)	HHW	1900	0.00	1915	-0.28	1940	0.17	1820	0.16	2100	0.80	2150	0.95	2150	1.60	2210	1.68	2340	2.71	2340	3.58
	LLW	0120	3.40	0120	3.32	0210	3.88	0010	3.32	0310	3.53	0340	3.42	0330	3.90	0400	3.75	0520	4.35	0540	4.80
	HLW	0900	-1.00	0915	-1.31	1000	-0.85	0840	-0.98	1130	0.30	1230	0.28	1240	1.50	1300	1.73	1420	2.92	1450	3.80
6/22 (10,500)	HHW	1440	2.20	1510	2.04	1510	2.74	1410	2.23	1700	2.61	1720	2.50	1730	3.02	1810	3.46	1920	3.68	1930	4.26
	LLW	1920	0.50	1940	0.20	2000	0.69	18.50	0.36	2150	1.18	2220	1.44	2300	2.12	2310	2.78	0020	3.27	0030	4.00
	HLW	0120	3.65	0200	3.68	0200	4.27	0030	3.73	0330	3.95	0430	3.88	0420	4.38	0440	4.78	0530	4.80	0600	5.15
6/23 (10,250)	HHW	0930	-0.85	1015	-1.15	1010	-0.64	0900	-0.77	1210	0.52	1300	0.97	1330	1.74	1400	2.48	1420	3.13	1540	3.90
	LLW	1520	2.37	1610	1.36	1600	2.94	1430	2.41	1750	2.80	1810	2.74	1830	3.21	1850	3.63	2020	3.84	2030	4.37
	HLW	2000	0.72	2030	0.49	2040	1.00	1920	0.70	2230	1.50	2300	1.70	2330	2.35	2400	2.95	0040	3.41	0110	4.10
6/24 (10,100)	HHW	0200	3.72	0250	3.77	0230	4.37	0120	3.86	0420	4.07	0500	4.00	0500	4.50	0520	4.86	0600	4.90	0640	5.20
	LLW	1000	-0.75	1040	-0.95	1050	-0.44	0920	-0.58	1240	0.69	1330	1.06	1420	1.87	1430	2.54	1540	3.16	1610	3.90
	HLW	1610	2.57	1700	1.60	1700	3.20	1540	2.73	1840	3.12	1910	3.03	1930	3.54	1930	3.90	2040	4.07	2100	4.50
8/29 (9,700)	HHW	2030	1.00	2120	0.83	2130	0.40	1940	1.12	2320	1.90	2320	2.06	0010	2.68	0020	3.22	0120	3.64	0140	4.24
	LLW	0250	3.90	0320	4.06	0310	4.70	0130	4.22	0500	4.43	0530	4.38	0530	4.87	0550	5.20	0640	5.23	0700	5.50
	HLW	1050	-0.50	1110	-0.60	1130	-0.08	0950	-0.16	1330	0.96	1410	1.48	1440	2.25	1500	2.90	1600	3.50	1640	4.20
8/30 (10,200)	HHW	1700	2.80	1740	2.90	1740	3.42	1540	3.07	1910	3.45	1950	3.39	2010	3.91	2020	4.30	2110	4.44	2140	4.87
	LLW	2120	1.32	2200	1.32	2200	0.85	2110	1.50					0030	3.11	0100	3.64	0150	4.05	0021	4.60
	HLW	0820	3.50	2100	3.44	2100	4.17	2140	4.62	2240	3.90	2240	3.85	2330	4.05	2330	4.23	0040	4.73	0130	5.32
8/31 (10,400)	HHW	0410	-0.37	0500	-0.53	0520	0.02	0540	0.76	0710	0.85	0720	1.30	0900	1.89	0840	2.22	0940	3.30	0920	4.33
	LLW	0930	2.24	1030	2.26	1040	2.87	1110	3.35	1230	2.80	1220	2.74	1310	3.91	1340	3.18	1420	3.85	1340	4.64
	HLW	1430	0.67	1540	0.51	1540	1.02	1600	1.68	1730	1.46	1740	1.66	2030	2.03	1900	2.34	2020	3.20	1950	4.20
9/1 (9,200)	HHW	2050	3.63	2200	3.68	2200	4.32	2220	4.78	2350	4.04	2400	4.00	0030	4.15	0030	4.37	0140	4.90	0240	5.48
	LLW	0520	-0.50	0620	-0.71	0630	-0.18	0640	0.64	0830	0.83	0830	1.30	1130	1.92	1000	2.26	1130	3.37	1230	4.42
	HLW	1130	2.40	1210	2.40	1210	3.00	1210	3.48	1340	2.90	1400	2.84	1430	3.03	1430	3.27	1440	3.90	1600	4.67
9/2 (10,400)	HHW	1600	0.70	1650	0.50	1700	1.30	1700	1.67	1830	1.50	1840	1.70	2100	2.07	2010	2.40	2120	3.19	2210	4.20
	LLW	2210	3.85	2310	3.83	2300	4.50	2310	4.90	0100	4.14	0100	4.08	0130	4.27	0130	4.50	0300	4.98	0320	5.52
	HLW	0620	-0.50	0720	-0.66	0710	-0.10	0740	0.70	0930	0.89	0930	1.32	1100	2.00	1100	2.25	1230	3.31	1310	4.36
9/3 (10,400)	HHW	1230	2.74	1340	2.76	1300	3.25	1330	3.87	1510	3.26	1510	3.20	1520	3.14	1550	3.65	1710	4.27	1800	4.98
	LLW	1700	0.87	1820	0.64	1800	1.03	1820	1.84	2000	0.75	2020	2.00	2140	2.20	2140	2.75	2230	3.62	2330	4.60
	HLW	2310	3.93	0010	4.00	2400	4.50	2400	5.10	0150	4.30	0150	4.27	0250	4.38	0240	4.68	0340	5.14	0420	5.70
9/27 (7,850)	HHW	0710	-0.56	0840	-0.80	0810	-0.36	0840	0.60	1030	0.85	1040	1.35	1330	2.10	1200	2.31	1310	3.37	1400	4.51
	LLW	1310	2.70	1330	2.70	1340	3.16	1410	3.75	1500	3.14	1500	3.03	1640	3.21	1630	3.48	1740	4.13	1830	4.96
	HLW	1810	0.35	1900	0.12	1900	0.51	1940	1.30	2100	1.30	2100	1.60	2310	2.31	2230	2.48	2330	3.50	0040	4.58
10/24 (7,400)	HHW	0000	3.80	0050	3.87	0100	4.38	0100	4.93	0200	4.17	0330	4.10	0400	4.10	0340	4.48	0510	5.10	0600	5.73
	LLW	0800	-0.66	0800	0.70	0840	-0.20	0930	0.74	1000	1.00	1140	1.50	1300	2.16	1230	2.56	1410	3.60	1520	4.80
	HLW	1340	2.78	1400	2.93	1430	3.46	1500	4.10	1530	3.46	1700	3.41	1720	3.71	1730	3.90	1900	4.58	1940	5.40
10/26 (7,600)	HHW	1930	0.38	1920	0.21	2100	1.60			2110	1.61	2300	1.92	2310	2.40	2350	2.80				
	LLW	1600	3.25	1710	3.30	1800	3.78	1830	4.33	1950	3.47	2030	3.40		2050	3.75	2130	4.10	2220	4.48	
	HLW	0000	-1.03	0110	-1.22	0140	-0.82	0240	0.16	0400	0.36	0500	0.60		0600	1.30	0640	2.00	0740	3.03	
10/27 (7,850)	HHW	0620	2.30	0740	2.27	0740	2.69	0830	3.30	1000	2.60	1010	2.50		1130	2.80	1200	3.20	1230	3.76	
	LLW	1100	0.50	1210	0.28	1210	0.67	1320	1.50	1500	1.30	1530	1.35		1630	1.85	1710	2.43	1800	3.30	
	HLW	1640	3.20	1810	3.38	1840	3.80	1910	4.42	2040	3.64	2100	3.57		2230	3.92	2220	4.30	2310	4.65	
10/28 (7,850)	HHW	0100	-0.98	0200	-1.14	0230	-0.80	0340	0.20	0520	0.43	0550	0.72		0700	1.44	0740	2.15	0830	3.20	
	LLW	0710	2.34	0830	2.39	0900	2.83	0930	3.48	1100	2.80	1120	2.63		1210	2.89	1240	3.24	1330	3.84	
	HLW	1230	0.23	1340	0.05	1400	0.40	1500	1.24	1630	1.10	1700	1.18		1810	1.70	1900	2.33	1920	3.30	
10/28 (7,850)	HHW	1730	2.75	1920	2.80	1930	3.22	2000	3.85	2120	3.05	2150	2.93		2240	3.20	2320	3.58	2400	4.11	
	LLW	0200	-1.38	0310	-1.56	0320	-1.27	0430	-0.20	0610	-0.04	0640	0.18		0810	0.98	0900	1.76	0940	2.95	
	HLW	0820	2.10	0940	2.05	1000	2.49	1040	3.10	1210	2.36	1220	2.23		1340	2.55	1410	2.97	1500	3.64	
10/28 (7,850)	HHW	1320	0.03	1500	-0.21	1500	0.16	1540	0.99	1740	0.88	1750	0.92		1920	1.50	2010	2.15	2040	3.11	
	LLW	1900	2.55	2030	2.55	2040	2.97	2100	3.60	2250	2.85	2300	2.70		2400	3.07	0040	3.47	0130	4.02	
	HLW	0240	-1.40	0410	-1.57	0430	-1.10	0530	-0.28	0710	-0.05	0720	0.20		0900	1.00	0940	1.76	1040	2.97	
10/28 (7,850)	HHW	0910	2.32	1100	2.30	1110	2.85	1200	3.37	1310	2.58	1330</									



LEGEND

- NIGHT
- ⊙ UNCERTAIN VALUES FOR 12-HOUR PERIOD
- ⊗ REJECTED VALUES FOR 12-HOUR PERIOD

Figure 29. DIURNAL VARIATIONS IN DISSOLVED OXYGEN IN SACRAMENTO RIVER



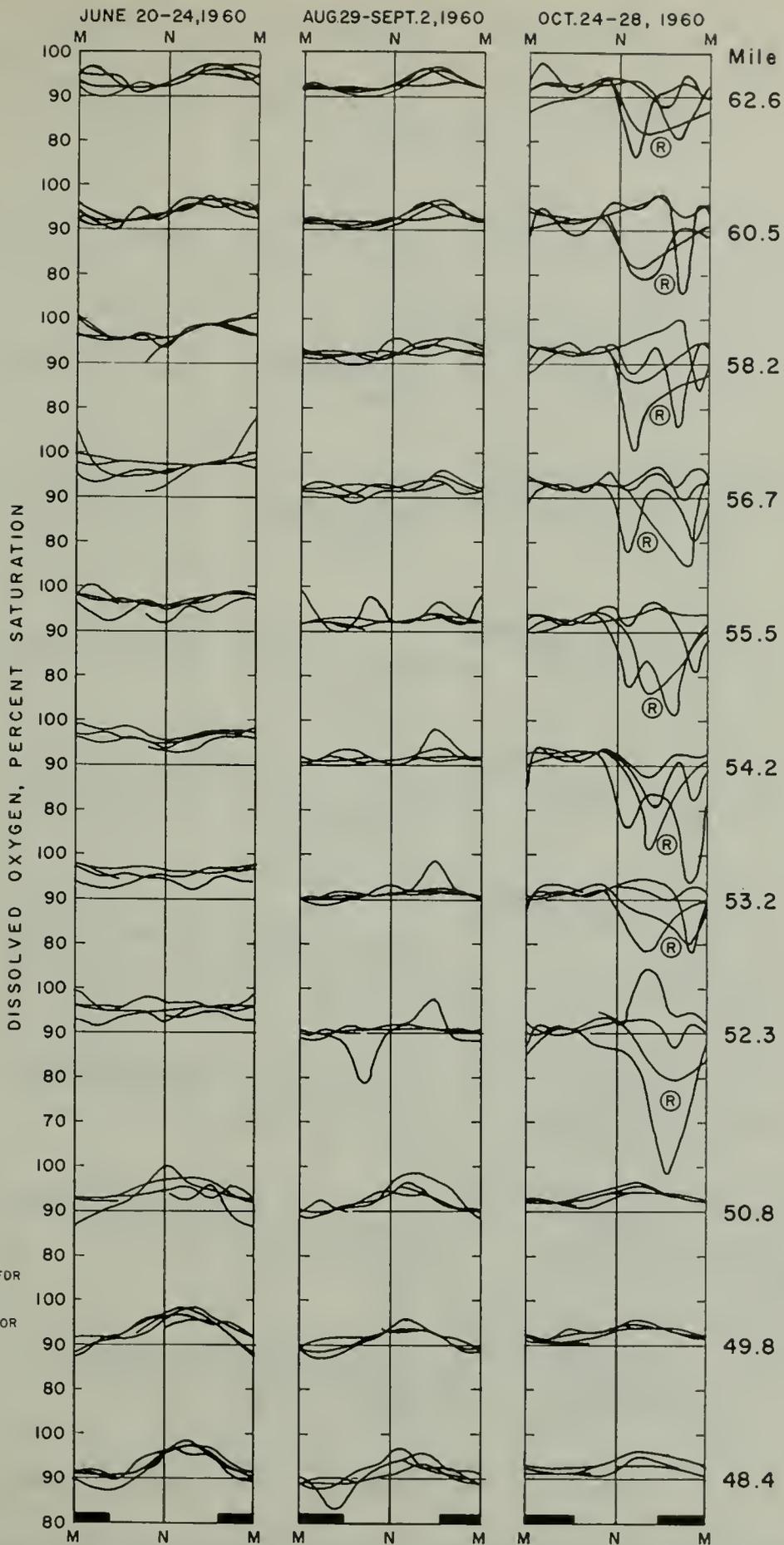


Figure 29.(Cont.) DIURNAL VARIATIONS IN DISSOLVED OXYGEN IN SACRAMENTO RIVER

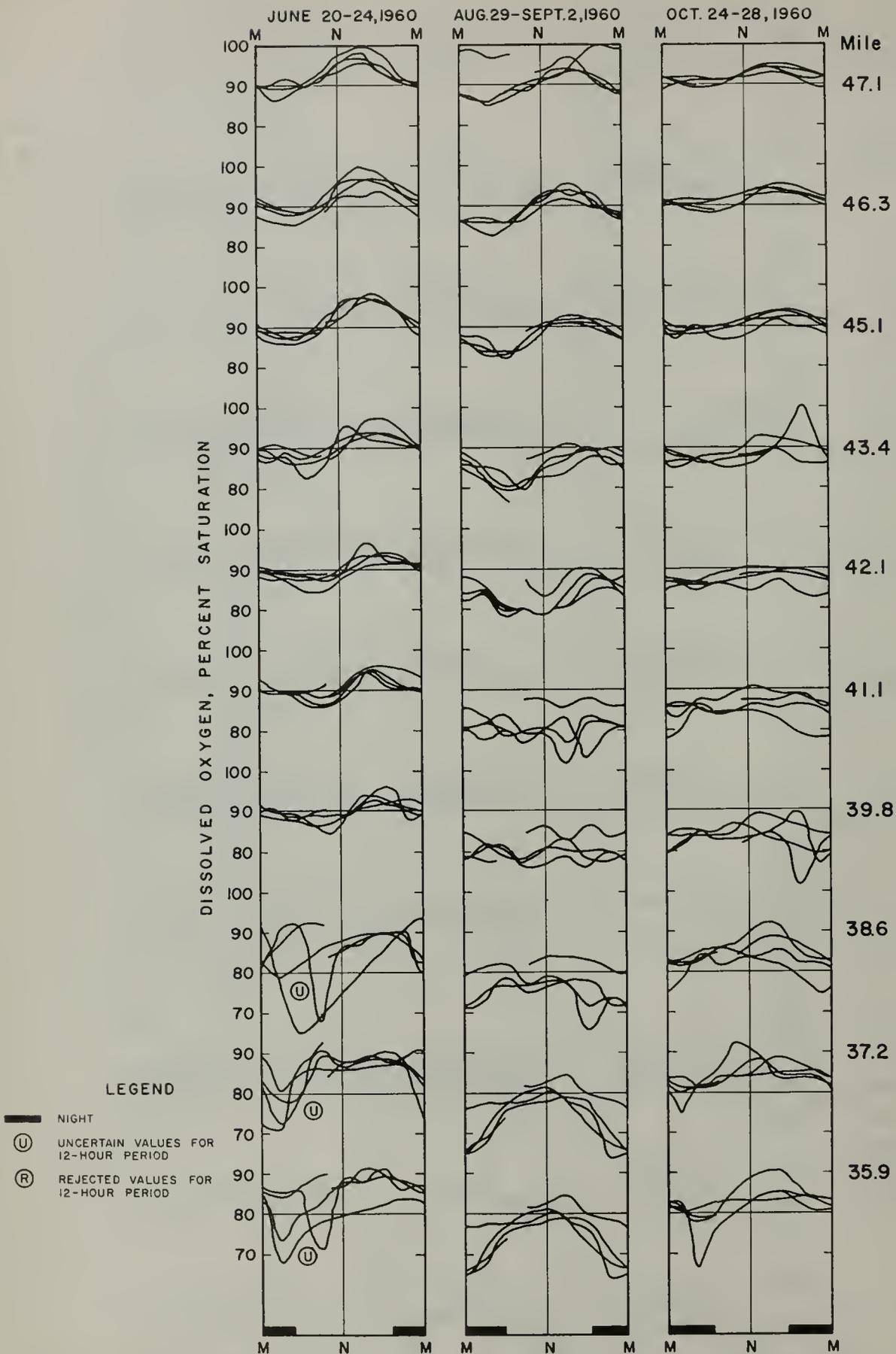


Figure 29.(Cont.) DIURNAL VARIATIONS IN DISSOLVED OXYGEN IN SACRAMENTO RIVER

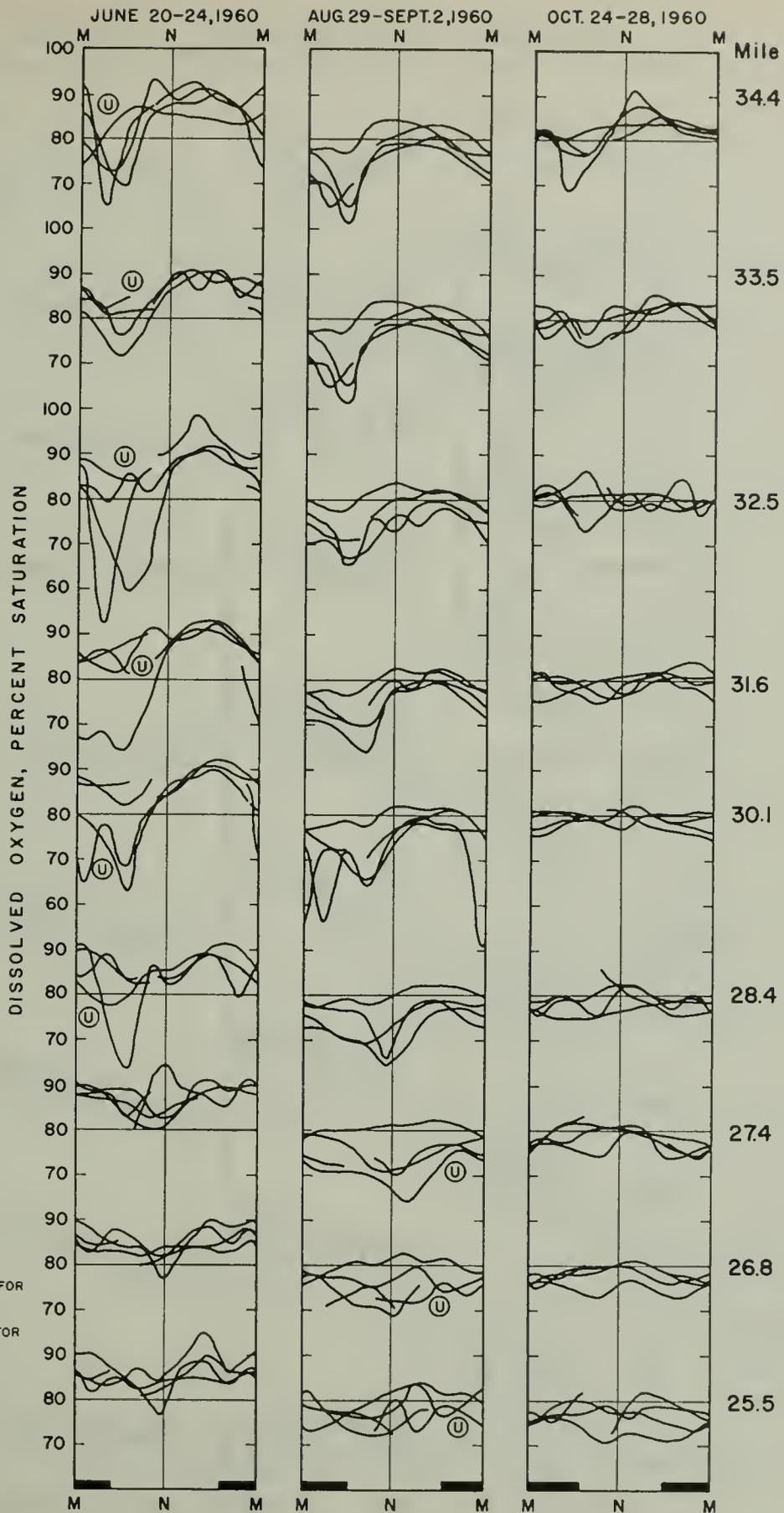


Figure 29.(Cont.) DIURNAL VARIATIONS IN DISSOLVED OXYGEN IN SACRAMENTO RIVER

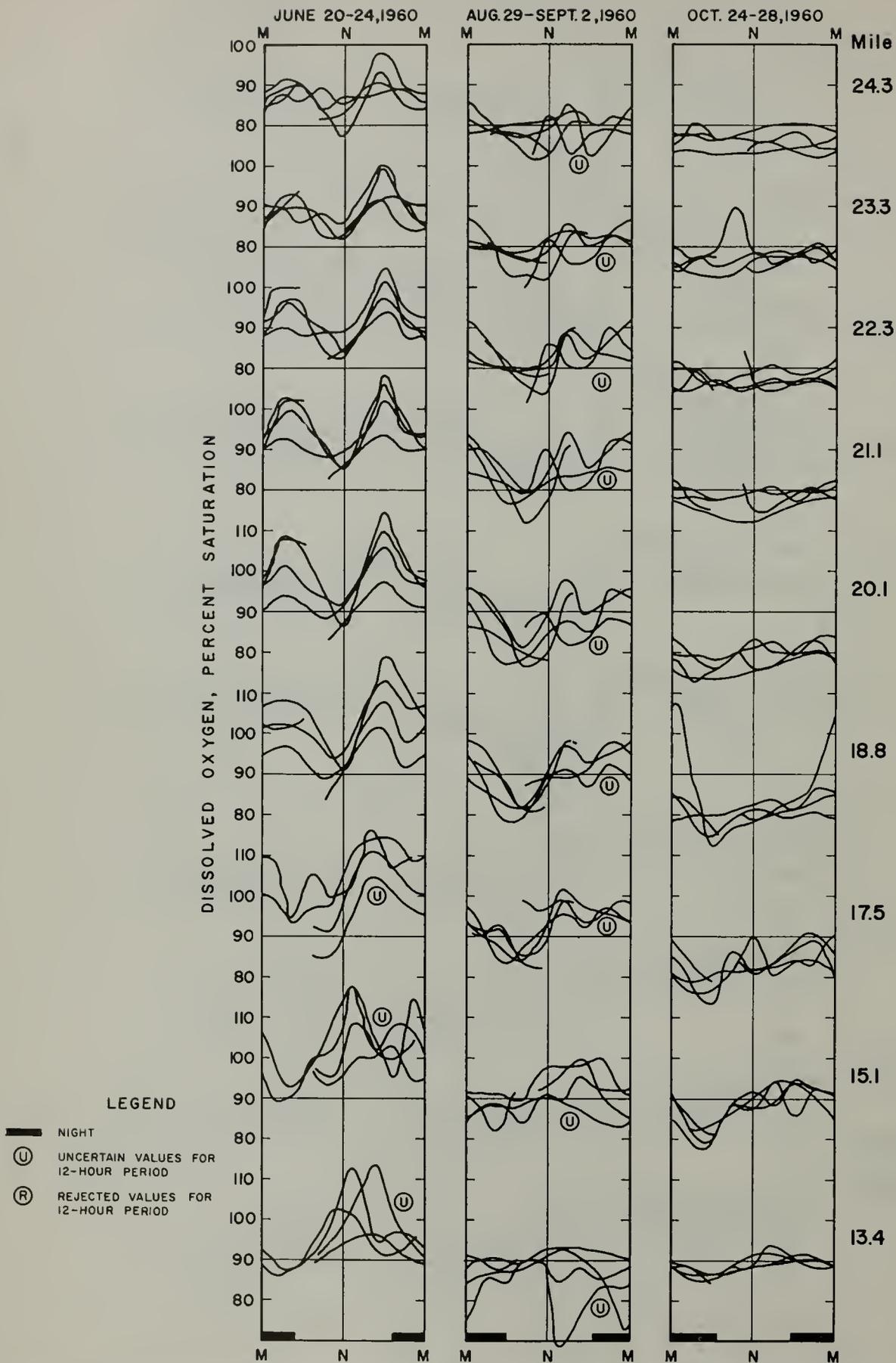


Figure 29.(Cont.) DIURNAL VARIATIONS IN DISSOLVED OXYGEN IN SACRAMENTO RIVER

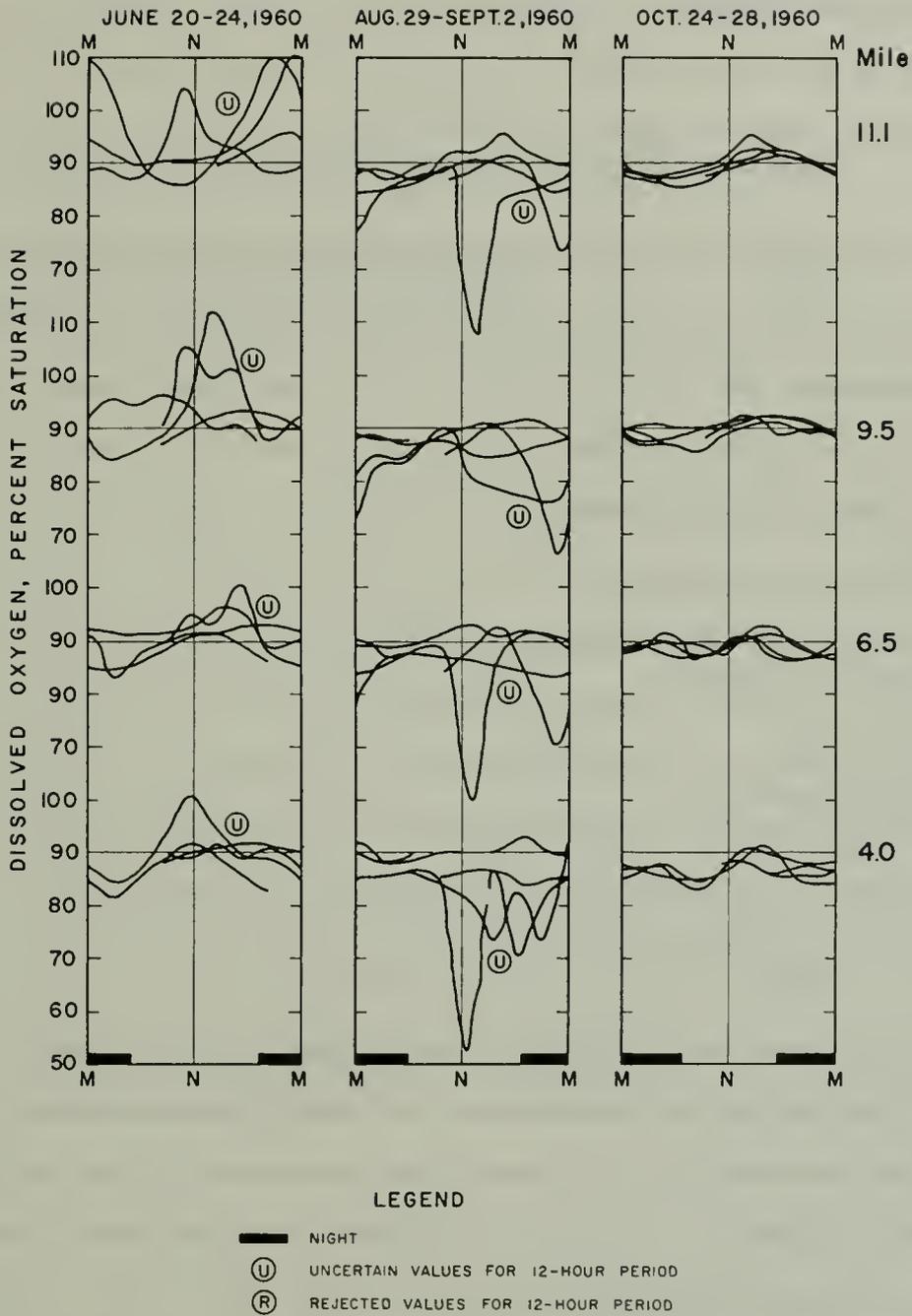


Figure 29.(Cont.) DIURNAL VARIATIONS IN DISSOLVED OXYGEN IN SACRAMENTO RIVER

curves showing percent saturation, which comprised 624 cases out of the total number of 785 station-days, were classified into seven types. Data from all intensive surveys in a particular reach were combined, and the results are summarized in Table 26.

Table 26  
CHARACTERIZATION OF SHAPES OF DIURNAL OXYGEN CURVES

Type	:Upper Reach:		:Middle Reach:		:Lower Reach:		:Combined	
	:293.9-184.5:	:184.5-62.6 :	:62.6-4.0 :	:293.9-4.0				
	: n :	% :	: n :	% :	: n :	% :	: n :	% :
I. Classical	64	62	61	48	110	28	235	37
II. Early (nighttime) minimum	19	18	7	5	62	16	88	14
III. Extended (evening) maximum	15	15	21	17	33	8	69	11
IV. Late (midmorning) minimum	5	5	2	2	31	8	38	6
V. Inverted (nighttime maximum daytime minimum)			7	5	22	6	29	5
VI. Semidiurnal					23	6	23	4
VII. Indeterminate			29	23	113	28	142	23
TOTAL	103		127		394		624	

Table 26 shows that the classical pattern occurs 62 percent of the time in the upper reach and that the frequency of departures from the classical pattern increases as the river flows downstream. The semi-diurnal type was found only during the June 20 - 24, 1960 period and is shown on Figure 29 to occur in the area of maximum current reversals due to tides (Part 1, Appendix A).

In an attempt to further explain departures from the classical pattern in the lower reach, records of wind direction and velocity at Travis Air Force Base near Fairfield were compared with oxygen levels in the river found during the intensive surveys. No correlation was found.

Nighttime Increases. Absolute concentration and saturation values frequently increased during the night. Such increases are implicit in the definitions of Types II, V, and VI, and frequently were found with Type VII. However, nighttime increases were occasionally superimposed upon the classical pattern (Type I) and upon Types III and IV in a manner which could not be correlated with particular slugs of water and which were not consistent for any station.

Since the intensive surveys were deliberately scheduled to take advantage of moonlit nights, the possibility of moonlight photosynthesis which was suggested by Kofoid (31) was investigated. No correlation of nighttime increases and variations in moonlight was found.

In addition to affecting the solubility of oxygen, temperature changes also alter the rates of biochemical reactions and accordingly metabolic activity. This relationship is usually referred to as the  $Q_{10}$  value or the ratio of the reaction rate at a given temperature to the reaction rate of 10°C lower (40).  $Q_{10}$  typically varies between 1 and 3 for most biochemical processes, and unrealistically greater values in the river would be necessary to account for the nighttime increases in dissolved oxygen where they were associated with temperature changes.

Significance of Random Diurnal Variations. The observations of frequent departures from the classical diurnal pattern of oxygen levels and of nighttime increases in oxygen can best be explained on the basis of changes in respiration. Oxygen is consumed by respiration of all life in a stream, including the native plankton, fish, and benthic populations. Bacteria and other microorganisms which feed on the natural organic detritus as well as any additional organic loading from municipal, industrial,

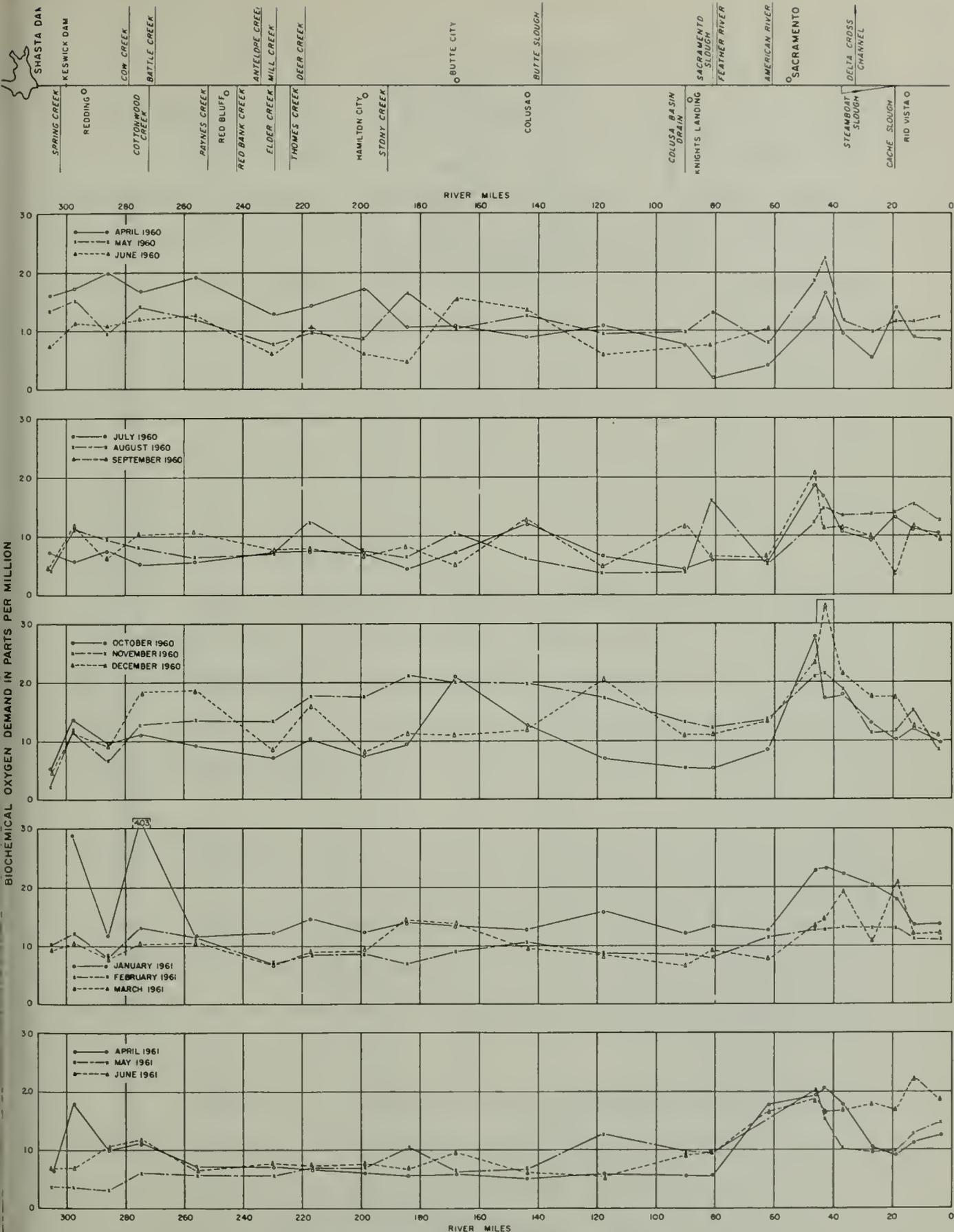
or agricultural waste waters also respire at a rate which is usually measured as BOD.

In general, the oxygen concentrations at night in the Sacramento River are below saturation so that there is a constant movement of atmospheric oxygen into the water. The rate of this movement determined by the level of saturation at a given location on the stream. It follows that if the respiration rate of life in the stream decreases, there will be an increase of oxygen in the water. Accordingly, the rates of nighttime increases in dissolved oxygen provide an indirect measure of the changes in respiration rates in the stream. Direct measurements of daytime respiration rates by light and dark bottle techniques which have been made in many areas and reported in the literature show comparable variations.

Variations in respiration can also account for the frequent departures from the classical curve of dissolved oxygen variations in natural waters. It is not possible, with present knowledge, to predict respiration changes, and they are reflected as random variations. The full significance of these random variations will be presented in a subsequent discussion of waste assimilative capacity.

#### Biochemical Oxygen Demand

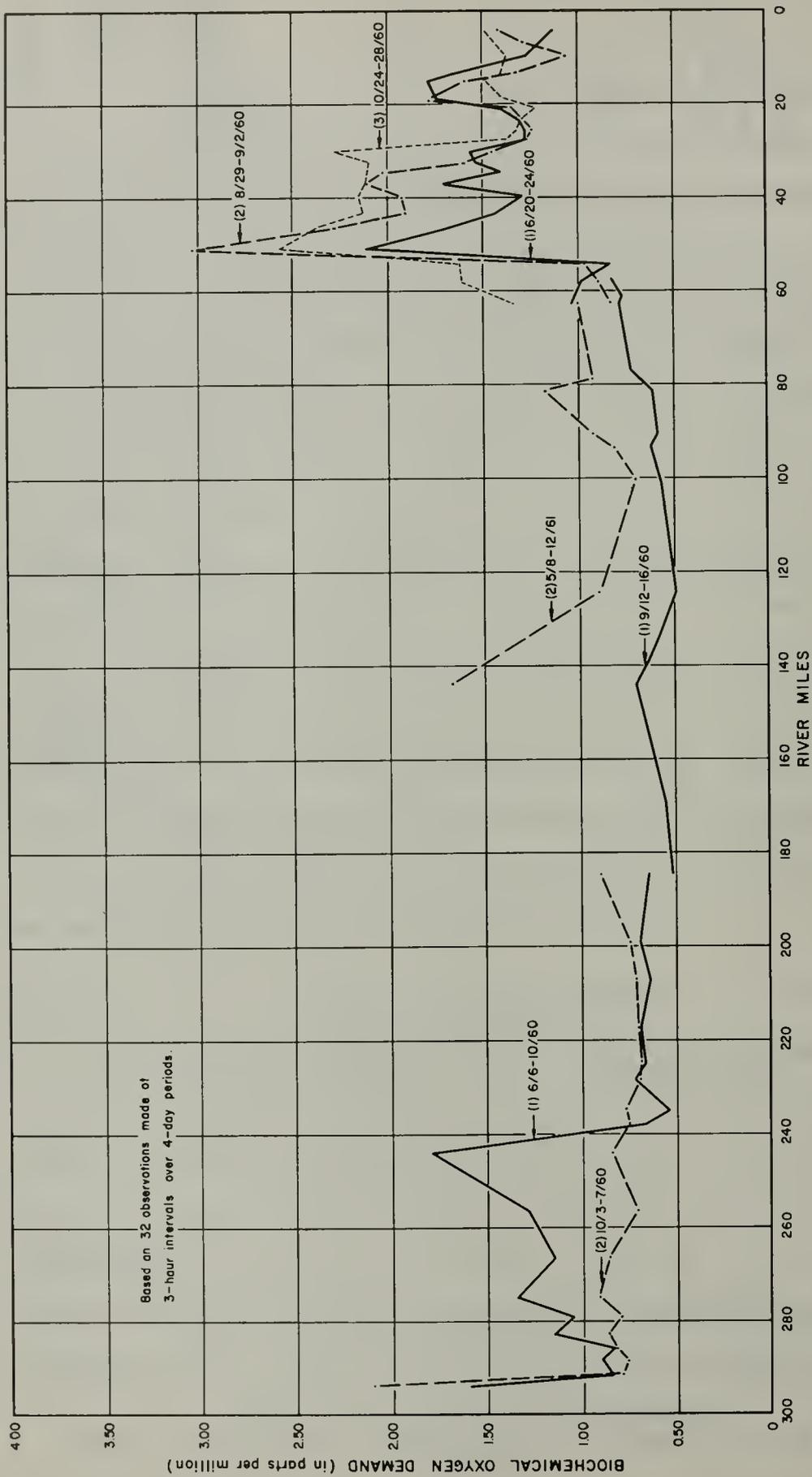
Figure 30 shows concentrations of 5-day BOD observed monthly at 22 river stations. Except for a consistent rise just below Sacramento, there is no particular seasonal or geographic pattern. Much of the variation is probably due to the inherent limitations of the analytical procedures in waters with low BOD. Figure 31 shows average BOD concentrations obtained during the intensive surveys. The only consistent relationship with the dissolved oxygen levels shown on Figure 27 is found below Sacramento.



SACRAMENTO RIVER WATER POLLUTION SURVEY

Figure 30. BIOCHEMICAL OXYGEN DEMAND - SACRAMENTO RIVER

1960-1961



**Figure 31. AVERAGE BIOCHEMICAL OXYGEN DEMAND IN SACRAMENTO RIVER**  
 LATE SPRING TO FALL

The highest BOD's occur at the beginning of the oxygen sag and decrease to a minimum at the beginning of the recovery portion of the sag curve.

Table 27 summarizes the 5-day BOD in the river and waste discharges below Sacramento. The table indicates that the organic loading discharged by the Sacramento Sewage Treatment Plant equaled the natural BOD in the river in June and reached a maximum of about twice the natural BOD in late summer. The loading from the American Crystal Sugar Company plant at Clarksburg was about 13 percent of the BOD already present in the stream. The June and August data showed that, after mixing, the total BOD in the river below the waste discharges was about equal to the initial BOD plus the waste BOD. In October, the increases in river BOD due to waste discharges were less pronounced.

It was previously shown (Figure 26) that the BOD loading from the Sacramento Sewage Treatment Plant is lowest in the late forenoon and highest at about midnight. This variation is in part reflected in the river 3.5 miles or 3.4 hours downstream but more detailed work is needed to confirm this observation.

#### Rate of BOD Exertion

Table 28 lists the results of long-term BOD analyses made on 29 river samples and four waste discharge samples. From these data, the ultimate first-stage or carbonaceous demand at 25°C ( $L_a$ ) was determined graphically and the ratio of  $L_a$  to the 5-day BOD computed; these derived figures are shown on Table 29.

Temperature corrections were made according to Theriault (46) where  $L_T = L_a (0.02T - 0.60)$  and  $T =$  observed river temperature. The rate of BOD exertion at river temperatures were then computed by means of the daily difference method (48), rapid-ratio method (41), moments

Table 27

5-DAY BIOCHEMICAL OXYGEN DEMAND IN SACRAMENTO RIVER  
AND WASTE DISCHARGES BELOW SACRAMENTO

Mile	June 20 - 24, 1960		August 29 - September 2, 1960		October 24 - 28, 1960	
	Average : :River Flow: : cfs	5-Day BOD : : Thousands of : : Pounds Per Day::	Average : :River Flow: : cfs	5-Day BOD : : Thousands of : : Pounds Per Day::	Average : :River Flow: : cfs	5-Day BOD : : Thousands of : : Pounds Per Day
54.2	9,200	41,100	10,000	51,800	7,400	64,200
(54.1L Sacramento Sewage Treatment Plant)	-----	(41,100)	-----	(99,100)	-----	(65,000)
50.8	9,200	105,000	10,000	164,000	7,400	102,400
46.2	9,200	83,700	10,000	122,500	7,400	94,000
43.4	9,200	71,300	10,000	102,500	7,400	84,800
(43.4R American Crystal Sugar Company)	-----	(0)	-----	(13,400)	-----	(11,100)
39.8	-----	-----	10,000	103,600	7,400	85,600
37.2	-----	-----	10,000	113,800	7,400	83,600
34.4	-----	-----	10,000	109,000	7,400	76,500



Table 29

RATIOS OF ULTIMATE CARBONACEOUS DEMAND  
TO 5-DAY BOD AT 20°C

River Mile	Date Collected	Observed 5-Day BOD	Observed 30-Day BOD	Ultimate Carbonaceous Demand (L <sub>a</sub> )	Ratio L <sub>a</sub> /5-Day BOD
293.9	10- 5-60	3.02	----	4.11	1.36
244.1	10- 5-60	1.06	----	1.94	1.83
217.6	5-24-61	0.71	1.63	0.92	1.30
184.5	10- 5-60	0.86	----	1.65	1.92
184.5	9-12-60	0.93	2.07	1.22	1.32
184.5	5-24-61	1.03	2.04	1.40	1.36
134.6	9-12-60	1.18	2.55	1.51	1.28
100.2	9- 1-60	0.40	1.20	0.87	2.18
90.5	5-24-61	0.98	2.64	1.63	1.66
62.6	8-30-60	0.60	2.10	0.77	1.28
62.6	9- 1-60	0.60	1.70	0.95	1.58
62.6	10-25-60	1.40	2.92	1.67	1.19
62.6	10-25-60	1.42	2.92	1.72	1.21
62.6	5-31-61	1.25	3.26	1.81	1.44
58.2	9-12-60	0.90	1.13	1.36	1.51
54.2	5-31-60	1.15	2.79	1.44	1.25
43.4	5-31-61	1.38	3.87	2.08	1.51
27.5	8-30-60	0.83	2.63	1.14	1.37
27.5	9- 1-60	1.02	3.01	1.80	1.76
27.5	10-25-60	1.05	2.98	1.49	1.42
27.5	10-25-60	1.07	3.09	1.80	1.68
25.4	8-30-60	1.10	2.58	1.28	1.16
25.4	9- 1-60	1.49	3.18	1.98	1.33
25.4	10-25-60	1.26	3.52	1.80	1.43
18.8	5-31-61	1.39	4.23	1.97	1.42
14.4	9- 1-60	1.08	2.93	1.90	1.76
13.4	8-30-60	1.76	5.32	2.53	1.44
13.4	10-25-60	1.10	3.17	1.82	1.65
13.4	10-25-60	1.15	2.25	1.30	1.13
Average					1.47

method (33), and slope method (47). The results of these computations are in the department's files. Subsequent attempts to use them in the Streeter-Phelps formulation of the oxygen-sag curve discussed in a later portion of this chapter were unsuccessful. Somewhat more consistent results were obtained by using Streeter's (43) formulation:

$K_1 = \frac{1}{t} (\log L_b/L_a)$  where  $K_1$  is the rate of deoxygenation in the river,  $L_a$  and  $L_b$  are the ultimate carbonaceous demands at upstream and downstream stations, respectively, at river temperatures, and  $t$  is the time in days.

The results of these calculations for the river below Sacramento are listed in Table 30. It will be noted that the highest values for  $K_1$  were obtained for the August 29 - September 2, 1960 data when the greatest loading was being discharged by the plant. The slack water BOD profiles were determined in the manner described for the oxygen profiles (Figure 28), and the slugs leaving the sewage treatment plant were chosen to represent the diurnal variation in BOD (Figure 26). The application of these data is discussed later in this chapter.

The rates of BOD exertion for the three major discharges in the lower reach were determined by the four methods listed above with consistent results. The best values for the rate ( $k_1$ ) for the West Sacramento Sewage Treatment Plant discharge varied from about 0.11 to 0.15;  $k_1$  for the Sacramento Sewage Treatment Plant discharge was about 0.22; and  $k_1$  for the American Crystal Sugar Company discharge was about 0.34. Although the amount of basic data is limited so that the derived values of  $k_1$  are only first approximations, the relative values of BOD exertion for the three wastes are considered reasonable.



### Chemical Oxygen Demand

Chemical oxygen demand (COD) was determined monthly from April 1960 to March 1961 at 22 river sampling stations. Median concentrations of COD increased from about 3 ppm in the upper reach to about 8 ppm in the lower reach. COD's at Mayberry Slough (mile 4.0) were typically about 17 ppm. The COD:BOD ratios generally varied between 4 and 5 in the upper reach, increased uniformly between Butte Slough and Sacramento to about 8, dropped to 4 below Sacramento, increased to seven at Rio Vista, and rose sharply to about 15 at Mayberry Slough.

### Characterization of Oxygen Relationships

The major effort toward evaluating the observed oxygen concentrations in the Sacramento River was restricted to the area below Sacramento since it was only in the lower reach that a significant oxygen deficit occurred.

Profiles of oxygen concentrations during the four-day intensive surveys have been previously presented (Figures 27 and 28). Other profiles were prepared which followed given slugs of water which contained sewage treatment plant effluent discharged at 6 a.m., noon, 6 p.m., and midnight. For all profiles, the time of travel was estimated from the data presented in Part 1, Appendix A.

### Streeter-Phelps Method

The classical method of characterizing oxygen relationships in streams was developed from studies conducted in 1914-15 on the Ohio River and published in 1925 by Streeter and Phelps (42). The method describes the oxygen sag curve as a function of BOD, oxygen saturation, rates of deoxygenation and reaeration, and time according to the equation:

$$D_t = \frac{k_1 L_a}{k_2 - k_1} (10^{-k_1 t} - 10^{-k_2 t}) + D_a (10^{-k_2 t})$$

where:

$D_t$  = dissolved oxygen saturation deficit in ppm, after time (t)

$D_a$  = upstream dissolved oxygen saturation deficit in ppm

$L_a$  = upstream ultimate first-stage oxygen demand of the organic matter of the water in ppm

$k_1$  = coefficient defining rate of deoxygenation

$k_2$  = coefficient defining rate of reaeration

t = elapsed time from initial point, in days

In computing coefficients of reaeration,  $k_2$ , the oxygen profiles previously discussed were utilized. Development of each oxygen sag consisted of designating an upper station (a), a lower station (b) and determining the travel time between each station.

The upper station, mile 50.8 in all cases, was chosen as representing typical initial conditions since it is below the major outfall, above tidal influence, completely mixed, and has a DO high enough so that any deoxygenation could be measured.

The station location of the lower station b, was determined by the location of the critical point on each oxygen curve.

The results of computations of stream reaeration coefficients are listed on Table 31 in which it is seen that  $k_2$  values were characteristically negative for the June 20 - 24, 1960 and October 24 - 28, 1960 period. Similar computations for the river below Redding also resulted in frequent negative values. A negative  $k_2$  value has no real physical meaning, and accordingly the Streeter-Phelps formulation is not generally applicable to the Sacramento River. Intuitively, negative  $k_2$  values

Table 31

## SUMMARY OF COMPUTATIONS BY STREETER-PHELPS METHOD

River Mile		20°C		At Temperature of River Water									
a	b	Type of Profile	5-Day BOD <sub>a</sub>	5-Day BOD <sub>b</sub>	D <sub>a</sub> : mg/l	D <sub>t</sub> : mg/l	L <sub>a</sub> : mg/l	L <sub>b</sub> : mg/l	t : days	T : °C	k <sub>1</sub>	k <sub>2</sub>	
June 20 - 24, 1960													
		4-day											
50.8	31.2	average	2.12	1.54	0.5	1.6	2.98	2.44	1.35	21.0	0.064	-0.125	
50.8	30.0	0600	2.12	1.56	0.5	1.8	2.98	2.47	1.43	21.0	0.057	-0.215	
50.8	31.8	1200	2.12	1.54	0.6	2.1	2.98	2.44	1.30	21.0	0.067	-0.252	
50.8	35.4	1800	2.12	1.50	0.7	2.0	2.98	2.38	0.98	21.0	0.100	-0.240	
50.8	37.0	2400	2.12	1.70	0.3	1.7	2.98	2.69	0.85	21.0	0.052	-0.668	
50.8	30.0	H.H.	2.12	1.56	0.4	1.8	2.98	2.47	1.43	21.0	0.057	-0.269	
50.8	31.2	L.H.	2.12	1.54	0.4	1.5	2.98	2.44	1.35	21.0	0.064	-0.200	
50.8	31.5	H.L.	2.12	1.54	0.5	1.5	2.98	2.44	1.31	21.0	0.066	-0.151	
50.8	26.2	L.L.	2.12	1.27	0.4	1.7	2.98	2.01	1.93	21.0	0.088	-0.069	
August 29 - September 2, 1960													
		4-day											
50.8	28.4	average	3.03	1.32	0.7	2.3	4.27	2.06	1.34	20.6	0.236	0.113	
50.8	27.4	0600	3.03	1.26	0.7	2.1	4.27	1.98	1.43	20.6	0.233	0.172	
50.8	28.0	1200	3.03	1.30	0.9	2.5	4.27	2.04	1.38	20.6	0.232	0.110	
50.8	30.0	1800	3.03	1.45	0.9	2.5	4.27	2.27	1.23	20.6	0.224	0.087	
50.8	36.6	2400	3.03	2.06	0.7	2.3	4.27	3.23	0.75	20.6	0.162	-0.217	
50.8	32.6	H.H.	3.03	1.59	0.9	2.4	4.27	2.49	1.02	20.6	0.230	0.073	
50.8	28.0	L.H.	3.03	1.26	0.6	2.3	4.27	1.98	1.38	20.6	0.241	0.109	
50.8	31.0	H.L.	3.03	1.52	0.7	2.1	4.27	2.39	1.13	20.6	0.224	0.120	
50.8	29.0	L.L.	3.03	1.38	0.7	2.2	4.27	2.16	1.30	20.6	0.228	0.121	
October 24 - 28, 1960													
		4-day											
50.8	25.5	average	2.57	1.31	0.6	2.4	3.54	1.87	2.99	16.0	0.093	-0.015	
50.8	25.3	0600	2.57	1.30	0.6	2.5	3.54	1.86	3.02	16.0	0.092	-0.020	
50.8	27.5	1200	2.57	1.36	0.8	2.3	3.54	1.94	2.39	16.0	0.110	0.015	
50.8	25.1	1800	2.57	1.22	0.7	2.5	3.54	1.74	3.05	16.0	0.101	0	
50.8	25.6	2400	2.57	1.31	0.5	2.4	3.54	1.87	2.95	16.0	0.094	-0.018	
50.8	28.3	H.H.	2.57	1.66	0.7	2.3	3.54	2.38	2.16	16.0	0.080	-0.065	
50.8	28.4	L.H.	2.57	1.66	0.5	2.3	3.54	2.38	2.14	16.0	0.081	-0.095	
50.8	24.1	H.L.	2.57	1.30	0.8	2.4	3.54	1.86	3.60	16.0	0.078	0.008	
50.8	25.2	L.L.	2.57	1.31	0.7	2.5	3.54	1.87	3.03	16.0	0.092	-0.012	

might be expected in the Sacramento River because of the consistent and relatively uniform loss of dissolved oxygen from the water shown in Figure 27.

Negative  $k_2$  values have been reported for other streams (48). In this connection, the sensitivity of the laboratory test for BOD's in low concentrations has been seriously questioned and it follows that the derived values for  $k_1$  are subject to the same errors. Regardless of the sensitivity of the laboratory method, the previously stated conclusion from field observations of dissolved oxygen that respiration varies indicates that the rate of BOD satisfaction,  $k_1$ , is not a first-order reaction in the river. It follows that, in these circumstances, the Streeter-Phelps method can never describe the oxygen relationships in the stream.

It is not surprising, then, that attempts to apply various modifications to or refinements of the basic oxygen sag equation, including those of Streeter (43), O'Connor and Dobbins (38), and Churchill (27), to the Sacramento River were similarly unsuccessful.

The  $k_2$  values obtained for the slack-water profiles (Figure 28) the August 29 - September 2, 1960 period were substituted into the basic formulation after correcting for river temperatures according to Elmore and West (28) where  $k_2(T) = k_2(20^\circ) \times 1.0241^{(T-20)}$ . The computed 5-day BOD loading was 113,600 pounds per day which is in excellent agreement with the measured quantity of 114,500 pounds per day. On occasion, then, the Streeter-Phelps method can be made to work, but other than the empirical observation that these apparently valid figures for  $k_2$  were obtained for the period of the greatest waste loading on the river, the reasons for the method's success or failures are imperfectly known.

## Multiple Linear Correlation Method

In another attempt undertaken to produce a waste assimilative capacity for the Sacramento River a "Standard Method for Analysis of Stream Purification Capacity" was used. This method was developed by Churchill and Buckingham (26) and is concerned principally with a stream that is polluted from a single source.

The basic theory presented in the paper states that

"A number of factors operate concurrently to produce a DO deficiency in a stream below a source of pollution. The basic procedure discussed here correlates these factors statistically, all at the same time, with the measured decrease, or drop, in DO concentration from above the point of pollution to the low point of the DO sag. The factors used must be readily measurable in quantitative units.

"When pollution is discharged into a stream such as this the factors subject to direct quantitative observation which affect the extent of the DO sag are the BOD, stream temperature, and stream discharge. Actually, water travel effects are indirectly included, because discharge is included in the correlation, and time of travel is obviously correlated with discharge."

Quantitative observations of the independent variables, BOD, discharge, and stream temperature can be statistically correlated with the dependent variable, DO drop, by using the following multiple correlation relationship:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 \quad (I)$$

where Y = dependent variable, DO drop, ppm

$X_1$  = 5-day BOD, ppm

$X_2$  = water temperature, °F

$X_3$  = stream discharge factor,  $\frac{100,000}{\text{Flow (cfs)}}$

a,  $b_1$ ,  $b_2$ ,  $b_3$  = constants derived from actual data used.

Reducing the above equation to simple terms:

$$\text{DO drop} = a + b_1 (\text{BOD}) + b_2 (\text{temp.}) + b_3 \frac{(100,000)}{\text{cfs}} \quad (II)$$

The constants  $b_1$ ,  $b_2$ , and  $b_3$  are obtained from the three "normal" equations:

$$b_1 \sum X_1^2 + b_2 \sum X_1X_2 + b_3 \sum X_1X_3 = \sum X_1Y \quad (\text{III})$$

$$b_1 \sum X_1X_2 + b_2 \sum X_2^2 + b_3 \sum X_2X_3 = \sum X_2Y \quad (\text{IV})$$

$$b_1 \sum X_1X_3 + b_2 \sum X_2X_3 + b_3 \sum X_3^2 = \sum X_3Y \quad (\text{V})$$

In order to include a wide range of dissolved oxygen and biochemical oxygen demand concentrations, temperatures, and flows, monthly data throughout the year for stations 62.6 and 27.5 were evaluated. Substituting values from Table 32 into equations (III), (IV), and (V):

$$b_1 = +0.4417$$

$$b_2 = -0.0285$$

$$b_3 = +0.1055$$

Solving for "a":

$$\begin{aligned} a &= M_y - b_1M_1 - b_2M_2 - b_3M_3 \\ &= - 2.1333 \end{aligned} \quad (\text{VI})$$

By substituting the constants and independent variables in equation (I) it is now possible to solve for the DO drop in ppm. The results of these computations are shown in Table 33. Following Churchill, the coefficient of multiple correlation was calculated from the equation:

$$R = \frac{b_1 (\sum yx_1) + b_2 (\sum yx_2) + b_3 (\sum yx_3)}{\sum (y^2)}$$

The high degree of correlation between calculated and observed DO drops is indicated by the coefficient (R) of 0.985.

MULTIPLE LINEAR CORRELATION OF OXYGEN RELATIONSHIPS,  
TEMPERATURE, AND DISCHARGE FROM BRYTE (62.6) TO DELTA CROSS CHANNEL (27.4)

Date	Dissolved Oxygen Drop				Biochemical Oxygen Demand Load				Remarks
	:D.O.:	:BOD:	:Temp.:	:Drop:	:BOD(100C#/Day):	:Temp.:	:DXC:	:cfs:	
:(ppm):	:(ppm):	:(°F):	:100,000:	:DXC*:	:Load:	:(°F):	:10,000:		
:Y:	:X <sub>1</sub> :	:X <sub>2</sub> :	:X <sub>3</sub> :	:Y:	:X <sub>1</sub> :	:X <sub>2</sub> :	:X <sub>3</sub> :		
5-20-60	0.7	0.98	66	5.86	20.38	64.04	61	1.26	Corrected sums for:
8-19-60	1.5	1.37	70	10.00	60.10	84.19	66	1.72	Y <sup>2</sup> = 24,889.60
9-22-60	1.6	1.01	70	10.87	33.80	59.96	72	0.86	YX <sub>1</sub> = 3060.91
10-19-60	1.7	1.30	60	14.08	52.40	63.06	70	1.00	YX <sub>2</sub> = -3,389.33
11-16-60	0.8	1.62	53	7.69	34.80	57.23	70	0.92	YX <sub>3</sub> = 569.42
12-15-60	0.9	1.77	47	7.30	74.10	84.50	60	0.71	X <sub>1</sub> <sup>2</sup> = 1,366.72
1-18-61	0.8	2.06	46	7.94	78.50	82.73	53	1.31	X <sub>1</sub> X <sub>2</sub> = -823.48
2-15-61	0.1	1.33	49	2.04	89.50	79.16	47	1.37	X <sub>1</sub> X <sub>3</sub> = 44.80
3-22-61	0.3	1.09	53	2.85	93.50	88.51	46	1.26	X <sub>2</sub> <sup>2</sup> = 949.61
4-20-61	0.7	1.04	60	7.94	199.00	76.40	49	4.90	X <sub>2</sub> X <sub>3</sub> = -59.69
Sums	9.10	13.57	574.0	76.57	856.20	826.00	647.00	18.81	X <sub>3</sub> <sup>2</sup> = 16.93
Means	0.91	1.36	57.4	7.66	77.84	75.09	58.82	1.71	
	M <sub>y</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>y</sub>	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	

\* DXC - Delta Cross Channel.

Table 33

## COMPARISON OF COMPUTED AND OBSERVED DISSOLVED OXYGEN DROP

Date	:Observed: :DO Drop : (ppm)	: :+0.4417 x BOD: :	: :-0.0285 x T°F: :	: :+0.1055 x $\frac{100,000}{Q}$ : :	:Computed :DO Drop : (ppm)
5-20-60	0.7	0.43	1.88	0.62	0.8
8-19-60	1.5	0.61	2.00	1.06	1.5
9-22-60	1.6	0.45	2.00	1.15	1.5
10-19-60	1.7	0.57	1.71	1.49	1.6
11-16-60	0.8	0.72	1.51	0.81	0.9
12-15-60	0.9	0.78	1.34	0.77	0.8
1-18-61	0.8	0.91	1.31	0.84	0.9
2-15-61	0.1	0.59	1.40	0.22	0.1
3-22-61	0.3	0.48	1.51	0.30	0.2
4-20-61	0.7	0.46	1.71	0.84	0.9

$$R = 0.985$$

To further establish an empirical approach to relate waste loadings with river conditions, a correlation of BOD load at the downstream station near the low point of the DO sag was formulated as a function of waste load, stream temperature, and stream discharge. The equation

$$\text{BOD load at lower station} = a + b_1 (\text{waste load})$$

$$+ b_2 (\text{temperature at lower station}) + b_3 (\text{stream discharge}) \quad (\text{VII})$$

is evaluated in the same manner as the DO drop formula. Using data from Table 32, the computed constants are:

$$a = +79.886$$

$$b_1 = +0.4779$$

$$b_2 = -1.4387$$

$$b_3 = +27.30$$

Substituting these constants into the "BOD load" equation:

$$\text{BOD (1000\#/Day)} = 79.886 + 0.4779 (\text{waste BOD 1000\#/Day})$$

$$-1.4387 (\text{river temperature } ^\circ\text{F}) + 27.30 (Q/10,000) \quad (\text{VIII})$$

This equation, along with the DO drop equation (I), can now be used to estimate conditions that would cause the oxygen deficiency in the river to fall below minimum requirements.

For example, the BOD at the low point on the oxygen sag can be calculated by assuming a specific river temperature and flow and causing the waste load to vary. This BOD along with the temperature and flow conditions can then be substituted into the DO drop equation to estimate the waste loading that would cause a specific river water DO reduction at a given river temperature and river discharge condition.

Table 34 shows how observed values of organic loadings compared to results obtained by multiple correlation calculations.

Table 34

COMPARISON OF COMPUTED AND OBSERVED BOD LOADING

Date	: Observed : : BOD Load : : 1000#/Day :	: : +0.478 x BOD <sub>w</sub> : : -1.4387 x T°F : : +27.30 x $\frac{Q}{10,000}$ : : 1000#/Day :	: : : : : : : : :	: : : : : : : : :	: Computed : BOD Load : 1000#/Day
4-21-60	20.38	30.61	87.76	34.40	57.14
5-19-60	60.10	40.24	94.95	46.96	72.14
7-26-60	33.80	28.66	103.59	23.48	28.44
8-22-60	52.40	30.14	100.71	27.30	36.62
9-26-60	34.80	27.36	100.71	25.12	31.66
10-20-60	74.10	40.39	86.32	19.38	53.34
11-18-60	78.50	39.54	76.25	35.76	78.94
12-15-60	89.50	37.84	67.62	37.40	87.50
1-19-61	93.50	40.31	66.18	34.40	88.42
2-16-61	199.00	36.52	70.50	133.77	179.68
3-23-61	120.00	41.21	76.25	95.55	140.40

$$R = 0.937$$

Computed allowable organic waste loadings for specific flows and DO drops at temperatures of 60 and 70°F are shown on Figure 32. The desired DO drop is the reduction in DO between Bryte, mile 62.6, and Delta Cross Channel, mile 27.4. Temperature is the average temperature at the

lower station and BOD discharged is the total organic load received by the river between Sacramento and Delta Cross Channel.

Figure 32 should be used only as a first approximation. Although the plotted and the observed values for BOD loading during the conditions of the August 29 - September 2, 1960 period are 115,000 and 114,500 pound per day, respectively, corresponding figures for the June 20 - 24, 1960 period was <10,000 and 44,200 and for the October 24 - 28, 1960 period were 32,000 and 78,300. It follows that, in order to make this method generally applicable, the correlations must be expanded to include variations of algae populations, relative amounts of wastes discharged from individual sources, and other factors. In addition, the linearity of the interrelationships should be confirmed.

#### Photosynthesis-Respiration Relationships

The methods of characterizing oxygen relationships outlined above have involved both laboratory and field determinations, and the limitations of these methods have been discussed. Some of these limitations may be avoided by using only field observations.

One approach to the problem of determining waste assimilative capacities in streams is the light and dark bottle method of determining photosynthesis and respiration in a stream. Where independent measurements of the rate of diffusion of atmospheric oxygen are available and where it can be assumed that metabolic activity in a bottle adequately represents the activity in a stream, the method is highly useful. It was, however, not possible to provide for light and dark bottle studies during the present investigation.

In 1956, Odum (34) published a new method for determining the amount of oxygen supplied by or lost to the atmosphere, added by

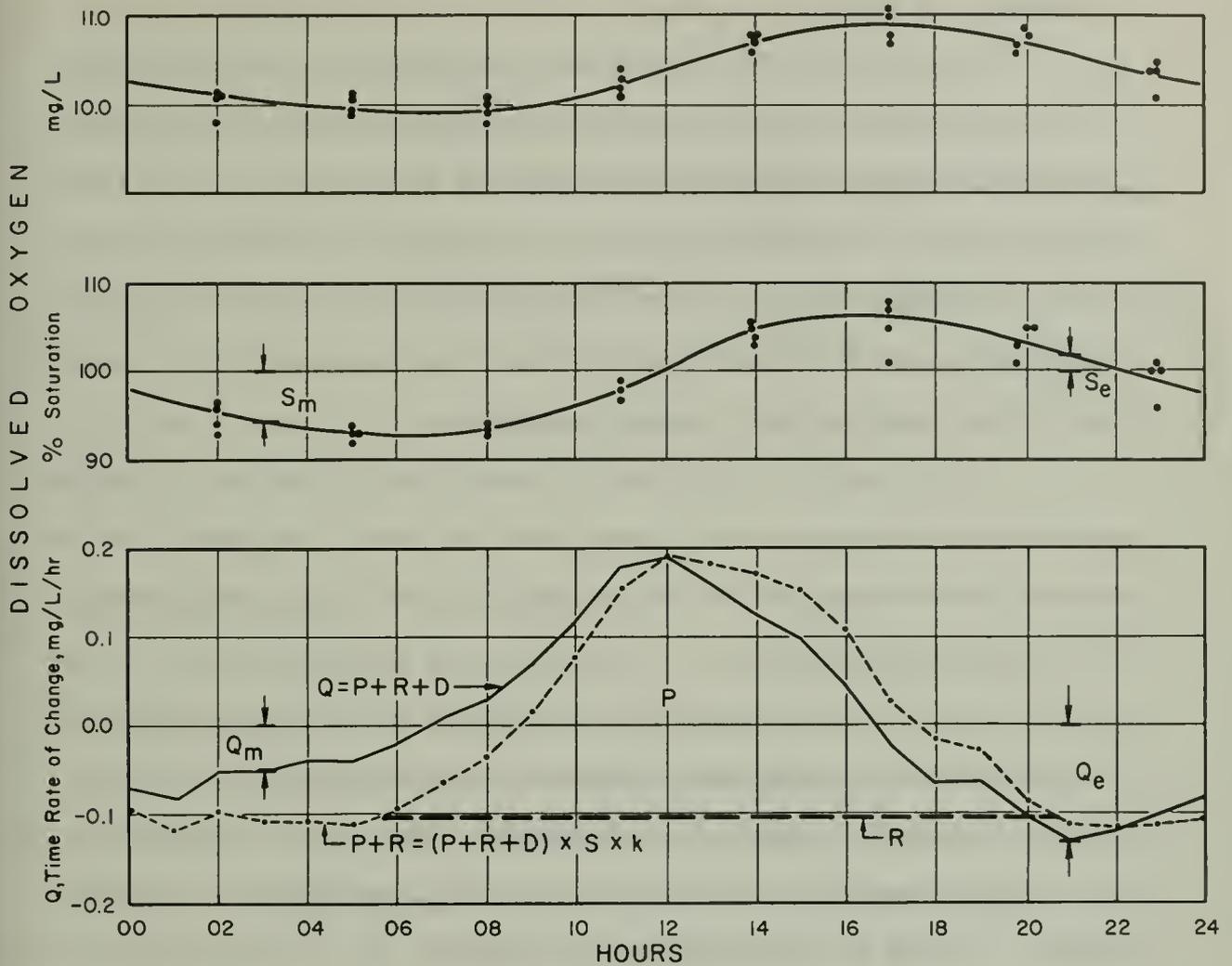


photosynthesis, and utilized by respiration. Values for these factors are derived graphically from observed diurnal changes in dissolved oxygen levels in the stream. The basis of the method is presented in detail in Odum's publications and has been applied to a wide variety of conditions (29, 34, 35, 36).

Figure 33 shows an example from the upper reach where the four-day averages were determined. The values are reported as grams per cubic meter per day which are equivalent to milligrams per liter per day or parts per million per day. This example was deliberately selected to show the method in an area where there are no significant discharge and where oxygen levels follow the classical pattern. In many of the cases shown on Figure 29 and summarized on Table 26, Odum's diurnal curve analysis is not applicable. It is impossible, for example, to use the method where maximum oxygen concentrations are found at night and minimum concentrations occur during the day (Type V in Table 26). Minor departures from the classical curve can, however, be accommodated. Nighttime increases in dissolved oxygen are reflected in reduced rates of respiration.

Odum's method has certain implicit advantages. The coefficient of atmospheric diffusion is determined for the hydrographic and meteorological conditions that existed at the time of observation. The effects of both floating and bottom organisms are inherently combined in the determination of community photosynthesis and respiration. However, there are several possible sources of error. Inspection of Figure 33 shows that the entire analysis derives from the determination of the atmospheric reaeration coefficient ( $k$ ) which in turn depends upon the selection of representative pre-dawn and post-sunset values for the saturation deficit ( $S$ ) and for the time rate of change ( $Q$ ). Errors in  $k$  are only slightly reflected in qualitative evaluation of the effects of waste discharges

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ATMOSPHERIC DIFFUSION COEFFICIENT

$$k = 100 \left( \frac{Q_m - Q_e}{S_m - S_e} \right) = 100 \left( \frac{-0.05 + 0.13}{5.8 + 2.0} \right) = 1.025 \text{ g/m}^3/\text{hr at 0\% Saturation}$$

RESPIRATION

$$R = 24 \times \text{Average Night-time Respiration} = 24 \times 0.104 = 2.49 \text{ g/m}^3/\text{d}$$

PHOTOSYNTHESIS

$$P = \text{Constant} \times \text{Area between (P+R) curve and R} = 0.0033 \times 647 = 2.14 \text{ g/m}^3/\text{d}$$

ATMOSPHERIC DIFFUSION

$$D = \text{Constant} \times \text{Area between (P+R+D) curve and (P+R) curve}$$

$$D_{IN} = 0.0033 \times 164 = 0.54 \text{ g/m}^3/\text{d}$$

$$D_{OUT} = 0.0033 \times 86 = 0.28 \text{ g/m}^3/\text{d}$$

$$P/R = 2.14 / 2.49 = 0.86$$

Figure 33. DETERMINATION OF ATMOSPHERIC DIFFUSION, PHOTOSYNTHESIS, AND RESPIRATION

and of the relative importance of photosynthesis and diffusion as sources of oxygen.

An even greater error may be introduced by the assumption that the average daytime respiration equals the average nighttime respiration. It has been previously shown that respiration does vary over wide ranges. An indication of the extent of these variations due to floating organisms could be obtained from short-term light and dark bottle observations made concurrently with determinations of diurnal oxygen changes and it is recommended that future studies include both methods.

Odum's method can be applied to a single station or to upstream and downstream stations where travel times are known. The single-station approach depends upon the assumption that each particle of water passing the station has essentially the same history as the preceding and succeeding particles. This assumption is not strictly fulfilled in the Sacramento River because of intermittent discharges of irrigation return flows and because of diurnal variations in BOD loadings from sewage treatment plants. Nevertheless, use of the single-station analysis provided more consistent results than did the upstream-downstream method, and the latter was accordingly abandoned.

An interesting feature of Odum's method is that photosynthesis, respiration, and diffusion can be determined for a group of stations with similar, though not identical, diurnal oxygen variations. Although the resulting relationships will be internally consistent, they will probably not be the average of the same relationships determined for the individual stations within the group. This means that the method inherently includes a self-regulating or feedback mechanism which ultimately derives from the cyclic characteristic of individual or averaged basic diurnal curves.

Rates. Table 35 summarizes the determinations of atmospheric diffusion coefficients and of rates of diffusion photosynthesis, and respiration at 72 stations on the Sacramento River. It was possible to determine these factors for as many as four intensive sampling periods at some of the stations. Data from the remaining stations and periods were not amenable to analysis by Odum's method because of the significant observed departures from the classical diurnal oxygen variations (Figure 29). Rates of photosynthesis and respiration in grams/square meter/day were obtained by multiplying the volumetric rates shown in the examples on Figure 33 by the depth in meters.

Figure 34 shows the longitudinal variations of dissolved oxygen and of photosynthesis and respiration rates in the river above Sacramento. Rates of photosynthesis and respiration are high at Redding (mile 293.7) and decrease downstream towards Red Bluff (mile 244.1). In this reach, the river is relatively shallow and passes through a number of riffle and rapids areas. Between Red Bluff and Sacramento, photosynthesis and respiration generally rise. Respiration rates typically increases below discharges from sewage treatment plants and irrigation drains. Photosynthesis generally increases below treatment plants and drains except in the reach just below R. D. 787. The reason for the decrease in photosynthesis below R. D. 787 is not known.

The changes in oxygen relationships caused by irrigation of a rice field discussed in Chapter IV, Part 3, Appendix A, are summarized in Table 36.



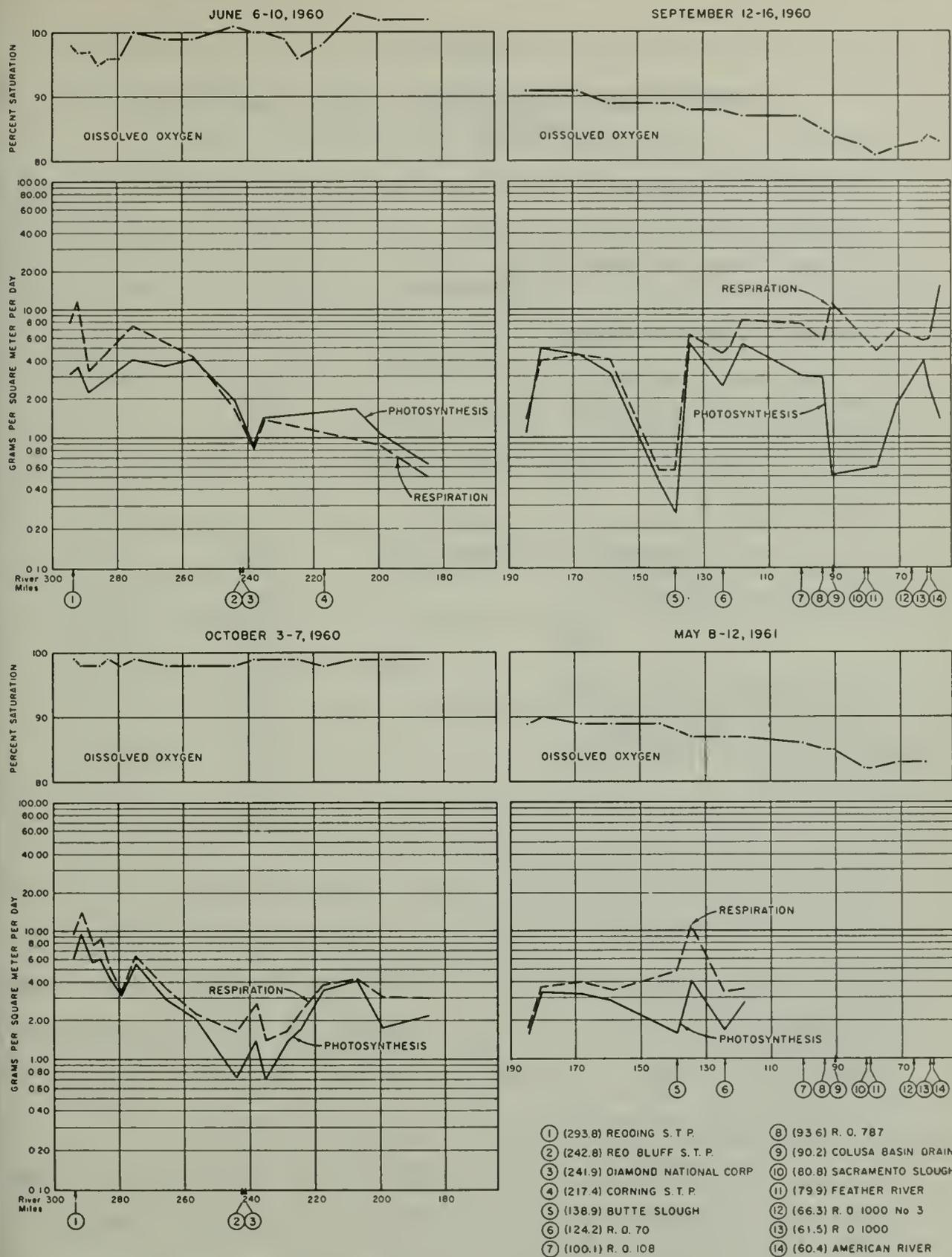


Figure 34. PHOTOSYNTHESIS AND RESPIRATION IN THE SACRAMENTO RIVER ABOVE SACRAMENTO

Table 36

EFFECTS OF RICE IRRIGATION UPON OXYGEN RELATIONSHIPS  
August 11 - 12, 1960

	: Supply :	: Drain
Average Dissolved Oxygen - mg/l	7.9	5.6
- % saturation	93	65
Ranges of Dissolved Oxygen - mg/l	6.8 - 9.1	3.1 - 9.3
- % saturation	79 - 110	34 - 115
Average Biochemical Oxygen Demand - mg/l	1.22	0.60
Range of Biochemical Oxygen Demand - mg/l	0.74 - 3.11	0.43 - 0.83
Temperature °F	75	73
Coefficient of Atmospheric Diffusion (K)	0.89	2.86
Diffusion (D), g/m <sup>3</sup> /d IN-	1.76	11.50
OUT-	0.17	0.14
NET-	1.59	11.36
Photosynthesis (P), g/m <sup>3</sup> /d	3.28	8.53
Respiration (R), g/m <sup>3</sup> /d	4.20	39.60
P/R ratio	0.78	0.22

Photosynthesis in the rice field, which includes the effects of both the algae and the submerged portion of the rice plants, was about twice the maximum found in the river while respiration was about four times as high. Accordingly, the net effect of rice irrigation was to increase the organic loading on the river. It follows that the 5-day BOD values obtained for the field do not adequately represent the organic loading.

The generally higher photosynthesis and respiration in the uppermost reach correspond with the greater populations of bottom organisms which occur in this area (Appendix D). Here, shallow, clear waters flow over a stable bottom and many rapids and riffles are found. These

observations are consistent with the classical picture of higher productivity in riffles and lower productivity in deeper pool areas (64, 66).

Figure 35 shows rates of photosynthesis, respiration and net inward diffusion of atmospheric oxygen between Sacramento (mile 62.6) and Mayberry Slough (mile 4.0). In addition to local variations due to individual waste discharges, photosynthesis and respiration rates increased throughout the degradation portion of the oxygen sag curve, decrease in the sag portion, and increase in the recovery portion of the curve. The figure shows that in the degradation phase, respiration is greater than the sum of diffusion plus photosynthesis,  $R > (P + D)$ , and oxygen levels in the stream decrease. Where respiration approximately equals diffusion plus photosynthesis, as in the sag portion, oxygen levels are essentially constant and where  $R < (P + D)$ , oxygen levels in the stream recover and approach initial concentrations.

The general levels of photosynthesis and respiration in the river also reflect the algal populations which increase with distance from Shasta (Chapter VII, Appendix C). This is particularly noticeable in the reach below Walnut Grove where concentrations of algae increase sharply and suggest eutrophication due to nutrients and growth factors, such as vitamin B<sub>12</sub>, in upstream waste discharges.

Different portions of the river can be characterized as containing autotrophic or heterotrophic communities in which the metabolism is predominantly plant type or animal type, respectively. In areas of autotrophic metabolism, photosynthesis is greater than respiration while heterotrophic communities show an excess of respiration over photosynthesis. These are indicated by the P/R ratios in Table 35 and may be determined by inspection of Figures 34 and 35. In general, the river is heterotrophic

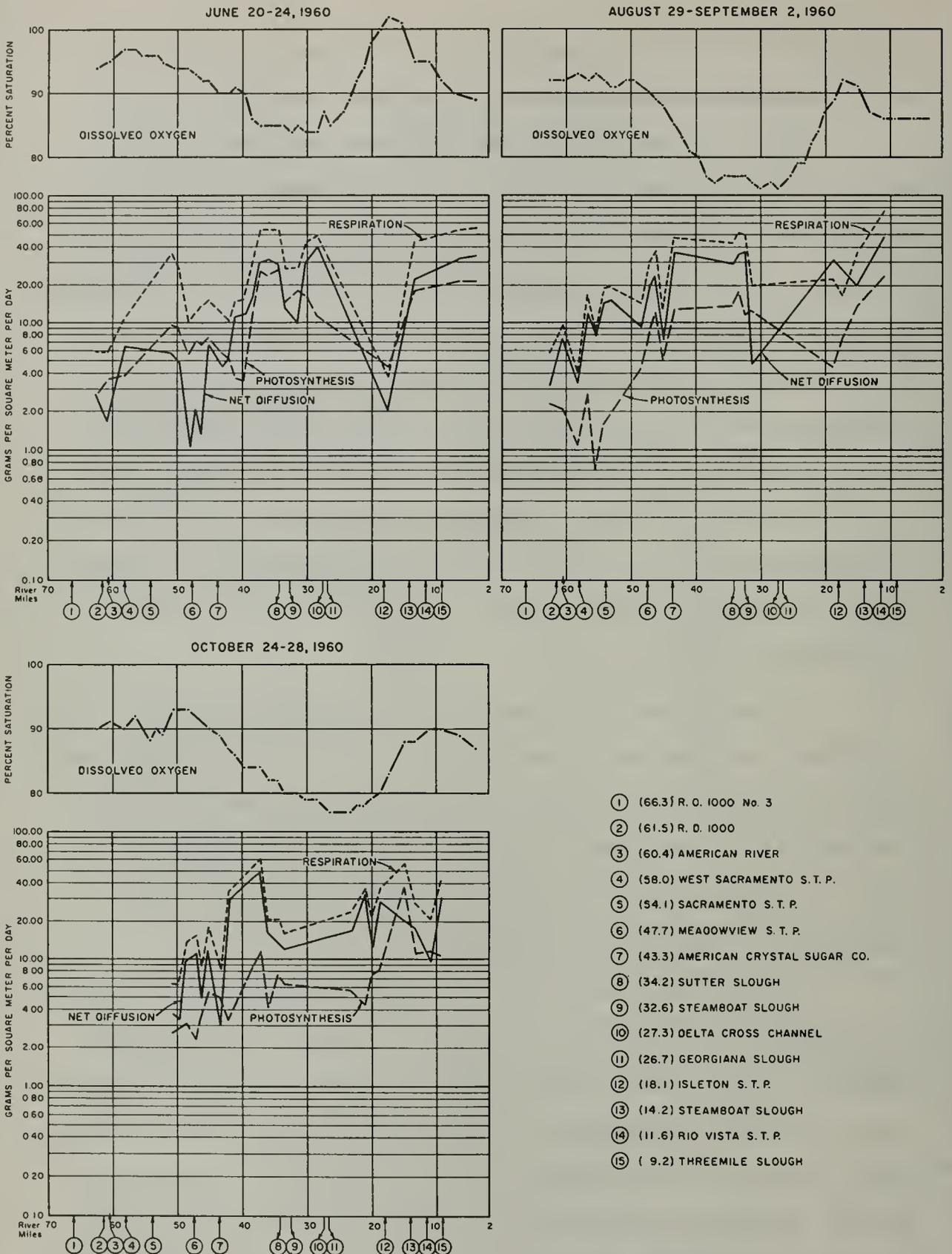


Figure 35. PHOTOSYNTHESIS, RESPIRATION, AND NET DIFFUSION IN THE SACRAMENTO RIVER BELOW SACRAMENTO

with the lowest P/R ratios showing the effects of waste and irrigation discharges.

Photosynthesis in the upper reach rose sharply to a peak between noon and 1 p.m. and decreased rapidly thereafter, indicating that the floating and attached plants in this clear, shallow water were quickly saturated with sunlight. In the deeper, turbid waters of the lower reach photosynthetic rates increased less rapidly to a plateau from about noon to 4 p.m. and then decreased slowly. In the middle reach, the pattern of photosynthesis was mixed.

Diffusion of oxygen to the atmosphere during periods of supersaturation in the river occurred at about 90 percent of the stations in the upper reach, 40 percent in the middle reach, and 2 percent in the lower reach.

Table 37 lists the total quantities of oxygen in the river and oxygen added or subtracted by atmospheric diffusion, photosynthesis, and respiration. The relative importance of the atmosphere and photosynthesis as sources of oxygen at various points in the river is shown. The net oxygen is obtained by summation of the various sources and losses of oxygen at each station. The close agreement between net oxygen and river oxygen is an indication of the completeness of accounting for the several sources and losses.

The concentrations of oxygen in the river reflect various waste discharges and tributary flows. The total pounds per day of oxygen reflects both oxygen level and flows so that, in the lower reach, the largest reductions in pounds per day between stations are due to diversions.

The numerical values of diffusion, photosynthesis, and respiration show a high degree of correlation with physical and biological conditions in the river and qualitatively demonstrate the response of the

TABLE 37

SACRAMENTO RIVER WATER POLLUTION SURVEY  
TOTAL DIFFUSION, PHOTOSYNTHESIS, AND RESPIRATION  
IN THE SACRAMENTO RIVER  
1960-1961

River Mile	Flow cfs	River Oxygen ppm	Diffusion		Photosynthesis		Respiration		Net Oxygen /DAY	Net Oxygen /1,000 ft DAY		
			In /DAY	Out /DAY	In /DAY	Out /DAY	In /DAY	Out /DAY				
June 20 - 24, 1960												
62.6	9,190	8.2	25,000	0.88	0.82	53,500	1.81	51,600	231.4	231.4		
58.2	9,190	8.1	23,000	0.57	1.21	33,000	1.97	21,400	231.1	231.1		
58.2	9,190	8.1	23,000	1.24	0.75	37,100	2.03	100,300	433.1	433.1		
49.8	9,190	8.6	435,000	4.74	0.84	334,000	6.76	334,000	415.0	415.0		
49.8	9,190	8.6	425,000	3.98	2.23	110,300	6.26	310,000	422.3	422.3		
47.1	9,190	8.5	44,500	0.90	1.38	68,200	2.52	124,700	409.0	409.0		
47.1	9,190	8.3	45,000	1.10	1.39	68,700	2.72	111,500	409.3	409.3		
43.4	9,190	8.3	41,000	1.19	1.56	67,000	2.05	121,000	409.4	409.4		
43.4	9,190	8.2	405,000	0.92	1.21	59,800	2.04	101,000	410.3	410.3		
42.1	9,190	8.1	401,000	0.94	0.99	49,000	1.87	92,500	404.0	404.0		
42.1	9,190	8.2	406,000	2.06	0.67	31,100	2.74	134,000	407.1	407.1		
37.2	9,190	7.8	38,000	1.07	1.26	107,000	5.11	234,000	391.0	391.0		
37.2	9,190	7.6	376,000	4.72	4.15	205,400	8.66	459,000	385.9	385.9		
35.9	9,190	7.6	376,000	5.07	3.81	188,500	8.66	459,000	386.5	386.5		
34.4	9,190	7.6	376,000	4.61	4.23	209,200	8.65	428,000	395.2	395.2		
33.5	9,190	7.6	304,000	1.16	2.34	91,500	4.22	116,000	297.3	297.3		
31.6	6,280	7.5	294,000	4.87	2.64	89,200	7.08	239,000	269.0	269.0		
31.6	6,280	7.5	294,000	4.47	1.86	62,900	7.86	266,000	272.9	272.9		
28.4	6,280	7.6	257,000	6.47	2.11	9,580	9.36	7,700	200.6	200.6		
17.5	4,782	8.4	216,000	2.62	2.11	94,200	5.18	133,000	200.6	200.6		
13.4	4,782	8.4	216,000	3.52	2.32	94,500	6.07	159,500	253.5	253.5		
6.5	5,356	8.0	234,000	3.70	2.35	74,500	6.07	191,500	253.5	253.5		
6.5	5,356	8.0	234,000	3.70	2.35	74,500	6.07	191,500	253.5	253.5		
August 29 - September 2, 1960												
62.6	8,670	8.4	392,000	0.91	0.65	30,400	1.57	73,400	391.5	391.5		
62.6	8,670	8.4	392,000	2.30	0.92	37,900	2.24	137,000	413.1	413.1		
58.2	10,010	8.4	432,000	2.62	0.61	32,900	3.62	195,500	432.1	432.1		
58.2	10,010	8.4	432,000	2.24	0.20	10,800	2.52	136,000	448.8	448.8		
55.5	10,010	8.4	433,000	2.24	0.20	10,800	2.52	136,000	448.8	448.8		
54.2	10,010	8.4	433,000	4.55	0.47	25,400	5.46	295,400	429.4	429.4		
54.2	10,010	8.3	448,000	6.16	0.71	38,500	7.09	381,000	437.3	437.3		
47.1	10,010	8.3	448,000	3.47	1.16	56,800	5.87	367,000	428.6	428.6		
47.1	10,010	8.1	435,000	4.95	2.57	138,900	7.72	417,000	426.9	426.9		
46.3	10,010	8.1	435,000	4.95	2.57	138,900	7.72	417,000	426.9	426.9		
45.1	10,010	8.0	432,000	1.54	1.07	57,800	2.71	146,200	426.8	426.8		
44.4	10,010	7.7	416,000	4.52	1.63	88,000	6.04	422.5	422.5	422.5		
44.4	10,010	7.0	378,000	4.46	2.07	111,900	6.62	337,000	373.8	373.8		
33.5	7,495	7.0	390,000	5.62	2.86	136,700	9.51	289,000	287.1	287.1		
32.5	6,960	7.0	295,000	3.46	2.05	69,100	7.25	276,000	287.1	287.1		
31.6	6,960	7.0	263,000	0.70	1.77	66,500	2.86	107,500	248.3	248.3		
18.8	11,900	8.0	81,900	7.40	1.11	11,370	5.47	56,000	113.0	113.0		
17.5	11,900	8.3	85,000	3.44	2.09	21,000	4.51	46,200	95.0	95.0		
15.1	11,900	8.3	85,000	4.79	3.31	31,900	8.94	87,400	80.5	80.5		
11.1	4,460	7.9	187,000	6.34	3.09	73,200	9.09	234,000	176.2	176.2		
October 24 - 28, 1960												
50.8	7,390	9.3	370,000	1.15	0.80	31,800	1.97	78,400	369.2	369.2		
49.8	7,390	9.3	370,000	0.70	0.60	23,900	1.32	58,500	369.3	369.3		
48.4	7,390	9.2	366,000	2.02	0.90	39,500	2.12	124,200	350.1	350.1		
47.1	7,390	9.1	362,000	1.64	0.47	30,600	1.62	78,400	363.6	363.6		
46.3	7,390	9.1	362,000	1.64	0.47	30,600	1.62	78,400	363.6	363.6		
45.1	7,390	9.0	358,000	2.43	1.15	45,800	3.70	147,200	353.3	353.3		
43.4	7,390	8.8	350,000	0.63	1.03	41,000	1.74	69,200	346.9	346.9		
42.1	7,390	8.7	346,000	5.96	0.67	28,600	6.70	339,200	343.7	343.7		
38.6	7,390	8.3	330,000	8.70	1.06	70,000	10.70	401,000	327.1	327.1		
37.2	7,390	8.3	330,000	8.70	1.06	70,000	10.70	401,000	327.1	327.1		
35.9	7,390	8.1	322,000	2.85	0.72	28,600	3.60	143,200	320.7	320.7		
34.4	7,390	8.1	322,000	2.56	1.39	55,200	3.85	133,200	320.9	320.9		
33.5	6,530	8.0	282,000	1.93	1.01	40,100	2.92	88,600	296.8	296.8		
33.5	6,530	8.0	282,000	1.93	1.01	40,100	2.92	88,600	296.8	296.8		
23.3	11,000	7.6	41,000	3.87	1.29	6,960	5.27	28,400	40.4	40.4		
21.1	11,000	7.7	41,500	8.30	1.16	2,660	9.45	50,900	41.6	41.6		
20.1	11,000	7.8	42,100	3.54	1.98	10,650	5.66	30,600	41.3	41.3		
18.8	11,000	7.9	42,600	5.30	1.60	8,650	7.12	38,400	41.4	41.4		
15.1	11,000	8.8	47,400	2.75	4.81	25,900	7.32	39,500	48.6	48.6		
13.4	2,890	8.9	136,800	2.37	1.45	25,300	3.70	85,600	138.7	138.7		
11.1	2,890	9.0	138,200	3.61	1.50	23,000	4.27	19,500	137.1	137.1		
9.5	2,890	9.0	138,200	3.61	1.53	23,000	4.27	19,500	135.3	135.3		
June 6 - 10, 1960												
293.9	8,020	10.9	471,000	2.28	2,590	64,800	3.72	160,800	470.9	470.9		
288.7	8,020	10.9	471,000	3.04	1,460	77,500	5.00	239,000	481.0	481.0		
288.7	8,020	10.9	471,000	3.04	1,460	77,500	5.00	239,000	481.0	481.0		
275.0	8,300	10.7	442,000	1.01	4,460	67,500	2.40	107,200	450.4	450.4		
265.5	8,300	10.3	461,000	0.80	37,100	67,100	2.24	100,000	452.6	452.6		
266.3	8,300	10.3	461,000	0.56	5,370	80,400	1.87	83,600	477.4	477.4		
244.1	8,976	10.2	493,000	0	0.95	45,900	500.7	38,200	494.9	494.9		
238.1	8,976	10.2	493,000	0.22	5,600	49,600	0.99	59,600	478.5	478.5		
238.1	8,976	10.2	493,000	0.22	5,600	49,600	0.99	59,600	478.5	478.5		
207.1	9,590	10.6	500,000	0	1.16	29,500	0.62	37,000	491.5	491.5		
199.6	9,590	9.9	365,000	0	0.19	700	0.53	20,300	368.4	368.4		
184.5	7,130	9.7	373,000	0.04	10,800	16,900	0.36	13,800	366.8	366.8		
October 3 - 7, 1960												
293.9	5,714	10.5	323,500	2.05	63,200	3,117	97,500	147,900	311.1	311.1		
291.7	5,714	10.5	323,500	3.61	111,100	4,767	147,000	7,200	222,000	317.8	317.8	
288.3	5,714	10.5	323,500	2.98	91,800	1,355	11,600	132,000	5,924	182,500	323.2	323.2
285.9	5,714	10.2	314,000	1.57	110,000	4,311	132,600	6,314	194,500	314.0	314.0	
283.0	5,714	10.3	333,000	1.97	60,600	3,209	96,600	3,179	126,700	316.1	316.1	
279.6	5,714	10.1	311,000	0.67	20,600	0.50	15,400	37,300	2,028	62,200	326.1	326.1
275.0	5,840	10.3	324,000	0.54	17,000	0.28	8,500	2,149	78,000	321.4	321.4	
265.5	5,840	10.2	321,000	0.24	7,900	0.06	1,890	42,700	1,633	51,200	318.5	318.5
256.3	5,840	10.1	317,000	0.20	6,290	0.04	1,044	32,700	1,155	36,100	318.6	318.6
244.1	6,350	10.1	345,000	0.42	14,300	0.41	14,050	0.94	32,200	341.2	341.2	
238.1	6,350	10.1	345,000	1.25	42,800	0.41	38,000	2,311	79,000	346.8	346.8	
235.2	6,350	10.2	342,000	0.50	17,100	0.12	4,110	4,380	0.84	28,750	340.8	340.8
228.4	6,350	9.9	339,000	0.30	10,280	0.14	4,790	1,260	1,031	43,000	336.6	336.6
224.4	6,350	9.8	335,000	0.23	7,870	0.14	4,790	1,333	1,540	63,000	320.5	320.5
217.6	6,400	9.8	338,000	0.1								

stream to waste discharges. It has not been possible to compute satisfactory oxygen balances for the river below Sacramento and the figures must therefore be considered as only semiquantitative. As with the other methods of characterizing oxygen relationships discussed previously, the greatest uncertainty lies in the evaluation of rates of respiration or BOD satisfaction ( $k_1$ ).

Future Work. The diurnal curve analysis method has the greatest potential for determining true oxygen balances and, ultimately, the best procedure for calculating the waste assimilative capacity of the Sacramento River. As previously stated, the method inherently describes conditions as they actually occur in the river. However, intensive surveys are required throughout wide ranges of flows and temperatures in order to be able to predict rates of diffusion, photosynthesis, and respiration under future conditions below Sacramento. In particular, more adequate data on respiration are required. These can be derived from pH and alkalinity determinations made concurrently with oxygen determinations (39), supplemented by light and dark bottle measurements made at three-hour intervals. In general, intensive field surveys should be conducted over 48-hour periods and include sampling at three-hour intervals at:

<u>Mile</u>	<u>Location</u>
62.6	Bryte
54.2	Above Sacramento Sewage Treatment Plant
46.3	Freeport
43.4	Above Clarksburg
34.6	Courtland
27.4	Above Delta Cross Channel
26.7	Walnut Grove
24.3	Ryde
18.8	Isleton
14.2	Above Steamboat Slough
14.2R0.2	Steamboat Slough
12.8	Rio Vista

The field program should be supplemented with additional laboratory studies, of river waters, possibly using manometric techniques, of oxygen uptake and carbon dioxide production. BOD determinations of wastes should be made at 1/2, 1, 2, 4, 8, and 16 hours and 1, 2, and 5 days.

General monitoring information on oxygen relationships should be obtained by continuous recorders for dissolved oxygen, temperature, and pH located at Sacramento between mile 54.1 and mile 55 and at Walnut Grove (mile 26.7).

## CHAPTER VI. ASPECTS OF WATER QUALITY MANAGEMENT

Effects of various tributary and waste discharges upon water quality in the Sacramento River have been discussed in detail in Chapters IV and V. The requirements for future monitoring of the river and its influents in order to maintain optimum water quality conditions must be rigorously established. For conservative constituents, such as chlorides, a logical data program can best be based upon salt-routing or materials balance techniques. For nonconservative constituents, such as organic materials and dissolved oxygen, the data program involves less exact methods based upon continuous evaluation of current conditions.

### Conservative Constituents in the Sacramento River

The conservative (dissolved mineral) content of the water in the Sacramento River is a significant characteristic, important not only in evaluating the water for various beneficial uses, but also in developing an understanding of the water quality regimen of the river.

The source and magnitude of dissolved mineral content are dependent upon many factors, generally dealing with geochemical and hydrologic conditions on tributary watersheds. For the purposes of this discussion it is sufficient to consider only the total amounts of dissolved minerals contributed by the various tributary streams and other accretions.

The general water quality regimen of the Sacramento River is best understood by outlining the flow and mineral concentration relationships that exist between the river and its various tributaries from Keswick Dam to Freeport.

## Basic Data

Various water sampling programs have been conducted during the past 50 years which serve to delineate the magnitude of dissolved minerals contained in the Sacramento River and its tributary streams. These programs have differed both in their periods of record and their degree of detail. Since the early 1940's, water sampling programs have been sufficiently continuous and detailed to provide an index of annual water quality conditions in the Sacramento River itself. However, only since about 1955 have water quality data been adequate to calculate with reasonable accuracy, the relationships between the various tributary sources and the water quality regimen of the river.

Throughout the following discussion, specific electrical conductance of water, expressed as micromhos per square centimeter at 25°C, is used as a measure of concentration of dissolved minerals. The conductance is proportional to the concentration of dissolved minerals in Sacramento River water.

## Flow-Mineral Concentration Relationships

The Sacramento River is generally an accreting stream, normally doubling its annual mean flow over the reach between Keswick Dam and Freeport. During the spring, it is normal for the river to more than triple its flow over this reach, while during the rest of the year, the flow remains more nearly constant. These different flow conditions are reflected in changes of dissolved mineral content.

In many streams, a well-defined relationship exists between flow and mineral concentration. This relationship can be determined empirically by plotting flow rate versus mineral concentration for the stream at any point. Such well-defined relationships generally exist

on streams draining watersheds of a homogeneous character and upon which very little change from natural conditions of storage and use has occurred, and indicate stable watershed characteristics. However, on the Sacramento River, a stable, well defined, characteristic is not in evidence.

Water from Keswick Reservoir contains dissolved mineral concentrations that are not related to the rate of flow from the reservoir; rather, these concentrations are controlled by the degree of mixing of waters of different characteristics flowing into the reservoir. As flows proceed downstream from Keswick Dam, accretions of water and dissolved minerals from the various independent tributaries, tend to develop a relationship between flows and mineral concentrations in the river. By the time flows have reached Sacramento, an indifferent relationship exists. This relationship is neither well defined nor stable, since it is heavily dependent upon which of the many independent tributary sources is predominating at the time of a particular flow occurrence. Mean concentrations of dissolved minerals at Freeport during months when Feather and American River flows are high, are inversely proportional to Sacramento River flows. When these tributary rivers are at low flow, and the agricultural drain flows are high, an increase in flow in the Sacramento River is usually associated with an increase in mineral concentration.

A mathematical model of flow and dissolved mineral content of the river system was developed to provide a quantitative description of the interrelationships between the dissolved mineral contents of the Sacramento River and its tributaries. The model was operated under conditions prevailing during the 1960 calendar year when water quality conditions were within 10 percent of the 20-year mean and hydrologic conditions were within 25 percent of the 50-year mean. This indicates that 1960 was adequately representative of normal conditions. Further, these

relationships suggest that water quality varies over a much smaller range than stream flows, conclusion that is supported by independent analyses of flow-quality correlations.

The mathematical processes employed in this evaluation were simple but voluminous. Commencing with a mean flow rate from Keswick Reservoir containing a measured mineral content, the various accretions to the river were successively added to both the flow rate and mineral content respectively. Just before each point of diversion, the summation of mineral content were divided by the summation of flow rate to compute the mineral concentration of diverted water. Subsequently, the quantity of both water and mineral content contained in the depletion was subtracted from the main flow. This process was repeated for each of the measured accretions and depletions of the river until a point was reached where daily sampling data provided an adequate measure of the river's mean mineral content. At these points, the computed mean mineral concentrations were compared with the measured values. This verification process indicated possible errors of less than 10 percent and 20 percent when considering annual and monthly means, respectively.

The apparent errors in these calculations are useful in establishing the significance of quantitative results of this study and for evaluating the adequacy of the existing basic data collection program.

#### Quantitative Results

The Sacramento River normally is an accreting stream with two typical seasonal accreting patterns. The annual mean flows and mineral concentrations (as electrical conductance) and means of two periods representative of the typical seasons are presented on Figure 36.

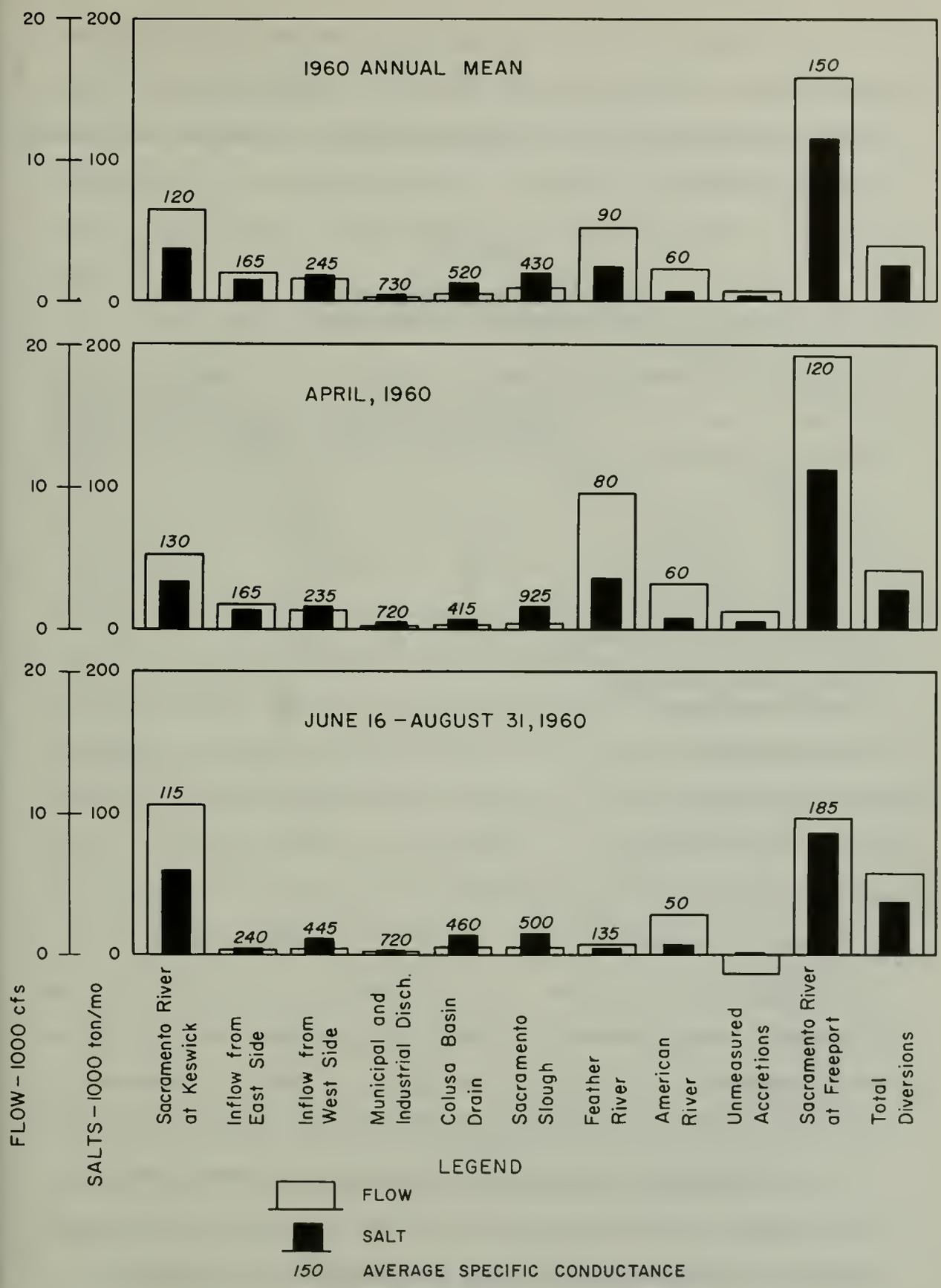


Figure 36. AVERAGE FLOWS AND TONS OF SALT TRIBUTARY TO SACRAMENTO RIVER, 1960

Although detailed interpretation of the water quality regimen cannot be made on an annual basis, the data in Table 38 are useful in evaluating contributions from various tributaries to the flow and mineral content of the river.

Table 38  
1960 ANNUAL MEAN CONTRIBUTION  
FLOW AND MINERAL ACCRETIONS TO SACRAMENTO RIVER, 1960

	Percent of Total Inflow	Percent of Total Mineral Content	Mean Mineral Concentration in Micromhos
<u>INFLOW</u>			
Sacramento at Keswick	33	27	120
Minor East Side Tributaries	10	11	165
Minor West Side Tributaries	8	13	245
Municipal and Industrial Waste Discharges	0	2	730
Colusa Basin Drain	3	9	520
Sacramento Slough	5	14	430
Feather River at Mouth	27	17	90
American River at Mouth	11	4	60
Net Unmeasured Accretion	3	3	---
<u>OUTFLOW</u>			
Sacramento River at Freeport	80	81	150
Total Diversions	20	19	---

From these annual statistics it can be seen that there is a mean increase in mineral concentration of the Sacramento River of about 25 percent occurring between Keswick and Freeport. This increase in mineral concentration can be attributed to dissolved minerals contained

in less than 20 percent of the accreting flows. In a sense, these flows could be considered as the sources of degradation of the river. Sacramento Slough and Colusa Basin Drain constitute the major portion of these degrading flows, and contribute almost 25 percent of the total mineral content in the river, while providing less than 10 percent of the total flow.

The Feather River reduces the effects of these degrading flows on the Sacramento River. Figure 36 shows that seasonal variations in the quantities of degrading flows are not large, while the extreme fluctuation in flows of the Feather River are instrumental in causing the mineral concentration of the Sacramento River at Freeport to vary more than 50 percent. It follows that when flows of the Feather River become regulated by large upstream storage capacity, seasonal mean mineral concentrations in the Sacramento River will approach the calculated annual mean. Other than for the effect of the Feather River, no generalized statement can be made concerning the relative effect of any specific tributary on seasonal variations in mineral concentrations of the Sacramento River. Although the American River exerts a significant effect by reducing the mineral concentrations in the Sacramento River, there appears to be no seasonal cycle to its effect. The same is true of the various agricultural drains. Although there is a tendency for all agricultural drains to become more concentrated with dissolved minerals during the winter months, there does not appear to be any distinct seasonal pattern among them, either individually or collectively, which would relate to the magnitude of their effects on the mineral concentrations in the Sacramento River.

There are about 70 sites of accretion or depletion along the Sacramento River, any one of which is capable of exerting a significant

effect on the river's dissolved mineral content. The relative magnitude of these effects is variable and with present knowledge, not predictable to a high degree of reliability. However, subject to the limits of accuracy with which water quality conditions can be measured on the tributary sources, a mathematical model of the river system is capable of computing the combined effect of these tributaries on the river's dissolved mineral concentration. A comparison of these computed values with measured values of dissolved mineral concentrations along the Sacramento River indicates some question of the accuracy with which the existing water quality data collection program measures conditions on the tributary sources. Comparison of dissolved mineral concentrations computed and measured on the Sacramento River at various locations are shown in Table 39.

#### Adequacy of Basic Data

During 1960, about 30 percent of the dissolved mineral inflow to the Sacramento River was sampled on a continuous or daily basis, about 60 percent was sampled monthly, and about 10 percent was not sampled at all. To a large degree, the frequency of sampling establishes the credibility of resulting basic data. Therefore, the major portion of dissolved minerals entering the river have been assessed at values that are not beyond question in accuracy.

Ground water surface contours indicate that the Sacramento River is usually accreting flow from ground water from Keswick to about Butte City, and that it is losing water to ground water from Butte City to Freeport. This condition causes an actual gain and loss of water that is included, but not always apparent, in the net unmeasured accretions to stream flow that are determined by difference between the summation of tributary flows and the measured outflow for a reach. Since accretions

MEAN DISSOLVED MINERAL CONCENTRATIONS IN SACRAMENTO RIVER  
 COMPUTED AND MEASURED  
 EC x 10<sup>6</sup> at 25°C  
 FOR YEAR 1960

Time Period	Near Red Bluff		Butte City		Below Wilkins Slough		Freeport	
	Meas- :ured	Com-: :puted	Meas-: :ured	Com-: :puted	Meas-: :ured	Com-: :puted	Meas-: :ured	Com-: :puted
January	140	146	150	143	163	184	185	+0.5%
February	123	133	131	142	136	120	136	+13%
March	128	133	151	143	158	113	127	+12%
April	131	134	154	137	166	118	126	+7%
May	126	123	143	128	160	181	183	+1%
June 1-15	130	120	144	131	154	160	155	-3%
June 16- August 31	120	117	131	120	136	184	166	-10%
September 1-14	120	115	134	120	148	235	225	-4%
September 15-30	120	115	137	120	146	207	178	-14%
October 1-17	122	119	139	123	145	180	183	+2%
October 18- November 11	125	123	140	128	143	176	189	+7%
November 12-30	129	131	138	130	149	160	163	+2%
December	119	141	136	126	147	150	161	+7%
Median Difference								+1%
								-8%
								+1%

of ground water are generally at least three times as concentrated with dissolved minerals as the river water, it would be expected that computed mineral concentrations as Butte City would be lower than the measured values by a magnitude that would indicate the quantity of ground water accretions. As shown in Table 39, the percent difference between computed and measured concentrations as Butte City ranges from -12% to +8% with a median value of -8%. The usual unmeasured accretions of dissolved minerals causing this magnitude of difference at Butte City is about 5,000 tons per month. A total accretion of about 200 cubic feet per second of ground water over the reach from Red Bluff to Butte City could easily account for this increment of minerals, and yet remain undetected in the determination of net unmeasured accretions of flow. The data suggest, therefore, that the Sacramento River is receiving an unmeasured accretion of ground water of some 200 cfs at a mineral concentration of about 500 micromhos.

In the reach of the Sacramento River from Butte City to Freeport, it is generally not possible for ground water to flow into the river. Computed values of mineral concentration appearing below Wilkins Slough and Freeport during the summer are low because they do not include unmeasured surface drainage water flowing into the river. It is also possible that values of mineral concentrations determined for the measured accretions to the river are too low, particularly for the Feather River during low flow conditions.

The computed mineral concentration values exceed the measured values during the winter and early spring, when flows from the small tributaries become more important. It follows that unrepresentative high values were obtained for winter-time mineral concentrations in these smaller accretions.

Short-term variations in concentrations of various mineral constituents have been previously noted, particularly with respect to continuous conductivity measurements. Results of mineral analyses of samples collected during the intensive sampling period, August 29 to September 2, 1960, at Bryte (mile 62.6) at three-hour intervals are summarized in Table 40.

Table 40

SHORT-TERM VARIATIONS IN MINERAL QUALITY IN SACRAMENTO RIVER  
AT BRYTE (MILE 62.6), AUGUST 29-SEPTEMBER 2, 1960

Constituent	: Median :	Range	:Maximum Change :in Three Hours
Specific Conductance, Micromhos	238	226 - 249	12
Total Hardness, ppm	82	78 - 84	4
Calcium, ppm	16	15 - 17	2
Magnesium, ppm	9.8	8.6 - 11.0	1.2
Sodium, ppm	18	16 - 20	3
Potassium, ppm	1.3	1.1 - 2.0	0.5
Bicarbonate, ppm	113	107 - 117	5
Sulfate, ppm	12	10 - 14	3
Chloride, ppm	12	11 - 13	2
Fluoride, ppm	0.1	0.0 - 0.2	0.2
Boron, ppm	0.10	0.03 - 0.14	0.08
Percent Sodium	32	30 - 35	4

There was no consistent relationship between the above variations. Some are due to analytical accuracy, bicarbonate could be expected to vary diurnally (although this was not found), and some of the variations are real. Extreme concentrations that may be missed entirely or that

may be fortuitously obtained during grab sampling can thus account for errors in salt-routing computations.

#### Monitoring for Conservative Constituents

Mineral concentrations in the Sacramento River reflect a fine and highly responsive balance of the complex and interacting flows and mineral concentrations in all of the tributary sources. It is impossible, with present knowledge, to relate significant changes in the mineral concentration of the river to any specific tributary or combination of tributaries with a high degree of reliability. On the other hand, this balance condition in the Sacramento River can be computed to a degree of accuracy limited almost entirely by the ability to determine flow and water quality conditions on the tributaries.

It is therefore concluded that, since the river is sum of its parts, future emphasis should be placed on study of conditions affecting flow and mineral concentrations of the tributary sources, rather than continuing attempts to study effects of the tributaries upon the Sacramento River. A knowledge of the factors affecting flow and mineral concentrations of the various tributaries, coupled with the existing knowledge of the tributaries combined effect on the Sacramento River, would constitute a sound basis for making short and long-term predictions of water quality conditions required for effective water quality management. The requirements for these predictions, for determining long range rates of accumulation or leaching of salts from soils and for maintaining current information on water quality in the river can be met by the monitoring program outlined in Table 41, evaluated in conjunction with water quality data obtained from within the tributary watersheds.

The program outlined in the table provides varying degrees of coverage on inflows from 95 percent of the tributary area above Sacramento. Although some new permanent stations are added, the ultimate effect will be a reduction in the department's surface water quality monitoring program for the Sacramento River. Temporary stations are shown for tributaries where supplemental data are required. On the main stem of the river, additional temporary stations will provide continuity and checks on calculated water quality.

The program outlined herein will provide adequate current data and the background for predictions of future water quality in the river. A necessary element in the revised program is the continuing analysis of current data so that periodic reports on water quality in the river can be published in the minimum time.

The partial mineral analyses include determinations of specific conductance, pH, calcium, sodium, carbonate, bicarbonate, chloride, boron, percent sodium, carbonate and noncarbonate hardness, and turbidity.

Complete mineral analyses include, in addition to those in the partial analyses, determinations of magnesium, potassium, sulfate, nitrate, fluoride, silica, phosphate, and total dissolved solids.

Analyses for trace elements include determination of aluminum, beryllium, bismuth, cadmium, cobalt, chromium, copper, iron, gallium, germanium, manganese, molybdenum, nickel, lead, silver, titanium, vanadium, and zinc by spectrographic methods. Wet chemical procedures are used for arsenic and selenium.

Analyses at the cooperative USGS daily stations include determinations of specific conductance, pH, calcium, magnesium, sodium, potassium, carbonate, bicarbonate, sulfate, chloride, boron, nitrate, fluoride, and carbonate and noncarbonate hardness, and silica.

## Nonconservative Constituents in the Sacramento River

Concentrations of dissolved oxygen, organic materials, and alkalinity vary seasonally and diurnally because of biological activity. Temperatures vary seasonally throughout the river and diurnally to a degree which is controlled by local hydrographic conditions. In general, intensive short-term studies in selected areas at critical periods of the year are the major sources of information required for water quality management. Continuous or integrated monitoring of certain constituents identify needs for intensive surveys and provide supporting data. The following monitoring program will provide the minimum amount of data required:

- |                   |  |
|-------------------|--|
| Temperature       | - continuous record at all stations where other types of recorders are or will be in operation.  |
| Dissolved Oxygen  | - continuous records are required at Sacramento (mile 63.6) and Walnut Grove (mile 27.4). At intervals of about three years, dissolved oxygen levels in the lower reaches of the Sacramento and American Rivers should be obtained from intensive surveys during the critical month. |
| pH and Alkalinity | - to be determined during intensive survey.  |
| Nitrogen Series   | - to be determined during intensive survey.  |
| Organic Materials | - permanent installations for determination of organic materials by the carbon adsorption method should be provided on the Sacramento River at Colusa  |

(mile 144.1), Sacramento (mile 63.6),  
and Walnut Grove (mile 27.4) and on the  
American River near the mouth.

**Algae** - monthly analyses of the Sacramento River  
at Redding (mile 297.7), Colusa (mile  
144.1), Sacramento (mile 63.6), and  
Walnut Grove (mile 27.4) are required.

**Bacteriological Quality** - sampling requirements for bacteriologi-  
cal data can be met during intensive  
surveys of oxygen relationships.

**Other Constituents** - analyses for ABS and phenols are made  
semiannually for monthly stations listed  
in Table 41.

Table 41

## RECOMMENDED WATER QUALITY MONITORING PROGRAM FOR THE SACRAMENTO RIVER

Station	(SWQMP No.): Mile	Cooperative:	Monthly	Semiannual Sampling	Dissolved:	Monthly
		Conductivity:USGS Daily	Sampling Station	Complete	Oxygen	Carbon:
		Recorder (a):	(Partial Mineral)	Mineral	Recorder	Filter:
		Perm.:Temp.:	Temp.:	Temp.:	Temp.:	Analyses
		Perm.:	Temp.:	Temp.:	Temp.:	Perm.:
		Perm.:	Temp.:	Temp.:	Temp.:	Perm.:
Sacramento River						
Keswick	(12) 300.9	x				
Bend	(12c) 256.3			x		x
Hamilton City	(13) 199.6			x		
Butte City	(87a) 168.2	x				
Colusa	(13b) 144.1			x		x
Boyers Pump	(14) 111.6			x		
Sacramento Weir	63.6			x		
Freeport	(15b) 46.4	x				x
Walnut Grove	27.4	x				
Rio Vista	(16) 12.8			x		x
Tributaries and Irrigation Drains						
Spring Creek at Mouth	302.3R					
Clear Creek at Mouth	288.1R					
Cow Creek at Mouth	278.9L					
Cottonwood Creek	272.4R					
Battle Creek	(88b) 270.1L	x				
Antelope Creek	(88c) 233.5L					
Mill Creek	(88) 229.0L					
Thomas Creek	(95b) 224.4R					
Deer Creek at Mouth	219.1L					
Big Chico Creek	(85a) 193.9L					
Stony Creek	(13a) 190.8R					
Butte Slough at Outfall Gates	138.9L					
R. D. 108 Drain at Pumps	100.1R					
Colusa Basin Drain at Mouth	90.2R					
Sacramento Slough	(14a) 80.8L					
Feather River at Mouth	79.9L					
R. D. 1000, Pumping Plant No. 3	66.3L					
R. D. 1000, Natomas Main Canal at Mouth	61.5L					
Natomas East Main Drain at Mouth	60.6L					
American River	(22) 60.4L					

Note: (a) Water temperature recorders at stations where other types of recorders are in operation.  
 (b) DO recorder to be located between mile 54.2 and mile 55.

## CHAPTER VII. SUMMARY

The Sacramento River Water Pollution Survey has provided base-line water quality conditions in the river from Shasta Dam to Mayberry Slough; information on present sources of degradation and their influence on water quality in the river; and recommendations for future routine water quality monitoring and special investigations necessary in a water quality management program.

The field program was conducted from April 1960 through June 1961 at stations shown on Plate 1. Hydrologic conditions during this period were 75 or more percent of the 50-year mean while water quality conditions were within 10 percent of the 20-year mean. This means that while hydrologic conditions vary over wide ranges, water quality varies over much smaller ranges. Accordingly, although the following discussion is based primarily on the 1960-61 survey data, it is considered representative of present conditions.

Water temperatures at Keswick generally vary between 50 and 55°F. During winter months, temperatures decrease as the water moves downstream. For the rest of the year, temperatures rise to between about 60 and 75° above Sacramento. After being cooled a few degrees by inflows from the American River, temperatures remain essentially constant except for local seasonal increases in the lower reach where tidal current reversals dominate. Diurnal temperature variations reflect local hydrographic conditions and may be used to determine mixing lengths.

The Sacramento River is slightly alkaline with a median pH of 7.3 from Keswick to Rio Vista. Tributary streams are similar and irrigation returns are somewhat more alkaline. Spring Creek is strongly acid

because of mine wastes; however, this discharge is quickly buffered or neutralized so that no effect on the river was observed.

Suspended solids, turbidity and color are low at Keswick, subsequently reflect seasonal runoff from unregulated tributary streams, and show increases due to irrigation returns and waste discharges and to algae in the middle and lower reaches. Tastes and odors reflect algal populations. River water used for domestic purposes accordingly requires treatment for turbidity and taste or odor removal in addition to that required for bacteriological purification.

Mineral quality of the water, as measured by specific conductance or total dissolved solids, typically improves during the spring months as the river flows from Keswick to Sacramento due to snowmelt in tributary streams. During the balance of the year, water quality is degraded by irrigation return flows below Colusa, which typically have specific conductance values between 300 and 600 micromhos during the irrigation season and between 600 and 1200 micromhos during the winter. Quality is improved by flows from the Feather and American Rivers. Specific conductance varied between about 120 and 140 micromhos in the upper reach throughout the year. At Sacramento, values ranged from about 120 in the spring to about 260 in September. Relationships between flow and quality in the river are not clearly defined. Relationships between specific conductance and dissolved constituents are, in general, reasonably defined; locally, different source waters cause these relationships to be poorly defined. In general, variations of constituent minerals are consistent with variations in conductance. Seven continuous conductivity recorders between Red Bluff and Isleton showed the effects of intermittent discharges of irrigation returns and provided data on travel times and mixing.

Salt-routing studies have shown that mineral quality in the Sacramento River can best be established and can only be explained on the basis of expanded monitoring of tributary flows.

The mineral quality of Sacramento River water presently meets criteria for all beneficial uses. Concentrations of various constituents in the river at Sacramento are from one-third to one-half the objectives stated in departmental contracts for the sale of water.

ABS concentrations in the river below sewage treatment plant discharges are low. At Freeport, concentrations of 0.1 ppm were found about half the time and none was detected during the remainder.

Dissolved oxygen concentrations varied between 10 and 11 ppm near Redding and decreased more or less uniformly throughout the remaining length of river. Saturation values started out at 98 or 99 percent, rose somewhat within the upper reach while the effects of heating were dominant, and then decreased towards the mouth of the river. The oxygen sag below Sacramento extends from about mile 50 to mile 15 with minimum observed values between 5.2 and 6.5 ppm and between 51 and 69 percent saturation. Diurnal variations of dissolved oxygen followed the classical pattern, with minima at about dawn and maxima in mid-afternoon, for 62, 48, and 28 percent of the time in the upper, middle, and lower reaches, respectively. The departures from the classical pattern which were found during the balance of the time are explained by variations in respiration. These variations, together with the over-all loss of oxygen in the water as it flows from Redding to Mayberry Slough, limit the application of both the oxygen-sag analysis (Streeter-Phelps, et seq) and the diurnal curve analysis (Odum) in characterizing the oxygen relationships in the river.

Rates of oxygen gains and losses due to atmospheric diffusion, photosynthesis, and respiration determined from diurnal curve analyses show qualitatively the response of the river to various waste discharges and provide the best method for ultimate quantitative determination of waste assimilation capacity. Multiple linear correlations of physical parameters and oxygen and BOD factors provide an independent method of evaluating assimilative capacity. Additional studies are required to establish absolute waste assimilative capacities by either method.

## CHAPTER VIII. RECOMMENDATIONS

Ultimate requirements for water quality management of the Sacramento River system can best be met on the basis of the following recommendations:

1. The emphasis in water quality monitoring for conservative constituents should be changed from the river to the tributaries. Two permanent and eight temporary conductivity recorder installations; three permanent daily water quality sampling stations in cooperation with the U. S. Geological Survey; thirteen permanent and eleven temporary monthly (partial mineral) surface water quality monitoring stations, with semi-annual complete mineral and trace element analyses; two permanent dissolved oxygen recorder stations; three permanent carbon filter installations; and four permanent monthly stations for algae analyses will provide the minimum of basic data. The locations of the above stations are listed on Table 41. This monitoring program will require monthly computation, evaluation, and reporting of water quality in the Sacramento River.

2. Further analysis of data obtained during the present investigation should include:

- a. Evaluation of vertical and longitudinal mixing from continuous conductivity recorder data.

- b. Multiple linear correlation of algae concentrations, atmospheric diffusion coefficients, and hydrographic features together with flows, temperatures, oxygen levels, and BOD's to better establish waste assimilative capacities.

3. Conduct special two-day intensive surveys of oxygen relationships with sampling at three-hour intervals during each month of the year for a two-year period. Determine flow, travel time, temperature,

pH, alkalinity, dissolved oxygen, and short-term BOD in river and photosynthesis and respiration in light and dark bottles. Sampling stations should be located at miles 62.6, 54.2, 46.3, 43.4, 34.6, 27.4, 26.7, 24.3, 18.8, 14.2, 14.2R0.2, and 12.8 on the river. Determine flows and short-term BOD's of waste discharges during intensive sampling periods.

4. A special study of water temperatures and heat balances throughout the Sacramento River system, including the Sacramento-San Joaquin Delta, should be made to provide operational criteria for reservoir operation, to estimate the capacity of the river to assimilate thermal pollution, and to provide data on mixing.

5. At intervals of about three years, conduct intensive surveys of oxygen relationships and bacteriological conditions of lower reaches of Sacramento and American Rivers during August or September when waste discharges reach annual peaks.

6. Investigate travel times, flow distribution, and mixing in waterways of the Sacramento-San Joaquin Delta by means of continuous conductivity recorders which will reflect intermittent discharges of irrigation return waters.

7. After monitoring program outlined in paragraph 1, above has been in operation for one year, make predictions of future water quality conditions in the Sacramento River. These predictions should be made biennially and should include consideration of a Sacramento Valley Master Drainage System.

8. Future investigations which are similar in scope to the Sacramento River Water Pollution Survey should provide for about two man-days on data evaluation for each man-day in the field, concurrently with the data collection phase. During the final data evaluation and report writing phase, an additional two man-days in the office are required for each day in the field. These ratios do not include laboratory requirements.

BASIC DATA  
TABLES AND FIGURES



Table T-1

RESULTS OF ANALYSES  
MONTHLY SAMPLING PROGRAM





TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

SPRING CREEK AT IRON MOUNTAIN ROAD, MILE 302.3R/10

Date Collected (F.S.T.)	Time (F.S.T.)	5-17-60 0735	6-14-60 0710	7-19-60 0705	8-16-60 0645	9-20-60 0745	10-18-60 0640	11-15-60 1030	12-13-60 0620	1-17-61	2-15-61	3-21-61
										0835	0720	0635
Discharge, dis-lean Daily	5 (est.)	81	67	71	63.5	62.0	54	50	45	8.0	215	30
										39	49	47
Temp.	pH	Dissolved Oxygen, ppm	pH Saturation	EC x 10 <sup>6</sup> at 25°C	34	3	3.0	2.8	3.1	2.9	2.8	3.1
										2.9	2.8	3.1
Constituents in												
Total Dissolved Solids												
Sum												
Silica												
Cations												
Calcium (Ca)	24	0.12	24	1.50	24	0.12	24	1.50	16	0.80	8.3	0.41
Magnesium (Mg)	44	0.72	44	3.36	44	0.72	44	3.36	17	1.40	27	2.07
Sodium (Na)	5.0	0.52	5.0	0.52	5.0	0.52	5.0	0.52	5.2	0.44	2.4	0.19
Potassium (K)	2.5	0.26	2.5	0.26	2.5	0.26	2.5	0.26	0.7	0.02	0.4	0.03
Iron (Total)												
(Fe)	54	120	198	16.33	304	269	260	308	16.54	132	31	1.67
(As)	31	49	73	11.23	101	101	87	93	10.34	47	33	1.67
(As)	0.04	0.02	0.04	0.04	0.04	0.04	0.04	0.17	0.01	0.03	0.00	0.00
Chromium (Cr <sup>+6</sup> )	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Copper (Cu)	3.9	5.6	11	0.47	8.0	8.0	5.6	12	0.38	5.6	2.3	0.07
Lead (Pb)	0.66	0.06	0.06	0.06	0.06	0.06	0.02	0.07	0.00	0.03	0.00	0.02
Manganese (Mn)	0.77	1.1	1.1	2.6	2.6	2.4	2.2	1.8	0.97	0.69	1.0	0.01
Zinc (Zn)	52	42	89	3.46	107	107	104	86	2.63	109	26	0.80
Total Cations	36.38											
Anions												
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00	0	0	0.00	0	0.00	0
Bicarbonate (HCO <sub>3</sub> )	0	0.00	0	0.00	0	0.00	0	0	0.00	0	0.00	0
Sulfate (SO <sub>4</sub> )	3380	27.69	1740	39.32	1900	39.32	1900	1900	16.08	140	173	3.60
Chloride (Cl)	2.2	0.13	2.2	0.13	2.2	0.13	2.2	2.2	0.14	0.4	0.24	0.0
Fluoride (F)	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.2	0.03	0.3	0.02	0.1
Nitrate (NO <sub>3</sub> )	0.2	0.00	0.2	0.00	0.2	0.00	0.2	0.2	0.01	0.7	0.01	0.5
Total Anions	35.15											
Barion												
Total Hardness (As CaCO <sub>3</sub> )	0.01											
NC Hardness	42	0.06	42	229	0.01	229	229	23	0.01	0.04	0.03	0.01
Percent Sodium	42	0.8	42	229	0.01	229	229	23	0.01	0.04	0.03	0.01
Color (Units)												
Turbidity (Silica Scale)												
Odor (Threshold)												
Nitrogen Series												
Organic Nitrogen (N)												
Nitrite (NO <sub>2</sub> )												
Nitrate (NO <sub>3</sub> )												
Ammonium (NH <sub>4</sub> )												
Phosphate - Ortho (PO <sub>4</sub> )												
Phosphate - Total (PO <sub>4</sub> )												
Other Solubles												
Biochemical Oxygen Demand (5-day at 20°C)												
Chemical Oxygen Demand												
Suspended Solids												
Detergent												
Phenolic Material (ABS)												
Settleable Solids (m <sup>3</sup> /l)												



TABLE T-1 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY  
RESULTS OF ANALYSES  
MONTHLY SAMPLING PROGRAM  
1960-1961

NAME (Stationed)	SACRAMENTO RIVER ABOVE REDDING DIVERSION DAM, MILE 297.7											
	6-13-61	6-24-61	7-1-61	7-13-61	7-27-61	8-10-61	8-24-61	9-7-61	9-21-61	10-5-61	10-19-61	11-2-61
Meacham, Cfs-Kean Hall	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Instantaneous	10.100	10.100	10.100	10.100	10.100	10.100	10.100	10.100	10.100	10.100	10.100	10.100
Total Dissolved Solids	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4
EC x 10 <sup>6</sup> at 25°C	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1
Constituents in												
Total Dissolved Solids	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4
Sum	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4	11.4
Silica	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Cations												
Calcium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Magnesium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sodium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iron (Total)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aluminum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arsenic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Copper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manganese	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Cations	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Anions												
Total Sulfate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bicarbonate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fluoride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Anions	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22
Boron	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Nitrogen (As N <sub>2</sub> )	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Percent Nitrogen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Color (Units)	24	24	24	24	24	24	24	24	24	24	24	24
Turbidity (Jella Scale)	10	10	10	10	10	10	10	10	10	10	10	10
Color (Threshold) (60°C)	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Nitrogen Series												
Organic Nitrogen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ammonia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phosphorus - Ortho	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Solids	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Biochemical Oxygen Demand (5-day at 20°C)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chemical Oxygen Demand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Suspended Solids	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Settleable Solids	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phosphate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfur Dioxide	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

\*\* Parenthetic values indicate concentration of B (1) for nitrogen series or P (2) for phosphate.

TABLE T-1 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY  
RESULTS OF ANALYSES  
MONTHLY SAMPLING PROGRAM  
1960-1961

Date Collected (P.M.T.)	5-18-60 0800/1600 Discharge cfs-Hour Daily 1.86 (1.2 MGD)		4-18-60 0800/1600 1.86 (1.2 MGD)		7-18-60 0700-1800 (Comp) 2.66 (1.72 MGD)		8-17-60 0700-1800 (Comp) 2.67 (1.72 MGD)		9-19-60 0700-1800 (Comp) 2.42 (1.56 MGD)		10-17-60 0800-1900 3.28 (2.1 MGD)		11-11-60 0800-1900 2.34 (1.49 MGD)		12/12/60 0800-1900 2.51 (1.62 MGD)		1-16-61 0800-1900 3.03 (1.90 MGD)		3-20-61 0800-1900 4.24 (2.74 MGD)		4-17-61 0800-1900 2.37 (1.53 MGD)		5-23-61 0700-1800 2.68 (1.73 MGD)		6-12-61 0700-1800 2.33 (1.37 MGD)					
	Temp. of field	X Saturation	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)			
Constituents in																														
Total Dissolved Solids			246	28	246	28	246	28	246	28	246	28	246	28	246	28	246	28	246	28	246	28	246	28	246	28				
Silica (SiO <sub>2</sub> )																														
Cations																														
Calcium (Ca)			11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55		
Magnesium (Mg)			12	0.59	12	0.59	12	0.59	12	0.59	12	0.59	12	0.59	12	0.59	12	0.59	12	0.59	12	0.59	12	0.59	12	0.59	12	0.59		
Sodium (Na)			16	0.82	16	0.82	16	0.82	16	0.82	16	0.82	16	0.82	16	0.82	16	0.82	16	0.82	16	0.82	16	0.82	16	0.82	16	0.82		
Potassium (K)			27	1.50	27	1.50	27	1.50	27	1.50	27	1.50	27	1.50	27	1.50	27	1.50	27	1.50	27	1.50	27	1.50	27	1.50	27	1.50		
Iron (Total) (Fe)																														
Aluminum (Al)																														
Arsenic (As)																														
Chromium (Cr-6)																														
Copper (Cu)																														
Lead (Pb)																														
Manganese (Mn)																														
Zinc (Zn)																														
Total Cations			52.33		52.33		52.33		52.33		52.33		52.33		52.33		52.33		52.33		52.33		52.33		52.33		52.33			
anions																														
Bicarbonate (CO <sub>3</sub> )			0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00		
Sulfate (SO <sub>4</sub> )			213	3.49	213	3.49	213	3.49	213	3.49	213	3.49	213	3.49	213	3.49	213	3.49	213	3.49	213	3.49	213	3.49	213	3.49	213	3.49	213	3.49
Chloride (Cl)			31	0.67	31	0.67	31	0.67	31	0.67	31	0.67	31	0.67	31	0.67	31	0.67	31	0.67	31	0.67	31	0.67	31	0.67	31	0.67	31	0.67
Fluoride (F)			0.7	0.01	0.7	0.01	0.7	0.01	0.7	0.01	0.7	0.01	0.7	0.01	0.7	0.01	0.7	0.01	0.7	0.01	0.7	0.01	0.7	0.01	0.7	0.01	0.7	0.01	0.7	0.01
Nitrate (NO <sub>3</sub> )																														
Total Anions			4.49		4.49		4.49		4.49		4.49		4.49		4.49		4.49		4.49		4.49		4.49		4.49		4.49			
Boron (B)			0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4		0.4	
Total Hardness (As CaCO <sub>3</sub> )			77		77		77		77		77		77		77		77		77		77		77		77		77		77	
Percent Sodium			0		0		0		0		0		0		0		0		0		0		0		0		0		0	
Color (Units)			36		36		36		36		36		36		36		36		36		36		36		36		36		36	
Turbidity (Jilica Scale)			900		900		900		900		900		900		900		900		900		900		900		900		900		900	
Color (Threshold) (GPC)			900		900		900		900		900		900		900		900		900		900		900		900		900		900	
Nitrogen Series																														
Organic Nitrogen (N)			9.4		9.4		9.4		9.4		9.4		9.4		9.4		9.4		9.4		9.4		9.4		9.4		9.4		9.4	
Inorganic Nitrogen (NO <sub>2</sub> )			0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	
Nitrite (NO <sub>2</sub> )			1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9		1.9	
Nitrate (NO <sub>3</sub> )			27		27		27		27		27		27		27		27		27		27		27		27		27		27	
Ammonia (NH <sub>3</sub> )			28		28		28		28		28		28		28		28		28		28		28		28		28		28	
Phosphate - Ortho (PO <sub>4</sub> )			38		38		38		38		38		38		38		38		38		38		38		38		38		38	
Phosphate - Total (PO <sub>4</sub> )			100		100		100		100		100		100		100		100		100		100		100		100		100		100	
Other Solubles			96		96		96		96		96		96		96		96		96		96		96		96		96		96	
Biochemical Oxygen Demand (5-Day at 20°C)			167		167		167		167		167		167		167		167		167		167		167		167		167		167	
Chemical Oxygen Demand			326		326		326		326		326		326		326		326		326		326		326		326		326		326	
Suspended Solids			91		91		91		91		91		91		91		91		91		91		91		91		91		91	
Petroleum			4.2		4.2		4.2		4.2		4.2		4.2		4.2		4.2		4.2		4.2		4.2		4.2		4.2		4.2	
Phenolic Material																														
Total Solids (mg/l)			3		3		3		3		3		3		3		3		3		3		3		3		3		3	

\*\* Parenthetic values indicate concentrations of N (1) for nitrogen series or P (2) for phosphate.  
\* Value is the result of analysis of a grab sample of effluent. All other values are results of analysis of a composite of hourly samples collected during the period shown.

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

Date Collected	SACRAMENTO RIVER ABOVE CHURN CREEK, MILE 285.9														
	4-18-60	5-17-60	6-11-60	7-19-60	8-15-60	9-20-60	10-18-60	11-19-60	12-13-60	1-17-61	2-15-61	3-21-61	4-18-61	5-24-61	6-21-61
Time (P.S.T.)	0900	0857	0830	0915	0850	0905	1020	1245	1030	0920	0900	1012	0900	0720	0840
Discharge, cfs-Mean Daily	6100	7100	8800	10,200	10,300	6,400	5300	4500	3700	4500	20,000 (Est.)	15,000 (Est.)	6,270	6,780	7,610
Instantaneous				52	51.5	53.5	55	56	56	46.5	49	48.5	50	51	52
Temp. °F	50	50	51	52	51.5	53.5	55	56	56	46.5	49	48.5	50	51	52
Dissolved Oxygen, Ppm	11.4	11.6	11.4	11.1	11.0	10.6	10.5	10.0	10.6	10.8	10.9	11.3	11.7	10.9	10.9
pH	7.2	7.2	7.3	7.3	7.3	7.4	7.8	7.5	7.5	7.7	7.4	7.4	7.5	7.3	7.5
EC x 10 <sup>3</sup> at 25°C	120	120	120	120	113	107	111	113	133	131	120	122	111	114	116
Constituents in	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l
Total Dissolved Solids	100	100	85	50	79	83	88	87	94	86	109	88	93	84	82
Silica (ASD)	24	22	24	23	23	23	23	25	26	26	25	23	23	23	23
Cations															
Calcium	10	11	10	10	9.9	10	10	10	9.0	12	11	10	11	10	11
Magnesium	5.1	4.7	4.4	4.4	4.2	4.1	4.6	5.4	4.4	4.6	4.2	4.2	4.4	4.4	4.4
Sodium	5.3	4.7	6.1	6.3	5.9	6.0	5.7	7.0	8.0	7.4	7.0	7.0	7.4	7.4	7.4
Potassium	1.1	1.1	1.1	1.2	1.2	1.1	1.1	1.4	1.4	1.5	1.4	1.4	1.4	1.4	1.2
Iron (Total)	0.14	0.07	0.05	0.06	0.06	0.04	0.03	0.10	0.15	0.23	0.27	0.17	0.17	0.17	0.17
Aluminum	0.0	0.0	0.0	0.0	0.02	0.0	0.0	0.0	0.06	0.05	0.06	0.06	0.06	0.06	0.06
Arsenic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromium	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Copper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manganese	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Non-Metals															
Carbonate	0.10	0.08	0.10	0.01	0.00	0.03	0.02	0.10	0.08	0.07	0.04	0.05	0.04	0.05	0.05
Bicarbonate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	0.11	0.11	0.12	0.10	0.10	0.10	0.10	0.10	0.10	0.13	0.11	0.11	0.11	0.11	0.11
Chloride	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Fluoride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrate	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Nitrogen	1.21	1.21	1.18	1.16	1.13	1.12	1.13	1.16	1.28	1.37	1.34	1.24	1.37	1.13	1.13
Boron (B)	0.07	0.11	0.08	0.02	0.05	0.05	0.03	0.07	0.07	0.05	0.11	0.04	0.11	0.04	0.04
Total Hardness (As CaCO <sub>3</sub> )	46	47	43	43	42	42	44	47	49	49	45	43	49	43	43
Percent Sodium	0.22	0.23	0.21	0.21	0.23	0.23	0.22	0.23	0.26	0.24	0.24	0.22	0.24	0.22	0.22
Total Solids (Total Solids)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Color (Threshold) (60°C)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Nitrogen Series															
Organic Nitrogen	0.0	0.0	0.1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Nitrite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrate	0.0	0.0	0.4	0.4	0.6	0.5	0.2	0.7	1.8	1.1	0.0	0.0	0.0	0.0	0.0
Ammonia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phosphate - Ortho	0.1	0.1	0.1	0.1	0.1	0.09	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Phosphate	0.1	0.1	0.1	0.1	0.1	0.19	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Solubles	5	3.8	16	2.4	1.2	2.3	2.3	2.3	2.6	2.1	2.1	2.1	2.1	2.1	2.1
Biochemical Oxygen Demand (5-day at 20°C)	0.58	0.58	1.13	0.26	0.68	0.59	0.59	0.59	0.81	1.28	0.93	0.90	0.94	0.90	0.90
Chemical Oxygen Demand	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07	1.07
Dissolved Solids	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42
Total Solids	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Satiable Solids (S.S.)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

\*\* Parenthetic values indicate concentrations of N (1) for nitrogen series or P (2) for phosphate.

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

Data Collected Item (P.S.R.)	SACRAMENTO RIVER AT BALLS FERRY BRIDGE, MILE 2750														
	8-19-60	5-17-60	6-15-60	7-19-60	8-16-60	9-20-60	10-18-60	11-15-60	12-13-60	1-17-61	2-15-61	3-21-61	4-18-61	5-24-61	6-13-61
	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)
Temp. (°C)	10.8	11.1	10.1	10.6	10.2	10.3	10.2	10.1	10.3	11.0	10.6	10.5	10.6	10.4	10.4
Dissolved Oxygen, ppm	94.2	93.1	94.2	94.2	94.2	95.2	95.2	95.2	95.2	95.2	95.2	95.2	95.2	95.2	95.2
pH	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Total Dissolved Solids	103	92	84	79	70	84	93	92	97	73	90	95	86	91	87
Calcium	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Magnesium	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Sulfate	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Potassium	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Iron (Total)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aluminum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Arsenic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Copper	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Zinc	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Manganese	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitrate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Calcium	1.24	1.22	1.21	1.15	1.15	1.16	1.19	1.19	1.33	1.33	1.38	1.14	1.14	1.14	1.14
Carbonate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Sulfate	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
Chloride	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9	2.9
Fluoride	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nitrate	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Nitrogen	1.21	1.23	1.20	1.14	1.09	1.14	1.18	1.18	1.39	1.34	1.02	1.14	1.14	1.14	1.14
Boron	0.07	0.09	0.09	0.04	0.05	0.05	0.05	0.05	0.06	0.05	0.05	0.07	0.07	0.07	0.07
Total Hardness (as CaCO3)	46	44	44	43	43	44	45	45	51	51	42	42	42	42	42
Free Hardness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent Sodium	22	22	22	22	22	22	22	22	21	21	20	20	20	20	20
Color (Units)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Turbidity (Jackson Turbidity)	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Odor (Threshold)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Nitrogen Series															
Organic Nitrogen	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitrate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Amoniacal Nitrogen	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phosphate - Total	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphate - Orthophosphate	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Biochemical Oxygen Demand	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Chemical Oxygen Demand	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Chlorophyll a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phenolic Material	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sesquioxide Solids (mg/l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

\*\* Parenthetic values indicate concentrations of M (1) for nitrogen series or P (2) for phosphate

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

Date	(SWMP) COTTONWOOD CREEK NEAR COTTONWOOD, MILE 272.4R/2.4											
	1-11-60	1-10-60	1-1-60	1-1-60	1-1-60	1-1-60	1-1-60	1-1-60	1-1-60	1-1-60	1-1-60	1-1-60
Time (P.S.T.)	1:40	1:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00	11:00
Discharge, cfs-Mean Daily	281	281	281	281	281	281	281	281	281	281	281	281
Instantaneous	51	51	51	51	51	51	51	51	51	51	51	51
Temp. °F	74	74	74	74	74	74	74	74	74	74	74	74
Dissolved Oxygen, Ppm	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
pH Saturation	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
EC x 10 <sup>3</sup> at 25°C	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Constituents in	mg/l (µm)	mg/l (µm)	mg/l (µm)	mg/l (µm)	mg/l (µm)	mg/l (µm)	mg/l (µm)	mg/l (µm)	mg/l (µm)	mg/l (µm)	mg/l (µm)	mg/l (µm)
Total Dissolved Solids	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
Sulfates	20	20	20	20	20	20	20	20	20	20	20	20
Cations												
Calcium	22	22	22	22	22	22	22	22	22	22	22	22
Magnesium	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92	1.92
Sodium	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1
Potassium	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Iron (Total)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aluminum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arsenic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Copper	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manganese	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Cations	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
Anions												
Bicarbonate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10	1.10
Chloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fluoride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Anions	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
Boron	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Hardness (As CaCO <sub>3</sub> )	5	5	5	5	5	5	5	5	5	5	5	5
Percent Sodium	0	0	0	0	0	0	0	0	0	0	0	0
Color (Pt-Co)	15	15	15	15	15	15	15	15	15	15	15	15
Odor (Threshold)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrogen Series												
Organic Nitrogen	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrite	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ammonia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Phosphate - Ortho	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other Solids												
Biochemical Oxygen Demand (5-day at 20°C)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chemical Oxygen Demand	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Solids	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Settleable Solids	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

(SWMP) Samples were collected in conjunction with the Surface Water Monitoring Program of the State Department of Water Resources.







TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

RED BANK CREEK AT DIAMOND NATIONAL CORPORATION, MILE 241.9R

Date Collected Time (P.S.T.)	4-19-60		5-17-60		6-15-60		7-10-60		8-16-60		9-10-60		10-18-60		11-15-60		12/13/60		1-17-61		2-15-61		3-21-61		4-18-61		5-24-61		6-13-61	
	mg/l (ppm)	me/l (ppm)																												
Discharge, cfs - Mean Daily	1320	4 est.	1345	3 est.	1145	1 est.	1115	30 est.	1030	1000	1085	6	1110	1120	1045	1120	1120	1120	1120	1120	1120	1120	1120	1120	1120	1120	1120	1120	1120	1120
Instantaneous	90	0.1	---	---	88	6.5	---	90	17	17	15	4 (Est.)	6 (Est.)	49	55.5	49	49	49	49	49	49	49	49	49	49	49	49	49	49	49
Dissolved Oxygen, ppm	0.1	---	---	---	82	---	---	---	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
Field Saturation	1.3	---	---	---	82	---	---	---	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82
pH	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
EC x 10 <sup>6</sup> at 25°C	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Constituents in	mg/l	me/l																												
Total Dissolved Solids	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sum	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Silica	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cations	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Calcium (Ca)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Magnesium (Mg)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sodium (Na)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Potassium (K)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Iron (Total) (Fe)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Aluminum (Al)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Arsenic (As)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Chromium (Cr-6)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Copper (Cu)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lead (Pb)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Manganese (Mn)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Zinc (Zn)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total Anions	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Anions	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Carbonate (CO <sub>3</sub> )	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Bicarbonate (HCO <sub>3</sub> )	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Sulfate (SO <sub>4</sub> )	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Chloride (Cl)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Fluoride (F)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Nitrate (NO <sub>3</sub> )	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total Boron (B)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Total Hardness (As CaCO <sub>3</sub> )	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Hardness	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Percey Sodium	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Color (Units)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Color (Pt-Co Scale)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Color (Hazen)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Nitrogen Series	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Organic Nitrogen	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Nitrite (NO <sub>2</sub> )	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Nitrate (NO <sub>3</sub> )	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Ammonium (NH <sub>4</sub> )	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Phosphate - Ortho (PO <sub>4</sub> )	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Phosphate - Total (PO <sub>4</sub> )	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Ether Solubles	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Biochemical Oxygen Demand (5-Day at 20°C)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Chemical Oxygen Demand	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Suspended Solids	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Detergents (ARS)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Phenolic Material	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Seawater Solids (mg/l)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

\*\* Parenthetic values indicate concentrations of N (1) for nitrogen series or P (2) for phosphate.

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

SACRAMENTO RIVER ABOVE ELDER CREEK, MILE 2298

Date Collected Time (P.M.T.) Discharge, cfs-Mean Daily Insitu ammonia Temp. of Dissolved Oxygen, ppm pH & Saturation EC x 10 <sup>6</sup> at 25°C	4-19-61		5-17-60		6-15-60		7-19-60		8-16-60		9-20-60		10-16-60		11-17-60		12-13-60		1-17-61		2-15-61		3-21-61		4-18-61		5-24-61		6-13-61				
	mg/l (ppm)																																
Total Dissolved Solids	113	99	86	82	88	88	83	83	93	85	92	92	113	104	100	96	113	110	110	110	110	110	110	110	110	110	110	110	110	110			
Calcium	12	0.60	11	0.50	11	0.55	10	0.50	10	0.50	10	0.50	10	0.50	11	0.55	12	0.60	12	0.60	12	0.60	12	0.60	12	0.60	12	0.60	12	0.60	12		
Magnesium	5.1	0.42	5.8	0.46	4.2	0.35	4.6	0.36	4.9	0.40	4.9	0.40	5.1	0.42	5.7	0.47	5.8	0.48	5.0	0.41	4.1	0.34	4.1	0.34	4.1	0.34	4.1	0.34	4.1	0.34	4.1		
Sodium	7.0	0.30	7.4	0.32	6.5	0.26	6.5	0.26	5.7	0.25	6.2	0.27	6.2	0.27	7.2	0.31	8.4	0.36	8.0	0.35	6.5	0.28	6.0	0.26	6.5	0.28	6.5	0.28	6.0	0.26	6.5		
Potassium	1.3	0.03	1.2	0.03	1.3	0.03	1.3	0.03	1.3	0.03	1.4	0.04	1.2	0.04	1.7	0.04	1.5	0.04	1.5	0.04	1.3	0.03	1.2	0.03	1.3	0.03	1.3	0.03	1.2	0.03	1.3		
Iron (Total)																																	
Aluminum																																	
Arrenic																																	
Chromium																																	
Copper																																	
Lead																																	
Manganese																																	
Zinc																																	
Carbonate	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0		
Bicarbonate	66	0.12	66	0.12	66	0.12	66	0.12	61	0.09	62	0.10	64	0.09	63	0.10	72	0.13	74	0.13	63	0.10	61	0.09	63	0.10	63	0.10	61	0.09	63		
Sulfate	2.9	0.04	2.9	0.04	3.1	0.04	2.1	0.04	1.6	0.04	1.6	0.04	2.0	0.06	4.4	0.15	4.6	0.15	3.6	0.12	4.3	0.09	5.6	0.12	4.3	0.09	4.3	0.09	5.6	0.12	4.3		
Chloride	0.1	0.00	0.1	0.00	0.0	0.00	0.0	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.0	0.00	0.1	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0		
Fluoride	0.7	0.00	0.7	0.01	0.5	0.01	0.3	0.00	0.3	0.00	0.2	0.00	0.3	0.00	1.0	0.02	0.7	0.01	0.7	0.01	0.8	0.01	1.0	0.02	0.8	0.01	0.8	0.01	1.0	0.02	0.8		
Nitrate																																	
Total Ammonia	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1		
Boron	0.06	0.12	0.09	0.03	0.05	0.03	0.03	0.03	0.05	0.03	0.04	0.04	0.04	0.05	0.09	0.09	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	
Total Hardness (as CaCO <sub>3</sub> )	51	0.90	49	0.88	45	0.80	44	0.80	45	0.80	45	0.80	46	0.80	51	0.90	50	0.90	54	0.90	48	0.88	47	0.88	48	0.88	48	0.88	47	0.88	47	0.88	
Water Hardness	0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		0		
Water Hardness (as CaCO <sub>3</sub> )	22	0.40	24	0.44	21	0.40	24	0.44	21	0.40	22	0.40	25	0.44	23	0.44	24	0.44	24	0.44	24	0.44	25	0.44	24	0.44	24	0.44	25	0.44	24	0.44	
Ammonia Nitrogen	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	
Nitrogen Series																																	
Organic Nitrogen	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	
Nitrite	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	
Nitrate	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	
Ammonium	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	
Phosphate - Ortho	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	
Phosphate - Total	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	
ELDER Solubles	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	
Biochemical Oxygen Demand (5-DAY AT 20°C)	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	
Chemical Oxygen Demand	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	
Suspended Solids	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	1.1	0.11	
Phenolic Material	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	
Settleable Solids (ml/l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

•• Parenthetic values indicate concentrations of N (1) for nitrogen series or P (2) for phosphate.

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

Date Collected Time (P.S.T.)	(SWMP) MILL CREEK NEAR LOS MOLINOS, MILE 229.0L/11														
	4-11-60	5-10-60	6-13-60	7-12-60	8-3-60	9-13-60	10-11-60	11-2-60	12-6-60	1-3-61	2-16-61	3-15-61	4-11-61	5-2-61	6-6-61
Discharge, cfs-Mean Daily	1115	350	1095 (est.)	47	2 (est.)	1.6	41	62.7	102	146	146	1473	1330	1345	
Temp. of Water	55	58	82	77	79	79	80.6	79	86.5	82	89	80	82	82	
Dissolved Oxygen, ppm	10.3	10.1	9.8	8.5	9.1	7.3	10.6	10.5	99.5	102	102	102	99.7	99.7	
pH	7.4	7.4	7.3	7.4	7.6	7.3	7.8	7.5	7.3	7.3	7.3	7.4	7.3	7.3	
EC x 10 <sup>6</sup> at 25°C	116	115	118	114	124	251	229	215	174	191	112	117	122	118	
Constituents in mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)
Total Dissolved Solids	98	29	192	42	19	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21
Silica (SiO <sub>2</sub> )															
Cations															
Calcium (Ca)	8.0	0.40	1.48	1.14	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
Magnesium (Mg)	4.9	0.40	1.48	1.14	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
Sodium (Na)	8.5	0.37	1.48	1.14	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
Potassium (K)	2.0	0.05	1.48	1.14	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48	1.48
Iron (Total) (Fe)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Aluminum (Al)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Chloride (Cl)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Copper (Cu)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead (Pb)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manganese (Mn)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc (Zn)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Cations	1.02	1.22	1.14	1.88	2.13	2.77	2.11	1.99	1.65	1.96	0.97	1.11	1.18	1.07	
anions															
Carbonate (CO <sub>3</sub> )	0	0.00	0.00	0.00	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate (HCO <sub>3</sub> )	38	0.62	34	62	1.02	94	1.54	67	60	62	47	51	43	39	39
Sulfate (SO <sub>4</sub> )	15	0.31	25	22	22	25	26	22	16	16	16	16	13	13	
Chloride (Cl)	10	0.28	5.0	22	0.68	28	0.73	22	16	16	16	16	13	13	
Fluoride (F)	0.2	0.01	0.1	0.01	0.01	0.1	0.01	0.2	0.01	0.01	0.01	0.01	0.2	0.2	
Nitrate (NO <sub>3</sub> )	0.6	0.01	0.3	0.01	0.01	0.3	0.01	0.6	0.01	0.01	0.01	0.01	0.6	0.6	
Total Anions	66	1.21	67	1.64	1.85	2.80	1.76	1.72	1.43	1.50	0.97	1.05	0.94	1.19	
Boron (B)	0.1	0.1	0.3	0.4	0.5	0.6	0.6	0.6	0.5	0.5	0.2	0.3	0.3	0.2	
Total Hardness (as CaCO <sub>3</sub> )	5	9	41	57	74	99	62	60	52	59	33	35	38	35	
Percent Sodium	3	30	11	6	3	22	10	5	3	8	0	0	0	6	
Color (Units)	15	25	25	33	31	25	41	39	3	40	32	41	35	35	
Turbidity (Silica Scale)	15	25	25	33	31	25	41	39	3	40	32	41	35	35	
Odor (Threshold)	15	25	25	33	31	25	41	39	3	40	32	41	35	35	
Nitrogen Series															
Organic Nitrogen (ON)															
Nitrite (NO <sub>2</sub> )															
Nitrate (NO <sub>3</sub> )															
Ammonia (NH <sub>3</sub> )															
Fluoride - Ortho (F <sub>2</sub> O)															
Fluoride - Total (F <sub>2</sub> O <sub>T</sub> )															
Other Solubiles															
Biochemical Oxygen Demand (BOD <sub>5</sub> )															
Chemical Oxygen Demand (COD)															
Suspended Solids															
Detergents															
Phenolic Material (ME)															
Settleable Solids (SS)															

(SWMP) Samples were collected in conjunction with the Surface Water Monitoring Program of the State Department of Water Resources.

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

SACRAMENTO RIVER AT VINA BRIDGE, MILE 2176

Date Collected Time (P.S.T.) Discharge, cfs - Mean Daily Instantaneous Temp. °F Dissolved Oxygen, ppm pH EC x 10 <sup>6</sup> at 25°C Lab.	4-19-60		5-17-60		6-15-60		7-19-60		8-16-60		9-20-60		10-18-60		11-19-60		12/13/60		1-17-61		2-15-61		3-21-61		4-18-61		5-24-61		6-13-61		
	mg/l (ppm)	meq/l (eqm)																													
Total Dissolved Solids	143	96	96	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	
Sulfate	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	
Calcium	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	11	0.55	
Magnesium	6.0	0.49	5.2	0.43	4.7	0.39	4.9	0.40	4.9	0.40	4.7	0.39	4.5	0.37	5.0	0.41	6.4	0.53	5.7	0.47	5.2	0.43	4.4	0.36	4.1	0.33	4.1	0.33	4.1	0.33	
Sodium	7.3	0.32	7.7	0.33	7.0	0.30	6.4	0.28	5.9	0.26	7.3	0.32	7.2	0.31	7.4	0.32	8.0	0.35	8.0	0.35	7.0	0.30	6.3	0.27	6.3	0.27	7.0	0.30	6.3	0.27	
Potassium	1.3	0.03	1.2	0.03	1.3	0.03	1.3	0.03	1.4	0.04	1.3	0.03	1.6	0.04	1.7	0.04	1.6	0.04	1.5	0.04	1.2	0.03	1.1	0.03	1.1	0.03	1.2	0.03	1.1	0.03	
Iron (Total)	0.10								0.05																						
Aluminum	0.00								0.02																						
Arsenic	0.00								0.00																						
Chromium	0.00								0.00																						
Copper	0.00								0.00																						
Lead	0.00								0.00																						
Manganese	0.00								0.00																						
Zinc	0.01								0.02																						
Carbonate	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	
Bicarbonate	70	1.15	67	1.10	63	1.03	63	1.03	62	1.02	65	1.06	67	1.10	61	1.10	74	1.21	76	1.24	64	1.05	63	1.03	63	1.03	64	1.05	63	1.03	
Sulfate	5.9	0.14	6.9	0.14	7.1	0.15	6.1	0.08	2.8	0.06	4.6	0.10	5.8	0.12	5.4	0.11	6.9	0.14	5.4	0.11	5.3	0.11	6.1	0.11	6.1	0.11	5.3	0.11	6.1	0.11	
Chloride	2.7	0.08	2.7	0.08	3.6	0.10	2.4	0.07	2.0	0.06	2.1	0.06	2.8	0.08	2.8	0.08	4.2	0.14	4.1	0.12	2.7	0.08	3.0	0.08	3.0	0.08	2.7	0.08	3.0	0.08	
Fluoride	0.2	0.01	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.2	0.01	0.0	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	
Nitrate	0.1	0.00	0.6	0.01	0.4	0.01	0.3	0.00	0.2	0.00	0.2	0.00	0.1	0.00	1.5	0.02	0.7	0.01	0.7	0.01	1.0	0.02	0.6	0.01	0.6	0.01	1.0	0.02	0.6	0.01	
Total Anions	1.36	1.33	1.23	1.23	1.23	1.23	1.23	1.23	1.14	1.22	1.22	1.31	1.31	1.31	1.27	1.32	1.32	1.32	1.32	1.18	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	
Boron	0.08	0.11	0.09	0.03	0.09	0.03	0.03	0.03	0.06	0.05	0.05	0.04	0.04	0.04	0.11	0.11	0.11	0.11	0.09	0.09	0.08	0.08	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	
Total Hardness (as CaCO <sub>3</sub> )	52	49	47	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Percent Sodium	0	25	0	24	0	24	0	23	22	25	25	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Calcium (mg/l)	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Magnesium (mg/l)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Sulfate (mg/l)	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Chloride (mg/l)	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Fluoride (mg/l)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nitrate (mg/l)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Hardness (as CaCO <sub>3</sub> )	52	49	47	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45
Biological Oxygen Demand (5-Day at 20°C)	1.35	1.00	1.18	0.71	1.24	0.51	1.04	0.71	1.11	1.04	0.51	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Chemical Oxygen Demand	1.35	1.00	1.18	0.71	1.24	0.51	1.04	0.71	1.11	1.04	0.51	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04	1.04
Unfiltered Solids	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
Soluble Solids	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

•• Parenthetic values indicate concentrations of P (1) for nitrogen series or P (2) for phosphate.

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

Date Collected Time (P.S.T.)	SACRAMENTO RIVER AT HAMILTON CITY BRIDGE, MILE 199.6														
	4-19-60	5-17-60	6-15-60	7-19-60	8-16-60	9-20-60	10-20-60	11-15-60	12-13/16-60	1-17-61	2-15-61	3-21-61	4-18-61	5-24-61	6-13-61
Discharge, cfs-Mean Daily	1600	1430	1420	1420	1385	1495	1495	1655	1520	1345	1320	1255	1295	1090	1242
Instream	59	61.5	61.5	65	10.1	8.8	10.4	10.2	10.9	11.3	10.9	10.1	9.9	10.2	9.8
Dissolved Oxygen, ppm	10.8	10.5	10.1	10.4	10.2	10.1	10.4	9.4	9.4	9.6	9.9	10.1	9.9	10.4	10.2
pH Station	105.2	105	104	104	102	101	101	94	94	96	96	99	99	104	102
EC x 10 <sup>6</sup> at 25°C	145	136	132	123	117	122	119	133	128	134	128	134	134	126	127
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	112	97	98	80	71	92	89	89	117	102	106	105	105	96	118
Sum	95	95	88	85	82	85	91	91	111	103	88	88	96	96	118
Silica	25	23	24	24	24	24	24	24	29	27	24	23	23	23	27
Calcium	(Ca)	12	11	11	11	11	11	11	13	13	11	12	12	11	12
Magnesium	(Mg)	5.8	4.9	4.7	4.5	4.9	4.4	5.0	6.2	6.0	5.2	4.4	4.4	4.4	4.4
Sodium	(Na)	7.2	0.31	6.8	5.9	5.9	5.9	7.2	5.0	5.2	7.0	6.3	6.3	6.3	6.3
Potassium	(K)	1.3	0.03	1.3	1.3	1.2	1.2	1.2	1.5	1.5	1.3	1.2	1.2	1.2	1.2
Iron (Total)	(Fe)			0.03				0.02							
Aluminum	(Al)			0.00				0.00							
Chromium	(Cr+6)			0.00				0.00							
Copper	(Cu)			0.00				0.00							
Lead	(Pb)			0.00				0.00							
Manganese	(Mn)			0.00				0.00							
Zinc	(Zn)			0.02				0.00							
Total Cations		1.42	1.36	1.27	1.21	1.19	1.22	1.29	1.59	1.54	1.31	1.26	1.25	1.25	1.26
anions															
Carbonate	(CO <sub>3</sub> )	0	0.00	0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0
Bicarbonate	(HCO <sub>3</sub> )	71	1.16	63	64	1.05	66	1.08	77	1.26	64	1.03	69	1.13	63
Sulfate	(SO <sub>4</sub> )	5.6	0.12	7.4	4.3	0.09	3.3	0.07	6.6	0.14	4.4	0.09	4.4	0.09	4.4
Chloride	(Cl)	3.1	0.09	2.9	2.1	0.07	2.1	0.09	4.3	0.14	3.1	0.09	3.1	0.08	3.1
Fluoride	(F)	0.2	0.01	0.1	0.1	0.00	0.1	0.00	0.1	0.11	0.1	0.00	0.1	0.00	0.1
Nitrate	(NO <sub>3</sub> )	0.2	0.00	0.4	0.3	0.00	0.2	0.00	0.5	0.01	0.9	0.01	0.9	0.01	0.9
Total Anions		1.38	1.40	1.26	1.21	1.15	1.20	1.24	1.58	1.49	1.25	1.25	1.25	1.25	1.25
Boron	(B)	0.08	0.12	0.10	0.04	0.05	0.06	0.06	0.09	0.08	0.10	0.06	0.06	0.06	0.06
Total Hardness (as CaCO <sub>3</sub> )		54	50	47	46	45	48	48	58	57	49	48	48	48	48
Percent Sodium		22	24	24	21	22	22	23	24	23	23	23	23	23	23
Color (Units)		10	5	10	10	5	5	5	5	10	25	15	15	15	15
Turbidity (Silica Scale)		2	5	5	5	4	4	4	3	19	25	15	15	15	15
Odor (Threshold)	(ppc)	2	5.6	2	2.8	2	1.4	2	1	2	1	1	1	1	1
Nitrogen Series															
Organic Nitrogen	(N)	0.0	0.0	0.1	0.4	0.0	0.0	0.2	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Nitrite	(NO <sub>2</sub> )	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrate	(NO <sub>3</sub> )	0.6	0.6	0.4	0.5	0.5	0.6	0.6	0.7	1.0	0.4	0.4	0.4	0.4	0.4
Ammonium	(NH <sub>4</sub> )	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phosphate - Ortho	(PO <sub>4</sub> )	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphate - Total	(P)	5	3.1	19	1.4	1.4	1.4	1.4	3.0	3.0	3.2	3.2	3.2	3.2	3.2
Biochemical Oxygen Demand (5-Day at 20°C)		1.82	0.92	0.61	0.75	0.68	0.68	0.68	0.86	1.08	0.76	0.83	0.83	0.83	0.83
Chemical Oxygen Demand		1.62	0.99	0.66	0.66	0.77	0.60	0.77	0.76	1.36	0.97	0.98	0.98	0.98	0.98
Suspended Solids		17	25	25	23	15	15	15	5	12	42	26	26	26	26
Detergent	(ABS)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phenolic Material		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Settleable Solids (ml/l)		0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

\*\* Parenthetic values indicate concentrations of N (1) for nitrogen series or P (2) for phosphate.

TABLE T-1 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY  
RESULTS OF ANALYSES  
MONTHLY SAMPLING PROGRAM  
1960-1961

Date Collected	(SWMP) SACRAMENTO RIVER AT HAMILTON CITY BRIDGE, MILE 199.6														
	1-12-60	5-9-60	6-15-60	7-11-60	8-2-60	9-12-60	10-10-60	11-1-60	12-5-60	1-2-61	2-15-61	3-2-61	4-10-61	5-1-61	6-8-61
Discipline, cis-stem Dist.	1200	1200	1200	1445	1040	1000	1405	1245	1110	1315	1265	1300	1245	1245	
Temperature	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Dissolved Oxygen, ppm	9.8	9.4	7.110	8.570	8.130	5.830	5.900	5.410	9.300	5.780	14.920	7.951	7.197	7.197	7.116
pH	7.4	7.4	7.3	7.4	7.3	7.3	7.3	7.5	7.1	7.3	7.3	7.5	7.3	7.3	7.4
EC x 10 <sup>6</sup> at 25°C	147	131	131	131	120	123	128	130	140	149	137	135	133	133	128
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	147	131	131	131	120	123	128	130	140	149	137	135	133	133	128
Sulfate	59	59	59	59	59	59	59	59	59	59	59	59	59	59	59
Calcium	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Magnesium	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Sodium	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Potassium	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron (Total)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Aluminum	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Arctic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carbonium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Copper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manganese	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Zinc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Solids	147	131	131	131	120	123	128	130	140	149	137	135	133	133	128
anions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Carbonate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bicarbonate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sulfate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chloride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fluoride	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total anions	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Boron	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Hardness (As CaCO <sub>3</sub> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MC Hardness	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent Sodium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent Chloride	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent Sulfate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent Nitrate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hardness (As CaCO <sub>3</sub> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Particulate Solids (Scale)	10	15	1	10	2	20	1	3	9	4	25	0.4	10	5	8
Color (Pt-Cobalt)	10	15	1	10	2	20	1	3	9	4	25	0.4	10	5	8
Nitrogen Series															
Organic Nitrogen															
Nitrite															
Nitrate															
Ammonium															
Phosphorus - Ortho															
Phosphorus - Total															
Biochemical Oxygen Demand (5-day at 20°C)															
Chemical Oxygen Demand															
Suspended Solids															
Intoxigents															
Mercuric Halogenide															
Settleable Solids (ml/l)															

(SWMP) Samples were collected in conjunction with the Surface Water Monitoring Program of the State Department of Water Resources.

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

Date Collected Time (P.M.)	SACRAMENTO RIVER AT ORD FERRY, MILE 184.5													
	4-20-60	5-13-60	7-15-60	8-11-60	9-28-60	10-18-60	11-15-60	12-13-60	1-17-61	2-15-61	3-21-61	4-18-61	5-24-61	6-13-61
Discharge, cfs-Mean Daily	07.5	1500	1150	1450	1330	2250	2250	2550	3100	3350	1400	1355	1230	1255
Instantaneous	67.0	1800	1300	1450	2190	2190	2550	3100	3350	1400	1355	1230	1255	1255
Temp.	17	9.1	9.1	9.1	9.9	10.3	10.3	10.7	11.2	11.1	10.8	9.7	9.8	9.8
Dissolved Oxygen, ppm	10.2	10.1	10.4	10.2	9.9	10.3	10.3	10.7	11.2	11.1	10.8	9.7	9.8	9.8
DO Saturation	100	100	100	100	103	103	107	112	112	111	108	97	101	108
EC x 10 <sup>3</sup> at 25°C	1.4	1.4	1.4	1.4	1.5	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	48	100	78	100	88	100	94	115	94	106	103	88	99	99
Sulfate	24	22	24	24	24	24	24	24	24	24	23	23	23	23
Calcium	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Magnesium	1.8	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Sodium	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Potassium	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Iron (Total)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Aluminum	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Zinc	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Copper	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Nickel	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Lead	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Manganese	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cadmium	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Total Cations	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44	1.44
Carbonate	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21	1.21
Sulfate	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Chloride	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
Fluoride	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nitrate	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Total Anions	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15	1.15
Baron	0.08	0.12	0.09	0.09	0.05	0.05	0.11	0.11	0.10	0.05	0.09	0.09	0.09	0.09
Total Hardness (as CaCO <sub>3</sub> )	54	52	48	46	48	50	46	53	59	51	50	50	50	50
NC Hardness	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent Sodium	23	24	24	21	23	22	26	22	24	22	21	21	21	21
Color (Units)	5	6	6	6	5	5	5	5	5	5	5	5	5	5
Turbidity (Silica Scale)	2	2	4	2	4	3	25	4	5	40	40	40	40	40
Odor (Threshold)	2	4	2	2	2.8	2.8	2.8	1.4	1	2	2.8	2.8	2.8	2.8
Nitrogen Series														
Organic Nitrogen	0.0	0.1	0.0	0.1	0.0	0.1	0.4	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Nitrite	0.00	0.00	0.0	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Nitrate	0.6	0.7	0.5	0.2	0.2	0.2	2.3	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Ammonium	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphate - Ortho	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Phosphate - Total	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Other Solutes	1.69	1.67	1.51	1.5	1.6	1.6	2.10	1.6	1.6	1.6	1.65	1.65	1.65	1.65
Boron	1.04	1.62	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43
Chemical Oxygen Demand	44	4.2	2.2	4	5.9	8	14.6	2.4	2.6	4.0	4.0	4.0	4.0	4.0
Suspended Solids	12	54	4	11	8	11	14	5	4	57	41	41	41	41
Detergents	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phenolic Material	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Settleable Solids (ml/l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

\*\* Parenthetic values indicate concentrations of N (l) for nitrogen series or P (2) for phosphate.

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

SACRAMENTO RIVER AT BUTTE CITY BRIDGE, MILE 168.2

Date Collected	4-00-60	5-18-60	6-15-60	7-10-60	8-16-60	9-20-60	10-18-60	11-15-60	12-13-60	1-17-61	2-15-61	3-21-61	4-18-61	5-24-61	6-13-61
Time (P.M.)	0900	0747	1650	1520	1900	1600	1300	1330	1430	1423	1443	1450	1530	1310	1320
Discharge, cfs Mean Daily	1450	16000	7050	7700	7800	8000	8500	8500	8500	8780	8700	8300	6620	8710	7260
Instantaneous															
Temp. °F	60	59	70.5	67	67	67.5	61.5	59.90	59.00	61.80	59.00	53.100	49.91	48.90	46.00
Dissolved Oxygen, ppm	10.1	9.8	7.6	8.8	7.6	7.5	10.4	10.3	10.8	10.5	11.9	11.1	9.7	9.9	9.8
pH	7.6	7.5	7.5	7.4	7.6	7.5	7.5	7.4	7.5	7.3	7.5	7.4	7.6	7.5	7.6
X Saturation Lab.	156.7	155	159	125	124	124	137	130	168	158	131	126	133	133	131
mg/l															
(ppm)															
mg/l															
(ppm)															
Total Dissolved Solids	104	108	94	81	76	92	102	93	122	96	102	100	90	103	83
Sulfate	103	92	86	84	84	91	88	88	117	87	92	87	90	103	
Silica	24	17	24	24	24	24	24	23	30	27	24	23			
Cations															
Calcium	13	13	11	11	11	11	12	9.5	13	14	12	11	13	12	12
Magnesium	6.4	5.2	4.7	4.7	4.7	5.5	5.1	4.2	7.7	8.1	7.9	7.0	8.1	7.1	7.1
Sodium	7.7	0.33	7.2	6.4	6.2	7.0	7.4	3.2	9.4	8.8	8.8	8.3	8.1	8.3	8.3
Potassium	1.3	0.03	1.2	1.4	1.4	1.2	1.3	0.03	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Iron (Total)			0.02			0.2	0.2				0.17				
Aluminum			0.0			0.0	0.0				0.00				
Arsenic			0.00			0.00	0.00				0.00				
Chromium			0.00			0.00	0.00				0.00				
Copper			0.00			0.00	0.00				0.00				
Lead			0.00			0.00	0.00				0.00				
Manganese			0.00			0.00	0.00				0.00				
Zinc			0.01			0.01	0.01				0.00				
Total Nitrate	1.57	1.44	1.35	1.26	1.26	1.25	1.33	1.37	1.27	1.27	1.62	1.35	1.27	1.24	1.11
Boron	0.08	0.11	0.08	0.09	0.05	0.05	0.05	0.12	0.09	0.09	0.08	0.08	0.08	0.08	0.08
Total Hardness (as CaCO <sub>3</sub> )	59	54	47	47	47	50	51	45	64	60	51	48	48	48	48
Calcium Chloride	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Magnesium Chloride	23	23	23	22	22	22	23	26	24	23	22	22	22	22	22
Total Chloride	23	23	23	22	22	22	23	26	24	23	22	22	22	22	22
Total Alkalinity (as CaCO <sub>3</sub> )	2	2	6	6	6	5	5	35	5	7	10	35	35	35	35
Total Hardness (as CaCO <sub>3</sub> )	2	2	2.8	2.8	2.8	2.2	2.2	2	1	1	1	1	1	1	1
Nitrogen Series															
Organic Nitrogen	0.0	0.1	0.3	0.3	0.4	0.2	0.2	0.4	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Nitrite	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Nitrate	0.4	0.5	0.6	0.6	0.6	0.5	0.2	2.0	1.2	0.9	0.9	0.9	0.9	0.9	0.9
Amonium	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phosphate - Ortho	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Phosphate	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Solubles	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
Biochemical Oxygen Demand (5-day at 20°C)	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09	1.09
Chemical Oxygen Demand	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Suspended Solids	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
Total Solids	104	108	94	81	76	92	102	93	122	96	102	100	90	103	83
Settleable Solids (ml/l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

\*\* Parenthetic values indicate concentrations of M (1) for nitrogen series or P (2) for phosphate.

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

Date Collected (P.S.T.)	(SWAMP) SACRAMENTO RIVER AT BUTTE CITY BRIDGE, MILE 168.2														
	4-13-60	5- 4-60	6-13-60	7-13-60	8- 3-60	9-13-60	10-11-60	11- 2-60	12- 6-60	1- 3-61	2-16-61	3- 2-61	4-11-61	5- 2-61	6- 8-61
Diaphane, cfs-Hour Daily	1120	1045	1255	0645	1125	0945	1625	1430	1325	1545	1130	1550	1340	1100	
Instantaneous	3,900	8,280	9,260	8,050	4,700	5,990	5,800	5,310	9,260	6,050	16,000	8,820	7,400	7,710	
Dissolved Oxygen, ppm	61	57	69	68	9.6	9.0	10.4	60	18	47	53	62	60	64	
% Saturation	97	97	100	97	99	95	101	103	90	117	104	95	104	89	
pH Field	7.5	7.7	7.5	7.4	7.3	7.4	7.5	7.5	7.3	7.4	7.4	7.4	7.5	7.5	
EC at 25°C	166	139	132	129	123	131	136	130	131	159	146	146	137	137	
Constituents in	mg/l (ppm)	me/l (ppm)	mg/l (ppm)	me/l (ppm)											
Total Dissolved Solids															
Sum	104	104	104	104	104	104	104	104	104	104	104	104	104	104	104
Silica (SiO <sub>2</sub> )	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
Cations															
Calcium (Ca)	1.28	0.70	1.14	1.14	10.98	7.1	0.58	11.10	11.36	1.24	1.10	1.10	1.14	0.60	1.08
Magnesium (Mg)	8.0	8.1	6.5	8.0	6.7	7.2	6.31	8.1	8.2	8.9	7.5	8.6	7.3	6.8	6.30
Sodium (Na)	0.35	0.35	0.29	0.35	0.35	0.29	0.35	0.27	0.36	0.39	0.33	0.33	0.32	0.32	0.30
Potassium (K)	1.7	0.04			1.3	0.03							4.7	0.12	
Iron (Total) (Fe)	0.15				0.01								0.05	0.05	
Aluminum (Al)	0.05				0.00								0.00	0.00	
Arsenic (As)	0.00				0.00								0.00	0.00	
Chromium (Cr-6)	0.00				0.00								0.00	0.00	
Copper (Cu)	0.02				0.00								0.00	0.00	
Lead (Pb)	0.00				0.00								0.00	0.00	
Manganese (Mn)	0.00				0.00								0.00	0.00	
Zinc (Zn)	0.03	1.47	1.43	1.33	1.27	0.01	1.52	1.37	1.52	1.63	1.43	1.43	1.46	1.38	1.26
Total Cations	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63
Anions															
Carbonate (CO <sub>3</sub> )	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate (HCO <sub>3</sub> )	84	73	71	70	72	70	71	72	67	76	72	73	72	70	70
Sulfate (SO <sub>4</sub> )															
Chloride (Cl)	61.8	5.0	2.0	6.0	1.5	12	5.0	5.0	5.0	4.5	2.6	3.0	3.8	4.0	4.0
Fluoride (F)	0.0	0.0	0.0	0.0	0.0	0.1	0.01						0.1	0.11	0.11
Nitrate (NO <sub>3</sub> )						0.2	0.00						0.4	0.01	0.01
Total Anions	1.57	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52	1.52
Boron (B)	0.1	0.0	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Total Hardness (As CaCO <sub>3</sub> )	64	54	57	49	49	59	55	52	58	62	55	57	51	54	54
NC Hardness	0	0	0	0	0	2	0	0	3	0	0	0	0	0	0
Percent Sodium	0	24	0	26	23	20	20	25	24	24	23	25	22	22	22
Color (Units)	0	21	0	20	23	20	20	20	20	20	20	20	20	20	20
Turbidity (Silica Series) (GFC)	25	15	10	3	5	5	10	15	60	17	20	30	2	11	11
Color (Pt-Co) (GFC)															
Nitrogen Series															
Oxygen Nitrogen (NO <sub>2</sub> )															
Nitrite (NO <sub>2</sub> )															
Nitrate (NO <sub>3</sub> )															
Ammonia (NH <sub>3</sub> )															
Phosphate - Ortho (PO <sub>4</sub> )															
Total (PO <sub>4</sub> )															
Other Solubles															
Biochemical Oxygen Demand (5-Day at 20°C)															
Chemical Oxygen Demand															
Suspended Solids															
Detergents															
Phenolic Material (ABS)															
Settleable Solids (ml/l)															

(SWAMP) Samples were collected in conjunction with the Surface Water Monitoring Program of the State Department of Water Resources.

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

SACRAMENTO RIVER AT COLUSA BRIDGE, MILE 144.1

Date Collected Time (P.M.T.)	1-24-61		2-15-61		3-21-61		4-18-61		5-24-61		6-13-61	
	mg/l (ppm)											
Temperature, cis-then Daily	60	60	60	60	60	60	60	60	60	60	60	60
Temperature, F	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1	10.1
Dissolved Oxygen, % Sat.	102.5	102.5	102.5	102.5	102.5	102.5	102.5	102.5	102.5	102.5	102.5	102.5
pH	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
EC x 10 <sup>5</sup> at 25°C	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Constituents in												
Total Dissolved Solids	102	102	102	102	102	102	102	102	102	102	102	102
Solids	21	21	21	21	21	21	21	21	21	21	21	21
Cations												
Calcium	13	13	13	13	13	13	13	13	13	13	13	13
Magnesium	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1
Sodium	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Potassium	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Iron (Total)												
Aluminum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arrenic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Copper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manganese	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total Cations												
anions	0	0	0	0	0	0	0	0	0	0	0	0
Carbonate	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	0	0	0	0	0	0	0	0	0	0	0	0
Chloride	0	0	0	0	0	0	0	0	0	0	0	0
Fluoride	0	0	0	0	0	0	0	0	0	0	0	0
Nitrate	0	0	0	0	0	0	0	0	0	0	0	0
Total Anions												
Boron	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07
Total Hardness (as CaCO <sub>3</sub> )	60	60	60	60	60	60	60	60	60	60	60	60
MC Hardness	0	0	0	0	0	0	0	0	0	0	0	0
Percent Sodium Sulfate	0	0	0	0	0	0	0	0	0	0	0	0
Color (Units)	23	23	23	23	23	23	23	23	23	23	23	23
Turbidity (Jalica scale)	5	5	5	5	5	5	5	5	5	5	5	5
Color (Platinum-Cobalt)	2	2	2	2	2	2	2	2	2	2	2	2
Nitrogen Series												
Organic Nitrogen (N)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitrite (NO <sub>2</sub> )	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Nitrate (NO <sub>3</sub> )	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Ammonia (NH <sub>3</sub> )	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phosphoric - Ortho (PO <sub>4</sub> )	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Soluble Phosphate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Biochemical Oxygen Demand (5-day at 20°C)	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Chemical Oxygen Demand	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34	0.34
Suspended Solids (ABS)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Solids (ABS)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Settleable Solids (ml/l)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

\*\* Parenthetic values indicate concentrations of N (1) for nitrogen series or P (2) for phosphate.

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

(SWMP) SACRAMENTO RIVER AT COLUSA BRIDGE, MILE 144.1

Parameter	4-11-60		5-1-60		6-13-60		7-13-60		8-3-60		9-13-60		10-12-60		11-2-60		12-5-60		1-3-61		2-16-61		3-2-61		4-11-61		5-2-61		6-8-61		
	mg/l (ppm)	me/l (ppm)																													
Total Dissolved Solids	111	1.1	132	1.3	134	1.3	134	1.3	146	1.4	146	1.4	146	1.4	150	1.5	162	1.6	162	1.6	162	1.6	162	1.6	162	1.6	162	1.6	162	1.6	
Calcium	12	0.60																													
Magnesium	11.3	1.1																													
Sodium	8.1	0.8																													
Potassium	1.1	0.05																													
Iron (Total)	0.06																														
Aluminum	0.06																														
Arsenic																															
Chromium																															
Copper																															
Lead																															
Manganese																															
Zinc																															
Total Cations	27.1	1.40																													
Carbonate	0	0.00																													
Chloride	1.1	0.11																													
Fluoride	0.0	0.00																													
Nitrate	0.0	0.00																													
Total Anions	1.1	0.11																													
Boron	0.0																														
Hardness (As CaCO3)	1.1	0.11																													
Percent Sodium	0	0																													
Color (Units)	0	0																													
Turbidity (Nephelometric Units)	0	0																													
Odor Threshold (60°C)	0	0																													
Nitrogen Series																															
Organic Nitrogen																															
Nitrite																															
Nitrate																															
Ammonia																															
Phosphorus - Ortho																															
Phosphorus - Total																															
Ether Soluble																															
Biochemical Oxygen Demand (5-Day at 20°C)																															
Chemical Oxygen Demand																															
Suspended Solids																															
Detergents																															
Phenolic Material																															
Settleable Solids (ml/l)																															

(SWMP) Samples were collected in conjunction with the Surface Water Monitoring Program of the State Department of Water Resources.



TABLE T-1 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY  
RESULTS OF ANALYSES  
MONTHLY SAMPLING PROGRAM  
1960-1961

Data Collected	SACRAMENTO RIVER BELOW WILKINS SLOUGH, MILE 118.1														
	4-20-60	5-18-60	6-16-60	7-20-60	8-18-60	9-27-60	10-26-60	11-16-60	12/14/60	1-18-61	2-16-61	3-22-61	4-18-61	5-24-61	6-13-61
Flow (cfs)	1330	1415	1030	9955	6847	6950	1000	1000	1100	1035	9900	9275	1050	1530	1550
Discharge (cfs-Mean Daily)	3350	5850	5000	5700	5,070	5,700	8450	8450	6800	6370	25,000	25,800	6,100	6,280	5,830
Instantaneous			5,080	5,700	5,080	5,050	8550	8550	6800	6370	23,000	23,800	6,300	6,680	5,800
Temp. °F	61	66	8.4	69	65.5	66	51	51	47.5	46.5	50	52	83	83	72
Dissolved Oxygen, ppm	9.5	9.6	8.4	8.9	8.5	9.8	9.9	10.2	10.1	11.1	11.0	10.7	9.1	9.1	10.2
% Saturation	95.7	102	94	98	98	98	100	91	91	94	94	94	89	89	105
pH	7.4	7.4	7.5	7.4	7.5	7.5	7.8	7.4	7.4	7.3	7.3	7.3	7.6	7.4	7.5
EC x 10 <sup>6</sup> at 25°C	162	165	134	134	132	143	146	129	153	174	133	127	156	149	142
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	105	109	106	85	80	108	109	88	123	122	91	93	112	110	85
Sum	104	104	85	84	81	95	98	91	122	117	93	88	110	110	85
Silica	201	24	22	24	24	24	25	23	28	27	25	23			
Cations															
Calcium	74	13	12	11	11	13	12	10	14	15	12	12	13	13	12
Magnesium	6.3	6.4	5.4	5.5	5.2	4.43	5.8	5.6	8.0	7.2	5.1	4.42	4.6	4.6	3.8
Sulfate	8.2	8.7	6.6	6.8	7.0	7.4	7.8	7.6	10	9.9	6.5	6.28	6.5	6.5	5.9
Potassium	1.4	1.3	1.4	1.4	1.3	1.4	1.4	1.7	1.6	1.6	1.2	1.1	1.2	1.2	1.1
Iron (Total)											0.18				
Aluminum			0.01			0.0					0.05				
Arsenic			0.0			0.0					0.03				
Chromium			0.0			0.0					0.00				
Copper			0.0			0.0					0.00				
Lead			0.0			0.0					0.00				
Manganese			0.0			0.0					0.00				
Zinc			0.0			0.0					0.00				
Total Cations	1.62	1.59	1.34	1.37	1.31	1.46	1.46	1.33	1.81	1.84	1.33	1.30	1.35	1.26	
anions															
Carbonate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	80	78	71	68	68	75	76	60	89	90	66	62	81	77	75
Sulfate	6.7	7.1	5.1	5.1	5.7	3.0	4.6	4.9	8.1	5.8	7.1	6.7	10.4	10.4	10.1
Chloride	4.0	5.0	4.0	3.4	2.7	3.3	3.8	6.1	7.1	6.0	3.5	3.5	3.5	3.3	3.9
Fluoride	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nitrate	0.8	0.7	0.6	0.6	0.6	0.8	0.8	0.8	0.8	0.7	1.0	0.2	1.0	0.2	0.6
Total Anions	1.57	1.58	1.28	1.32	1.33	1.38	1.46	1.28	1.78	1.84	1.35	1.30	1.26	1.26	
Boron	0.07	0.07	0.08	0.09	0.05	0.06	0.05	0.13	0.10	0.08	0.08	0.07	0.08	0.07	
Total Hardness (As CaCO <sub>3</sub> )	61	59	52	50	49	55	54	48	60	67	51	49	61	57	
NC Hardness			0	0	0	0	0	0	0	0	0	0	0	0	
Percent Sodium	22	24	21	22	23	22	24	25	24	24	21	22	22	22	
Color (Units)	5	5	10	10	15	6	8	50	15	15	15	15	15	20	
Turbidity (Silica Scale)	2	4.1	5	9	2	2	2	2	2	1.4	1.4	30	2	2.8	
Odor (Threshold)	60°C														
Nitrogen Series															
Organic Nitrogen	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.2	0.0	0.1	0.1	0.0	0.0	0.0	
Nitrite	0.01	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00	0.00	0.00	
Nitrate	0.4	0.5	0.6	0.3	0.6	0.3	0.4	2.3	1.2	1.3	0.5	0.6	0.6	0.6	
Ammonium	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Phosphate - Ortho	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Total (PO <sub>4</sub> )	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Other Solubles	18	6.9	6.5	6.5	6.6	4.2	2.9	2.8	2.5	1.60	0.80	0.80	0.80	0.80	
Biochemical Oxygen Demand (5-Day at 20°C)	1.09	0.94	0.68	0.71	0.36	0.53	0.66	1.81	1.60	1.60	0.91	0.80	0.80	0.80	
Chemical Oxygen Demand	0.99	0.99	0.48	0.71	0.36	0.71	0.69	1.69	1.24	1.60	0.86	0.80	0.80	0.80	
Suspended Solids	<4	5.4	3.0	4.5	2.0	2.2	3.8	12.9	1.5	5.2	7.5	6.7	7.5	6.7	
Phenolic Material	ABS	27	49	40	38	20	17	81.5	17	17	81.5	66.7	81.5	66.7	
Settleable Solids (ml/l)	ABS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

\*\* Parenthetical values indicate concentrations of N (l) for nitrogen series or P (2) for phosphate.

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

SACRAMENTO RIVER ABOVE COLUSA BASIN DRAIN, MILE 90.5

Date Collected Time (P.S.T.) Discharge, cfs - Mean Daily Instantaneous Term, day Dissolved Oxygen, % % Saturation pH Field Lab. EC x 10 <sup>6</sup> at 25°C	4-20-60		5-19-60		6-21-60		7-20-60		8-18-60		9-16-60		10-15-60		11-13-60		12-12-60		1-18-61		2-16-61		3-16-61		4-14-61		5-11-61		
	mg/l (ppm)																												
Constituents in Total Dissolved Solids Sulfate (SO <sub>4</sub> )	1515 3300																												
Cations																													
Calcium	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	
Magnesium	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	
Sodium	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3	
Potassium	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Iron (Total)	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	
Aluminum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Arsenic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Chromium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Copper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Zinc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Mercurous	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Mercuric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
anions																													
Carbonate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicarbonate	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81
Sulfate	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9	6.9
Chloride	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
Fluoride	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nitrate	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Total anions	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60	3.60
Boron	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Mercurous (As 510 <sub>2</sub> )	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
Free Sodium	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Color (Ug/L)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Color (Ug/L) (As 510 <sub>2</sub> )	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Other Solubles	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
Biological Oxygen Demand (5-day at 20°C)	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	2.06	
Chemical Oxygen Demand	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
Suspended Solids	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
Organic Matter	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Solids	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

See Parenthetic values indicate concentrations of B (1) for nitrogen series or P (2) for phosphate.

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

COLUSA BASIN DRAIN AT OUTFALL GATES, MILE 90.2R/O.3

Data Collected Time (P.S.T.) Discharge, cfs-Mean Daily Temperature Dissolved Oxygen, ppm pH EC x 10 <sup>3</sup> at 25°C	5-2-60		5-19-60		6-16-60		7-20-60		8-18-60		9-22-60		10-20-60		11-16-60		12/15/60		1-18-61		2- -61		3- -61		4- -61		5-24-61		6-13-61			
	mg/l (ppm)	me/l (ppm)																														
Constituents in Total Dissolved Solids	263	299	275	284	275	277	280	272	272	280	277	272	280	272	272	280	272	272	280	272	272	280	272	272	280	272	272	280	272	272		
Sulfate	16	16	21	22	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21		
Calcium	20	21	27	24	24	26	23	23	24	23	26	23	23	23	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21		
Magnesium	12	15	18	19	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18		
Sodium	14	15	18	19	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18	18		
Potassium	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2		
Iron (Total)																																
Aluminum																																
Arsenic																																
Chromium																																
Copper																																
Lead																																
Manganese																																
Zinc																																
Total Cations	3.97	4.11	4.58	4.95	4.80	4.71	4.70	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	4.43	
Carbonate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicarbonate	2.11	1.60	2.62	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	3.18	
Sulfate	1.80	1.25	1.74	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	
Chloride	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
Fluoride	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	
Nitrate	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
Total Anions	3.961	4.42	4.42	4.89	4.87	4.68	4.69	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	4.41	
Boron	0.20	0.30	0.44	0.35	0.29	0.22	0.38	0.38	0.29	0.29	0.22	0.38	0.38	0.29	0.29	0.22	0.38	0.38	0.29	0.29	0.22	0.38	0.38	0.29	0.29	0.22	0.38	0.38	0.29	0.29	0.22	
Total Hardness (As CaCO <sub>3</sub> )	100	116	142	137	134	137	137	137	134	134	137	137	137	134	134	137	137	137	134	134	137	137	137	134	134	137	137	137	134	134	137	
Percent Sodium	48	48	48	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	
Color (Units)	4.5	10	50	10	20	50	10	20	20	20	50	10	20	20	20	50	10	20	20	20	20	50	10	20	20	20	20	20	20	20	20	
Turbidity (Siltica Scale)	360	40	330	42	40	50	42	42	40	40	50	42	42	40	40	50	42	42	40	40	40	50	42	42	40	40	40	40	40	40	40	
Color (Threshold)	60°C	8	8	2.8	4	2	2.8	4	4	4	2	4	4	4	4	2	4	4	4	4	4	2	4	4	4	4	4	4	4	4	4	
Nitrogen Series																																
Organic Nitrogen	0.5	0.3	0.6	0.6	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
Nitrite	0.00	0.02	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
Nitrate	1.0	1.0	1.2	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Ammonium	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
Phosphate - Ortho	0.3	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
Phosphate - Total	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
Other Solubles	33	5.7	33	7.6	7.6	5.5	4.7	4.7	4.7	4.7	5.5	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	4.7	
Biochemical Oxygen Demand (5-Day at 20°C)	4.40	2.26	2.26	1.33	1.15	1.80	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	2.44	
Chemical Oxygen Demand	21	4.42	2.68	1.35	1.05	1.80	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	2.35	
Suspended Solids	243	154	164	100	108	172	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108	108
Detergents	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Phenolic Material	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Settleable Solids (ml/l)																																

TABLE T-1 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY  
RESULTS OF ANALYSES  
MONTHLY SAMPLING PROGRAM  
1960-1961

SACRAMENTO RIVER ABOVE SACRAMENTO SLOUGH, MILE 81.5

Date Collected Time of Day	4-21-60		4-19-60		6-16-60		7-20-60		8-11-60		9-21-60		10-19-60		11-16-60		12-15/60		1-18-61		2-16-61		3-22-61		4-19-61		5-26-61		6-14-61		
	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l											
Dissolved Oxygen, ppm	10.0	10.0	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	14.3	
Dissolved Oxygen, % Saturation	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
pH	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	
EC x 10 <sup>6</sup> at 25°C	147	147	211	211	211	211	211	211	211	211	211	211	211	211	211	211	211	211	211	211	211	211	211	211	211	211	211	211	211	211	
Constituents in Total Dissolved Solids																															
Calcium	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Magnesium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Sodium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Potassium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Iron (Total)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aluminum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Arsenic	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chromium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Copper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Manganese	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Anions																															
Boron	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Total hardness (as CaCO <sub>3</sub> )	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65
Percent sodium	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Percent chloride	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
Percent sulfate	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52	52
Percent nitrate	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Percent nitrite	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Nitrogen Series																															
Organic Nitrogen	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nitrate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrite	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ammonia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phosphorus - Total	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Ascorbic Acids	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22
Iron	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	
Iron (Total)	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	
Iron (Total) at 20°C	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	
Chemical Oxygen Demand	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Suspended Solids	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Detergents	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phenolic Material	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Settleable Solids (at 1/1)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

\*\* Parenthetic values indicate concentrations of N (1) for nitrogen series or P (2) for phosphate.











TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

SACRAMENTO SEWAGE TREATMENT PLANT, MILE 54.1L

Parameter	4-20-60		5-18/19-60		8-21-60		10-19-60		11-16-60		12/21/60		1-18-61		2-15-61		3-22-61		4-19-61		5-17-61		6-14-61		
	mg/l	(ppm)	mg/l	(ppm)	mg/l	(ppm)	mg/l	(ppm)	mg/l	(ppm)	mg/l	(ppm)	mg/l	(ppm)	mg/l	(ppm)	mg/l	(ppm)	mg/l	(ppm)	mg/l	(ppm)	mg/l	(ppm)	
Temperature	17.5	61.5	17.5	61.5	17.5	61.5	17.5	61.5	17.5	61.5	17.5	61.5	17.5	61.5	17.5	61.5	17.5	61.5	17.5	61.5	17.5	61.5	17.5	61.5	
Dissolved Oxygen	7.2	256	7.2	256	7.2	256	7.2	256	7.2	256	7.2	256	7.2	256	7.2	256	7.2	256	7.2	256	7.2	256	7.2	256	
DO at 2°C	7.3	260	7.3	260	7.3	260	7.3	260	7.3	260	7.3	260	7.3	260	7.3	260	7.3	260	7.3	260	7.3	260	7.3	260	
Constituents In																									
Total Dissolved Solids	683	683	683	683	683	683	683	683	683	683	683	683	683	683	683	683	683	683	683	683	683	683	683	683	
Sulfate	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	480	
Silica	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	
Calcium	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	
Copper	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
Chlorine	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	
Sulfur	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	
Potassium	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	
Iron (Total)																									
Aluminum																									
Artenic																									
Chromium																									
Copper																									
Lead																									
Manganese																									
Zinc																									
Total Solids																									
Carbonate																									
Non-carbonate																									
Sulfate																									
Chloride																									
Fluoride																									
Nitrate																									
Total Nitrogen																									
Ammonia																									
Nitrite																									
Nitrate																									
Phosphate - Total																									
Other Solutes																									
Chemical Oxygen Demand																									
5-day BOD at 20°C																									
Suspended Solids																									
Settleable Solids																									
Phenolic Material																									
Settleable Solids (s/L)																									

\*\* Parenthetic values indicate concentrations of N (1) for nitrogen series or P (2) for phosphorus.

\* Value is the result of analysis of a grab sample of effluent. All other values are results of analysis of a composite of hourly samples collected during the period shown.

TABLE T-1 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY  
RESULTS OF ANALYSES  
MONTHLY SAMPLING PROGRAM  
1960-1961

Date Collected Time (P.S.T.)	SACRAMENTO RIVER AT FREEPORT BRIDGE, MILE 46.4														
	4-21-60	5-25-60	6-30-60	7-24-60	8-22-60	9-26-60	10-20-60	11-18-60	12/15/60	1-19-61	2-16-61	3-23-61	4-20-61	5-18-61	6-15-61
Discharge, cfs-Mean Daily	12,700	13,500	9300	9600	13,100	8,600	10,800	12,000	14,100	12,600	34,000	34,000	12,900	14,100	9,580
Temperature, °C	60.5	60	70	70	70	67.5	60	66	46.5	46	49	53	59.5	66	75
Dissolved Oxygen, ppm	9.7	8.4	8.4	8.4	8.4	8.2	9.1	9.1	11.0	11.1	10.5	10.5	9.35	8.1	7.7
% Saturation	97.1	94	94	87	93	89	91	90	92	93	91	96	93	86	90
pH Field	7.4	7.6	7.4	7.4	7.5	7.6	7.4	7.4	7.3	7.3	7.6	7.5	7.3	7.4	7.3
EC x 10 <sup>6</sup> at 25°C	111	211	172	169	157	196	174	152	172	187	128	128	128	197	204
Constituents in (ppm)	72	130	106	114	126	130	116	107	98	110	94	93	92	114	121
Total Dissolved Solids	70	126	104	102	121	123	111	107	108	106	83	86	86	114	121
Silica (SiO <sub>2</sub> )	15	19	20	19	20	22	21	19	20	20	20	24	24	121	121
Sulfate (SO <sub>4</sub> )	9.8	0.49	12	12	14	14	13	13	13	13	10	12	11	14	14
Magnesium (Mg)	4.2	0.35	6.3	5.8	7.3	8.5	7.2	5.7	7.4	7.2	5.6	4.4	4.4	8.4	8.4
Sodium (Na)	2.1	0.25	1.7	1.5	1.5	1.3	1.4	1.0	1.0	1.0	5.7	6.5	5.6	1.03	1.03
Potassium (K)	0.8	0.02	1.2	1.1	1.2	1.5	1.5	1.04	1.5	1.4	1.2	1.0	1.0	0.02	0.02
Iron (Total) (Fe)															
Aluminum (Al)															
Arsenic (As)															
Chromium (Cr-6)															
Copper (Cu)															
Lead (Pb)															
Manganese (Mn)															
Zinc (Zn)															
Total Cations	1.11	2.03	1.63	1.63	1.63	1.98	1.72	1.72	1.50	1.74	1.24	1.26	1.26	1.26	1.26
Carbonate (CO <sub>3</sub> )	0.0	0.00	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate (HCO <sub>3</sub> )	54	0.88	72	72	89	92	89	68	1.11	77	1.24	61	63	84	1.38
Sulfate (SO <sub>4</sub> )	3.0	0.06	1.2	1.2	1.5	1.5	1.1	0.7	0.14	0.19	0.13	0.13	0.13	0.13	0.13
Chloride (Cl)	5.0	0.00	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nitrate (NO <sub>3</sub> )	0.5	0.01	1.0	0.02	0.1	0.00	0.3	0.00	1.1	0.02	0.01	0.00	0.00	0.00	0.00
Total Anions	1.09	2.04	1.63	1.63	1.63	1.93	1.73	1.46	1.68	1.65	1.21	1.25	1.25	1.25	1.25
Barium (Ba)	0.05	0.12	0.10	0.07	0.11	0.07	0.08	0.10	0.09	0.07	0.06	0.05	0.05	0.05	0.05
Total Hardness (As CaCO <sub>3</sub> )	0	0	56	54	65	70	62	51	63	62	48	48	48	48	48
Percent Sodium	22	32	0	0	33	28	26	29	25	26	0	0	0	0	0
Color (Units)	2	5	12	2	5	10	5	15	5	5	20	20	20	20	20
Turbidity (Silica Scale)	2	5	12	2	5	12	5	15	5	5	20	20	20	20	20
Odor (Threshold) (60°C)	5-8	4	4	4	2	4	2	4	2.8	4	2.8	2.8	2.8	2.8	2.8
Nitrogen Series															
Organic Nitrogen (N)	0.2	0.2	0.0	0.2	0.3	0.2	0.1	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2
Nitrite (NO <sub>2</sub> )	0.01	0.03	0.0	0.0	0.0	0.01	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nitrate (NO <sub>3</sub> )	1.0	1.0	0.0	1.1	0.5	0.7	0.3	1.4	0.8	0.6	0.5	0.6	0.6	0.6	0.6
Ammonium (NH <sub>4</sub> )	0.0	0.0	0.0	0.2	0.2	0.2	0.3	0.3	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Phosphate - Ortho (PO <sub>4</sub> )	0.1	0.3	0.3	0.4	0.1	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2
Phosphate - Total (PO <sub>4</sub> )	0.4	0.4	0.3	0.4	0.2	0.4	0.5	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3
Ether Solubles	5	0.5	15	1.0	0.5	2.7	3.5	1.8	0.8	1.2	0.8	0.8	0.8	0.8	0.8
Biochemical Oxygen Demand (5-Day at 20°C)	1.17	1.87	1.17	1.87	1.25	2.03	2.83	2.12	2.35	2.28	1.28	1.43	1.43	1.43	1.43
Chemical Oxygen Demand	<4	10.1	9.2	8.3	5.5	6.6	2.09	2.75	2.35	2.33	1.26	1.31	1.31	1.31	1.31
Suspended Solids	4	28	26	26	40	14	18	13.0	10.2	9.6	12	12	12	12	12
Petroleum	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phenolic Material	0.00	0.00	0.001	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Settleable Solids (mL/L)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

\*\* Parenthetic values indicate concentrations of N (1) for nitrogen series or P (2) for phosphate.





TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

AMERICAN CRYSTAL SUGAR COMPANY AT CLARKSBURG, MILE 43.3R

Date Collected (Time, P.M.T.)	8-21-60 24 hr. comp. 2.5 (3-9:00) Ext. 5.0 (3:20-10:00)		9-25-60 24 hr. comp. 4.6 (2:30-10:00)		10-19-60 24 hr. comp. 4.6 (2:30-10:00)		11- -60 Not Sampled		12- -60 Not Sampled		1/18/61 0001-2300	
	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)
Discharge, cis-uran daily												
Inorganic												
Dissolved Oxygen, ppm												
pH												
EC x 10 <sup>6</sup> at 25°C												
Lab.												
EC x 10 <sup>6</sup> at 25°C												
Constituents in	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)
Total Dissolved Solids												
Sum												
Silica (SiO <sub>2</sub> )												
Calcium												
Magnesium												
Sodium												
Potassium												
Iron (Total)												
Aluminum												
Arsenic												
Chromium												
Copper												
Lead												
Manganese												
Nickel												
Zinc												
Total Cations												
anions												
Carbonate												
Bicarbonate												
Sulfate												
Chloride												
Fluoride												
Nitrate												
Total Anions												
boron												
Total Hardness (as CaCO <sub>3</sub> )												
Percent Sodium												
Color (Units)												
Turbidity (Nephelometer)												
Total Nitrogen												
Organic Nitrogen												
Nitrite												
Nitrate												
Ammonium												
Phosphate - Ortho												
Total Soluble Solids												
Biological Oxygen Demand (5-day at 20°C)												
Chemical Oxygen Demand												
Suspended Solids												
Settleable Solids												
Penicillin Material												
Settleable Solids (ml/l)												

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

Date Collected	SACRAMENTO RIVER AT SNODGRASS SLOUGH, MILE 37.2											
	1-21-60	1-30-60	2-07-60	2-24-60	3-03-60	3-21-60	4-08-60	4-25-60	5-12-60	5-29-60	6-15-60	6-22-60
Time (P.S.T.)	10:0	10:0	10:17	10:17	10:17	10:24	10:24	10:24	10:24	10:24	10:24	10:24
Discharge, cfs-Mean Daily	14,000	14,000	800	800	800	14,000	14,000	14,000	14,000	14,000	14,000	14,000
Instantaneous	---	---	---	---	---	---	---	---	---	---	---	---
Temp. °C	6	6	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1
Dissolved Oxygen, ppm	3.2	3.1	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
pH Saturation	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1
EC x 10 <sup>6</sup> at 25°C	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	11	11	11	11	11	11	11	11	11	11	11	11
Silica	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Cations												
Calcium	11	11	11	11	11	11	11	11	11	11	11	11
Magnesium	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Sodium	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Potassium	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Iron (Total)	---	---	---	---	---	---	---	---	---	---	---	---
Aluminum	---	---	---	---	---	---	---	---	---	---	---	---
Arsenic	---	---	---	---	---	---	---	---	---	---	---	---
Chromium	---	---	---	---	---	---	---	---	---	---	---	---
Copper	---	---	---	---	---	---	---	---	---	---	---	---
Zinc	---	---	---	---	---	---	---	---	---	---	---	---
Manganese	---	---	---	---	---	---	---	---	---	---	---	---
Total Gases	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
anions												
Carbonate	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	0	0	0	0	0	0	0	0	0	0	0	0
Sulfate	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Chloride	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Fluoride	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nitrate	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Total Anions	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Boron	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Total Hardness (As Ca)	44	44	44	44	44	44	44	44	44	44	44	44
Hardness (CaCO <sub>3</sub> )	0	0	0	0	0	0	0	0	0	0	0	0
Percent Hardness	0	0	0	0	0	0	0	0	0	0	0	0
Color (Pt-Co)	1	1	1	1	1	1	1	1	1	1	1	1
Odor (Threshold)	0	0	0	0	0	0	0	0	0	0	0	0
Nitrogen Series												
Organic Nitrogen	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Nitrite	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Nitrate	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Ammonium	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phosphate - Ortho	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Phosphate	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Other Solubles	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Biochemical Oxygen Demand (5-DAY @ 20°C)	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Chemical Oxygen Demand	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
Suspended Solids	4	4	4	4	4	4	4	4	4	4	4	4
Detergents	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phenolic Material	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Settleable Solids (ml/l)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01

\*\* Parenthetic values indicate concentrations of N (l) for nitrogen series or P (2) for phosphate.

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

SACRAMENTO RIVER ABOVE DELTA CROSS CHANNEL, MILE 27.4

Date Collected Time (P.M.)	1-21-60		5-19-60		6-24-60		9-8-60		10-20-60		11-18-60		12-15/15/60		1/19/61		12-16-61		1-23-61		4-20-61		5-18-61		7-12-61		
	mg/l (ppm)																										
Discharge, cfs-mean daily	3600	1100	1105	6700	1105	6700	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900	6900
Total Dissolved Solids	9.4	66	66	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
Dissolved Oxygen, ppm	9.4	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2	8.2
pH	7.1	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4	7.4
EC x 10 <sup>6</sup> at 25°C	125	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134
Constituents in																											
Total Dissolved Solids	70	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107	107
Sulfate	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
Cations																											
Calcium	30	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
Magnesium	5.7	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Sodium	2.7	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Potassium	0.8	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Iron (Total)	0.03																										
Aluminum	0.00																										
Arsenic	0.00																										
Chromium	0.00																										
Copper	0.00																										
Lead	0.01																										
Manganese	0.00																										
Nickel	0.02																										
Total Cations	1.17																										
Anions																											
Carbonate	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Bicarbonate	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Sulfate	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Chloride	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Fluoride	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Nitrate	0.9	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
Total Anions	1.15																										
Boron	0.05																										
Total Hardness (as CaCO <sub>3</sub> )	55																										
% Hardness	0																										
Percent Soda	0																										
Color (Units)	21																										
Turbidity (Units)	5																										
Color (Threshold)	1																										
Nitrogen Series																											
Organic Nitrogen	0.0																										
Nitrite	0.0																										
Nitrate	0.0																										
Ammonia	0.0																										
Phosphorus - Ortho	0.1																										
Phosphorus - Total	0.1																										
Other Solubles	0.54																										
Biochemical Oxygen Demand (5-day at 20°C)	0.50																										
Chemical Oxygen Demand	11.2																										
Suspended Solids	1																										
Emergent Solids	1																										
Phenolic Material	0.0																										
Settleable Solids (ml/l)	0.01																										

Parentetic values indicate concentrations of N (1) for nitrogen series or P (2) for phosphate.

TABLE T-1 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY  
RESULTS OF ANALYSES  
MONTHLY SAMPLING PROGRAM  
1960-1961

Date Collected (P.S.T.)	(SWMP) DELTA CROSS CHANNEL NEAR WALNUT GROVE, MILE 27.3L														
	4-11-60 1045	5-2-60 0800	6-5-60 0740	7-11-60 0850	8-1-60 1010	9-5-60 0830	10-3-60 0900	11-7-60 0930	12-12-60 0845	1-9-61 0930	2-13-61 0950	3-6-61 0900	4-10-61 0930	5-1-61 0825	6-5-61 0745
Time (P.S.T.)	1045	0800	0740	0850	1010	0830	0900	0930	0845	0930	0950	0900	0930	0825	0745
Discharge, cfs-Mean Daily															
Instantaneous															
Temp. of															
Dissolved Oxygen, ppm	58	60	70	69	70	60	68	58	66	64	52	51	58	64	68
% Saturation	9.3	9.8	7.6	8.2	7.5	6.5	6.2	8.0	10.1	11.2	8.9	10.1	9.2	8.5	7.4
pH	7.2	7.3	7.3	7.5	7.3	7.3	7.7	7.3	7.3	7.3	7.1	7.4	7.4	7.4	7.3
Et x 10 <sup>6</sup> at 25°C	141	153	141	166	169	233	233	187	188	181	106	148	135	159	187
Constituents in															
Total Dissolved Solids															
Sum	103	21				149	22							101	
Silica (SiO <sub>2</sub> )														19	
Cations															
Calcium (Ca)		11	0.55			17	0.95							12	0.60
Magnesium (Mg)		10.86	6.2	1.08	1.18	8.9	0.73	1.24	1.34	1.30	0.92	1.37	1.33	6.2	0.53
Sodium (Na)		4.3	0.12	0.36	0.52	19	0.93	0.48	1.2	0.48	5.0	0.52	7.4	11	0.43
Potassium (K)			1.4	0.04		1.4	0.04							1.5	0.04
Iron (Total) (Fe)		0.11				0.04								0.03	
Aluminum (Al)		0.11				0.04								0.02	
Arsenic (As)		0.00				0.00								0.00	
Chromium (Cr)		0.00				0.00								0.00	
Copper (Cu)		0.00				0.00								0.00	
Zinc (Zn)		0.00				0.00								0.00	
Manganese (Mn)		0.00				0.00								0.00	
Total Cations		1.05	1.54	1.44	1.70	2.15	1.84	1.72	1.86	1.78	1.41	1.49	1.42	1.63	1.82
Anions															
Carbonate (CO <sub>3</sub> )	0	0.00	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	52	68	1.11	1.34	82	113	1.85	1.31	80	1.31	48	0.79	66	1.00	1.38
Sulfate (SO <sub>4</sub> )	13	13	0.27	0.10	8.8	9.0	0.19	0.08	10	0.28	5.0	0.14	3.6	0.10	0.21
Chloride (Cl)	3.8	0.11	0.20	10	0.28	15	0.42	8.0	8.0	0.23	7.5	0.21	5.5	0.16	0.21
Fluoride (F)	0.0	0.00	0.0	0.0	0.00	0.0	0.00	0.0	0.0	0.00	0.0	0.0	0.0	0.1	0.01
Nitrate (NO <sub>3</sub> )	0.2	0.00	0.00	0.0	0.00	0.5	0.01	0.0	0.0	0.00	0.0	0.0	0.0	0.00	0.00
Total Anions	0.96	1.38	1.29	1.62	1.59	2.17	1.61	1.49	1.59	1.75	0.93	1.35	1.24	1.58	1.59
Boron (B)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.1
Calc. Hardness (as CaCO <sub>3</sub> )	43	53	54	58	59	79	62	62	67	65	46	59	55	56	66
Total Hardness	0	0	2	0	0	0	0	0	1	0	7	0	1	0	0
Percent Sodium	18	29	25	31	31	34	28	28	1	0	7	0	1	0	0
Color (Units)															
Turbidity (Silica Scale)	35	60	25	15	10	5	8	8	40	8	145	40	15	10	15
Odor (Threshold)															
Nitrogen Series															
Organic Nitrogen (N)															
Nitrite (NO <sub>2</sub> )															
Nitrate (NO <sub>3</sub> )															
Ammonium (NH <sub>4</sub> )															
Phosphate - Ortho (PO <sub>4</sub> )															
Total (PO <sub>4</sub> )		0.20				0.30								0.25	
Other Solubles															
Biochemical Oxygen Demand (5 days at 20°C)															
Chemical Oxygen Demand															
Suspended Solids															
Detergents (ABS)															
Phenolic Material															
Settleable Solids (ml/l)															

(SWMP) Samples were collected in conjunction with the Surface Water Monitoring Program of the State Department of Water Resources.

TABLE T-1 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

SACRAMENTO RIVER AT ISLETON BRIDGE, MILE 188

Data Collected (See Appendix I)	4-29-60		5-19-60		6-24-60		7-26-60		8-29-60		9-26-60		10-20-60		11-18-60		12-15-60		1-27-61		2-16-61		3-23-61		4-20-61		5-18-61		6-15-61							
	(mg/l)	(ppm)	(mg/l)	(ppm)	(mg/l)	(ppm)	(mg/l)	(ppm)	(mg/l)	(ppm)	(mg/l)	(ppm)	(mg/l)	(ppm)	(mg/l)	(ppm)	(mg/l)	(ppm)	(mg/l)	(ppm)																
Temp. by Dissolved Oxygen, ppm	60	69	60	69	60	69	60	69	60	69	60	69	60	69	60	69	60	69	60	69	60	69	60	69	60	69	60	69	60	69						
pH	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1	7.1						
EC at 25°C	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136	136					
Constituents in Total Dissolved Solids	59	101	59	101	59	101	59	101	59	101	59	101	59	101	59	101	59	101	59	101	59	101	59	101	59	101	59	101	59	101	59	101				
Silica	31	36	31	36	31	36	31	36	31	36	31	36	31	36	31	36	31	36	31	36	31	36	31	36	31	36	31	36	31	36	31	36				
Cations	10.0	0.50	12	0.60	13	0.65	12	0.60	14	0.70	14	0.70	14	0.70	14	0.70	14	0.70	14	0.70	14	0.70	14	0.70	14	0.70	14	0.70	14	0.70	14	0.70	14	0.70		
Calcium	5.4	0.44	6.8	0.54	5.0	0.41	5.6	0.44	8.3	0.68	6.6	0.54	6.6	0.54	6.6	0.54	6.6	0.54	6.6	0.54	6.6	0.54	6.6	0.54	6.6	0.54	6.6	0.54	6.6	0.54	6.6	0.54	6.6	0.54		
Magnesium	6.8	0.30	12	0.52	9.8	0.43	10	0.43	11	0.65	12	0.52	10	0.43	10	0.43	10	0.43	10	0.43	10	0.43	10	0.43	10	0.43	10	0.43	10	0.43	10	0.43	10	0.43		
Sodium	1.0	0.02	1.1	0.03	1.2	0.03	1.1	0.03	1.3	0.03	1.5	0.04	1.1	0.04	1.1	0.04	1.1	0.04	1.1	0.04	1.1	0.04	1.1	0.04	1.1	0.04	1.1	0.04	1.1	0.04	1.1	0.04	1.1	0.04		
Potassium																																				
Anions																																				
Bicarbonate	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00		
Sulfate	57	0.93	78	1.00	69	1.13	72	1.18	87	1.42	94	1.54	83	1.36	77	1.26	77	1.26	79	1.29	61	1.00	62	1.02	62	1.02	70	1.15	79	1.09	86	1.14	79	1.09		
Chloride	5.3	0.11	12	0.25	8.1	0.47	7.7	0.46	9.7	0.21	7.7	0.21	6.6	0.14	9.2	0.14	10	0.21	9.0	0.19	6.6	0.14	6.1	0.13	6.1	0.13	5.4	0.15	9.2	0.26	9.7	0.27	9.7	0.27		
Fluoride	5.8	0.16	8.1	0.23	7.8	0.22	7.2	0.20	9.7	0.27	9.6	0.27	7.8	0.22	6.1	0.17	6.9	0.19	8.5	0.24	5.5	0.16	3.9	0.11	3.9	0.11	5.4	0.15	9.2	0.26	9.7	0.27	9.7	0.27		
Nitrate	0.0	0.00	0.1	0.00	0.1	0.00	0.3	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.2	0.01	0.1	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00		
Total anions	1.21	1.69	1.71	2.17	1.52	1.52	1.56	1.56	1.94	1.94	1.94	1.94	1.74	1.65	1.65	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73			
Boron	0.04	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.10	0.06	0.06	0.06	0.11	0.08	0.08	0.08	0.08	0.08	0.09	0.09	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05		
Total Hardness (As CaCO <sub>3</sub> )	47	30	40	30	40	30	40	30	40	30	40	30	40	30	40	30	40	30	40	30	40	30	40	30	40	30	40	30	40	30	40	30	40	30	40	
Phenolics	1	5.6	15	5.6	15	5.6	15	5.6	8	2	2	8	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Nitrogen Series																																				
Ammonia Nitrogen (NH <sub>3</sub> )	0.06	0.02	0.2	0.02	0.2	0.02	0.2	0.02	0.2	0.02	0.1	0.02	0.2	0.02	0.1	0.02	0.1	0.02	0.2	0.02	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02
Nitrite Nitrogen (NO <sub>2</sub> )	0.02	0.01	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00	0.0	0.00
Nitrate Nitrogen (NO <sub>3</sub> )	0.9	0.0	0.4	0.0	0.4	0.0	0.8	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0	0.3	0.0
Phosphate - Ortho (PO <sub>4</sub> )	0.2	0.0	0.2	0.0	0.2	0.0	0.2	0.0	0.2	0.0	0.1	0.02	0.2	0.02	0.1	0.02	0.1	0.02	0.2	0.02	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02
Phosphate - Total (PO <sub>4</sub> )	0.2	0.0	0.2	0.0	0.2	0.0	0.2	0.0	0.2	0.0	0.1	0.02	0.2	0.02	0.1	0.02	0.1	0.02	0.2	0.02	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02	0.1	0.02
Atomic Solids	1.35	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15
Biochemical Oxygen Demand (5-Day at 20°C)	1.35	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15
Chemical Oxygen Demand	1.35	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15	1.4	1.15
Unfiltered Solids	25	29	25	29	25	29	25	29	25	29	25	29	25	29	25	29	25	29	25	29	25	29	25	29	25	29	25	29	25	29	25	29	25	29	25	29
Filtered Solids (ASST)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Settleable Solids (STL)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

•• Parenthetic values indicate concentrations in M (l) for all phosphorus series P (l) for phosphorus.

TABLE T-1 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
MONTHLY SAMPLING PROGRAM  
1960-1961

SACRAMENTO RIVER AT RIO VISTA BRIDGE, MILE 12.8 (L-1/4 Pt)

Date Collected Time (P.S.T.)	1-22-60		5-20-60		6--60		7-25-60		8-22-60		9-26-60		10-20-60		11-17-60		12-15-60		1-19-61		2-16-61	
	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)
Discharge, 615-Mean Daily (P.S.T.)	1330		1605		9100		3600		4600		4400		1112		5100		3345		1865		1300	
Transmittance	58		65		Not Sampled		76		71		70		60		55		45.5		45		50	
Dissolved Oxygen, ppm	9.8		8.8				7.8		8.3		8.1		9.2		7.3		10.2		10.1		10.0	
% Saturation	95.5		93				92		93		91		92		84		84		83		88	
pH	7.4		7.5				7.5		7.55		7.4		7.4		7.4		7.3		7.4		7.3	
EC x 10 <sup>6</sup> at 25°C	124		132				132		197		224		183		174		183		211		142	
Constituents in	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l
Total Dissolved Solids	85		126				142		142		142		138		117		126		130		104	
Sum	74		113				113		120		136		116		109		115		120		91	
Silica	16		18				18		18		20		22		20		20		20		20	
Cations																						
Calcium	(Ca)	0.9	0.49				13	0.65	14	0.70	16	0.80	14	0.70	12	0.60	14	0.70	14	0.70	10	0.50
Magnesium	(Mg)	4.7	0.39				6.9	0.52	7.5	0.69	8.8	0.76	7.3	0.69	7.8	0.64	7.5	0.69	7.8	0.64	6.6	0.54
Sodium	(Na)	5.9	0.26				14	0.21	15	0.65	16	0.76	12	0.52	11	0.48	11	0.48	11	0.48	1.7	0.33
Potassium	(K)	1.1	0.03				1.1	0.03	1.2	0.03	1.6	0.04	1.3	0.03	1.7	0.04	1.6	0.04	1.4	0.04	1.3	0.03
Iron (Total)	(Fe)	0.04							0.02													
Aluminum	(Al)	0.00							0.0													
Arsenic	(As)	0.00							0.0													
Chromium	(Cr-6)	0.00							0.0													
Copper	(Cu)	0.00							0.0													
Lead	(Pb)	0.03							0.0													
Mercury	(Hg)	0.00							0.0													
Manganese	(Mn)	0.00							0.0													
Zinc	(Zn)	0.00							0.0													
Total Cations																						
Sum		1.37					1.36		2.00		2.26		1.85		1.76		1.84		1.84		1.50	
anions																						
Carbonate	(CO <sub>3</sub> )	0	0.00				0	0.00	0	0.00	0.0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bicarbonate	(HCO <sub>3</sub> )	54	0.86				80	1.31	67	1.42	103	1.69	86	1.44	81	1.33	70	1.24	82	1.34	6	0.00
Sulfate	(SO <sub>4</sub> )	5.4	0.11				10	0.21	10	0.41	11	0.51	8.1	0.21	7.7	0.26	13	0.25	12	0.24	1.9	0.03
Fluoride	(F)	4.4	0.12				10	0.28	10	0.41	11	0.51	8.1	0.21	7.7	0.26	9.0	0.25	9.9	0.28	8.9	0.16
Chloride	(Cl)	0.1	0.00				0.1	0.02	0.0	0.00	0.1	0.00	0.2	0.01	0.1	0.00	0.0	0.00	0.0	0.00	0.2	0.00
Nitrate	(NO <sub>3</sub> )	0.2	0.01				0.4	0.01	0.4	0.01	1.3	0.02	1.2	0.02	1.3	0.02	1.4	0.02	1.4	0.02	0.4	0.01
Total Anions																						
Sum		1.32					1.83		1.95		2.23		1.84		1.71		1.78		1.78		1.89	
Boron	(B)	0.03					0.10		0.10		0.09		0.09		0.11		0.10		0.09		0.08	
Total Hardness (As CaCO <sub>3</sub> )		44					61		66		76		65		62		66		67		52	
RC Hardness		0					0		0		0		0		0		0		0		0	
Percent Sodium		22					33		32		31		28		27		26		29		24	
Color (Units)		5					15		10		35		10		10		25		10		10	
Turbidity (Silica Scale)		2					5		14		42		23		20		25		40		75	
Odor (Threshold) (60°C)		4					2		4		2		4		8		2.8		4		2	
Nitrogen Series																						
Organic Nitrogen	(N)	0.0					0.0		0.1		0.2		0.2		0.0		0.0		0.0		0.1	
Nitrite	(NO <sub>2</sub> )	0.03					0.00		0.0		0.60		0.01		0.01		0.00		0.00		0.00	
Nitrate	(NO <sub>3</sub> )	0.0					0.5		0.7		0.5		0.6		0.9		0.7		0.6		0.6	
Ammonium	(NH <sub>4</sub> )	0.0					0.0		0.0		0.1		0.2		0.0		0.1		0.1		0.6	
Ortho Phosphate	(PO <sub>4</sub> )	0.2					0.3		0.3		0.1		0.3		0.3		0.2		0.2		0.3	
Total Phosphate	(P)	3					0.3		0.4		0.3		0.3		0.3		0.3		0.2		0.3	
Other Solubles		7.4					0.3		0.8		0.4		3.6		3.1		2.4		1.2		1.1	
Biochemical Oxygen Demand (5-Day at 20°C)		0.91					1.0		1.59		0.97		0.91		1.69		1.34		1.33		1.43	
Chemical Oxygen Demand		0.86					1.08		1.64		0.97		0.96		1.26		1.54		1.54		1.39	
Suspended Solids		<4					8.0		6.9		7.6		7.6		7.7		11.5		9.0		12	
Detergents		37					54		38		32		22		30		34		41		118	
Phenolic Material	(ABS)	0.0					0.0		0.0		0.0		0.0		0.0		0.1		0.0		0.0	
Settleable Solids (ml/l)		0.00					0.00		0.000		0.000		0.000		0.000		0.000		0.000		0.000	





TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

(SWMP) SACRAMENTO RIVER AT RIO VISTA, MILE 12.0

Data Collected Time (P.S.T.) Discharge, cfs Mean Daily Instantaneous Temp. of Dissolved Oxygen, ppm X Skumston pH Field EC x 10 <sup>3</sup> at 25°C	4-11-60 1140		5-2-60 0905		6-6-60 0900		7-11-60 1000		8-1-60 1210		9-5-60 0935		10-3-60 1055		11-7-60 1035		12-12-60 1010		1-9-61 1000		2-13-61 1055		3-6-61 1105		4-10-61 1100		5-1-61 1040		6-5-61 0920	
	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)
Constituents in	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	
Total Dissolved Solids	111	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	139	
Silica	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	39	
Cations																														
Calcium	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	
Magnesium	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	
Potassium	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	
Iron (Total)																														
Aluminum	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	
Arsenic	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	
Chromium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Copper	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Manganese	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Zinc	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total Cations	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	1.86	
Anions																														
Carbonate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicarbonate	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	51	
Sulfate	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	
Chloride	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	
Fluoride	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Nitrate	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
Total Anions	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	
Boron	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Hardness (As CaCO <sub>3</sub> )	49	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
Free Boric Acid	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
Free Borate	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
Total Hardness (As CaCO <sub>3</sub> )	45	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	
Nitrogen Series																														
Organic Nitrogen																														
Nitrite																														
Nitrate																														
Ammonia																														
Total Nitrogen																														
Other Solubles																														
Biochemical Oxygen Demand (5-day at 20°C)																														
Chemical Oxygen Demand																														
Suspended Solids																														
Total Solids																														
Free Borate																														
Soluble Solids																														

(SWMP) samples were collected in conjunction with the Surface Water Monitoring Program of the State Department of Water Resources.

TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

Date Collected Time (P.S.T.) Discharge, cfs-Mean Daily	SACRAMENTO RIVER ABOVE MAYBERRY SLOUGH, MILE 40(L-1/4 Pt)											
	4-22-60	5-24-60	6--60	7--60	8-29-60	9-26-60	10-20-60	11-17-60	12-15-60	1-20-61	2-16-61	
Marcanthineous	60	62	60	60	60	60	60	60	60	60	60	60
Dissolved Oxygen, ppm	9.1	9.0	8.7	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
pH	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3
EC x 10 <sup>3</sup> at 25°C	114	114	114	114	114	114	114	114	114	114	114	114
Constituents in	mg/l	me/l	me/l	me/l	me/l	me/l	me/l	me/l	me/l	me/l	me/l	me/l
Total Dissolved Solids	114	114	114	114	114	114	114	114	114	114	114	114
Sum	114	114	114	114	114	114	114	114	114	114	114	114
Silica	114	114	114	114	114	114	114	114	114	114	114	114
Cations												
Calcium	10	10	10	10	10	10	10	10	10	10	10	10
Magnesium	10	10	10	10	10	10	10	10	10	10	10	10
Sodium	10	10	10	10	10	10	10	10	10	10	10	10
Potassium	10	10	10	10	10	10	10	10	10	10	10	10
Iron (Total)	10	10	10	10	10	10	10	10	10	10	10	10
Aluminum	10	10	10	10	10	10	10	10	10	10	10	10
Arsenic	10	10	10	10	10	10	10	10	10	10	10	10
Chromium	10	10	10	10	10	10	10	10	10	10	10	10
Copper	10	10	10	10	10	10	10	10	10	10	10	10
Lead	10	10	10	10	10	10	10	10	10	10	10	10
Manganese	10	10	10	10	10	10	10	10	10	10	10	10
Zinc	10	10	10	10	10	10	10	10	10	10	10	10
Total Cations	114	114	114	114	114	114	114	114	114	114	114	114
Anions												
Carbonate	10	10	10	10	10	10	10	10	10	10	10	10
Bicarbonate	10	10	10	10	10	10	10	10	10	10	10	10
Sulfate	10	10	10	10	10	10	10	10	10	10	10	10
Chloride	10	10	10	10	10	10	10	10	10	10	10	10
Fluoride	10	10	10	10	10	10	10	10	10	10	10	10
Nitrate	10	10	10	10	10	10	10	10	10	10	10	10
Total Anions	114	114	114	114	114	114	114	114	114	114	114	114
Boron	10	10	10	10	10	10	10	10	10	10	10	10
Total Hardness (as CaCO <sub>3</sub> )	114	114	114	114	114	114	114	114	114	114	114	114
Percent Sodium Chloride	10	10	10	10	10	10	10	10	10	10	10	10
Color (Units)	10	10	10	10	10	10	10	10	10	10	10	10
Turbidity (Silica Scale)	10	10	10	10	10	10	10	10	10	10	10	10
Odor (Threshold)	10	10	10	10	10	10	10	10	10	10	10	10
Nitrogen Series												
Organic Nitrogen	10	10	10	10	10	10	10	10	10	10	10	10
Nitrite	10	10	10	10	10	10	10	10	10	10	10	10
Nitrate	10	10	10	10	10	10	10	10	10	10	10	10
Ammonium	10	10	10	10	10	10	10	10	10	10	10	10
Phosphate - Ortho	10	10	10	10	10	10	10	10	10	10	10	10
Other Solubles	10	10	10	10	10	10	10	10	10	10	10	10
Biochemical Oxygen Demand (5-day at 20°C)	10	10	10	10	10	10	10	10	10	10	10	10
Chemical Oxygen Demand	10	10	10	10	10	10	10	10	10	10	10	10
Suspended Solids	10	10	10	10	10	10	10	10	10	10	10	10
Detergents	10	10	10	10	10	10	10	10	10	10	10	10
Phenolic Material	10	10	10	10	10	10	10	10	10	10	10	10
Settleable Solids (-1/1)	10	10	10	10	10	10	10	10	10	10	10	10



TABLE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 MONTHLY SAMPLING PROGRAM  
 1960-1961

SACRAMENTO RIVER ABOVE MAYBERRY SLOUGH, MILE 4.0 (R-1/4 Pt)

Data Collected	4-22-60		5-24-60		6- - -60		7- - -60		8-28-60		9-8-60		10-30-60		11-17-60		12-15-60		1-20-61		8-16-61	
	mg/l (ppm)	me/l (cpm)																				
Time (P.S.T.)	1000	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350	1350
Discharge, cfs-Mean Daily	9800	10,700	10,700	10,700	10,700	10,700	10,700	10,700	10,700	10,700	10,700	10,700	10,700	10,700	10,700	10,700	10,700	10,700	10,700	10,700	10,700	10,700
Instantaneous	9800	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62	62
Temp. °F	95.5	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94	94
Dissolved Oxygen, ppm	7.5	7.4	7.3	7.8	7.5	7.8	7.5	7.8	7.5	7.8	7.5	7.8	7.5	7.8	7.5	7.8	7.5	7.8	7.5	7.8	7.5	7.8
% Saturation	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
pH Field	7.5	7.4	7.3	7.8	7.5	7.8	7.5	7.8	7.5	7.8	7.5	7.8	7.5	7.8	7.5	7.8	7.5	7.8	7.5	7.8	7.5	7.8
EC x 10 <sup>6</sup> at 25°C	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
Constituents in	mg/l (ppm)	me/l (cpm)																				
Total Dissolved Solids	95	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134
Sum	95	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134	134
Sulfate (SO <sub>4</sub> )	16	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27	27
Cations																						
Calcium (Ca)	9.9	0.49	14	0.70	14	0.70	14	0.70	14	0.70	14	0.70	14	0.70	14	0.70	14	0.70	14	0.70	14	0.70
Magnesium (Mg)	4.7	0.39	6.3	0.52	6.3	0.52	6.3	0.52	6.3	0.52	6.3	0.52	6.3	0.52	6.3	0.52	6.3	0.52	6.3	0.52	6.3	0.52
Sodium (Na)	5.9	0.26	18	0.78	18	0.78	18	0.78	18	0.78	18	0.78	18	0.78	18	0.78	18	0.78	18	0.78	18	0.78
Potassium (K)	1.1	0.03	1.2	0.03	1.2	0.03	1.2	0.03	1.2	0.03	1.2	0.03	1.2	0.03	1.2	0.03	1.2	0.03	1.2	0.03	1.2	0.03
Iron (Total) (Fe)																						
Aluminum (Al)																						
Arsenic (As)																						
Chromium (Cr-6)																						
Copper (Cu)																						
Lead (Pb)																						
Manganese (Mn)																						
Zinc (Zn)																						
Total Cations	1.17	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03
Anions																						
Carbonate (CO <sub>3</sub> )	0	0.0	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	53	0.87	74	1.21	74	1.21	74	1.21	74	1.21	74	1.21	74	1.21	74	1.21	74	1.21	74	1.21	74	1.21
Sulfate (SO <sub>4</sub> )	5.9	0.02	13	0.27	13	0.27	13	0.27	13	0.27	13	0.27	13	0.27	13	0.27	13	0.27	13	0.27	13	0.27
Chloride (Cl)	4.4	0.12	19	0.54	19	0.54	19	0.54	19	0.54	19	0.54	19	0.54	19	0.54	19	0.54	19	0.54	19	0.54
Fluoride (F)	0.0	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00
Nitrate (NO <sub>3</sub> )	0.3	0.00	0.9	0.01	0.9	0.01	0.9	0.01	0.9	0.01	0.9	0.01	0.9	0.01	0.9	0.01	0.9	0.01	0.9	0.01	0.9	0.01
Total Anions	1.11	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03	2.03
Boron (B)	0.03	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Total Hardness (As CaCO <sub>3</sub> )	44	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61	61
HC Hardness	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Percent Sodium	22	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
Color (Units)	4	10	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
turbidity (Silica Scale)	4	10	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Color (Iriescence) (GPC)	4	10	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
Nitrogen Series																						
Organic Nitrogen (N)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nitrite (NO <sub>2</sub> )	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Nitrate (NO <sub>3</sub> )	1.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Ammonium (NH <sub>4</sub> )	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Phosphate - Ortho (PO <sub>4</sub> )	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Phosphate - Total (PO <sub>4</sub> )	2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Ether Solubles	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Biochemical Oxygen Demand (5-Day at 20°C)	0.79	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34
Chemical Oxygen Demand	0.82	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34	1.34
Suspended Solids	59	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66
Nonionic Inertial (ABS)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saturable Solids (mg/l)	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 DAILY SAMPLING PROGRAM  
 SACRAMENTO RIVER AT BEND, MILE 256.3

1960-1961

Date Collected	6/1-3, 5-9/60	6/4/60	6/10-17/60	6/18-30/60	7/1-10/60	7/11-20/60
Mean Discharge, cfs	8,600	8,870	9,550	10,500	10,840	10,130
pH	7.3	7.3	7.5	7.3	7.9	7.8
EC x 10 <sup>6</sup> at 25°C	127	127	127	127	123	122
Constituents in mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)
Total Dissolved Solids	100	105	97	93	102	102
Sum	94	97	29	28	94	90
Silica (SiO <sub>2</sub> )	28	29	29	25	25	25
Calcium (Ca)	10	11	11	11	11	11
Magnesium (Mg)	5.1	5.2	5.2	6.0	6.0	6.0
Sodium (Na)	1.3	1.3	1.3	1.3	1.3	1.3
Potassium (K)	1.1	1.2	1.2	1.2	1.4	1.1
Total Cations	1.27	1.34	1.27	1.40	1.30	1.27
Anions						
Carbonate (CO <sub>3</sub> )	0	0	0	0	0	0
Bicarbonate (HCO <sub>3</sub> )	68	69	69	70	63	63
Sulfate (SO <sub>4</sub> )	8.0	8.0	8.0	7.0	6.0	6.4
Chloride (Cl)	1.5	1.5	1.5	1.5	1.2	1.2
Fluoride (F)	0.0	0.0	0.0	0.0	0.1	0.1
Nitrate (NO <sub>3</sub> )	0.0	0.0	0.0	0.2	0.8	0.7
Total Anions	1.32	1.33	1.32	1.38	1.26	1.26
Boron (B)	0.0	0.0	0.0	0.0	0.0	0.1
Total Hardness (As CaCO <sub>3</sub> )	56	49	49	52	48	46
% Hardness	0	0	0	0	0	0
Percent Sodium	25	25	25	24	24	29

Date Collected	4/1-10/60	4/21-30/60	5/1-10/60	5/11-20/60	5/21-31/60
Mean Discharge, cfs	4,620	9,480	8,590	8,290	7,740
pH	7.7	7.9	8.0	8.0	8.0
EC x 10 <sup>6</sup> at 25°C	135	139	134	128	126
Constituents in mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)
Total Dissolved Solids	36	95	112	104	111
Sum	30	95	96	92	91
Silica (SiO <sub>2</sub> )	27	28	27	26	26
Calcium (Ca)	12	11	10	11	10
Magnesium (Mg)	6.3	5.2	6.1	5.1	5.6
Sodium (Na)	1.1	1.1	1.1	1.1	1.1
Potassium (K)	1.7	1.6	1.4	1.6	1.3
Total Cations	1.47	1.45	1.32	1.35	1.26
Anions					
Carbonate (CO <sub>3</sub> )	0	0	0	0	0
Bicarbonate (HCO <sub>3</sub> )	74	71	69	68	69
Sulfate (SO <sub>4</sub> )	7.0	2.0	7.8	8.0	8.0
Chloride (Cl)	5.5	4.5	2.2	2.0	2.0
Fluoride (F)	0.1	0.1	0.1	0.1	0.1
Nitrate (NO <sub>3</sub> )	0.3	0.2	0.0	0.0	0.0
Total Anions	1.53	1.48	1.35	1.32	1.29
Boron (B)	0.1	0.0	0.0	0.0	0.0
Total Hardness (As CaCO <sub>3</sub> )	56	49	51	48	48
% Hardness	0	0	0	0	0
Percent Sodium	21	21	21	22	21

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
April 1	0730	5,340	56	134
2	0720	5,080	54	132
3	0715	5,080	54	132
4	0715	4,760	54	132
5	0650	4,460	59	135
6	1200	4,435	59	135
7	1200	4,310	60	135
8	1200	4,310	60	135
9	1550	4,060	60	135
10	1700	4,060	60	135
11	1730	4,060	59	137
12	1730	4,060	58	135
13	1715	4,435	58	136
14	1800	4,310	58	135
15	1630	6,000	57	133
16	1600	6,410	57	131
17	1030	6,550	56	131
18	0930	6,440	56	131
19	1500	6,950	55	131
20	1500	7,170	55	131
21	1430	7,230	56	130
22	1730	7,230	54	129
23	1600	9,630	51	127
24	1430	9,940	51	129
25	1600	9,940	51	126
26	1600	10,940	52	133
27	1200	10,940	52	128
28	1700	10,840	52	127
29	1700	9,650	53	127
30	1200	9,360	54	127

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
June 18	2000	10,300	60	128
19	1800	10,300	60	125
20	2000	10,155	60	127
21	2030	10,155	58	123
22	0715	10,300	56	123
23	0715	10,600	56	122
24	0715	10,600	55	122
25	0715	10,600	55	122
26	0715	10,600	55	122
27	1130	11,050	57	121
28	1130	11,050	57	122
29	1130	11,050	57	123
30	1130	11,050	58	122
July 1	1430	10,840	58	121
2	1430	10,840	58	125
3	1500	10,840	58	123
4	1100	10,840	60	122
5	1000	10,840	59	120
6	1830	10,840	60	122
7	0630	10,840	56	121
8	0630	10,840	57	124
9	0630	10,840	56	122
10	0700	10,840	57	122
11	1415	10,840	56	123
12	0700	10,840	56	124
13	0930	10,340	56	124
14	0715	10,340	55	119
15	0715	10,240	56	119
16	2000	10,240	58	119
17	1200	10,090	57	120
18	1430	10,090	58	121
19	1430	10,090	58	121
20	1430	10,090	58	119

Analyses by U. S. Geological Survey, Quality of Water Branch.  
 \* Mean Daily.



SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

DAILY SAMPLING PROGRAM  
SACRAMENTO RIVER AT BEND, MILE 256.3

1960 - 1961

Date Collected	11/21-30/60	12/1/60	12/2-15/60	12/16-21/60	12/22-31/60	1/1-9/61
Mean Discharge, cfs	7,030	50,500	7,290	9,610	7,280	5,120
pH	7.3	Analysed	7.4	6.9	7.7	7.8
Temp. at 25°C	13.5	not recorded	13.3	12.7	13.9	13.9
Constituents In	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)
Total Dissolved Solids	103	103	103	99	102	102
Sulfate	26	29	28	28	26	26
Cations						
Calcium (Ca)	12	13	13	13	13	11
Magnesium (Mg)	5.8	5.0	5.2	4.7	4.7	6.1
Sodium (Na)	7.4	7.4	6.7	6.2	7.2	8.3
Potassium (K)	1.4	2.0	1.4	1.8	1.8	2.0
Total Cations	1.44	1.43	1.43	1.31	1.40	1.46
Anions						
Carbonate (CO <sub>3</sub> )	0	0	0	0	0	0
Bicarbonate (HCO <sub>3</sub> )	0	64	1.05	59	65	1.07
Sulfate (SO <sub>4</sub> )	7.0	10	0.24	10	8.0	7.2
Chloride (Cl)	5.0	3.7	3.0	3.0	4.0	3.2
Fluoride (F)	0.0	0.1	0.0	0.1	0.0	0.0
Nitrate (NO <sub>3</sub> )	0.4	0.6	0.1	0.1	0.6	0.2
Total Anions	1.40	1.38	1.29	1.36	1.48	1.48
Boron (B)	0.1	0.0	0.0	0.0	0.0	0.0
Total Hardness (As CaCO <sub>3</sub> )	54	52	52	52	52	52
NO Hardness	0	1	0	0	0	0
Percent Sodium	22	22	22	22	22	25

Date Collected	1/10-19/61	1/20-29/61	2/1-2/15/61	2/16-2/21/61	2/22-2/27/61	2/28-3/6/61	3/7-3/13/61
Mean Discharge, cfs	2,600	2,410	2,688	2,688	11,270	24,200	24,200
pH	7.6	8.0	7.1	7.1	7.6	7.8	7.7
Temp. at 25°C	14.2	14.8	14.0	14.0	13.7	11.9	13.1
Constituents In	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)
Total Dissolved Solids	100	103	103	103	94	86	94
Sulfate	27	27	21	21	24	24	26
Cations							
Calcium (Ca)	12	12	9.6	9.6	12	10	11
Magnesium (Mg)	5.6	5.8	3.9	3.9	5.4	4.9	5.7
Sodium (Na)	8.3	8.9	5.2	5.2	6.9	6.0	7.2
Potassium (K)	1.6	1.4	1.0	1.0	1.0	1.0	1.3
Total Cations	1.46	1.51	1.06	1.06	1.37	1.19	1.36
Anions							
Carbonate (CO <sub>3</sub> )	0	0	0	0	0	0	0
Bicarbonate (HCO <sub>3</sub> )	75	78	1.28	1.28	64	58	68
Sulfate (SO <sub>4</sub> )	1.6	1.6	1.1	1.1	8.0	7.0	8.0
Chloride (Cl)	3.1	3.1	0.89	0.89	3.5	3.0	3.6
Fluoride (F)	0.1	0.0	0.1	0.1	0.1	0.1	0.1
Nitrate (NO <sub>3</sub> )	0.2	0.0	0.4	0.4	1.2	1.3	0.8
Total Anions	1.43	1.53	1.07	1.07	1.35	1.21	1.33
Boron (B)	0.0	0.0	0.1	0.1	0.1	0.0	0.0
Total Hardness (As CaCO <sub>3</sub> )	53	54	40	40	52	45	51
NO Hardness	0	0	1	1	0	0	0
Percent Sodium	25	26	22	22	22	22	23

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Nov. 21	11:30	5,190	57	130
22	11:30	7,050	55	137
23	10:00	1,650	54	137
24	09:00	4,930	54	137
25	14:00	9,020	54	121
26	14:00	16,400	52	103
27	16:00	7,730	52	133
28	17:00	5,890	53	138
29	5:10	5,510	52	140
30	17:00	5,730	53	140
Dec. 1	17:00	50,540	53	---
2	14:00	23,400	52	122
3	14:00	14,110	53	121
4	11:00	7,590	50	143
5	6:40	6,400	50	135
6	07:15	5,770	48	145
7	07:15	2,480	47	148
8	07:15	2,650	47	148
9	07:15	2,250	48	151
10	17:00	4,980	49	145
11	17:00	5,910	50	145
12	11:00	4,910	52	145
13	11:00	4,760	51	145
14	12:00	4,720	52	153
15	12:00	4,870	52	144

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Jan. 10	16:00	5,190	51	139
11	16:00	5,100	50	140
12	15:15	5,650	49	142
13	12:00	5,080	49	140
14	15:00	5,040	49	143
15	16:00	5,000	48	144
16	07:15	4,950	46	146
17	07:15	4,950	47	141
18	07:30	4,930	47	143
19	09:00	4,930	47	150
20	09:00	5,050	50	140
21	14:15	5,040	51	142
22	13:00	5,000	51	143
23	13:00	5,170	52	141
24	13:00	5,940	52	145
25	13:00	5,850	50	145
26	11:00	7,660	49	146
27	11:00	19,200	52	108
28	17:00	32,600	53	83
29	17:00	22,700	53	112
30	17:00	25,000	53	98
Jan. 31	17:00	25,000	53	98
Feb. 1	15:30	25,000	53	98
2	15:30	25,000	53	98

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Feb. 3	15:45	18,900	53	130
4	14:00	12,500	53	136
5	11:00	10,200	53	135
6	15:45	9,150	53	139
7	07:30	8,700	51	138
8	07:30	8,180	51	141
9	07:15	25,000	51	127
10	07:30	23,600	52	98
11	08:30	30,200	52	115
12	10:00	25,200	51	117
13	14:00	20,900	50	123
14	13:00	21,900	52	116
15	14:00	23,700	52	116
16	14:00	23,100	51	116
17	12:00	20,400	50	124
18	17:00	19,300	50	128
19	17:00	17,900	50	129
20	17:00	17,800	52	130
21	15:30	17,500	52	131
22	17:30	17,300	52	133
23	17:00	16,900	52	133
24	17:00	16,700	52	132
25	17:00	16,600	52	130
26	18:00	16,300	51	131
27	16:00	16,200	52	130
28	07:15	16,200	49	130

Analyzed by U. S. Geological Survey, Quality of Water Branch.  
• Mean Daily.

Analyzed by U. S. Geological Survey, Quality of Water Branch.  
• Mean Daily.

TABLE T-2 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY  
RESULTS OF ANALYSES  
DAILY SAMPLING PROGRAM  
SACRAMENTO RIVER AT BEND, MILE 256.3

1960-1961

Date Collected	3/1-10/61	3/11-20/61	3/21-31/61	4/1-10/61	4/11-20/61	4/21-30/61	5/1-10/61	5/11-20/61	5/21-31/61	6/1-13/61	6/14-21/61	6/22-30/61
Mean Discharge, cfs	14,900	13,190	16,640	9,270	8,190	9,160	9,210	8,660	8,360	9,280	9,764	10,922
pH	7.5	7.5	7.5	8.0	7.6	7.7	7.8	7.7	7.6	7.6	7.4	7.4
EC x 10 <sup>6</sup> at 25°C	332	322	322	130	128	126	125	124	123	123	124	123
Constituents in	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l
Total Dissolved Solids	95	100	104	93	100	92	97	94	93	96	93	90
Sum	97	100	104	96	91	69	91	94	93	96	93	90
Silica (SiO <sub>2</sub> )	27	25	25	24	24	24	20	20	25	28	25	25
Cations												
Calcium (Ca)	11	0.55	11	0.55	11	0.55	12	0.60	11	0.55	12	0.60
Magnesium (Mg)	5.7	0.47	5.6	0.44	5.5	0.45	5.4	0.44	6.0	0.44	4.4	0.36
Sodium (Na)	8.0	0.35	6.9	0.30	6.4	0.28	6.5	0.28	6.5	0.28	6.4	0.26
Potassium (K)	1.4	0.04	1.1	0.03	1.0	0.03	1.1	0.03	1.1	0.03	1.4	0.04
Total Cations	1.41	1.29	1.29	1.31	1.33	1.28	1.37	1.35	1.35	1.28	1.28	1.23
Anions												
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	70	1.15	63	1.03	64	1.05	64	1.05	64	1.05	64	1.05
Sulfate (SO <sub>4</sub> )	6.0	0.12	6.0	0.12	7.0	0.15	7.6	0.16	8.0	0.17	7.0	0.15
Chloride (Cl)	3.0	0.08	3.0	0.08	2.5	0.07	3.2	0.09	3.0	0.08	3.4	0.12
Fluoride (F)	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.2	0.01	0.1	0.01
Nitrate (NO <sub>3</sub> )	1.0	0.02	0.8	0.01	0.7	0.00	0.5	0.01	0.5	0.01	0.2	0.00
Total Anions	1.38	1.25	1.26	1.27	1.28	1.25	1.34	1.31	1.32	1.27	1.32	1.25
Boron (B)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Hardness (As CaCO <sub>3</sub> )	51	48	48	50	50	48	52	52	52	48	48	47
NC Hardness	0	0	0	0	0	0	0	0	0	0	0	0
Percent Sodium	25	23	23	21	23	23	21	21	21	23	22	21

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
March 1	0715	15,200	49	132
2	0715	14,600	49	131
3	0815	14,900	48	134
4	0815	14,800	49	133
5	1015	14,800	50	132
6	1015	14,800	51	132
7	1015	14,500	51	131
8	1015	14,500	49	133
9	1130	16,500	49	126
10	1015	15,400	51	126
March 11	1200	15,200	51	125
12	1815	15,000	51	128
13	1515	14,900	51	127
14	1530	21,200	51	127
15	1530	21,500	51	112
16	1630	19,600	51	117
17	1700	23,400	51	110
18	1600	19,500	52	121
19	1700	17,800	50	123
20	1430	19,800	52	121
March 21	0900	17,800	50	123
22	0715	17,100	50	123
23	0715	17,100	50	126
24	0725	18,200	50	123
25	0715	18,900	49	113
26	1000	15,600	49	122
27	1115	16,200	51	111
28	1100	12,500	52	123
29	1830	11,400	53	123
30	1200	11,000	54	124
31	1200	10,400	55	129

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
May 1	1100	9,370	54	127
2	1630	9,370	57	124
3	1800	9,150	57	124
4	1800	9,200	57	128
5	1800	9,180	55	128
6	1930	9,180	53	121
7	1800	9,490	56	126
8	1400	9,210	56	123
9	1745	9,120	55	121
10	1400	9,230	55	124
May 11	1415	9,430	55	123
12	1015	9,460	56	122
13	1900	8,870	57	124
14	1930	8,590	57	121
15	1930	8,480	59	124
16	1900	8,370	60	125
17	1600	8,350	60	122
18	1530	8,320	60	122
19	1800	8,350	60	122
20	1900	8,370	58	122
May 21	2000	8,430	60	121
22	1700	8,370	58	121
23	0730	8,350	58	122
24	0730	8,290	56	121
25	0715	8,180	56	124
26	0730	8,210	56	122
27	1900	8,320	58	122
28	1900	8,210	58	121
29	1830	8,670	57	121
30	2100	8,290	58	122
31	1400	8,590	56	122

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
June 1	1100	9,070	55	122
2	1200	9,600	55	120
3	1800	9,980	56	124
4	1800	9,530	56	122
5	1600	9,530	60	125
6	1900	9,460	59	123
7	1730	9,330	60	124
8	2100	9,200	60	124
9	1900	9,180	61	125
10	1800	9,090	61	125
11	1630	9,070	59	123
12	1900	9,040	60	122
13	0730	8,930	60	123
June 14	0800	9,150	59	124
15	0730	9,320	59	123
16	0720	9,780	59	122
17	0830	9,750	59	122
18	2030	9,690	61	121
19	1830	9,720	61	122
20	1030	10,500	59	120
21	1930	10,500	60	121
June 22	1015	10,600	60	120
23	1830	11,000	61	120
24	1900	11,000	62	119
25	1900	11,000	61	121
26	1530	11,000	61	121
27	1900	10,900	61	121
28	2000	10,900	60	121
29	1800	11,000	59	121
30	1900	10,900	61	120

Analyses by U. S. Geological Survey, Quality of Water Branch.  
\* Mean Daily.

SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 DAILY SAMPLING PROGRAM  
 SACRAMENTO RIVER AT BUTTE CITY, MILE 168.2

1960-1961

Date Collected	5/22-31/60	5/10-20/60	5/1-9/60	4/20-30/60	4/10-19/60	4/1-9/60	6/3-30/60	6/12-22/60	6/23-30/60	7/1-9/60	7/10-19/60	7/20-31/60
Mean Discharge, cfs	6,700	6,700	6,020	6,880	8,000	7,900	6,090	7,000	7,710	7,900	7,000	7,300
pH	7.9	7.9	7.9	7.8	8.0	7.9	7.0	7.1	7.3	7.1	7.3	7.5
EC x 10 <sup>6</sup> at 25°C	317	317	317	317	317	317	337	337	337	337	337	337
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	117	117	117	117	117	117	117	117	117	117	117	117
Sum	117	117	117	117	117	117	117	117	117	117	117	117
Silica	33	33	33	33	33	33	33	33	33	33	33	33
Cations	Ca	15	0.75	12	0.60	13	12	11	0.55	12	0.60	13
Magnesium	Mg	6.9	0.37	7.1	0.49	7.3	6.9	6.9	0.57	7.6	0.43	4.6
Sodium	Na	8.1	0.37	8.1	0.37	8.5	8.3	8.3	0.34	7.6	0.33	8.0
Potassium	K	1.6	0.04	1.6	0.03	1.3	0.03	2.1	0.05	1.9	0.04	1.2
Total Cations		1.77	1.71	1.56	1.54	1.60	1.43	1.57	1.41	1.38	1.40	1.40
Anions	Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0
Bicarbonate (HCO <sub>3</sub> )	79	1.24	79	1.29	77	1.26	74	1.29	74	1.21	71	1.16
Sulfate (SO <sub>4</sub> )	9.0	0.12	7.0	0.15	10	0.21	6.0	0.12	6.0	0.12	6.0	0.12
Chloride (Cl)	5.2	0.16	5.2	0.16	2.0	0.08	4.2	0.12	3.2	0.09	2.8	0.08
Fluoride (F)	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.0	0.00
Nitrate (NO <sub>3</sub> )	0.4	0.01	0.4	0.01	0.8	0.01	1.1	0.02	1.1	0.02	0.6	0.01
Total Anions		1.78	1.75	1.62	1.49	1.62	1.43	1.61	1.45	1.39	1.37	1.43
Boron	(B)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Hardness (as CaCO <sub>3</sub> )	58	57	60	60	60	60	58	58	58	49	51	52
Percent Sodium	22	24	23	23	24	24	22	24	23	26	25	24

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
June 1	1600	4,990	75	152
June 2	1700	5,090	75	147
June 3	1730	5,905	75	150
June 4	1700	6,430	75	145
June 5	1700	6,130	75	148
June 6	1700	6,285	74	146
June 7	1700	6,325	73	136
June 8	1700	6,340	72	137
June 9	1630	6,870	72	134
June 10	1700	6,870	72	135
June 11	1700	6,840	72	135
June 12	1700	6,760	73	147
June 13	1700	6,870	73	143
June 14	1700	7,090	71	135
June 15	1630	7,200	69	135
June 16	1700	7,310	68	133
June 17	1700	7,200	69	134
June 18	1700	7,200	69	134
June 19	1730	7,310	68	133
June 20	1630	7,200	69	134
June 21	1630	7,310	69	134
June 22	1630	7,540	69	136
June 23	1630	7,540	71	139
June 24	1730	7,540	71	136
June 25	1730	7,540	71	136
June 26	1700	7,090	66	139
June 27	1700	7,090	66	139
June 28	1700	6,430	68	143
June 29	1730	8,000	70	135
June 30	1630	8,000	70	139

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
July 1	1630	8,000	64	137
July 2	1700	8,000	68	130
July 3	1630	8,000	70	138
July 4	1700	8,000	69	135
July 5	1700	8,000	69	131
July 6	1700	7,885	70	132
July 7	1700	7,885	70	132
July 8	1700	7,885	69	132
July 9	1700	7,885	69	138
July 10	1700	7,885	69	127
July 11	1700	7,885	69	129
July 12	1700	7,770	69	135
July 13	1700	7,540	69	132
July 14	1700	7,425	69	139
July 15	1700	7,425	69	130
July 16	1700	7,425	69	130
July 17	1700	7,425	69	130
July 18	1700	7,425	69	130
July 19	1730	7,425	69	130
July 20	1730	7,310	69	131
July 21	1600	7,310	69	130
July 22	1730	7,310	69	130
July 23	1600	7,310	69	131
July 24	1600	7,310	69	131
July 25	1730	7,425	60	128
July 26	1600	7,425	60	128
July 27	1600	7,425	60	127
July 28	1600	7,425	60	127
July 29	1730	7,310	59	105
July 30	1600	7,310	59	105
July 31	1600	7,310	59	128

Analyses by U. S. Geological Survey, Quality of Water Branch.  
 \* Mean Daily.

TABLE T-3 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 DAILY SAMPLING PROGRAM  
 SACRAMENTO RIVER AT BUTTE CITY, MILE 168.2

1960 - 1961

Date Collected	8/12-20/60	8/22-30/60	9/1-10/60	9/11-20/60	9/21-30/60
Mean Discharge, cfs	7,460	6,980	6,510	6,010	5,530
pH	7.3	7.5	7.4	7.4	7.5
EC x 10 <sup>6</sup> at 25°C	131	129	134	137	140
Constituents in	mg/l	mc/l	mg/l	mc/l	mg/l
Total Dissolved Solids	91	99	103	92	97
Sum	93	94	94	94	94
Silica (SiO <sub>2</sub> )	27	27	29	26	26
Cations					
Calcium (Ca)	12	0.60	12	7.9	12
Magnesium (Mg)	4.9	0.40	5.6	0.46	5.1
Sodium (Na)	7.4	0.32	7.1	0.31	7.0
Potassium (K)	1.1	0.03	1.2	0.03	1.2
Total Cations	1.35	1.34	1.35	1.34	1.36
Anions					
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0
Bicarbonate (HCO <sub>3</sub> )	70	1.15	69	1.13	71
Sulfate (SO <sub>4</sub> )	4.0	0.08	5.0	0.12	5.4
Chloride (Cl)	2.5	0.07	2.2	0.06	3.3
Fluoride (F)	0.1	0.01	0.0	0.00	0.0
Nitrate (NO <sub>3</sub> )	0.3	0.01	0.3	0.00	0.4
Total Anions	1.31	1.33	1.37	1.37	1.33
Boron (B)	0.0	0.0	0.1	0.0	0.1
Total Hardness (As CaCO <sub>3</sub> )	50	50	50	50	50
NO Hardness	0	0	0	0	0
Percent Sodium	24	24	23	22	24

Date Collected	10/1-10/60	10/11-20/60	10/21-31/60	11/1-7/60	11/8-15/60	11/16-25/60
Mean Discharge, cfs	5,730	5,390	5,170	5,270	6,510	5,700
pH	7.4	7.6	7.4	7.4	7.4	7.5
EC x 10 <sup>6</sup> at 25°C	135	139	138	144	144	155
Constituents in	mg/l	mc/l	mg/l	mc/l	mg/l	mc/l
Total Dissolved Solids	116	110	108	106	108	118
Sum	98	100	100	104	104	113
Silica (SiO <sub>2</sub> )	27	26	28	30	29	31
Cations						
Calcium (Ca)	12	0.60	12	0.60	12	0.65
Magnesium (Mg)	4.9	0.40	5.1	0.48	4.7	0.50
Sodium (Na)	8.0	0.35	8.1	0.35	8.4	0.38
Potassium (K)	1.7	0.04	1.3	0.04	1.9	0.07
Total Cations	1.39	1.41	1.44	1.47	1.46	1.60
Anions						
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	72	1.18	74	1.21	76	1.21
Sulfate (SO <sub>4</sub> )	5.0	0.15	5.0	0.10	5.0	0.10
Chloride (Cl)	3.0	0.08	3.0	0.08	5.2	0.15
Fluoride (F)	0.1	0.01	0.2	0.01	0.2	0.01
Nitrate (NO <sub>3</sub> )	1.2	0.02	1.2	0.01	0.7	0.02
Total Anions	1.39	1.44	1.41	1.52	1.47	1.62
Boron (B)	0.1	0.0	0.0	0.0	0.1	0.1
Total Hardness (As CaCO <sub>3</sub> )	50	51	53	54	52	58
NO Hardness	0	0	0	0	0	0
Percent Sodium	25	25	24	24	25	24

Date	Time PST	Flow* cfs	Temp. °F	Specific Conductance
Aug. 1	1730	7,540	58	128
2	1730	7,425	59	126
3	1730	7,310	59	128
4	1800	7,310	59	127
5	1730	7,310	59	126
6	1730	7,425	59	127
7	1730	7,425	59	127
8	1830	7,540	59	127
9	1830	7,425	59	128
10	1730	7,425	59	128
11	1730	7,425	59	126
12	1730	7,425	59	126
13	1730	7,425	59	126
14	1730	7,425	59	126
15	1730	7,425	59	126
16	1700	7,425	59	126
17	1700	7,425	59	126
18	1730	7,425	59	126
19	1730	7,425	59	125
20	1700	7,425	59	125
21	1730	7,425	59	125
22	1730	7,425	59	125
23	1730	7,425	59	125
24	1800	7,425	59	125
25	1830	7,425	59	125
26	1800	7,425	59	125
27	1800	7,425	59	125
28	1800	6,870	59	125
29	1830	6,650	59	125
30	1800	6,650	59	125
31	1800	6,650	59	125

Date	Time PST	Flow* cfs	Temp. °F	Specific Conductance
Sept. 1	1630	7,110	64	129
2	1630	6,920	68	130
3	1700	7,000	65	130
4	1630	6,940	68	132
5	1630	6,260	66	133
6	1630	6,260	66	136
7	1645	6,300	66	136
8	1645	6,280	65	134
9	1700	6,280	65	134
10	1630	6,200	68	135
11	1700	6,260	68	135
12	1700	6,140	68	134
13	1630	6,050	69	138
14	1630	6,090	68	138
15	1645	5,950	68	138
16	170	5,970	67	137
17	1700	6,040	67	133
18	1630	5,990	68	134
19	1700	6,010	67	135
20	1645	6,010	66	136
21	1640	5,990	65	135
22	1630	5,940	65	136
23	1630	5,940	65	138
24	1700	5,940	67	136
25	1630	5,470	66	136
26	1730	5,450	68	140
27	1700	5,450	68	136
28	1630	5,410	68	138
29	1700	5,430	66	138
30	1700	5,390	65	140

Date	Time PST	Flow* cfs	Temp. °F	Specific Conductance
Nov. 1	1630	5,150	60	142
2	1630	5,230	59	139
3	1700	5,210	54	141
4	1700	5,270	50	141
5	1635	5,350	50	142
6	1630	5,310	50	143
7	1630	5,390	58	142
8	1630	5,430	57	143
9	1600	5,430	57	143
10	1630	5,510	56	143
11	1630	5,780	53	146
12	1630	5,780	53	146
13	1700	9,500	52	138
14	1625	8,510	52	139
15	1630	6,470	55	155
16	1700	5,800	54	155
17	1600	5,700	55	151
18	1700	6,070	54	152
19	1645	6,030	55	156
20	1645	5,650	54	153
21	1630	5,650	54	153
22	1630	5,650	54	153
23	1630	5,650	54	153
24	1700	5,350	53	156
25	1600	5,350	53	156
26	1600	5,290	52	155

Analyses by U. S. Geological Survey, Quality of Water Branch.  
 \* Mean Daily.



TABLE T-3 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 DAILY SAMPLING PROGRAM  
 SACRAMENTO RIVER AT BUTTE CITY, MILE 168.2  
 1960 - 1961

Date Collected	2/20-28/61	3/1-9/61	3/10-20/61	3/21-31/61	4/1-10/61	4/11-20/61
Mean Discharge, cfs	20,010	17,000	21,360	19,800	11,737	1,480
pH	7.2	7.7	7.8	7.6	7.7	7.8
EC x 10 <sup>6</sup> at 25°C	142	144	132	130	116	149
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	100	106	99	87	108	111
Sum	100	106	99	87	108	111
Silica	26	28	27	26	25	25
Cations						
Calcium	12	0.60	12	0.55	12	0.60
Magnesium	6.3	0.52	5.4	0.44	6.2	0.51
Sodium	7.7	0.33	8.5	0.37	7.9	0.37
Potassium	1.3	0.03	1.4	0.04	1.4	0.04
Total Cations	1.48	1.58	1.42	1.35	1.52	1.52
Anions						
Carbonate	0	0.00	0	0.00	0	0.00
Bicarbonate	72	1.18	69	1.13	70	1.15
Sulfate	8.0	0.17	6.0	0.12	7.4	0.15
Chloride	2.5	0.07	4.0	0.11	5.6	0.16
Fluoride	0.0	0.00	0.1	0.01	0.0	0.00
Nitrate	0.7	0.01	0.9	0.02	0.2	0.00
Total Anions	1.43	1.56	1.38	1.35	1.46	1.50
Boron	0.1	0.1	0.1	0.1	0.1	0.1
Total Hardness (As CaCO <sub>3</sub> )	56	56	52	50	56	57
NC Hardness	0	0	0	0	0	0
Percent Sodium	22	24	24	24	24	24

Date Collected	4/21-30/61	5/1-10/61	5/11-20/61	5/22-31/61	6/1-10/61	6/11-20/61
Mean Discharge, cfs	1,220	7,180	6,990	6,630	7,040	7,400
pH	8.1	7.6	7.8	7.8	8.0	7.9
EC x 10 <sup>6</sup> at 25°C	141	141	141	141	137	139
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	94	104	103	102	105	102
Sum	94	104	103	101	101	98
Silica	21	24	25	28	28	27
Cations						
Calcium	12	0.60	13	0.65	12	0.60
Magnesium	8.1	0.50	6.6	0.53	5.7	0.48
Sodium	8.2	0.46	7.5	0.33	7.0	0.30
Potassium	1.1	0.03	1.3	0.03	1.2	0.03
Total Cations	1.44	1.50	1.42	1.46	1.43	1.41
Anions						
Carbonate	0	0.00	0	0.00	0	0.00
Bicarbonate	70	1.15	70	1.15	71	1.16
Sulfate	9.0	0.21	9.0	0.12	6.0	0.12
Chloride	1.1	0.14	5.6	0.12	5.5	0.16
Fluoride	0.0	0.00	0.1	0.00	0.0	0.00
Nitrate	0.5	0.01	0.3	0.01	0.4	0.01
Total Anions	1.41	1.54	1.52	1.43	1.45	1.40
Boron	0.0	0.0	0.0	0.0	0.1	0.1
Total Hardness (As CaCO <sub>3</sub> )	57	57	59	56	54	53
NC Hardness	0	0	2	0	0	0
Percent Sodium	24	22	21	22	21	22

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Feb. 20	1700	22,000	53	141
21	1630	21,300	54	141
22	1700	20,600	53	129
23	1500	20,200	52	140
24	1645	19,500	51	141
25	1700	19,800	53	142
26	1630	19,200	53	141
27	1630	18,900	54	144
28	1630	18,600	53	141
March 1	1630	18,500	54	142
2	1600	16,700	51	145
3	1600	16,600	51	142
5	1700	16,400	51	143
6	1600	16,600	53	145
7	1630	16,600	53	145
8	1630	16,400	51	144
9	1630	17,700	52	141
March 10	1500	19,000	53	133
11	1500	17,800	54	136
12	1630	17,400	53	136
13	1630	17,200	53	137
14	1630	17,000	54	140
15	1530	25,400	52	---
16	1530	25,800	52	---
17	1630	25,500	53	117
18	1530	25,500	53	115
19	1700	23,800	52	138
20	1700	22,400	52	133

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
April 21	1530	6,860	55	141
22	1500	7,170	54	139
23	1600	7,570	52	134
24	---	8,310	51	137
25	1700	8,140	60	138
26	1500	7,300	61	138
27	1530	6,750	61	145
28	1600	6,550	61	143
29	1700	6,710	61	143
30	1630	6,880	62	144
May 1	1630	7,350	61	141
2	1730	7,400	62	144
3	1530	7,350	59	141
4	1630	6,980	60	138
5	1630	6,880	60	141
6	1630	7,190	60	137
7	1645	7,400	62	143
8	1700	7,150	61	144
9	1530	7,100	62	145
10	1700	7,100	62	145
11	1600	7,330	62	138
12	1530	7,940	61	138
13	1515	7,590	62	139
14	1625	7,130	63	141
15	1630	6,910	66	144
16	1530	6,750	65	143
17	1630	6,550	67	141
18	1630	6,550	66	138
19	1530	6,690	66	141
20	1700	6,150	64	141

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
June 1	1700	7,400	68	137
2	1600	7,380	67	136
3	1530	7,260	69	138
4	1630	7,100	71	144
5	1700	7,170	73	138
6	1600	7,350	71	136
7	1600	7,260	71	136
8	1600	7,660	72	138
9	1600	7,560	71	135
10	1700	7,400	68	136

Analyses by U. S. Geological Survey, Quality of Water Branch.  
 \* Mean Daily.

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

DAILY SAMPLING PROGRAM

SACRAMENTO RIVER AT BUTTE CITY, MILE 168.2

1960 - 1961

Date Collected	6/23-30/61								
Mean Discharge, cfs	8,100								
pH	7.9								
EC x 10 <sup>6</sup> at 25°C	134								
Constituents in	mg/l	mc/l	mg/l	mc/l	mg/l	mc/l	mg/l	mc/l	mg/l
Total Dissolved Solids	(ppm)	(cps)	(ppm)	(cps)	(ppm)	(cps)	(ppm)	(cps)	(ppm)
Sum	98	99							
Silica	(SiO <sub>2</sub> )	29							
Cations	(Ca)	12	0.60						
Calcium	(Mg)	5.4	0.144						
Magnesium	(Na)	7.0	0.30						
Sodium	(K)	1.4	0.04						
Potassium	Total Cations		1.38						
Anions	Carbonate	(CO <sub>3</sub> )	0	0.00					
Bicarbonate	(HCO <sub>3</sub> )	69	1.13						
Sulfate	(SO <sub>4</sub> )	5.6	0.12						
Chloride	(Cl)	4.5	0.13						
Fluoride	(F)	0.1	0.01						
Nitrate	(NO <sub>3</sub> )	0.4	0.01						
Total Anions			1.40						
Boron	(B)	0.0							
Total Hardness (As CaCO <sub>3</sub> )		78							
1/2 Hardness		0							
Percent Sulfium		22							

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
June 21	1630	7,690	71	138
22	1600	8,090	70	129
23	1630	8,120	70	133
24	1600	8,360	69	135
25	1700	8,110	69	129
26	1600	8,490	70	135
27	1700	8,260	70	137
28	1630	8,240	69	130
29	1700	8,240	69	130
30	1630	8,100	68	129

Analyses by U. S. Geological Survey, Quality of Water Branch.  
 \* Mean Daily.

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

DAILY SAMPLING PROGRAM

SACRAMENTO RIVER AT BOYERS PUMPHOUSE, MILE 111.6

1960-1961

Date Collected	6/1-8/60	6/9-21/60	6/22-30/60	7/1-10/60	7/11-20/60	7/21-31/60
Mean Discharge, cfs	5,248	5,313	5,891	6,423	6,111	5,952
pH	7.6	7.5	7.8	7.6	7.4	7.6
EC x 10 <sup>6</sup> at 25°C	139	144	136	138	136	132
Constituents in	mg/l (ppm)					
Total Dissolved Solids	132	117	99	117	107	106
Silica	143	105	83	108	107	106
Calcium	13	12	12	11	12	12
Magnesium	6.4	6.1	6.1	6.4	5.6	5.6
Sodium	7.1	8.5	8.2	9.5	9.1	8.9
Potassium	1.2	1.2	1.1	1.3	1.3	1.3
Total Cations	1.65	1.50	1.49	1.52	1.49	1.48
Carbonate	0.00	0.00	0.00	0.00	0.00	0.00
Bicarbonate	81	76	74	1.26	1.25	1.25
Sulfate	10	8.0	8.0	6.0	6.0	6.0
Chloride	4.0	3.5	3.0	3.8	3.8	3.5
Fluoride	0.0	0.0	0.0	0.0	0.0	0.0
Nitrate	0.0	0.0	0.0	0.0	0.0	0.0
Total Anions	1.68	1.52	1.47	1.52	1.49	1.48
Boron	0.1	0.0	0.0	0.0	0.0	0.0
Total Hardness (As CaCO <sub>3</sub> )	61	55	54	54	53	53
NC Hardness	0	0	0	0	0	0
Percent Sodium	24	25	24	27	27	26

Date Collected	8/1-9/60	8/10-17/60	8/18-27/60	8/28-31/60	9/1-10/60	9/11-20/60
Mean Discharge, cfs	6,044	6,045	5,956	5,770	5,770	5,863
pH	7.8	8.0	7.9	8.1	7.9	8.1
EC x 10 <sup>6</sup> at 25°C	133	134	132	130	126	129
Constituents in	mg/l (ppm)					
Total Dissolved Solids	101	109	99	106	105	110
Silica	97	94	94	102	107	110
Calcium	11	11	11	11	11	11
Magnesium	5.2	6.0	5.7	7.2	6.4	6.5
Sodium	7.1	7.1	7.1	7.4	7.9	7.9
Potassium	1.2	1.2	1.2	1.2	1.2	1.4
Total Cations	1.32	1.38	1.36	1.49	1.55	1.54
Carbonate	0	0	0	0	0	0
Bicarbonate	70	72	74	74	74	82
Sulfate	6.0	6.0	6.0	6.0	5.0	6.0
Chloride	2.8	3.2	3.0	3.5	4.2	4.0
Fluoride	0.0	0.0	0.0	0.0	0.0	0.1
Nitrate	0.3	0.3	0.3	0.4	0.4	0.9
Total Anions	1.35	1.39	1.33	1.44	1.53	1.59
Boron	0.0	0.0	0.0	0.0	0.0	0.0
Total Hardness (As CaCO <sub>3</sub> )	49	52	51	57	59	58
NC Hardness	0	0	0	0	0	0
Percent Sodium	23	22	23	21	22	22

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
June 1	1700	5,450	79	170
2	1700	4,920	80	167
3	1700	5,300	79	157
4	1700	5,250	79	179
5	1700	5,330	77	177
6	1700	5,330	75	179
7	1700	5,390	73	179
8	1700	5,390	73	179
9	1700	4,900	74	143
10	1700	4,900	75	146
11	1700	5,080	75	143
12	1700	5,350	75	141
13	1700	5,460	76	144
14	1700	5,330	75	141
15	1700	5,220	75	141
16	1700	5,210	76	143
17	1700	5,260	76	145
18	1700	5,390	73	138
19	1700	5,460	73	137
20	1700	5,700	74	139
21	1700	5,750	75	137
22	1700	5,650	72	136
23	1700	5,740	74	138
24	1700	5,740	74	135
25	1700	5,840	72	133
26	1700	5,920	72	132
27	1700	5,980	73	133
28	1700	5,980	73	132
29	1700	6,070	71	132
30	1700	6,320	70	133

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Aug. 1	1700	6,000	70	130
2	1700	6,050	70	131
3	1700	5,980	71	131
4	1700	6,020	72	132
5	1700	6,020	72	134
6	1700	6,030	74	132
7	1700	6,070	73	131
8	1700	6,150	73	131
9	1700	6,110	71	132
10	1700	6,080	75	131
11	1700	6,100	74	133
12	1700	6,100	73	134
13	1700	5,970	75	133
14	1700	6,050	75	132
15	1700	6,040	71	132
16	1700	5,990	72	132
17	1700	6,030	72	136
18	1700	6,070	72	132
19	1700	5,960	73	130
20	1700	6,030	72	131
21	1700	6,140	72	131
22	1700	6,090	70	131
23	1700	5,810	70	131
24	1700	5,740	69	130
25	1700	5,950	69	132
26	1700	5,920	69	132
27	1700	5,960	69	132
28	1700	5,960	72	132
29	1700	5,970	72	131
30	1700	5,960	72	130
31	1700	5,960	72	131

Analyses by U. S. Geological Survey, Quality of Water Branch.

\* Mean Daily.

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

DAILY SAMPLING PROGRAM

SACRAMENTO RIVER AT BOYERS PUMPHOUSE, MILE III.6

1960-1961

Date Collected	10/21-30/60	10/11-20/60	10/21-31/60	11/1-10/60	11/11-20/60	11/21-31/60	11/1-10/60	11/11-20/60	11/21-31/60	12/1-10/60	12/11-20/60	12/21-31/60
Mean Discharge, cfs	5,175	5,280	5,653	5,236	5,236	5,653	5,236	5,236	5,653	7,990	7,990	8,179
EC x 10 <sup>6</sup> at 25°C	1.2	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.6	1.6	1.6
Temperature, °C	14.2	14.4	14.7	14.7	14.7	14.7	14.7	14.7	14.7	15.3	15.3	15.3
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	107	113	108	108	108	108	108	108	108	110	110	110
Silica	27	33	29	29	29	29	29	29	29	31	31	31
Cations												
Calcium (Ca)	14	13	13	13	13	13	13	13	13	14	14	14
Magnesium (Mg)	6.8	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.3	6.3	6.3
Sodium (Na)	10	10	10	10	10	10	10	10	10	10	10	10
Potassium (K)	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Total Anions	1.52	1.61	1.61	1.61	1.61	1.56	1.56	1.56	1.56	1.56	1.56	1.56
Anions												
Carbonate (CO <sub>3</sub> )	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate (HCO <sub>3</sub> )	78	83	83	83	83	83	83	83	83	83	83	83
Sulfate (SO <sub>4</sub> )	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Chloride (Cl)	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Fluoride (F)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nitrate (NO <sub>3</sub> )	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Total Boron	1.55	1.62	1.62	1.62	1.62	1.55	1.55	1.55	1.55	1.55	1.55	1.55
Boron (B)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Hardness (As CaCO <sub>3</sub> )	128	138	138	138	138	138	138	138	138	138	138	138
Specific Hardness	0	0	0	0	0	0	0	0	0	0	0	0
Percent Sodium	2	2	2	2	2	2	2	2	2	2	2	2

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance	Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Sept. 21	1700	5,700	70	147	Oct. 21	1700	5,640	64	146
Sept. 22	1700	5,630	69	147	Oct. 22	1700	5,680	64	146
Sept. 23	1700	5,560	70	145	Oct. 23	1700	5,110	62	145
Sept. 24	1700	5,290	70	144	Oct. 24	1700	5,180	62	144
Sept. 25	1700	5,250	69	144	Oct. 25	1700	5,180	63	144
Sept. 26	1700	5,200	69	143	Oct. 26	1700	5,160	61	142
Sept. 27	1700	5,200	70	143	Oct. 27	1700	5,160	61	142
Sept. 28	1700	5,150	70	143	Oct. 28	1700	5,150	61	142
Sept. 29	1700	5,150	69	144	Oct. 29	1700	5,150	61	142
Sept. 30	1700	5,150	69	144	Oct. 30	1700	5,110	61	142
Oct. 1	1700	5,200	69	147	Nov. 1	1700	5,170	61	146
Oct. 2	1700	5,250	69	147	Nov. 2	1700	5,180	61	146
Oct. 3	1700	5,150	69	144	Nov. 3	1700	5,180	59	144
Oct. 4	1700	5,150	69	144	Nov. 4	1700	5,150	59	144
Oct. 5	1700	5,350	68	154	Nov. 5	1700	5,170	56	146
Oct. 6	1700	5,400	68	154	Nov. 6	1700	5,280	56	147
Oct. 7	1700	5,600	66	154	Nov. 7	1700	5,350	57	144
Oct. 8	1700	5,600	64	149	Nov. 8	1700	5,440	58	147
Oct. 9	1700	5,700	61	146	Nov. 9	1700	5,470	56	143
Oct. 10	1700	5,750	59	144	Nov. 10	1700	5,470	57	147
Oct. 11	1700	5,700	60	144	Nov. 11	1700	5,500	57	147
Oct. 12	1700	5,650	60	144	Nov. 12	1700	5,500	55	146
Oct. 13	1700	5,600	60	143	Nov. 13	1700	5,600	55	145
Oct. 14	1700	5,250	61	145	Nov. 14	1700	5,900	55	145
Oct. 15	1700	5,200	61	147	Nov. 15	1700	6,700	55	145
Oct. 16	1700	5,200	61	147	Nov. 16	1700	6,100	54	141
Oct. 17	1700	5,150	62	170	Nov. 17	1700	8,450	53	138
Oct. 18	1700	5,050	62	149	Nov. 18	1700	7,610	56	147
Oct. 19	1700	5,050	63	150					
Oct. 20	1700	5,050	63	148					

Analyses by U. S. Geological Survey, Quality of Water Branch. Mean Daily.

TABLE T-4 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

DAILY SAMPLING PROGRAM

SACRAMENTO RIVER AT BOYERS PUMPHOUSE, MILE 111.6

1960-1961

Date Collected	12/22-31/60	1/1-10/61	1/11-20/61	1/21-30/61	1/31,2/1-6/61	2/7-10/61	2/11-19/61	2/19-28/61	3/1-10/61	3/11-20/61	3/21-31/61	4/1-10/61
Mean Discharge, cfs	8,042	6,501	6,537	6,943	23,471	16,800	25,338	20,680	16,610	20,290	20,173	12,750
pH	8.1	8.2	8.2	7.9	7.7	7.5	7.1	7.9	7.8	7.7	7.9	8.0
EC x 10 <sup>6</sup> at 25°C	169	172	178	179	126	137	129	132	116	131	132	148
Constituents in	mg/l	mc/l	mg/l	mc/l	mg/l	mc/l	mg/l	mc/l	mg/l	mc/l	mg/l	mc/l
Total Dissolved Solids	147	122	125	121	87	103	100	100	94	97	105	104
Sum	145	121	123	119	85	101	98	98	108	97	100	101
Silica (SiO <sub>2</sub> )	27	29	28	28	20	23	25	25	29	26	26	26
Cations												
Calcium (Ca)	14	0.70	14	0.70	12	0.60	11	0.55	12	0.55	12	0.60
Magnesium (Mg)	7.1	0.58	7.8	0.64	4.9	0.40	6.1	0.45	6.8	0.56	5.6	0.46
Sodium (Na)	9.0	0.39	9.9	0.43	12	0.52	5.9	0.38	8.9	0.39	7.5	0.33
Potassium (K)	1.2	0.03	0.9	0.02	1.0	0.03	1.1	0.03	1.0	0.03	1.0	0.03
Total Cations	1.70	1.82	1.86	1.86	1.29	1.56	1.23	1.45	1.58	1.42	1.42	1.51
Anions												
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	78	1.28	92	1.51	93	1.52	58	1.15	80	1.31	69	1.16
Sulfate (SO <sub>4</sub> )	9.0	0.19	9.0	0.19	7.2	0.19	10	0.21	6	0.12	4.0	0.12
Chloride (Cl)	7.5	0.21	5.0	0.14	4.8	0.14	3.3	0.09	3.2	0.09	3.5	0.10
Fluoride (F)	0.1	0.01	0.0	0.00	0.0	0.00	0.0	0.00	0.1	0.01	0.1	0.01
Nitrate (NO <sub>3</sub> )	1.9	0.03	0.4	0.01	0.4	0.01	1.1	0.02	0.7	0.01	0.7	0.01
Total Anions	1.72	1.85	1.86	1.83	1.25	1.55	1.20	1.42	1.56	1.38	1.45	1.48
Boron (B)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Hardness (As CaCO <sub>3</sub> )	64	63	67	66	50	60	55	58	53	53	53	58
NC Hardness	0	0	0	0	0	0	0	0	0	0	0	0
Percent Sodium	23	24	28	28	20	21	22	22	25	23	23	21

Date	Time PST	Flow* cfs	Temp. °F	Specific Conductance
Dec. 22	1700	11,000	50	150
23	1700	9,870	50	155
24	1700	8,510	49	162
25	1700	7,580	48	166
26	1700	7,140	48	170
27	1700	7,120	49	172
28	1700	7,120	49	172
29	1700	6,820	47	175
30	1700	6,660	47	177
31	1700	6,550	49	175
Jan. 1	1700	6,450	46	179
2	1700	6,390	46	176
3	1700	6,480	45	173
4	1700	6,250	45	172
5	1700	6,510	45	171
6	1700	6,530	45	169
7	1700	6,480	45	170
8	1700	6,490	45	174
9	1700	6,510	47	172
10	1700	6,650	50	175
Jan. 11	1700	6,760	49	175
12	1700	6,880	49	176
13	1700	6,760	49	177
14	1700	6,570	49	179
15	1700	6,570	45	177
16	1700	6,500	48	174
17	1700	6,430	48	178
18	1700	6,350	48	178
19	1700	6,300	49	179
20	1700	6,260	47	181

Date	Time PST	Flow* cfs	Temp. °F	Specific Conductance
Feb. 11	1700	25,500	53	95
12	1700	25,800	52	115
13	1700	25,800	51	99
14	1700	25,400	51	123
15	1700	25,000	50	134
16	1700	25,000	52	126
17	1700	25,400	53	127
18	1700	24,900	50	127
19	1700	24,300	51	137
20	1700	23,500	53	139
21	1700	22,500	55	139
22	1700	21,600	53	141
23	1700	20,800	54	142
24	1700	20,100	53	144
25	1700	19,500	52	144
26	1700	19,200	52	142
27	1700	18,800	54	141
28	1700	18,400	54	141
29	1700	18,000	53	145
30	1700	18,000	54	145
31	1700	15,400	59	145
April 1	1700	14,600	62	144
2	1700	14,000	69	144
3	1700	13,800	65	147
4	1700	13,500	65	145
5	1700	13,300	64	143
6	1700	13,300	63	142
7	1700	12,500	62	143
8	1700	11,800	63	146
9	1700	11,800	62	146
10	1700	10,200	63	151

Analyses by U. S. Geological Survey, Quality of Water Branch. \* Mean Daily.

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

DAILY SAMPLING PROGRAM

SACRAMENTO RIVER AT BOYERS PUMPHOUSE, MILE III.6

1960-1961

Date Collected	4/11-20/61		4/21-30/61		5/1-10/61		5/11-20/61		5/21-31/61		6/1-10/61		6/21-30/61	
	Mean Discharge, cfs	pH	EC x 10 <sup>6</sup> at 25°C	mg/l (ppm)										
Mean Discharge, cfs	5,859	8.1	150	150	150	150	150	150	150	150	150	150	150	
pH	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	8.1	
EC x 10 <sup>6</sup> at 25°C	107	107	107	107	107	107	107	107	107	107	107	107	107	
Constituents in Total Dissolved Solids	107	107	107	107	107	107	107	107	107	107	107	107	107	
Sum Silica (SiO <sub>2</sub> )	27	26	26	27	27	27	27	27	27	27	27	27	27	
Cations														
Calcium (Ca)	74	74	74	74	74	74	74	74	74	74	74	74	74	
Magnesium (Mg)	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	
Sodium (Na)	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	9.3	
Potassium (K)	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	
Total Cations	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	1.65	
Anions														
Carbonate (CO <sub>3</sub> )	0	0	0	0	0	0	0	0	0	0	0	0	0	
Bicarbonate (HCO <sub>3</sub> )	79	79	79	79	79	79	79	79	79	79	79	79	79	
Sulfate (SO <sub>4</sub> )	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6	
Chloride (Cl)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	
Fluoride (F)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Nitrate (NO <sub>3</sub> )	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
Total Anions	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	1.61	
Boron (B)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Hardness (as CaCO <sub>3</sub> )	85	85	85	85	85	85	85	85	85	85	85	85	85	
Percent Sodium	24	24	24	24	24	24	24	24	24	24	24	24	24	

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
April 11	1700	9,340	63	150
12	1700	8,730	59	152
13	1700	8,390	63	152
14	1700	7,990	63	159
15	1700	7,510	64	161
16	1700	7,140	64	158
17	1700	6,730	65	155
18	1700	6,140	65	152
19	1700	6,100	65	156
20	1700	5,990	65	152
April 21	1700	5,970	58	151
22	1700	5,680	55	151
23	1700	5,980	57	150
24	1700	6,590	57	146
25	1700	6,890	60	141
26	1700	6,390	60	142
27	1700	5,540	62	148
28	1700	5,130	65	155
29	1700	5,050	65	153
30	1700	5,100	65	153
May 1	1700	5,350	65	152
2	1700	5,660	65	150
3	1700	5,850	64	148
4	1700	5,700	63	148
5	1700	5,910	62	150
6	1700	5,530	62	151
7	1700	5,870	64	147
8	1700	5,740	62	145
9	1700	5,810	63	148
10	1700	5,610	63	148

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
June 11	1700	6,430	70	152
12	1700	6,240	70	152
13	1700	5,830	73	148
14	1700	5,680	75	149
15	1700	5,420	75	149
16	1700	5,230	77	141
17	1700	5,520	75	148
18	1700	5,520	75	137
19	1700	5,520	75	137
20	1700	5,430	75	137
June 21	1700	5,330	75	139
22	1700	5,940	75	138
23	1700	5,740	75	134
24	1700	5,980	74	135
25	1700	6,300	76	132
26	1700	6,510	75	133
27	1700	6,470	72	134
28	1700	6,490	72	137
29	1700	6,400	72	136
30	1700	6,490	72	139

Analyses by U. S. Geological Survey, Quality of Water Branch.  
° Mean Daily.

TABLE T-5  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
DAILY SAMPLING PROGRAM  
SACRAMENTO RIVER AT BRYTE, MILE 62.6

1960-1961

Date Collected	4/19-20/60	4/21-5/5/60	5/17-27/60	5/28-6/3/60	6/4-10/60
Mean Discharge, cfs	9,900	14,900	13,500	13,800	9,500
pH	7.9	7.9	7.8	7.7	7.8
EC x 10 <sup>6</sup> at 25°C	140	134	203	190	172
Constituents in	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)
Total Dissolved Solids	86	115	122	116	110
Silica	18	22	19	22	22
Cations					
Calcium (Ca)	12	0.60	13	12	12
Magnesium (Mg)	1.0	0.42	0.60	0.65	0.60
Sodium (Na)	7.0	0.30	13	0.56	7.3
Potassium (K)	0.9	0.02	1.2	0.03	1.2
Total Cations	1.34	1.79	1.79	1.94	1.71
Anions					
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0
Bicarbonate (HCO <sub>3</sub> )	53	1.03	1.28	80	1.31
Sulfate (SO <sub>4</sub> )	4.6	0.10	0.25	14	0.29
Chloride (Cl)	7.0	0.20	8.7	0.24	9.0
Fluoride (F)	0.1	0.00	0.1	0.00	0.1
Nitrate (NO <sub>3</sub> )	0.2	0.00	0.9	0.01	0.9
Total Anions	1.33	1.76	1.76	1.96	1.71
Boron (B)	0.05	0.08	0.07	0.11	0.09
Total Hardness (As CaCO <sub>3</sub> )	51	60	65	62	60
Ca Hardness	0	0	0	0	0
Percent Sodium	22	31	31	31	28

Date Collected	6/11-19/60	6/20-30/60	7/1-7/60	7/8-15/60	7/15-23/60	7/24-31/60
Mean Discharge, cfs	7,300	6,600	7,500	7,400	6,900	6,500
pH	7.8	7.6	8.1	8.0	8.0	8.0
EC x 10 <sup>6</sup> at 25°C	234	212	215	216	215	215
Constituents in	mg/l (ppm)					
Total Dissolved Solids	131	131	136	138	138	137
Silica	25	25	27	27	27	27
Cations						
Calcium (Ca)	14	0.70	15	0.75	14	0.70
Magnesium (Mg)	8.5	0.60	8.4	0.69	9.2	0.76
Sodium (Na)	15	0.65	16	0.70	16	0.70
Potassium (K)	1.2	0.03	1.5	0.04	1.5	0.04
Total Cations	2.08	2.08	2.18	2.16	2.20	2.18
Anions						
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	90	1.48	96	1.57	98	1.64
Sulfate (SO <sub>4</sub> )	9.7	0.19	10	0.21	9.9	0.21
Chloride (Cl)	1.2	0.34	1.0	0.28	1.0	0.28
Fluoride (F)	0.1	0.00	0.1	0.00	0.1	0.00
Nitrate (NO <sub>3</sub> )	1.8	0.03	1.5	0.02	1.5	0.02
Total Anions	2.05	2.04	2.07	2.11	2.15	2.13
Boron (B)	0.14	0.11	0.11	0.10	0.10	0.08
Total Hardness (As CaCO <sub>3</sub> )	70	70	72	71	73	72
Ca Hardness	0	0	0	0	0	0
Percent Sodium	31	31	32	32	32	32

Date	Time PST	Flow* cfs	Temp. °F	Specific Conductance
April 19	1245	9,700	62	146
20	0800	9,700	59	129
21	0800	10,100	59	124
22	0800	9,950	59	136
23	0800	9,700	57	135
24	0800	9,600	55	143
25	0800	10,800	56	142
26	0800	10,800	56	156
April 27	0800	12,000	56	196
28	0800	15,200	55	213
29	0815	16,700	59	178
30	0730	17,200	59	172
May 1	0732	15,800	60	169
2	0800	14,600	60	178
3	0800	14,300	60	177
4	0800	14,300	60	177
5	0800	14,500	60	179
6	0830	14,500	61	176
May 7	1030	13,800	65	177
8	0810	13,300	64	194
9	0800	13,700	64	179
10	0805	14,200	64	164
11	0800	14,400	66	184
12	0800	14,700	67	187
13	0825	14,900	67	182
14	0815	14,900	65	182
15	0830	14,300	65	196
16	0805	13,700	65	190

Date	Time PST	Flow* cfs	Temp. °F	Specific Conductance
June 11	No Time	7,900	72	202
12	No Time	7,800	74	219
13	No Time	8,000	74	216
14	No Time	7,600	75	211
15	No Time	7,400	76	207
16	No Time	7,200	77	214
17	No Time	6,250	74	225
18	No Time	6,800	72	214
19	No Time	6,600	72	214
June 20	No Time	6,400	72	200
21	No Time	6,400	70	200
22	No Time	6,300	72	216
23	No Time	6,400	72	216
24	No Time	6,700	70	205
25	No Time	6,800	71	209
26	No Time	6,700	71	218
27	No Time	6,700	71	218
28	No Time	6,700	69	213
29	No Time	6,800	69	208
30	No Time	6,900	69	208
July 1	0810	7,100	69	201
2	0700	7,300	69	210
3	0830	7,500	71	214
4	0815	7,700	72	214
5	0800	7,800	71	214
6	0800	7,800	71	211
7	0800	7,600	71	211
June 8	0800	7,500	72	213
9	0700	7,500	71	210
10	0930	7,500	70	210
11	0800	7,600	70	213
12	0800	7,300	69	210
13	0800	7,500	70	212
14	0800	7,500	70	212
15	0800	7,200	70	214
July 16	0700	7,100	72	216
17	0815	7,100	73	217
18	0800	7,200	73	215
19	0800	7,600	74	220
20	0800	7,600	75	227
21	0800	7,650	74	215
22	0800	6,500	74	215
23	0700	6,600	74	215
July 24	0800	6,300	74	213
25	0800	6,700	73	218
26	0800	6,500	73	215
27	0800	6,600	73	219
28	0800	6,400	72	216
29	0800	6,300	71	219
30	0800	6,600	71	219
31	0800	6,500	73	214

\* Approximate mean daily flow.

\* Approximate mean daily flow.

TABLE T-5 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 DAILY SAMPLING PROGRAM  
 SACRAMENTO RIVER AT BRYTE, MILE 62.6  
 1960 - 1961

Date Collected	9/1-8/60	9/9-15/60	9/16-23/60	9/24-31/60	9/1-7/60	9/8-14/60	9/15-23/60	9/24-30/60	10/2-9/60	10/10-16/60	10/17-24/60	10/25-31/60
Mean Discharge, cfs	6,500	7,200	7,400	7,800	9,000	9,200	9,100	7,500	7,500	6,900	6,700	7,000
pH	8.1	8.4	9.1	8.8	9.3	9.1	9.1	8.4	8.5	8.4	8.3	8.4
Temp. x 10 <sup>6</sup> at 25°C	23	27	28	27	23	24	22	24	24	24	27	27
Constituents in mg/l (ppm)												
Calcium	15	15	14	15	15	14	14	14	14	17	14	14
Magnesium	9.1	9.6	10	10	11	12	12	13.5	13	13	14	13
Sodium	17	19	19	20	22	20	20	18.5	18	18	18	17
Potassium	1.6	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.5	1.6	1.6
Total Dissolved Solids (ppm)												
Silica	23	24	22	21	22	21	21	25	21	21	25	21
Cations (ppm)												
Calcium	15	15	14	15	15	14	14	14	14	17	14	14
Magnesium	9.1	9.6	10	10	11	12	12	13.5	13	13	14	13
Sodium	17	19	19	20	22	20	20	18.5	18	18	18	17
Potassium	1.6	1.5	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.5	1.6	1.6
Total Anions (ppm)												
Carbonate	14	13	14	13	20	17	17	2	2	1	0	0
Bicarbonate	103	103	81	98	82	84	84	95	84	84	88	87
Sulfate	13	13	13	13	15	14	14	9.5	9.5	9.5	8.6	8.4
Chloride	11	12	12	13	13	12	12	9.2	9.2	9.2	7.1	6.5
Fluoride	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Nitrate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Anions												
Boron	0.10	0.09	0.10	0.10	0.11	0.10	0.10	0.08	0.07	0.07	0.07	0.06
Total Hardness (as CaCO <sub>3</sub> )	75	77	76	80	84	83	83	76	63	62	65	64
MC Hardness	0	0	0	0	0	0	0	0	0	0	0	0
Percent Sodium	32	34	35	35	36	34	34	30	26	26	26	27

Date	Temp. °F	Flow* cfs	Specific Conductance
Aug. 1	70	6,400	231
2	70	6,700	219
3	70	6,800	222
4	70	6,900	221
5	71	6,000	222
6	71	7,000	222
7	72	7,000	222
8	71	7,300	215
9	71	7,000	226
10	70	7,100	219
11	70	7,200	219
12	70	7,100	226
13	72	7,000	228
14	72	7,500	229
15	71	7,500	211
16	70	7,300	233
17	70	7,400	234
18	70	7,400	234
19	70	7,500	234
20	71	7,300	234
21	71	7,400	235
22	69	7,000	233
23	68	7,400	229

\* Approximate mean daily flow.

Date	Temp. °F	Flow* cfs	Specific Conductance
Aug. 24	68	7,500	228
25	68	7,400	234
26	68	7,600	232
27	68	7,600	232
28	69	7,900	234
29	67	8,000	243
30	67	8,100	243
31	67	8,200	243
Sept. 1	67	8,400	248
2	67	8,600	252
3	67	9,200	260
4	67	9,100	257
5	67	9,200	253
6	67	9,100	258
7	68	8,900	253
8	68	9,000	248
9	69	9,400	241
10	70	9,300	241
11	70	9,100	237
12	70	9,100	237
13	69	8,900	236
14	69	8,800	236

\* Approximate mean daily flow.

Date	Temp. °F	Flow* cfs	Specific Conductance
Sept. 15	69	8,300	234
16	68	8,200	224
17	68	8,200	---
18	68	8,200	---
19	68	8,200	---
20	68	8,200	---
21	68	8,200	---
22	68	8,100	---
23	68	8,100	---
24	68	8,100	---
25	68	8,100	---
26	68	8,100	---
27	68	8,100	---
28	68	8,100	---
29	68	8,100	---
30	68	8,100	---
Sept. 24	68	7,000	210
25	67	7,500	199
26	68	7,400	195
27	68	7,400	187
28	68	7,400	195
29	67	7,000	192
30	68	7,700	186
Oct. 1	67	7,700	186
2	67	7,700	189
3	66	7,600	186
4	66	7,600	186
5	66	7,600	186
6	66	7,600	186
7	66	7,600	186
8	66	7,600	186
9	66	7,600	186

\* Approximate mean daily flow.

Date	Temp. °F	Flow* cfs	Specific Conductance
Oct. 10	69	7,400	172
11	69	7,100	162
12	69	7,100	161
13	68	7,000	166
14	68	6,700	166
15	68	6,700	174
16	68	6,700	178
17	68	6,600	177
18	68	6,600	171
19	68	6,500	175
20	68	6,500	163
21	68	6,500	163
22	68	6,700	163
23	68	7,000	178
24	68	7,000	178
25	61	6,700	181
26	61	7,100	176
27	61	7,300	178
28	61	7,000	178
29	61	7,000	177
30	61	7,100	174
31	60	7,100	174

\* Approximate mean daily flow.

TABLE T-5 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 DAILY SAMPLING PROGRAM  
 SACRAMENTO RIVER AT BRYTE, MILE 62.6  
 1960-1961

Date Collected	11/1-8/60	11/9-15/60	11/16-22/60	11/23-29/60	11/30-12/1/60	12/2/60
Mean Discharge, cfs	7,200	8,500	11,000	13,600	15,400	17,500
pH	8.0	8.0	7.9	7.8	7.7	7.9
EC x 10 <sup>6</sup> at 25°C	176	171	173	159	211	190
Constituents in	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)
Total Dissolved Solids	117	23	22	102	153	20
Sulfate	117	23	22	102	153	20
Silica (SiO <sub>2</sub> )	26	23	22	21	20	20
Cations						
Calcium (Ca)	13	0.65	12	10	8.3	0.41
Magnesium (Mg)	7.7	0.63	7.8	10	8.6	0.71
Sodium (Na)	11	0.48	11	9.4	31	1.35
Potassium (K)	1.6	0.04	1.6	0.04	1.8	0.05
Total Cations	1.80	1.76	1.76	1.61	2.52	1.80
Anions						
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	88	1.44	80	1.31	71	1.16
Sulfate (SO <sub>4</sub> )	7.7	0.16	9.9	8.2	13	0.27
Chloride (Cl)	6.3	0.18	5.9	6.4	0.18	8.9
Fluoride (F)	0.1	0.00	0.1	0.00	0.1	0.00
Nitrate (NO <sub>3</sub> )	0.2	0.00	0.4	0.01	1.6	0.02
Total Anions	1.78	1.74	1.73	1.59	2.47	1.80
Boron (B)	0.11	0.11	0.13	0.11	0.10	---
Total Hardness (As CaCO <sub>3</sub> )	64	62	62	58	56	62
MC Hardness	0	0	0	0	0	29
Percent Sodium	27	27	27	25	54	29

Date Collected	12/3/60	12/4-5/60	12/9-18/60	12/20-23/60	12/24-31/60	1/4-10/61
Mean Discharge, cfs	26,700	30,400	13,000	29,300	12,700	10,000
pH	7.8	7.5	7.9	7.7	7.9	8.0
EC x 10 <sup>6</sup> at 25°C	356	101	132	150	201	195
Constituents in	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)
Total Dissolved Solids	---	---	---	---	---	---
Sulfate	23	16	23	24	22	24
Silica (SiO <sub>2</sub> )	23	16	23	24	22	24
Cations						
Calcium (Ca)	8.5	0.42	13	11	10	11
Magnesium (Mg)	8.3	0.68	8.1	6.2	8.0	8.5
Sodium (Na)	9.3	0.40	12	9.0	13	11
Potassium (K)	1.7	0.04	1.8	1.5	1.5	1.3
Total Cations	1.54	0.99	1.89	1.49	1.96	1.95
Anions						
Carbonate (CO <sub>3</sub> )	0	0.00	0	0	0	0
Bicarbonate (HCO <sub>3</sub> )	72	1.18	86	1.41	63	1.03
Sulfate (SO <sub>4</sub> )	---	---	---	---	---	---
Chloride (Cl)	5.4	0.15	2.8	6.8	15	12
Fluoride (F)	0.0	0.00	0.0	0.0	0.0	0.0
Nitrate (NO <sub>3</sub> )	1.1	0.02	2.5	1.3	0.02	0.1
Total Anions	0.92	0.92	1.90	1.47	1.96	1.92
Boron (B)	0.10	0.09	0.10	0.09	0.09	0.11
Total Hardness (As CaCO <sub>3</sub> )	52	30	66	51	68	70
MC Hardness	0	2	0	1	0	0
Percent Sodium	26	23	28	26	28	27

Date	Time PST	Flow* cfs	Temp. °F	Specific Conductance
Nov. 1	0800	7,100	61	175
Nov. 2	0800	7,100	60	174
Nov. 3	0800	7,200	60	175
Nov. 4	0800	7,200	59	174
Nov. 5	0800	7,300	57	172
Nov. 6	0800	7,300	56	171
Nov. 7	0730	7,200	56	176
Nov. 8	0800	7,100	56	174
Nov. 9	0800	7,300	56	175
Nov. 10	0730	7,600	56	175
Nov. 11	0800	8,000	57	175
Nov. 12	0800	9,100	56	171
Nov. 13	0900	9,100	54	166
Nov. 14	0800	10,800	53	164
Nov. 15	0800	11,900	53	174
Nov. 16	0800	12,200	53	173
Nov. 17	0800	10,900	53	165
Nov. 18	1000	10,100	56	177
Nov. 19	0800	10,800	53	174
Nov. 20	0800	10,800	53	181
Nov. 21	0800	10,800	52	181
Nov. 22	0800	10,200	52	179

Date	Time PST	Flow* cfs	Temp. °F	Specific Conductance
Dec. 3	0745	26,700	50	156
Dec. 4	0830	30,800	50	78
Dec. 5	0800	30,000	49	96
Dec. 6	0800	26,200	47	129
Dec. 7	0800	22,400	46	146
Dec. 8	0800	19,600	45	172
Dec. 9	0800	17,900	44	187
Dec. 10	0730	13,800	44	198
Dec. 11	0800	13,000	44	205
Dec. 12	0800	12,300	45	202
Dec. 13	0800	11,900	44	198
Dec. 14	0800	11,450	43	193
Dec. 15	0800	11,200	44	185
Dec. 16	0800	11,200	44	178
Dec. 17	0730	11,200	44	184
Dec. 18	0800	12,800	45	184
Dec. 19	0800	18,230	50	167
Dec. 20	0800	21,900	50	139
Dec. 21	0800	20,700	50	134
Dec. 22	0800	18,200	50	151
Dec. 23	0800	16,400	50	140
Dec. 24	0800	15,300	49	198
Dec. 25	0800	14,100	44	205
Dec. 26	0800	13,300	46	201
Dec. 27	0800	12,800	46	205
Dec. 28	0800	12,300	46	205
Dec. 29	0800	11,600	47	196
Dec. 30	0800	11,700	47	196
Dec. 31	0730	10,700	43	190
Jan. 1	0800	10,500	43	201
Jan. 2	0800	10,100	43	198
Jan. 3	0800	9,900	43	199
Jan. 4	0800	10,000	43	198
Jan. 5	0800	10,100	43	211
Jan. 6	0800	10,100	43	201
Jan. 7	---	---	---	---
Jan. 8	0800	9,900	43	197
Jan. 9	0800	9,800	44	197
Jan. 10	0800	10,000	45	201

\* Approximate mean daily flow.

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

DAILY SAMPLING PROGRAM

SACRAMENTO RIVER AT BRYTE, MILE 62.6

1960-1961

Date Collected	1/11/61	1/12-20/61	1/21-27/61	1/28/61	1/29-31/61	2/1/61
Mean Discharge, cfs	13,400	10,200	9,900	11,400	15,200	31,500
pH	8.0	8.0	8.0	8.0	8.3	8.3
EC x 10 <sup>6</sup> at 25°C	220	159	106	200	237	143
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	---	---	---	---	---	---
Sum	24	23	23	23	34	---
Silica	---	---	---	---	---	---
Cations	Ca	15	15	15	16	16
Magnesium	10	7.9	11.9	36	29	8.0
Sulfate	---	---	---	---	---	---
Potassium	3.3	1.4	1.4	1.5	1.0	0.35
Total Cations	2.19	2.00	2.82	2.39	---	---
Anions	Carbonate (CO <sub>3</sub> )	0	0	0	0	0
Bicarbonate (HCO <sub>3</sub> )	94	1.54	91	106	1.74	91
Sulfate (SO <sub>4</sub> )	---	---	---	---	---	---
Chloride (Cl)	10	0.28	8.5	18	0.51	6.5
Fluoride (F)	0.1	0.00	0.0	0.0	0.0	0.0
Nitrate (NO <sub>3</sub> )	0.6	0.01	0.7	0.8	0.01	0.01
Total Anions	1.96	2.02	2.37	2.37	---	---
Boron	0.12	0.11	0.11	0.13	0.11	0.08
Total Hardness (As CaCO <sub>3</sub> )	11	70	70	87	75	---
% Hardness	0	0	0	0	0	---
Percent Sulfate	12	28	30	37	36	---

Date Collected	2/2-3/61	2/8-10/61	2/12/61	2/13-19/61	2/22-28/61
Mean Discharge, cfs	4,000	32,900	44,600	46,400	28,400
pH	8.0	7.9	8.0	7.8	8.0
EC x 10 <sup>6</sup> at 25°C	1.1	1.9	1.09	1.27	1.51
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	---	---	---	---	---
Sum	18	10	10	86	102
Silica	---	---	---	---	---
Cations	Ca	15	15	12	14
Magnesium	1.2	0.7	0.7	1.1	0.12
Sulfate	---	---	---	---	---
Potassium	1.2	0.04	1.5	1.3	1.3
Total Cations	1.00	1.63	---	1.27	1.52
Anions	Carbonate (CO <sub>3</sub> )	0	0	0	0
Bicarbonate (HCO <sub>3</sub> )	5	72	1.18	60	0.98
Sulfate (SO <sub>4</sub> )	---	---	---	---	---
Chloride (Cl)	21	7.1	1.0	2.9	7.4
Fluoride (F)	0.0	0.21	3.6	4.6	0.13
Nitrate (NO <sub>3</sub> )	1.1	0.1	0.01	0.1	0.00
Total Anions	0.97	1.99	---	1.24	---
Boron	0.06	0.06	0.06	0.06	0.07
Total Hardness (As CaCO <sub>3</sub> )	1	0.1	---	47	28
% Hardness	0	0	---	0	24
Percent Sulfate	21	2	---	24	---

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Jan. 11	0800	13,400	45	221
Jan. 12	0800	10,600	45	201
Jan. 13	0800	10,600	44	203
Jan. 14	0800	10,400	44	201
Jan. 15	0800	10,300	44	205
Jan. 16	0800	10,100	44	200
Jan. 17	0800	10,000	47	201
Jan. 18	0800	10,000	47	199
Jan. 19	0800	9,800	44	199
Jan. 20	0800	9,500	44	197
Jan. 21	0800	9,600	44	216
Jan. 22	0800	9,700	44	201
Jan. 23	1400	9,700	46	205
Jan. 24	0800	9,700	46	201
Jan. 25	0825	9,600	46	206
Jan. 26	1400	10,300	50	201
Jan. 27	1400	10,600	51	201

\* Approx. mean daily flow.

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Feb. 2	0800	39,500	51	105
Feb. 3	0800	41,700	52	106
Feb. 4	0730	43,940	51	128
Feb. 5	0730	45,810	51	114
Feb. 6	0800	45,390	53	118
Feb. 7	0800	41,100	52	133
Feb. 8	0800	35,600	53	156
Feb. 9	0800	31,500	53	162
Feb. 10	0800	31,700	54	176
Feb. 11	0730	39,900	46	128

\* Approximate mean daily flow.

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Feb. 12	0800	44,600	51	109
Feb. 13	1300	47,700	47	131
Feb. 14	0800	48,400	51	125
Feb. 15	0800	48,000	51	124
Feb. 16	0800	47,000	50	133
Feb. 17	0800	46,000	50	140
Feb. 18	0800	44,600	51	135
Feb. 19	0800	42,700	49	144
Feb. 20	0800	39,744	49	143
Feb. 21	0800	36,892	50	150
Feb. 22	0800	34,700	52	144
Feb. 23	0800	32,500	50	153
Feb. 24	0800	29,110	52	160
Feb. 25	0800	27,500	51	154
Feb. 26	0800	26,000	46	155
Feb. 27	0800	25,200	50	162
Feb. 28	0800	24,100	51	154

TABLE T-5 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 DAILY SAMPLING PROGRAM  
 SACRAMENTO RIVER AT BRYTE, MILE 62.6

1960 - 1961

Date Collected	3/1-11/61	3/12-15/61	3/16-21/61	3/22-31/61
Mean Discharge, cfs	21,700	22,200	33,700	33,500
pH				
EC x 10 <sup>6</sup> at 25°C	145	137	124	121
Constituents in	mg/l	mc/l	mc/l	mc/l
(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Total Dissolved Solids				
Sulfate (SO <sub>4</sub> )				
Silica				
Cations				
Calcium (Ca)	11.16	1.06	0.98	0.96
Magnesium (Mg)				
Sodium (Na)	7.8	7.5	8.2	7.7
Potassium (K)	1.3	0.03	1.2	1.0
Total Cations				
Anions				
Carbonate (CO <sub>3</sub> )				
Bicarbonate (HCO <sub>3</sub> )				
Sulfate (SO <sub>4</sub> )				
Chloride (Cl)	3.8	0.11	4.2	0.12
Fluoride (F)				
Nitrate (NO <sub>3</sub> )				
Total Anions				
Boron				
Total Hardness (As CaCO <sub>3</sub> )	0.68	0.07	0.06	0.05
NC Hardness	58	53	49	48
Percent Sodium	22	23		25

Date	Time PST	Flow* cfs	Temp.* °F	Specific Conductance
March 25	0800	34,900	49	118
26	0800	36,500	46	119
27	0800	36,800	52	124
28	0800	35,900	52	119
29	0800	35,000	52	122
30	0800	32,700	53	123
31	0800	28,300	54	126
April 1	0730	23,700	58	129
April 2	0800	24,345	58	137
3	0800	23,754	60	169
4	0800	23,854	61	141

Date	Time PST	Flow* cfs	Temp.* °F	Specific Conductance
March 1	0800	21,700	52	145
2	0800	21,500	52	145
3	0800	22,700	52	149
4	0800	21,800	52	149
5	0800	21,600	50	148
6	0800	21,200	50	142
7	0800	21,000	50	142
8	0800	21,100	51	148
9	0800	21,300	52	146
10	0800	21,500	52	148
11	0700	23,200	52	147
March 12	0800	23,200	52	141
13	0800	22,800	53	139
14	0800	22,300	53	143
15	0800	23,100	53	139
March 16	0800	28,800	52	130
17	0800	32,900	52	123
18	0800	35,000	52	118
19	0800	35,800	51	124
20	0800	34,500	51	128
21	0800	34,400	51	129
22	0800	34,800	52	128
23	0800	33,400	53	124
24	0800	34,100	54	124

\* Approximate mean daily flow.

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

DAILY SAMPLING PROGRAM

SACRAMENTO RIVER AT FREEPORT, MILE 46.4

1960-1961

Date Collected	8/1-2/60	8/3-13/60	8/16-25/60	8/26-31/60	9/1-10/60	9/11-20/60
Mean Discharge, cfs	2,900	9,800	9,100	6,900	6,900	7,000
pH	7.3	7.7	8.1	8.2	7.9	7.6
ES x 10 <sup>6</sup> at 25°C	142	142	142	142	142	142
Constituents in	mg/l (ppm)					
Total Dissolved Solids	---	128	134	140	145	147
Sulfate	---	24	22	23	24	24
Calcium	12	13	14	14	14	17
Magnesium	7.1	7.9	8.0	8.5	8.9	8.6
Sodium	12	14	16	17	18	17
Potassium	3.2	3.2	3.2	3.2	3.1	3.6
Total Anions	1.73	1.94	1.94	2.17	2.32	2.34
Anions						
Carbonate	0	0	0	0	0	0
Bicarbonate	86	86	92	96	108	106
Sulfate	8.0	8.0	8.0	8.0	8.0	8.0
Chloride	8.5	9.5	10	12	12	12
Fluoride	---	---	---	---	---	---
Nitrate	1.0	0.8	0.9	0.9	1.0	1.5
Total Anions	1.66	1.94	1.94	2.20	2.42	2.38
Boron	0.1	0.1	0.1	0.0	0.0	0.0
Total Hardness (As CaCO <sub>3</sub> )	59	65	68	70	79	78
NC Hardness	0	0	0	0	0	0
Percent Sulfate	30	31	33	34	33	32

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance	Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Aug. 1	0830	9,960	69	170	Aug. 26	0830	8830	69	9,550
Aug. 2	0830	9,970	69	172	Aug. 27	0830	8830	69	9,510
Aug. 3	0730	9,470	69	188	Aug. 28	0830	8830	68	9,620
Aug. 4	0730	9,660	69	188	Aug. 29	0830	8830	68	9,700
Aug. 5	0730	9,700	70	193	Aug. 30	0830	8830	69	9,730
Aug. 6	0730	9,790	70	196	Sept. 1	0835	9,890	68	9,930
Aug. 7	0730	10,000	70	193	Sept. 2	0835	10,100	68	226
Aug. 8	0730	9,940	70	192	Sept. 3	0835	10,700	68	231
Aug. 9	0730	9,660	70	190	Sept. 4	0835	10,600	68	237
Aug. 10	0830	9,590	71	191	Sept. 5	0835	10,700	68	236
Aug. 11	0830	9,490	69	196	Sept. 6	0835	11,400	68	235
Aug. 12	0830	9,980	70	191	Sept. 7	0730	11,400	69	242
Aug. 13	0830	9,800	70	191	Sept. 8	0730	11,500	69	217
Aug. 14	0830	9,800	70	191	Sept. 9	0730	11,500	70	238
Aug. 15	0830	9,800	70	191	Sept. 10	0730	11,500	70	236
Aug. 16	0830	9,800	70	196	Sept. 11	0700	10,800	70	235
Aug. 17	0830	9,940	70	199	Sept. 12	0700	10,700	71	235
Aug. 18	0830	9,870	71	202	Sept. 13	0700	10,700	71	232
Aug. 19	0830	9,690	70	202	Sept. 14	0700	10,800	70	242
Aug. 20	0830	9,930	70	201	Sept. 15	0700	9,900	69	231
Aug. 21	0830	9,930	69	201	Sept. 16	0700	9,110	69	221
Aug. 22	0830	9,940	69	205	Sept. 17	0830	9,110	68	222
Aug. 23	0830	9,470	69	203	Sept. 18	0830	9,130	68	220
Aug. 24	0830	9,400	69	203	Sept. 19	0830	9,170	68	207
Aug. 25	0830	9,400	69	203	Sept. 20	0830	9,170	68	207

Analyses by U. S. Geological Survey, Quality of Water Branch.  
 • Mean Daily Flow at Sacramento.

TABLE T-6 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

DAILY SAMPLING PROGRAM

SACRAMENTO RIVER AT FREEPORT, MILE 46.4

1960-1961

Date Collected	9/21-30/60	10/1-11/60	10/12-20/60	10/21-31/60	11/1-9/60	11/10-19/60
Mean Discharge, cfs	6,900	6,500	6,000	6,100	5,900	5,700
pH	8.0	7.4	7.2	7.4	7.9	7.6
EC x 10 <sup>6</sup> at 25°C	134	135	174	173	171	163
Constituents in	mg/l	me/l	mg/l	me/l	me/l	me/l
Total Dissolved Solids	129	134	123	123	108	110
Sum	128	132	117	120	114	115
Silica	(SiO <sub>2</sub> ) 23	24	25	25	25	25
Cations						
Calcium	16	0.80	14	0.70	13	0.65
Magnesium	7.3	0.60	7.1	0.58	6.7	0.50
Sodium	13	0.57	12	0.48	11.0	0.48
Potassium	1.4	0.04	1.4	0.04	1.4	0.04
Total Cations	2.01	1.87	1.80	1.84	1.72	1.71
Anions						
Carbonate	0	0.00	0	0.00	0	0.00
Bicarbonate	92	1.51	83	1.36	84	1.34
Sulfate	11	0.23	8.0	0.17	8.0	0.19
Chloride	9.5	0.27	8.0	0.23	6.8	0.18
Fluoride	0.1	0.01	0.2	0.01	0.1	0.01
Nitrate	3.1	0.03	1.6	0.03	1.5	0.02
Total Anions	2.05	1.93	1.80	1.87	1.77	1.74
Boron	0.0	0.0	0.0	0.0	0.0	0.1
Total Hardness (As CaCO <sub>3</sub> )	70	66	64	64	60	60
NC Hardness	0	0	0	0	0	0
Percent Sodium	28	28	27	28	28	28

Date Collected	11/20-28/60	11/29-30/60	12/1-3/60	12/4-7/60	12/8-19/60	12/20-31/60
Mean Discharge, cfs	5,800	5,000	5,000	5,000	4,900	4,900
pH	7.7	7.1	7.2	6.9	8.1	8.1
EC x 10 <sup>6</sup> at 25°C	169	124	167	111	170	158
Constituents in	mg/l	me/l	me/l	me/l	me/l	me/l
Total Dissolved Solids	115	98	112	72	116	101
Sum	112	85	112	73	112	102
Silica	(SiO <sub>2</sub> ) 23	20	23	16	21	20
Cations						
Calcium	14	0.70	13	0.44	14	0.70
Magnesium	6.6	0.54	6.0	0.36	6.6	0.51
Sodium	11	0.48	11	0.48	10	0.44
Potassium	1.5	0.04	1.5	0.04	1.5	0.04
Total Cations	1.76	1.23	1.66	1.09	1.72	1.55
Anions						
Carbonate	0	0.00	0	0.00	0	0.00
Bicarbonate	82	1.34	70	0.70	76	1.25
Sulfate	8.0	0.17	11	0.23	12	0.21
Chloride	6.5	0.18	6.0	0.17	6.5	0.24
Fluoride	0.1	0.01	0.1	0.01	0.1	0.01
Nitrate	1.2	0.02	3.4	0.05	2.1	0.03
Total Anions	1.71	1.21	1.71	1.07	1.76	1.60
Boron	0.1	0.0	0.0	0.0	0.0	0.1
Total Hardness (As CaCO <sub>3</sub> )	69	63	57	60	62	56
NC Hardness	0	0	0	0	0	0
Percent Sodium	27	27	29	23	26	26

Date	Time PST	Flow* cfs	Temp. °F	Specific Conductance
Sept. 21	0830	9,160	68	215
22	0830	9,040	68	195
23	0830	8,210	67	199
24	0830	8,580	67	206
25	0830	8,470	68	202
26	0830	8,460	68	202
27	0830	8,550	78	185
28	0830	8,670	68	184
29	0830	8,820	67	201
30	0845	8,670	68	199
1	0830	8,270	67	193
2	0830	8,150	66	181
3	0830	8,220	66	180
4	0830	8,140	67	177
5	0830	8,100	68	182
6	0830	8,080	67	182
7	0830	7,810	65	180
8	0830	7,360	63	181
9	0830	7,940	61	188
10	0830	7,600	59	188
11	0830	7,610	61	168
12	0830	7,500	59	170
13	0830	7,250	59	172
14	0830	6,760	59	170
15	0830	7,240	59	176
16	0830	7,130	60	176
17	0830	7,130	60	176
18	0830	7,330	60	174
19	0730	7,100	60	174
20	0730	7,020	60	178

Date	Time PST	Flow* cfs	Temp. °F	Specific Conductance
Dec. 4	0830	32,400	51	83.7
5	0830	31,600	51	108
6	0830	27,800	49	115
7	0830	24,000	49	121
8	0830	21,200	46	150
9	0830	18,600	47	164
10	0830	16,900	49	171
11	0830	16,000	49	182
12	0830	15,100	51	182
13	0830	14,500	51	170
14	0830	13,700	48	176
15	0830	13,400	48	170
16	0830	13,400	50	167
17	0830	13,400	50	164
18	0830	15,000	50	164
19	0830	20,400	50	156
20	0830	23,900	51	131
21	0830	22,900	52	122
22	0830	20,900	52	124
23	0830	20,900	50	163
24	0830	18,000	49	169
25	0830	18,800	49	167
26	0830	16,500	47	164
27	0830	15,500	47	163
28	0830	14,900	47	164
29	0830	14,400	46	170
30	0830	13,400	46	164
31	0830	13,400	46	164

Date	Time PST	Flow* cfs	Temp. °F	Specific Conductance
Nov. 20	0830	12,000	53	172
21	0830	11,900	53	173
22	0830	11,300	53	175
23	0830	10,800	53	168
24	0830	10,400	52	181
25	0830	10,500	53	177
26	0830	11,400	52	168
27	0900	17,000	52	168
28	0830	22,600	50	148
29	0830	20,700	50	183
30	0830	17,300	49	149
1	0830	16,200	50	168
2	0830	17,100	51	159
3	0830	28,300	50	172

Analyzed by U. S. Geological Survey, Quality of Water Branch.  
\* Mean Daily Flow at Sacramento.

SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 DAILY SAMPLING PROGRAM  
 SACRAMENTO RIVER AT FREEPORT, MILE 46.4  
 1960-1961

Date Collected	2/20-28/61	3/1-10/61	3/11-20/61	3/21-31/61	4/1-10/61	4/11-20/61
Mean Discharge, cfs	5,100	5,200	5,200	5,200	5,300	6,000
pH	7.9	7.7	7.7	7.6	7.7	7.9
EC x 10 <sup>6</sup> at 25°C	146	136	138	127	140	143
Constituents in	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)
Total Dissolved Solids	100	109	107	107	108	110
Sum	100	109	107	107	108	110
Silice	(SiO <sub>2</sub> ) 24	26	24	23	22	24
Cations						
Calcium (Ca)	13	13	12	11	12	12
Magnesium (Mg)	5.5	6.7	5.8	5.7	5.8	6.0
Sodium (Na)	0.35	0.40	0.36	0.35	0.36	0.33
Potassium (K)	1.1	1.3	1.3	0.9	0.9	0.9
Total Anions	1.48	1.63	1.47	1.32	1.46	1.44
Anions						
Carbonates (CO <sub>3</sub> )	0	0	0	0	0	0
Bicarbonate (HCO <sub>3</sub> )	1	1.36	1.13	0.65	1.07	0.67
Sulfate (SO <sub>4</sub> )	0.07	7.0	0.43	6.0	0.19	8.0
Chloride (Cl)	2.2	5.5	4.5	3.5	5.5	5.8
Fluoride (F)	0.1	0.01	0.1	0.01	0.1	0.1
Nitrate (NO <sub>3</sub> )	0.7	1.0	0.02	1.0	0.02	0.9
Total Anions	1.47	1.63	1.44	1.32	1.45	1.44
Boron (B)	0.2	0.1	0.1	0.1	0.1	0.1
Total Hardness (As CaCO <sub>3</sub> )	55	60	54	57	54	55
NC Hardness	0	0	0	0	0	0
Percent Solium	24	25	24	21	25	23

Date Collected	1/1-9/61	1/10-18/61	1/19-28/61	2/2-10/61	2/11-19/61
Mean Discharge, cfs	4,600	4,700	4,800	5,400	5,100
pH	7.7	7.8	7.4	7.7	7.4
EC x 10 <sup>6</sup> at 25°C	140	137	132	131	136
Constituents in	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)
Total Dissolved Solids	117	128	124	100	87
Sum	117	124	124	100	85
Silice	(SiO <sub>2</sub> ) 22	22	16	16	20
Cations					
Calcium (Ca)	12	13	15	12	11
Magnesium (Mg)	7.2	6.9	7.4	5.8	6.0
Sodium (Na)	0.61	1.4	0.65	9.1	6.2
Potassium (K)	0.5	1.5	1.4	1.2	1.0
Total Anions	1.81	1.87	1.98	2.05	1.51
Anions					
Carbonates (CO <sub>3</sub> )	0	0	0	0	0
Bicarbonate (HCO <sub>3</sub> )	1.34	1.36	1.46	1.31	1.02
Sulfate (SO <sub>4</sub> )	9.0	7.1	10	0.33	8.4
Chloride (Cl)	7.0	7.3	8.9	6.5	3.0
Fluoride (F)	0.1	0.01	0.1	0.01	0.1
Nitrate (NO <sub>3</sub> )	0.5	0.01	0.3	0.02	1.0
Total Anions	1.76	1.80	1.93	2.01	1.48
Boron (B)	0.0	0.1	0.1	0.1	0.1
Total Hardness (As CaCO <sub>3</sub> )	57	61	65	54	48
NC Hardness	0	0	2	3	0
Percent Solium	34	33	32	26	21

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance	Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Feb. 20	0830	40,500	51	149	March 21	0830	35,000	53	131
21	0830	31,600	51	134	22	0830	34,000	53	128
22	0830	31,600	51	137	23	0830	34,000	53	137
23	0830	33,800	51	132	24	0830	34,000	53	128
24	0830	33,800	51	144	25	0830	37,000	53	126
25	0830	28,300	52	146	26	0830	37,000	52	117
26	0830	26,700	50	146	27	0830	37,000	52	114
27	0830	25,800	50	152	28	0830	36,000	51	120
28	0830	24,800	51	146	29	0830	35,000	51	120
March 1	0830	22,300	53	146	30	0830	33,000	54	124
2	0830	22,100	52	158	31	0830	29,200	54	127
3	0830	23,300	51	147	April 1	0830	26,600	56	132
4	0830	22,400	53	169	2	0830	24,700	60	166
5	0830	22,000	52	158	3	0830	24,700	60	152
6	0830	21,700	52	165	4	0830	24,800	60	149
7	0830	21,700	51	151	5	0700	25,200	60	128
8	0830	21,700	51	148	6	0700	25,900	60	129
9	0830	21,900	51	162	7	0800	23,800	59	134
10	0830	22,100	52	149	8	0800	23,800	56	135
March 11	0830	23,800	52	154	9	0830	20,000	56	136
12	0830	21,900	52	144	10	0830	20,000	56	136
13	0830	23,500	52	167	April 11	0830	19,900	59	130
14	0830	23,000	53	140	12	0830	19,700	59	135
15	0830	23,800	53	138	13	0830	17,800	59	134
16	0830	29,500	53	154	14	0830	17,300	59	137
17	0830	33,600	53	159	15	0830	16,000	60	147
18	0830	36,700	52	118	16	0845	14,000	61	144
19	0830	30,500	52	133	17	0845	14,200	60	148
20	0830	35,500	52	136	18	0845	13,800	61	152
					19	0830	12,800	61	147
					20	0830	13,700	60	132

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance	Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Jan. 29	0830	14,700	50	---	Jan. 10	0830	11,400	49	171
30	0830	14,000	50	---	11	0830	11,200	47	178
31	0830	21,100	52	---	12	0830	11,200	47	160
Feb. 1	0830	32,500	54	---	13	0830	11,400	49	181
Feb. 2	0830	40,600	52	---	14	0830	11,400	49	179
3	0830	45,000	53	---	15	0830	12,900	48	179
4	0830	45,000	53	---	16	0830	12,700	48	176
5	0830	44,900	54	---	17	0830	11,600	47	178
6	0830	46,500	54	---	18	0845	11,600	47	174
7	0830	42,200	55	---	Jan. 19	0830	12,200	47	178
8	0830	36,700	54	---	20	0830	12,400	46	176
9	0830	32,600	54	---	21	0830	11,000	46	171
10	0830	32,700	53	---	22	0845	11,300	46	182
Feb. 11	0830	40,900	53	---	23	0830	11,200	46	188
12	0830	45,600	52	115	24	0830	11,200	47	177
13	0830	48,700	52	119	25	0830	11,100	47	183
14	0830	43,400	51	130	26	0830	11,300	47	178
15	0830	49,000	52	117	27	0830	11,800	48	198
16	0830	49,000	50	125	28	0830	12,800	49	191
17	0830	47,000	50	133					
18	0830	45,700	50	130					
19	0830	43,600	50	126					

Analyses by U. S. Geological Survey, Quality of Water Branch.  
 • Mean Daily Flow at Sacramento.

TABLE T-6 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

DAILY SAMPLING PROGRAM

SACRAMENTO RIVER AT FREEPORT, MILE 46.4

1960 - 1961

Date Collected	4/21-30/61	5/1-10/61	5/11-20/61	5/21-31/61	6/1-10/61	6/11-20/61
Mean Discharge, cfs	5,900	6,200	6,400	6,600	6,800	7,400
pH	7.8	7.9	7.9	8.0	7.6	8.0
EC x 10 <sup>6</sup> at 25°C	1.60	1.82	1.91	2.05	2.07	2.04
Constituents in	mg/l (ppm)					
Total Dissolved Solids	136	156	157	132	139	134
Sulfate	106	126	126	130	136	134
Silica (SiO <sub>2</sub> )	22	25	24	22	24	24
Cations						
Calcium (Ca)	13	0.65	14	0.70	14	0.70
Magnesium (Mg)	6.2	0.54	7.8	0.64	8.3	0.68
Sodium (Na)	11	0.48	14	0.61	15	0.65
Potassium (K)	0.9	0.02	1.1	0.03	1.2	0.03
Total Cations	1.66	1.87	1.98	2.08	2.06	2.02
Anions						
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	70	1.15	82	1.34	90	1.44
Sulfate (SO <sub>4</sub> )	301	9.0	31	0.27	12	0.25
Chloride (Cl)	8.8	0.28	12	0.34	12	0.34
Fluoride (F)	0.0	0.00	0.0	0.00	0.0	0.00
Nitrate (NO <sub>3</sub> )	1.1	0.02	1.0	0.02	1.1	0.02
Total Anions	1.61	1.84	1.97	2.06	2.09	2.03
Boron	0.1	0.0	0.0	0.1	0.1	0.1
Total Hardness (As CaCO <sub>3</sub> )	58	66	67	70	69	69
MC Hardness	1	4	0	0	0	0
Percent Sodium	29	28	31	31	32	30

Date Collected	6/21-30/61				
Mean Discharge, cfs	7,100				
pH	7.9				
EC x 10 <sup>6</sup> at 25°C	1.84				
Constituents in	mg/l (ppm)				
Total Dissolved Solids	124				
Sulfate	119				
Silica (SiO <sub>2</sub> )	23				
Cations					
Calcium (Ca)	11	0.65			
Magnesium (Mg)	7.2	0.59			
Sodium (Na)	13	0.57			
Potassium (K)	1.3	0.03			
Total Cations	1.84				
Anions					
Carbonate (CO <sub>3</sub> )	0	0.00			
Bicarbonate (HCO <sub>3</sub> )	77	1.26			
Sulfate (SO <sub>4</sub> )	11	0.23			
Chloride (Cl)	11	0.31			
Fluoride (F)	0.0	0.00			
Nitrate (NO <sub>3</sub> )	1.2	0.02			
Total Anions	1.82				
Boron	0.1				
Total Hardness (As CaCO <sub>3</sub> )	62				
MC Hardness	0				
Percent Sodium	31				

Date	Time PST	Flow* cfs	Temp. °F	Specific Conductance
April 21	0830	11,300	60	137
22	0830	10,800	59	146
23	0830	11,800	56	146
24	0830	11,700	57	177
25	0830	11,700	57	177
26	0830	11,600	58	156
27	0830	10,900	59	156
28	0830	9,180	61	161
29	0830	9,580	61	172
30	0830	9,380	62	177
1	0830	10,200	62	178
2	0830	10,500	62	163
3	0830	11,700	62	172
4	0830	11,700	62	170
5	0830	11,700	62	184
6	0830	11,400	62	186
7	0830	10,900	60	180
8	0830	11,300	61	183
9	0830	11,500	61	196
10	0830	11,500	64	200
11	0830	11,800	63	195
12	0830	12,500	61	186
13	0830	14,300	61	183
14	0830	14,500	63	191
15	0830	14,500	63	183
16	0830	13,800	65	195
17	0830	14,100	65	191
18	0830	14,300	66	200
19	0830	14,700	66	204
20	0830	13,800	66	198
21	0830	14,700	66	213
22	0830	14,000	66	206
23	0830	14,400	67	228
24	0830	15,300	68	199
25	0830	15,600	68	203
26	0830	14,800	68	197
27	0830	13,800	67	214
28	0830	12,600	66	209
29	0830	11,800	66	224
30	0830	11,800	66	224
31	0830	11,800	66	207
1	0830	12,700	66	213
2	0830	14,000	66	206
3	0830	14,400	67	228
4	0830	15,300	68	199
5	0830	15,600	68	203
6	0830	14,800	68	197
7	0830	13,800	68	191
8	0830	13,000	68	212
9	0830	12,600	69	216
10	0830	11,600	69	187
11	0830	11,300	70	198
12	0845	11,000	70	201
13	0830	10,200	71	211
14	0830	9,580	73	206
15	0830	9,440	75	209
16	0830	9,260	76	207
17	0800	9,160	76	202
18	0800	9,070	75	201
19	0800	8,090	75	204
20	0800	7,920	75	194

Date	Time PST	Flow* cfs	Temp. °F	Specific Conductance
June 21	0830	8,170	74	190
22	0830	9,030	73	192
23	0830	9,270	72	185
24	0830	9,890	71	174
25	0830	9,890	71	174
26	0830	10,500	72	175
27	0830	10,700	71	187
28	0830	10,700	69	178
29	0830	10,400	68	181
30	0830	10,000	68	183

Analyses by U. S. Geological Survey, Quality of Water Branch.  
\* Mean Daily Flow at Sacramento.

TABLE T-7

SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 DAILY SAMPLING PROGRAM  
 WILKINS SLOUGH AT POINT OF DIVERSION MILE 118.1R  
 1960-1961

Date Collected	4/13-17/60		4/19-23/60		4/30-5/10/60		5/12-24/60		5/25-6/6/60		6/7-19/60		6/21-7/1/60		7/13-25/60		7/27-8/4/60	
	Mean Discharge, cfs*	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)	mg/l (ppm)
pH	8.2	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133	133
EC x 10 <sup>6</sup> at 25°C																		
Constituents in																		
Total Dissolved Solids																		
Sum																		
Silica	11.9	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
Cations																		
Calcium	14	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Magnesium	8.5	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
Sodium	9.4	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Potassium	1.7	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Total Cations		1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95
Anions																		
Carbonate		0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bicarbonate		7.3	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29	1.29
Sulfate		7.4	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
Chloride		1.7	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18
Fluoride		0.1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Nitrate		3.6	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Total Anions		1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78	1.78
Boron		0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
Total Hardness (As CaCl <sub>2</sub> )		7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
NC Hardness																		
Percent Sodium																		

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
April 15				182
April 16				138
April 17				151
April 18	Not sampled			
April 19				164
April 20	Not sampled			
April 21				163
April 22				155
April 23				157
April 24				143
April 25				145
April 26				143
April 27				148
April 28				145
April 29				143
April 30	Not sampled			
May 1				150
May 2				147
May 3				148
May 4				147
May 5				147
May 6				146
May 7				145
May 8				146
May 9				146
May 10				146
May 11	Not sampled			

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
June 7				146
June 8				143
June 9				142
June 10				143
June 11				144
June 12				142
June 13				143
June 14				144
June 15				142
June 16				141
June 17				140
June 18				140
June 19				140
June 20	Not sampled			
June 21				136
June 22				137
June 23				135
June 24				132
June 25				133
June 26				133
June 27				133
June 28				132
June 29				132
June 30				133
July 1				133

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
July 2				149
July 3				128
July 4				135
July 5				135
July 6				135
July 7				138
July 8				135
July 9				135
July 10				128
July 11				131
July 12				133
July 13				129
July 14				130
July 15				132
July 16				132
July 17				131
July 18				131
July 19				131
July 20				131
July 21				131
July 22				130
July 23				130
July 24				130
July 25				129
July 26				128
July 27				128
July 28				128
July 29				128
July 30				128
July 31				128
Aug. 1				128
Aug. 2				128
Aug. 3				128
Aug. 4				128

\* Flows computed on monthly basis only.

TABLE T-7 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 DAILY SAMPLING PROGRAM  
 WILKINS SLOUGH AT POINT OF DIVERSION, MILE 118.1R

1960-1961

	8/6-15/60	8/16-21/60	8/22-27/60	8/28-31/60	9/1-5/60	9/6-16/60
Date Collected						
Mean Discharge, cfs *						
pH	7.7					
EC x 10 <sup>6</sup> at 25°C	131	131	131	141	144	151
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Total Dissolved Solids						
Sum						
Silica						
						106
						25
Cations						
Calcium (Ca)						13
Magnesium (Mg)						6.2
Sodium (Na)	10.0	9.0	9.0	10.0	10.0	9.0
Potassium (K)						1.6
Total Cations						1.59
Anions						
Carbonate (CO <sub>3</sub> )						0
Bicarbonate (HCO <sub>3</sub> )						78
Sulfate (SO <sub>4</sub> )						1.28
Chloride (Cl)	2.8	2.4	3.0	3.0	3.2	4.6
Fluoride (F)						0.10
Nitrate (NO <sub>3</sub> )						3.8
Total Anions						0.2
Boron (B)						0.01
Total Hardness (as CaCO <sub>3</sub> )	----	----	----	----	----	0.8
MC Hardness						0.01
Percent Sodium						1.51

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Sept. 1				143
2				143
3				143
4				144
5				143
6				146
7				145
8				145
9				149
10				149
11				149
12				146
13				150
14				150
15				149
16				149

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Aug. 5		Not sampled		
6				132
7				135
8				132
9		Not sampled		
10				133
11				133
12				131
13				132
14				128
15				129
16				132
17				132
18				132
19				132
20				131
21				132
22				129
23				128
24				130
25				131
26				131
27				130
28				133
29				135
30				141
31				144

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

DAILY SAMPLING PROGRAM  
IRRIGATION DRAIN FROM RECLAMATION DISTRICT NO. 108, MILE 100.1R

1960 - 1961

Date Collected Mean Discharge, cfs	4/15/60		4/17/60		4/23, 23, 24/60		4/26/60		4/27/60		4/28, 30, 31/60		5/2-12/60		5/13-17/60		5/18-20/60		5/22-24/60		5/25-29/60		5/30-31/60		
	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	
pH	7.0	7.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	
Total Dissolved Solids																									
Sum	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	53	
Silica (SiO <sub>2</sub> )																									
Calcium (Ca)																									
Magnesium (Mg)																									
Sodium (Na)																									
Potassium (K)																									
Total Cations																									
Carbonate (CO <sub>3</sub> )																									
Bicarbonate (HCO <sub>3</sub> )																									
Sulfate (SO <sub>4</sub> )																									
Chloride (Cl)																									
Fluoride (F)																									
Nitrate (NO <sub>3</sub> )																									
Total Anions																									
Boron (B)																									
Total Hardness (As CaCO <sub>3</sub> )																									
Percent Sulfate																									

Date	Flow cfs	Temp. °F	Specific Conductance
April 15			600
16	Not sampled		
17			357
18	Not sampled		
19	Not sampled		
20	Not sampled		
21	Not sampled		877
22			958
23	112		966
24			
25	Not sampled		
26	262		762
27	31		641
28	327		513
29	316		506
30	314		534
May 1			
2	294		643
3	305		659
4	305		652
5	359		778
6	299		676
7	297		676
8	413		688
9	293		659
10	304		649
11	307		671
12	314		628
13	366		543
14	314		587
15	569		544
16	359		605
17	364		512
18	370		467
19	451		461
20	479		460
May 21	Not sampled		
22	581		573
23	416		566
24	416		504
25	Not sampled		
26	Not sampled		
27	472		461
28	421		477
29	578		534
30	422		505
31	375		523
June 1			

TABLE T-8 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

DAILY SAMPLING PROGRAM  
IRRIGATION DRAIN FROM RECLAMATION DISTRICT NO.108, MILE 100.1R

1960 - 1961

Date Collected	6/3-8/60	6/9-10/60	6/11-13/60	6/14-30/60	7/1-7/60	7/8/60
Mean Discharge, cfs	273	330	283	300	333	322
pH				8.6		
EC x 10 <sup>6</sup> at 25°C	59h	59	59h	57h	59	52
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Sum				33h		
Silica	(SiO <sub>2</sub> )			35		
Cations						
Calcium	(Ca)			22	1.10	
Magnesium	(Mg)			23	1.90	
Sodium	(Na)	64	2.78	62	2.70	2.83
Potassium	(K)			1.2	0.03	
Total Cations				5.73		
Anions						
Carbonate	(CO <sub>3</sub> )			6	0.20	
Bicarbonate	(HCO <sub>3</sub> )			19h	3.18	
Sulfate	(SO <sub>4</sub> )			57	1.19	
Chloride	(Cl)	41	1.16	36	1.02	31
Fluoride	(F)			0.4	0.02	0.87
Nitrate	(NO <sub>3</sub> )			1.5	0.02	
Total Anions				5.63		
Boron	(B)	0.47		0.42	0.32	0.32
Total Hardness (As CaCO <sub>3</sub> )			0.46	1.90		
NC Hardness				0.0		
Percent Sodium				47		

Date Collected	7/9-13/60	7/14-35/60	7/16-20/60	7/21-25/60	7/26-27/60	7/28-8/2/60
Mean Discharge, cfs	322	322	322	322	322	332
pH						8.5
EC x 10 <sup>6</sup> at 25°C	57h	54h	59	52	52	52
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Sum						361
Silica	(SiO <sub>2</sub> )					33
Cations						
Calcium	(Ca)					24
Magnesium	(Mg)					22
Sodium	(Na)	71	2.91	63	2.96	3.04
Potassium	(K)					72
Total Cations						1.0
Anions						
Carbonate	(CO <sub>3</sub> )					5
Bicarbonate	(HCO <sub>3</sub> )					3.41
Sulfate	(SO <sub>4</sub> )					66
Chloride	(Cl)	34	0.96	32	0.93	32
Fluoride	(F)					0.4
Nitrate	(NO <sub>3</sub> )					1.1
Total Anions						5.95
Boron	(B)	0.30	0.30	0.46	0.32	0.33
Total Hardness (As CaCO <sub>3</sub> )						1.90
NC Hardness						0
Percent Sodium						51

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
July 1		322		532
July 2		322		555
July 3		328		557
July 4		409		561
July 5		317		570
July 6		317		568
July 7		317		568
July 8		322		519

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
June 2	Not sampled			
June 3		322		661
June 4		188		584
June 5		322		584
June 6		322		602
June 7		322		592
June 8		163		596
June 9		307		557
June 10		352		550
June 11		302		613
June 12		322		601
June 13		224		602
June 14		282		562
June 15		320		560
June 16		320		587
June 17		320		598
June 18		176		598
June 19		313		568
June 20		326		594
June 21		322		627
June 22		262		580
June 23		322		577
June 24		326		599
June 25		322		599
June 26		322		613
June 27		322		594
June 28		163		578
June 29		326		540
June 30		326		576

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
July 9		322		563
July 10		322		578
July 11		322		577
July 12		322		578
July 13		322		568
July 14		322		550
July 15		322		558
July 16		322		560
July 17		322		566
July 18		322		572
July 19		322		563
July 20		322		562

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
July 21		322		550
July 22		322		548
July 23		322		537
July 24		322		537
July 25		322		552
July 26		322		522
July 27		322		540
July 28		322		550
July 29		322		540
July 30		322		551
July 31		322		551
Aug. 1		322		557
Aug. 2		322		546

TABLE T-8 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
DAILY SAMPLING PROGRAM

IRRIGATION DRAIN FROM RECLAMATION DISTRICT NO.108, MILE 100.1R  
1960-196.

Date Collected	8/3-6/60	8/7-9/60	8/10-11/60	8/12-30/60	8/17/60	8/18-20/60	8/21-23/60	8/24-27/60	8/31/60	9/2-4/60	9/5-10/60	9/11-12/60
Mean Discharge, cfs	349	371	375	339	375	375	414	388	421	436	406	304
pH											8.1	
EC x 10 <sup>6</sup> at 25°C	519	538	460	538	490	522	572	548	572	513	560	617
Constituents in mg/l												
Total Dissolved Solids (ppm)												
Silica (SiO <sub>2</sub> )											355	
Cations												
Calcium (Ca)											25	1.25
Magnesium (Mg)											21	1.13
Sodium (Na)	67	62	2.70	71	3.09	62	71	62	2.70	67	2.48	2.96
Potassium (K)											2.0	0.05
Total Cations												5.99
Anions												
Carbonate (CO <sub>3</sub> )												1
Bicarbonate (HCO <sub>3</sub> )												204
Sulfate (SO <sub>4</sub> )												3.25
Chloride (Cl)												36
Fluoride (F)	3.6	0.29	0.29	30	0.85	26	35	0.29	33	0.93	36	1.02
Nitrate (NO <sub>3</sub> )											0.4	0.02
Total Anions												1.1
Boron (B)	0.49											5.95
Total Hardness (As CaCO <sub>3</sub> )											0.35	
NC Hardness											149	
Percent Sodium											0	

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Sept. 1		421		558
Sept. 2		430		503
Sept. 3		420		499
Sept. 4		469		498
Sept. 5		358		538
Sept. 6		312		539
Sept. 7		317		574
Sept. 8		312		540
Sept. 9		221		552
Sept. 10		317		525
Sept. 11		172		604
Sept. 12		231		575

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Aug. 21		502		558
Aug. 22		370		443
Aug. 23		370		541
Aug. 24		370		520
Aug. 25		370		535
Aug. 26		374		524
Aug. 27		374		520
Aug. 28		475		508
Aug. 29		370		534
Aug. 30		375		495
Aug. 31		421		520

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Aug. 12		375		522
Aug. 13		375		525
Aug. 14		370		530
Aug. 15		370		539
Aug. 16		375		517
Aug. 17		375		484
Aug. 18		375		517
Aug. 19		375		517
Aug. 20		375		508

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Aug. 3		375		531
Aug. 4		375		530
Aug. 5		375		531
Aug. 6		322		533
Aug. 7		469		519
Aug. 8		322		542
Aug. 9		322		510
Aug. 10		375		490
Aug. 11		375		487

TABLE T-8 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

DAILY SAMPLING PROGRAM  
IRRIGATION DRAIN FROM RECLAMATION DISTRICT NO. 108, MILE 100.1R  
1960-1961

Date Collected	9/13-14/60	9/15/60	9/18/60	9/21-23/60	9/25-28/60	10/3-5/60	10/6-7/60	10/8-9/60	10/19/60	10/23-24/60	10/26-27/60
Mean Discharge, cfs	158	158	122	70	37	8.5	46	34	142	16	17
pH	8.3	7.21		9.21	11.80		4.1		9.00	12.80	10.00
EC x 10 <sup>6</sup> at 25°C	121	506	335	921	1180		4.1	5.39	900	1280	1000
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)	(ppm)
Sum	489										
Silica	(SiO <sub>2</sub> )	35				37					
Cations											
Calcium	(Ca)	29	1.45			43	2.31				
Magnesium	(Mg)	27	2.25			43	3.27				
Sodium	(Na)	98	8.26			189	16.22	48	2.09	63	2.74
Potassium	(K)	2.1	0.05	44	1.91	116	5.50	161	7.00	4.61	1.65
Total Cations		8.01				14.39				4.61	1.65
Anions											
Carbonate	(CO <sub>3</sub> )	0	0.00			10	0.33				
Bicarbonate	(HCO <sub>3</sub> )	258	1.23			403	6.60				
Sulfate	(SO <sub>4</sub> )	97	2.02			210	4.37				
Chloride	(Cl)	51	1.14	40	1.13	110	3.20	26	0.73	34	0.96
Fluoride	(F)	0.5	0.03	69	1.94	100	2.62			61	1.72
Nitrate	(NO <sub>3</sub> )	2.1	0.03			0.5	0.03				
Total Anions		7.75				14.48					
Boron	(B)	0.21		0.26		0.06		0.41	0.55	0.99	0.76
Total Hardness (As CaCO <sub>3</sub> )		149	----	0.69		306					
MC Hardness		0				0					
Percent Sodium		49				57					

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Sept. 13		158		702
Sept. 14		158		702
Sept. 15		158		575
Sept. 16		158		719
Sept. 17		102		659
Sept. 18		122		398
Sept. 19		109		834
Sept. 20		102		620
Sept. 21		86		863
Sept. 22		79		926
Sept. 23		46		966
Sept. 24		40		742
Sept. 25		43		1120
Sept. 26		46		1230
Sept. 27		30		1140
Sept. 28		30		1260
Sept. 29	Not sampled			
Sept. 30		46		1250
Oct. 1	Not sampled			
Oct. 2	Not sampled			
Oct. 3		0		1300
Oct. 4		64		1370
Oct. 5		67		1340
Oct. 6		54		457
Oct. 7		37		428
Oct. 8		34		512
Oct. 9		31		546
Oct. 10		30		684
Oct. 11	Not sampled			
Oct. 12		30		942
Oct. 13	Not sampled			
Oct. 14	Not sampled			
Oct. 15	Not sampled			
Oct. 16	Not sampled			
Oct. 17	Not sampled			
Oct. 18	Not sampled			
Oct. 19		142		910
Oct. 20	Not sampled			
Oct. 21		15		1250
Oct. 22		15		1170
Oct. 23		15		1290
Oct. 24		16		1360
Oct. 25		15		1190
Oct. 26		18		1060
Oct. 27		15		1030
Oct. 28		18		911
Oct. 29		15		1060

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

DAILY SAMPLING PROGRAM  
IRRIGATION DRAIN FROM RECLAMATION DISTRICT NO. 108, MILE 100IR

1960-1961

Date Collected	12/1-2/60	12/4-11/60	12/16-30/60
Mean Discharge, cfs	112	173	27
pH			
EC x 10 <sup>6</sup> at 25°C	85	100	350
Constituents in	mg/l	mg/l	mg/l
Total Dissolved Solids	(ppm)	(ppm)	(ppm)
Sum			
Sulfate			
Chloride			
Nitrate			
Total Anions			
Calcium			
Magnesium			
Sodium			
Potassium			
Total Cations			
Carbonate			
Bicarbonate			
Sulfate			
Chloride			
Fluoride			
Nitrate			
Total Anions			
Boron			
Total Hardness (As CaCO <sub>3</sub> )			
NC Hardness			
Percent Sodium			

Date Collected	11/9-10/60	11/13-16/60	11/22-23/60	11/24-25/60
Mean Discharge, cfs	15	22	80	15
pH				
EC x 10 <sup>6</sup> at 25°C	100	100	120	110
Constituents in	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	(ppm)	(ppm)	(ppm)	(ppm)
Sum				
Sulfate				
Chloride				
Nitrate				
Total Anions				
Calcium				
Magnesium				
Sodium				
Potassium				
Total Cations				
Carbonate				
Bicarbonate				
Sulfate				
Chloride				
Fluoride				
Nitrate				
Total Anions				
Boron				
Total Hardness (As CaCO <sub>3</sub> )				
NC Hardness				
Percent Sodium				

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Dec. 15	Not sampled			
Dec. 16	32			1500
Dec. 17	Not sampled			
Dec. 18	24			1500
Dec. 19	Not sampled			
Dec. 20	29			1500
Dec. 21	Not sampled			
Dec. 22	29			1470
Dec. 23	Not sampled			
Dec. 24	25			1440
Dec. 25	Not sampled			
Dec. 26	19			1500
Dec. 27	Not sampled			
Dec. 28	29			1410
Dec. 29	Not sampled			
Dec. 30	23			1540

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Dec. 1		19		----
Dec. 2		204		----
Dec. 3	Not sampled			
Dec. 4		69		1430
Dec. 5	Not sampled			
Dec. 6	38			1420
Dec. 7	Not sampled			
Dec. 8	10			1440
Dec. 9	Not sampled			
Dec. 10	3c			1360
Dec. 11	Not sampled			
Dec. 12	35			1360
Dec. 13	Not sampled			
Dec. 14	3c			1330

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Nov. 17		22		959
Nov. 18		19		1080
Nov. 19		23		1050
Nov. 20		19		1260
Nov. 21		19		1080
Nov. 22		19		1260
Nov. 23		20		1310
Nov. 24		16		1150
Nov. 25		13		1140
Nov. 26	Not sampled			
Nov. 27	Not sampled			
Nov. 28	Not sampled			
Nov. 29	Not sampled			
Nov. 30	Not sampled			

Date	Time PST	Flow cfs	Temp. °F	Specific Conductance
Oct. 30		15		957
Oct. 31		15		868
Nov. 1		15		888
Nov. 2		10		866
Nov. 3		12		941
Nov. 4		14		1180
Nov. 5		12		1220
Nov. 6		12		1220
Nov. 7		12		1220
Nov. 8		20		1170
Nov. 9		13		743
Nov. 10		16		858
Nov. 11		20		1080
Nov. 12		20		1080
Nov. 13		17		1080
Nov. 14		22		1090
Nov. 15		13		1080

Table T-9

RESULTS OF ANALYSES  
UPPER REACH INTENSIVE SAMPLING PROGRAM  
JUNE 6 - 10, 1960

EXPLANATORY COMMENTS

1. Unless otherwise noted, the stations are on the Sacramento River. The numerical designation of the stations was an arbitrary method of identifying the stations during the sampling program.
2. Values shown in parenthesis and marked with an asterisk ( )\* appeared unrealistic and were not used in computing maximum, minimum and average values.
3. Values for biochemical oxygen demand (BOD) are reported in the following manner:

<u>Method</u>	<u>Example</u>	
	<u>Time</u>	<u>BOD</u>
a. Values shown in the example at right were obtained from duplicate analyses of a composite of the two samples collected at the specified times.	0105	1.93
	0345	1.03
b. Two BOD values shown for one time indicates that duplicate analyses were made on a single sample collected at that time.	1915	1.27, 1.22
c. A single BOD value reported between two times indicates that the value was obtained from a composite of samples collected at those times.	1330	1.25
	1620	
d. A single value shown for a specific time is the BOD of the sample collected at that time.	1530	1.40

4. Values for ABS, O-PO<sub>4</sub>, and T-PO<sub>4</sub> were reported in the same manner as described for BOD results under sections c. and d. of item 3.

TABLE T-9  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

UPPER REACH INTENSIVE SAMPLING PROGRAM

JUNE 6-10, 1960

STATION A1		MILE 293.9							
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-6-60	0720	50	11.0	97	1.45	0.0	0.0	0.0	
	1020	54	11.2	104	1.40				
	1315	53	11.1	102	2.14	0.0	0.1	0.2	
6-7-60	1600	53	11.5	106	1.94				
	1920	52.5	10.6	96	1.16	0.0	0.0	0.2	
	2200	53	11.1	102	1.21				
6-7-60	0105	51	10.9	97	1.93	0.0	0.1	0.1	
	0345	52	10.9	98	1.03				
	0705	52	10.9	98	1.47	0.0	0.1	0.1	
6-8-60	1015	51.5	11.0	99	1.47				
	1310	54	11.2	104	1.83	0.0	0.0	0.1	
	1605	51.5	11.0	99	1.83				
6-8-60	1915	51	10.8	94	1.27, 1.22	0.0	0.0	0.0	
	2130	50	10.5	94					
	0050	53	(9.2)	(84)	2.26	0.0	0.0	0.0	
6-9-60	0330	52.5	10.6	96					
	0720	49.5	10.9	96	----	0.0	0.1	0.1	
	1010	50.5	11.3	100					
6-9-60	1330	52	11.1	100	1.25	0.0	0.1	0.1	
	1620	52	11.5	104					
	1930	53	10.6	97	1.05	0.0	0.0	0.0	
6-9-60	2210	50	10.3	91					
	0055	50	10.6	94	1.41	0.0	0.0	0.0	
	0340	50	10.7	95					
6-10-60	0705	50	10.8	96	1.51	0.0	0.1	0.1	
	1010	51	11.1	99					
	1330	53	10.7	98	1.74	0.0	0.0	0.0	
6-10-60	1630	54	10.6	98					
	1940	54	10.0	93	2.95	0.0	0.0	0.1	
	2135	53	10.0	92					
6-10-60	0055	48.5	11.1	96	1.45	0.0	0.0	0.2	
	0345	49	11.2	97					
	0710	50	11.1	98					
RANGE	MAXIMUM	54	11.5	106	2.95	0.0	0.1	0.2	
	MINIMUM	48.5	10.0	91	1.03	0.0	0.0	0.0	
AVERAGE		51.5	10.9	98	1.59	0.0	0.0	0.1	

STATION Redding Sewage Treatment Plant Discharge		MILE 293.8R							
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-6-60	0657	72							
	1000	76			91	3.6	19	20	
	1250	78							
6-7-60	1640	78			148	6.5	15	24	
	1900	74							
	2150	74			129	5.9	18	18	
6-7-60	0045	73							
	0325	72			92	3.8	16	19	
	0650	71.5							
6-8-60	0955	73			88	6.7	16	16	
	1250	74							
	1550	74			99	6.8	21	22	
6-8-60	1857	73							
	2115	73			97	6.8	15	15	
	0035	74							
6-9-60	0310	74			68	5.3	12	12	
	0650	73							
	0955	73			113	3.8	18	18	
6-9-60	1320	73							
	1605	74			176	7.0	24	24	
	1910	74							
6-9-60	2113	73			115	5.7	23	23	
	0035	74							
	0325	72			70	4.5	16	16	
6-10-60	0655	71							
	0955	73			78	2.3	18	18	
	1245	73							
6-10-60	1610	74			226	4.9	26	28	
	1930	73							
	2110	74			120.3	4.4	7.8	8.0	
6-10-60	0035	74							
	0330	72.5			78	3.6	16	23	
	0700	72			58	2.7	7.8	10	
RANGE	MAXIMUM	78			226	7.0	26	28	
	MINIMUM	71			58	2.3	7.8	8	
AVERAGE		73.5			109	5.0	17.0	18.5	

STATION A2		MILE 291.7							
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-6-60	0820	50	11.2	99	0.71	0.0	0.1	0.1	
	1050	52	11.6	105	0.61				
	1402	54	10.6	98	0.73, 0.63	0.0	0.1	0.1	
6-7-60	1650	54	11.1	103					
	2020	52	10.5	95	0.84	0.0	0.1	0.2	
	2355	--	----	--	0.84				
6-7-60	0140	50	10.8	96	0.58	0.0	0.1	0.1	
	0425	50	10.7	95	0.57				
	0740	50	11.0	97	0.87	0.0	0.1	0.1	
6-8-60	1050	51.5	11.4	103	0.71				
	1440	54	11.2	104	0.58	0.0	0.0	0.0	
	1645	52	10.5	95	0.88				
6-8-60	1955	51	10.8	96	0.71	0.0	0.1	0.1	
	2220	50	10.5	93	1.02				
	0135	49	10.8	94	0.81	0.0	0.0	0.0	
6-9-60	0410	50	10.8	96					
	0750	49	10.9	95	0.77	0.0	0.1	0.1	
	1040	50	11.3	100					
6-9-60	1405	52	11.0	99	1.09	0.0	0.1	0.1	
	1650	52	11.0	99					
	1947	52	11.0	99	0.83	0.0	0.0	0.0	
6-9-60	2140	51	10.6	95					
	0125	50	10.7	95	1.01	0.0	0.0	0.1	
	0420	49.5	10.6	93					
6-10-60	0740	50	11.0	97	1.29	0.0	0.1	0.1	
	1045	51	11.2	100					
	1405	54	10.9	101	0.96	0.0	0.1	0.1	
6-10-60	1655	52	10.8	97					
	2010	50.5	10.2	90	1.06	0.0	0.0	0.0	
	2230	50	10.1	89					
6-10-60	0130	48.5	10.9	94	1.34	0.0	0.0	0.0	
	0420	48.5	11.2	97					
RANGE	MAXIMUM	54	11.6	105	1.34	0.0	0.1	0.2	
	MINIMUM	48.5	10.1	89	0.57	0.0	0.0	0.0	
AVERAGE		51	10.9	97	0.84	0.0	0.1	0.1	

STATION A3		MILE 288.3							
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-6-60	0935	52	11.4	103	0.61	0.0	0.1	0.1	
	1130	52	11.6	105	0.56				
	1445	55	11.2	105	0.71	0.0	0.1	0.1	
6-7-60	1720	53	10.8	99	0.59				
	2100	53	----	--	0.97	0.0	0.1	0.1	
	2320	53	10.1	93	0.88				
6-7-60	0220	50	10.9	96	----	0.0	0.1	0.1	
	0455	50	10.8	96					
	0840	50	11.2	99	0.74	0.0	0.1	0.1	
6-8-60	1135	52	11.8	106	0.66				
	1515	54	11.5	106	0.78	0.0	0.0	0.0	
	1725	53	10.9	100	0.67				
6-8-60	2015	53	10.5	96	0.92	0.0	0.1	0.1	
	2300	51	10.4	93	0.51				
	0215	49	10.7	93	0.81	0.0	0.0	0.0	
6-9-60	0515	50	10.5	93					
	0820	49.5	11.1	97	0.78	0.0	0.1	0.1	
	1125	50.5	11.5	102					
6-9-60	1420	53	11.1	102	1.07	0.0	0.1	0.1	
	1720	53	----	--					
	2020	52	10.6	95	1.39	0.0	0.0	0.0	
6-9-60	2320	50	10.3	91					
	0220	49.5	10.5	92	1.93	0.0	0.0	0.0	
	0515	49.5	10.6	93					
6-10-60	0830	50	11.0	97	0.90	0.0	0.1	0.1	
	1125	51	11.5	103					
	1435	53	11.8	108	1.23	0.0	0.1	0.1	
6-10-60	1730	53	10.3	94					
	2035	51	10.0	89	0.96	0.0	0.0	0.0	
	2325	49	9.9	86					
6-10-60	0220	48.5	10.4	90	1.20	0.0	0.0	0.0	
	0520	48.5	11.1	96					
RANGE	MAXIMUM	55	11.8	108	1.93	0.0	0.1	0.1	
	MINIMUM	48.5	9.9	86	0.51	0.0	0.0	0.0	
AVERAGE		51.5	10.9	97	0.90	0.0	0.1	0.1	

TABLE T-9 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
UPPER REACH INTENSIVE SAMPLING PROGRAM  
JUNE 6-10, 1960

STATION B4 MILE 285.9

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-6-60	0700	52	10.4	94	0.76	0.0	0.1	0.1
	1000	52	10.3	93	1.15	0.0	0.0	0.0
	1600	57	10.3	99	1.10	0.0	0.0	0.0
6-7-60	1830	56	10.6	101	0.93	0.0	0.1	0.1
	2130	54	10.0	93	0.85	0.0	0.1	0.1
	0030	52	10.5	95	0.47	0.0	0.1	0.1
6-8-60	0330	52	9.5	86	0.58	0.0	0.1	0.1
	0730	51	10.0	89	0.66	0.0	0.1	0.1
	1000	53	10.6	97	0.61	0.0	0.1	0.1
6-9-60	1240	57	10.3	99	0.62	0.0	0.0	0.0
	1555	57	11.0	106	0.67	0.0	0.0	0.0
	1835	56	10.8	103	0.81	0.0	0.1	0.1
6-10-60	2130	53	10.6	97	0.66	0.0	0.1	0.1
	0030	51	9.2	82	0.92	0.0	0.1	0.2
	0330	51	10.7	96	0.92	0.0	0.1	0.2
6-9-60	0700	51	9.2	82	0.61	0.0	0.1	0.1
	1000	52	9.9	89	0.61	0.0	0.1	0.1
	1300	58	11.1	108	1.39	0.0	0.1	0.1
6-10-60	1600	58	11.6	113	1.39	0.0	0.1	0.1
	1910	56	10.5	100	0.99	0.0	0.0	0.0
	2130	54	10.4	96	0.99	0.0	0.0	0.0
6-9-60	0030	51	9.2	82	0.92	0.0	0.0	0.1
	0330	50	9.5	84	0.92	0.0	0.0	0.1
	0700	52	10.5	94	0.82	0.0	0.1	0.1
6-10-60	1000	51	9.4	85	0.82	0.0	0.1	0.1
	1340	56	11.0	105	0.84	0.0	0.1	0.1
	1600	54	11.6	107	0.84	0.0	0.1	0.1
6-10-60	1900	55	10.9	102	0.96	0.0	0.1	0.1
	2130	54	10.4	96	0.96	0.0	0.1	0.1
	0050	53	9.5	87	1.22	0.0	0.0	0.0
6-10-60	0335	52	10.1	91	1.22	0.0	0.0	0.0
RANGE	MAXIMUM	58	11.6	113	1.39	0.0	0.1	0.2
	MINIMUM	50	9.2	82	0.47	0.0	0.0	0.0
AVERAGE		53.9	10.2	95	0.84	0.0	0.1	0.1

STATION B5 MILE 283.0

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-6-60	0750	54	8.8	81	0.81	0.0	0.1	0.1
	1050	54	7.9	73	0.71	0.0	0.1	0.1
	1400	63	10.2	105	(5.32)*	0.0	0.1	0.1
6-7-60	1630	62	10.6	108	(5.37)*	0.0	0.1	0.1
	1950	59	---	---	0.72	0.0	0.1	0.1
	2230	57	9.9	95	1.16	0.0	0.1	0.1
6-8-60	0130	54	8.8	81	1.95	0.0	0.1	0.1
	0430	53	10.8	99	1.79	0.0	0.1	0.1
	0750	51	9.5	85	1.67	0.0	0.1	0.2
6-9-60	1050	58	10.6	103	1.72	0.0	0.1	0.2
	1355	58	11.2	109	0.67	0.0	0.0	0.1
	1700	58	11.0	107	0.72	0.0	0.0	0.1
6-10-60	1930	57	10.8	104	0.61	0.0	0.1	0.1
	2240	56	10.3	98	0.90	0.0	0.1	0.1
	0130	55	8.9	83	1.29	0.0	0.0	0.0
6-9-60	0430	52	10.1	91	1.29	0.0	0.1	0.1
	0750	54	8.8	81	0.79	0.0	0.1	0.1
	1050	55	8.3	78	0.79	0.0	0.1	0.1
6-10-60	1400	60	11.3	112	1.29	0.0	0.1	0.1
	1700	60	11.2	112	1.29	0.0	0.1	0.1
	1940	58	10.5	102	1.17	0.0	0.0	0.0
6-9-60	2230	56	10.5	100	1.17	0.0	0.0	0.0
	0130	52	9.7	87	1.03	0.0	0.1	0.1
	0430	50	8.8	78	1.03	0.0	0.1	0.1
6-10-60	0750	52	10.0	90	0.74	0.0	0.1	0.1
	1050	54	10.3	95	0.74	0.0	0.1	0.1
	1410	60	11.2	112	1.41	0.0	0.1	0.1
6-10-60	1700	60	11.3	113	1.41	0.0	0.1	0.1
	1930	58	11.1	108	1.82	0.0	0.0	0.0
	2230	54	10.4	96	1.82	0.0	0.0	0.0
6-10-60	0205	51	10.4	93	1.22	0.0	0.0	0.0
	0430	50	9.7	86	1.22	0.0	0.0	0.0
RANGE	MAXIMUM	63	11.3	113	1.95	0.0	0.1	0.2
	MINIMUM	50	7.9	73	0.61	0.0	0.0	0.0
AVERAGE		56	10.1	96	1.15	0.0	0.1	0.1

STATION B6 MILE 279.6

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-6-60	0820	52	11.1	100	0.65	0.0	0.1	0.1
	1120	53	10.7	98	0.76	0.0	0.1	0.1
	1430	60	10.3	103	(5.42)*	0.0	0.0	0.0
6-7-60	1730	64	10.2	106	(5.49)*	0.0	0.0	0.0
	2015	58	9.7	94	0.78	0.0	0.1	0.3
	2310	56	9.7	92	0.92	0.0	0.1	0.3
6-8-60	0210	54	9.8	91	1.09	0.0	0.1	0.1
	0510	53	10.6	97	0.99	0.0	0.1	0.1
	0820	56	10.0	95	1.67	0.0	0.1	0.1
6-9-60	1120	61	10.1	102	2.02	0.0	0.1	0.1
	1430	61	11.2	113	0.72	0.0	0.0	0.1
	1730	60	11.0	110	0.72	0.0	0.0	0.1
6-10-60	2000	56	10.9	104	0.92	0.0	0.1	0.1
	2320	58	10.3	100	0.82	0.0	0.1	0.1
	0210	57	7.3	70	0.38	0.0	0.0	0.0
6-8-60	0510	52	8.1	73	0.38	0.0	0.0	0.0
	0820	53	8.3	76	0.93	0.0	0.1	0.1
	1120	56	10.5	100	0.93	0.0	0.1	0.1
6-9-60	1430	60	11.0	110	2.00	0.0	0.1	0.1
	1730	61	10.9	110	2.00	0.0	0.1	0.1
	2030	58	10.4	101	1.02	0.0	0.0	0.1
6-10-60	2310	55	10.5	98	1.02	0.0	0.0	0.1
	0210	53	8.0	73	1.20	0.0	0.1	0.1
	0510	50	9.2	81	1.20	0.0	0.1	0.1
6-9-60	0820	53	9.7	89	0.96	0.0	0.1	0.1
	1120	55	10.4	97	0.96	0.0	0.1	0.1
	1445	61	11.2	113	0.79	0.0	0.1	0.4
6-10-60	1730	60	11.2	112	0.79	0.0	0.1	0.4
	2000	58	10.8	105	1.42	0.0	0.0	0.0
	2310	54	10.3	95	1.42	0.0	0.0	0.0
6-10-60	0250	52	9.5	86	1.35	0.0	0.0	0.0
	0510	50	10.3	91	1.35	0.0	0.0	0.0
RANGE	MAXIMUM	64	11.2	113	2.02	0.0	0.1	0.4
	MINIMUM	50	7.3	70	0.38	0.0	0.0	0.0
AVERAGE		56.5	10.1	96	1.05	0.0	0.1	0.1

STATION C7 MILE 275.0

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-6-60	0815	52	10.3	93	1.32	0.0	0.1	0.1
	1115	52	10.9	99	1.12	0.0	0.1	0.1
	1415	57	11.0	106	1.74	0.0	0.1	0.1
6-7-60	1715	58	10.7	104	1.67	0.0	0.1	0.1
	2000	58	10.8	105	1.10	0.0	0.1	0.3
	2301	56	10.4	99	1.00	0.0	0.1	0.3
6-8-60	0215	54	10.1	94	0.92	0.0	0.1	0.1
	0510	53	10.5	96	0.52	0.0	0.1	0.1
	0815	50	10.5	93	1.01	0.0	0.1	0.1
6-9-60	1115	52	10.8	97	1.21	0.0	0.1	0.1
	1420	56	11.1	106	1.01	0.0	0.0	0.1
	1720	58	11.1	108	2.49	0.0	0.0	0.1
6-10-60	2000	57	10.8	104	1.17	0.0	0.1	0.2
	2301	55	10.4	97	1.17	0.0	0.1	0.2
	0220	52	10.3	94	0.96	0.0	0.0	0.0
6-8-60	0510	53	10.4	94	0.96	0.0	0.0	0.0
	0815	52	10.6	95	1.08	0.0	0.1	0.1
	1115	55	10.7	100	1.08	0.0	0.1	0.1
6-9-60	1425	57	10.2	98	2.02	0.0	0.1	0.1
	1715	57	11.3	109	2.02	0.0	0.1	0.1
	2010	57	10.7	103	2.22	0.0	0.0	0.1
6-10-60	2301	55	10.4	97	2.22	0.0	0.0	0.1
	0220	53	10.4	95	1.12	0.0	0.0	0.0
	0510	51.5	10.3	93	1.12	0.0	0.0	0.0
6-9-60	0815	52.5	10.5	95	1.59	0.0	0.1	0.1
	1115	55	11.0	103	1.59	0.0	0.1	0.1
	1425	57	11.4	110	1.30	0.0	0.1	0.2
6-10-60	1720	56	11.1	106	1.30	0.0	0.1	0.2
	2000	56	10.8	103	2.14	0.0	0.0	0.1
	2301	55	10.5	98	2.14	0.0	0.0	0.1
6-10-60	0215	53	10.4	95	1.21			

TABLE T-9 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
UPPER REACH INTENSIVE SAMPLING PROGRAM  
JUNE 6-10, 1960

STATION C8		MILE 265.5							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-6-60	0855	51	10.2	91	0.81, 0.76	0.0	0.1	0.1	
	1155	56	10.5	100					
	1505	58	10.4	101	0.76	0.0	0.1	0.1	
6-7-60	2045	59	10.5	103	0.50	0.0	0.1	0.1	
	2340	58	10.0	97	0.51				
	0300	57	10.0	96	0.95	0.0	0.1	0.1	
6-8-60	0550	54	10.0	93					
	0855	52	10.2	92	0.96	0.0	0.1	0.1	
	1155	54	10.6	98	1.07				
6-9-60	1505	58	11.0	107	2.05	0.0	0.0	0.1	
	1800	59	10.6	104	1.90				
	2100	58	10.5	102	0.77	0.0	0.1	0.1	
6-10-60	2340	58	10.3	100	0.71				
	0310	55	9.9	93	1.10	0.0	0.0	0.0	
	0550	54	10.0	93					
6-10-60	0855	55	10.3	96	1.40	0.0	0.1	0.2	
	1130	57	11.1	107					
	1505	58	10.3	100	2.49	0.0	0.1	0.1	
6-10-60	1755	59	10.7	105					
	2050	58	10.4	101	1.01	0.0	0.0	0.0	
	2340	57	10.2	98					
6-10-60	0310	56	10.0	95	1.10	0.0	0.0	0.0	
	0550	55	9.9	93					
	0855	55	10.3	96	1.95	0.0	0.1	0.1	
6-10-60	1155	51.5	10.7	96					
	1500	57	10.4	100	1.05	0.0	0.1	0.1	
	1800	58	10.8	105					
6-10-60	2045	58	10.5	102	1.32	0.0	0.1	0.1	
	2340	57	10.0	96					
	0310	55	10.2	95	1.47	0.0	0.0	0.0	
0550	54	10.0	93						
RANGE	MAXIMUM	60	11.1	107	2.49	0.0	0.1	0.2	
	MINIMUM	51	9.9	91	0.50	0.0	0.0	0.0	
AVERAGE		56.5	10.3	99	1.15	0.0	0.1	0.1	

STATION C9		MILE 266.3							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-6-60	0926	52	9.9	89	1.01	0.0	0.1	0.1	
	1225	56	10.3	98	0.96				
	1535	58	10.2	99	0.85	0.0	0.1	0.1	
6-7-60	1825	59	10.4	102	0.90				
	2130	59	10.2	100	1.19	0.0	0.1	0.1	
	0020	59	10.0	98	1.19				
6-8-60	0355	58	10.2	99	0.87	0.0	0.1	0.1	
	0620	56.5	10.0	95	0.88				
	0925	54	10.1	94	2.03	0.0	0.1	0.1	
6-8-60	1225	56	10.4	99	1.22				
	1535	58	10.6	103	1.52	0.0	0.0	0.1	
	1830	59	10.5	103	1.83				
6-9-60	2130	58	10.4	101	1.22	0.0	0.1	0.1	
	0020	58	10.1	98	1.42				
	0355	57	10.2	98	1.12	0.0	0.0	0.1	
6-9-60	0620	56	10.0	95					
	0925	56	10.0	95	1.38	0.0	0.1	0.2	
	1225	57	11.5	110					
6-10-60	1535	58	10.4	101	1.38	0.0	0.1	0.1	
	1835	58	10.6	103					
	2125	59	10.4	102	1.48	0.0	0.0	0.0	
6-10-60	0020	58	10.2	99					
	0355	57	10.2	98	1.41	0.0	0.1	0.1	
	0550	56	9.9	94					
6-10-60	0920	56	10.2	97	1.26	0.0	0.1	0.1	
	1225	57	10.5	101					
	1530	58	10.6	103	1.40	0.0	0.1	0.1	
6-10-60	1830	58	10.8	105					
	2130	58	10.5	102	1.93	0.0	0.0	0.1	
	0020	58	10.0	97					
6-10-60	0355	57	10.0	96	1.28	0.0	---	---	
	0620	55	9.8	92					
	RANGE	MAXIMUM	59	11.5	110	2.03	0.0	0.1	0.2
	MINIMUM	52	9.8	89	0.85	0.0	0.0	0.0	
AVERAGE		57	10.3	99	1.29	0.0	0.1	0.1	

STATION D10		MILE 244.1							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-6-60	0830	58	9.8	95	0.82	0.0	0.0	0.1	
	1120	60	10.1	101	0.82				
	1415	59	10.2	100	3.35	0.0	0.1	0.4	
6-7-60	1640	60	10.1	101	2.23	0.0	0.1	0.1	
	1950	60	10.2	102	1.19				
	2245	58	10.2	99	2.11	0.0	0.1	0.1	
6-8-60	0200	59	10.1	99	2.01				
	0500	59	10.0	98	0.83	0.0	0.1	0.1	
	0800	59	10.0	98	1.74				
6-8-60	1105	60	10.2	102	2.16	0.0	0.1	0.4	
	1405	60	10.3	103	2.28				
	1650	60	10.4	104	2.09	0.0	0.0	0.1	
6-8-60	1915	59	10.4	102	2.06				
	2235	59	10.4	102	1.37	0.0	0.1	0.1	
	0040	59	10.2	100	1.58				
6-9-60	0500	58	10.1	98	1.01	0.0	0.1	0.3	
	0800	58	10.1	98					
	1120	60	10.2	102	2.25	0.0	0.1	0.1	
6-9-60	1405	60	10.3	103					
	1650	60	10.5	105	2.28	0.0	0.0	0.0	
	1925	59	10.4	102					
6-10-60	2225	59	10.3	101	1.42	0.0	0.0	0.0	
	0155	58	10.2	99					
	0505	58	10.0	97	1.06	0.0	0.1	0.1	
6-10-60	0800	58	10.0	97					
	1110	59	10.2	100	2.62	0.0	0.0	0.0	
	1400	60	10.4	104					
6-10-60	1700	59	10.5	103	1.72	0.0	0.0	0.0	
	1945	58	10.4	101					
	2240	58	10.3	100	1.48	0.0	0.0	0.0	
0145	59	10.3	101						
0505	58	10.2	99	1.20	0.0	0.2	0.2		
RANGE	MAXIMUM	60	10.5	105	3.35	0.0	0.2	0.4	
	MINIMUM	58	9.8	95	0.82	0.0	0.0	0.0	
AVERAGE		59	10.2	101	1.80	0.0	0.1	0.1	

STATION Red Bluff Sewage Treatment Plant		MILE 242.98							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-6-60	0730	73			70	2.6	7.3	9.5	
	1045	76				11.8	8.8	31	
	1330	78						33	
6-7-60	1615	78				88	7.0	14.0	
	1930	77						19	
	2155	75			96	5.2	16	16	
6-7-60	0120	75							
	0430	73				41	2.1	7.7	
	0720	76						8.8	
6-8-60	1030	76			116	6.6	25	26	
	1330	78							
	1620	78				88	6.9	19	
6-8-60	1855	77						20	
	2210	76				88	6.3	14	
	0050	75						14	
6-9-60	0430	73				68	2.3	8.0	
	0725	74						8.0	
	1045	77			112	7.1	26	26	
6-9-60	1330	78							
	1625	78				85	7.2	19	
	1855	77						20	
6-10-60	2200	76			77	5.5	16	16	
	0105	74							
	0430	74				34	2.0	7.3	
6-10-60	0720	74						7.6	
	1030	77			126	6.1	26	27	
	1335	78							
6-10-60	1630	78				90	5.2	18	
	1920	77						19	
	2210	76			90	4.5	14	15	
0055	75								
0445	74				37	2.4	1.9		
								3.9	
RANGE	MAXIMUM	78			126	8.8	31	33	
	MINIMUM	73			34	2.0	1.9	3.9	
AVERAGE		76			83.8	5.2	15.9	17.0	

TABLE T-9 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

UPPER REACH INTENSIVE SAMPLING PROGRAM

JUNE 6-10, 1960

STATION 011		MILE 238.1						
DATE	TIME PST	TEMP °F	D.O mg/l	O.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-6-60	0855	59	10.0	98	0.59 0.61	0.0	0.0	0.1
	1145 1450	60 63	10.3 10.0	103 103	0.92 0.87	0.0	0.1	0.2
	1715 2015	60 59	10.2 10.0	102 98	1.51 0.40	0.0	0.1	0.1
6-7-60	2320 0230	58 58	10.1 10.2	98 99	0.91 0.88	0.0	0.1	0.1
	0525 0825	58 59	10.0 10.0	97 98	0.70 0.53	0.0	0.1	0.1
	1140 1425	60 61	10.3 10.3	103 104	0.50 0.48	0.0	0.1	0.4
6-8-60	1725 1945	60 59	10.4 10.3	104 101	0.34 0.59	0.0	0.1	0.1
	2310 0215	58 58	10.2 10.2	99 99	0.71 0.81	0.0	0.1	0.2
	0530 0830	58 58	10.2 10.2	99 99	0.40	0.0	0.1	0.1
6-9-60	1145 1430	60 60	10.1 10.3	101 103	0.51	0.0	0.1	0.1
	1715 2020	60 59	10.4 10.3	104 101	0.54	0.0	0.1	0.1
	2255 0230	58 58	10.2 10.3	99 100	0.66	0.0	0.1	0.1
6-10-60	0530 0815	58 59	10.1 10.1	98 99	0.56	0.0	0.1	0.1
	1140 1425	60 60	10.4 10.4	104 104	0.55	0.0	0.1	0.1
	1725 2010	59 58	10.4 10.2	102 99	0.66	0.0	0.1	0.1
6-10-60	2305 0215	57 57	10.2 10.2	98 98	0.69	0.0	0.0	0.1
	0530	57	10.3	99	0.50	0.0	0.0	0.0
RANGE	MAXIMUM	63	10.4	104	1.51	0.0	0.1	0.4
	MINIMUM	57	10.0	97	0.34	0.0	0.0	0.0
AVERAGE		59	10.2	100	0.66	0.0	0.1	0.1

STATION D12		MILE 235.2						
DATE	TIME PST	TEMP °F	D.O mg/l	O.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-6-60	0945	59	9.9	97	0.74 0.53	0.0	0.1	0.1
	1225 1525	61 62	10.2 10.1	103 103	0.30 0.51	0.0	0.1	0.1
	1745 2045	60 59	10.2 10.0	102 98	0.47 0.52	0.0	0.1	0.1
6-7-60	2350 0315	58 58	10.1 10.2	98 99	0.14 0.14	0.0	0.1	0.1
	0600 0905	58 60	10.0 10.1	97 101	0.68 0.50	0.0	0.1	0.1
	1210 1450	61 62	10.3 10.3	104 105	0.41 0.93	0.0	0.1	(1.6)*
6-8-60	1750 2015	61 60	10.3 10.2	104 102	0.52 0.47	0.0	0.1	0.1
	2345 0300	58 58	10.1 10.2	98 99	0.71 0.71	0.0	0.1	0.1
	0600 0915	58 59	10.2 10.2	99 100	0.47	0.0	0.0	0.1
6-9-60	1225 1500	61 61	10.2	103	0.55	0.0	0.2	0.2
	1740 2045	61 59	10.3 10.2	104 100	0.61	0.0	0.1	0.1
	2325 0310	58 57	10.2 10.1	99 97	0.66	0.0	0.1	0.1
6-10-60	0610 0930	58 59	10.0 10.1	97 99	0.60	0.0	0.1	0.1
	1215 1500	61 61	10.1 10.3	102 104	0.77	0.0	0.1	0.1
	1750 2040	60 58	10.3 10.2	103 99	0.76	0.0	0.0	0.0
6-10-60	2335 0305	57 57	10.2 10.2	98 98	0.78	0.0	0.0	0.0
	0605	57	10.1	97	0.62	0.0	0.0	0.0
RANGE	MAXIMUM	62	10.3	105	0.93	0.0	0.2	0.2
	MINIMUM	57	9.9	97	0.14	0.0	0.0	0.0
AVERAGE		59.5	10.2	100	0.56	0.0	0.1	0.1

STATION E13		MILE 228.4						
DATE	TIME PST	TEMP °F	D.O mg/l	O.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-6-60	0730	62	9.9	101	1.26 0.93	0.0	0.1	0.1
	1045 1325	66 69	9.8 8.9	104 98	0.56 0.51	0.0	0.1	0.1
	1625 1910	68 66	9.1 9.6	99 102	0.64, 0.54	0.0	0.1	0.1
6-7-60	2215 0115	63 60	8.9 9.9	92 99	0.82 0.82	0.0	0.1	0.1
	0500 0745	58 59	9.9 9.6	96 94	0.44 0.37	0.0	0.0	0.0
	1045 1335	62 67	10.0 9.3	102 100	0.65 0.76	0.0	0.1	0.1
6-8-60	1630 1915	66 64	8.8 9.2	94 96	0.58 0.48	0.0	0.1	0.1
	2215 0115	61 59	9.2 10.1	93 99	0.66 0.81	0.0	0.1	0.2
	0500 0745	57 59	9.8 9.4	94 92	0.60	0.0	0.1	0.1
6-9-60	1045 1330	61 68	9.8 9.6	99 104	0.67	0.0	0.1	0.1
	1630 1915	68 65	9.6 9.9	104 104	0.83	0.0	0.1	0.1
	2215 0120	61 58	9.6 10.1	97 98	1.11	0.0	0.1	0.1
6-10-60	0500 0750	57 59	9.7 10.0	93 98	0.94	0.0	0.0	0.1
	1050 1330	62 67	9.9 10.0	101 107	0.68	0.0	0.1	0.1
	1625 1915	67 64	10.0 9.9	107 103	0.91	0.0	0.1	0.1
6-10-60	2215 0120	60 57	9.9 9.6	99 92	0.87	0.0	0.0	0.1
	0500	57	9.8	94	0.66	0.0	0.1	0.1
RANGE	MAXIMUM	69	10.1	107	1.26	0.0	0.1	0.2
	MINIMUM	57	8.8	92	0.37	0.0	0.0	0.0
AVERAGE		62.5	9.7	99	0.72	0.0	0.1	0.1

STATION E14		MILE 224.4						
DATE	TIME PST	TEMP °F	D.O mg/l	O.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-6-60	0815	62	9.9	101	1.10 1.07	0.1	0.1	0.1
	1130 1410	62 64	9.9 8.9	101 93	0.35 0.20	0.0	0.1	0.1
	1700 1950	65 64	9.2 9.3	97 97	0.56 0.52	0.0	0.1	0.1
6-7-60	2255 0200	64 60	8.6 9.6	90 96	1.32 1.20	0.0	0.1	0.1
	0530 0815	59 59	9.8 9.9	96 97	0.43 0.35	0.0	0.0	0.0
	1120 1410	62 63	9.9 9.1	101 94	0.51 0.30	0.0	0.1	0.1
6-8-60	1700 1955	63 63	9.3 9.4	96 97	0.46 0.56	0.0	0.1	0.1
	2255 0155	61 60	9.2 9.8	93 98	0.86 0.71	0.0	0.1	0.2
	0540 0815	59 59	9.5 9.7	93 95	0.50	0.0	0.1	0.1
6-9-60	1115 1410	61 62	10.0 9.6	101 98	0.48	0.0	0.1	0.1
	1700 1955	63 62	10.1 9.6	96 98	0.74	0.0	0.1	0.1
	2255 0200	60 59	9.5 9.7	95 95	0.81	0.0	0.1	0.1
6-10-60	0530 0815	57 59	9.7 9.8	93 96	0.77	0.0	0.0	0.1
	1120 1410	62 62	9.9 9.3	101 95	0.57	0.0	0.0	0.0
	1700 1955	63 62	9.6 9.6	99 98	0.83	0.0	0.0	0.0
6-10-60	2255 0155	60 59	9.6 9.5	96 93	0.85	0.0	0.0	0.1
	0535	57	9.6	92	0.71	0.0	0.0	0.0
RANGE	MAXIMUM	65	10.1	101	1.32	0.1	0.1	0.2
	MINIMUM	57	8.6	90	0.20	0.0	0.0	0.0
AVERAGE		61	9.6	96	0.67	0.0	0.1	0.1

TABLE T-9 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
UPPER REACH INTENSIVE SAMPLING PROGRAM  
JUNE 6-10, 1960

STATION F15		MILE 217.6							
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-6-60	0850	65	9.7	102	0.64 0.61	0.0	0.1	0.1	
	1205	65	9.6	101	0.66	0.0	0.1	0.1	
	1450	70	9.0	100	0.61	0.0	0.1	0.1	
6-7-60	1750	70	8.6	96	0.65	0.0	0.1	0.1	
	2050	67	8.9	96	0.74	0.0	0.1	0.1	
	2355	64	8.5	89	0.73	0.0	0.1	0.2	
6-7-60	0300	59	9.5	93	0.86	0.0	0.1	0.0	
	0620	59	9.6	94	0.71	0.0	0.0	0.0	
	0905	61	9.7	98	0.53	0.0	0.0	0.0	
6-8-60	1220	64	10.1	105	0.51	0.0	0.1	0.1	
	1500	68	9.2	100	0.46	0.0	0.1	0.1	
	1755	65	9.2	97	0.66	0.0	0.1	0.1	
6-8-60	2055	65	8.8	93	0.55	0.0	0.1	0.1	
	2355	63	9.3	96	0.81	0.0	0.1	0.2	
	0250	59	9.6	94	0.77	0.0	0.1	0.2	
6-9-60	0630	58	9.5	92	0.55	0.0	0.1	0.1	
	0900	59	9.8	96	0.55	0.0	0.1	0.1	
	1200	63	9.8	101	0.72	0.0	0.1	0.1	
6-9-60	1500	66	9.6	102	0.72	0.0	0.1	0.1	
	1755	68	9.5	103	0.76	0.0	0.1	0.1	
	2055	65	9.5	100	0.77	0.0	0.1	0.1	
6-10-60	2355	63	9.2	95	0.78	0.0	0.1	0.1	
	0310	59	9.5	93	0.78	0.0	0.1	0.1	
	0620	59	9.9	97	0.90	0.0	0.1	0.1	
6-10-60	0910	60	9.7	97	0.90	0.0	0.1	0.1	
	1205	62	9.7	99	0.77	0.0	0.1	0.1	
	1500	68	9.9	107	0.77	0.0	0.1	0.1	
6-10-60	1755	68	9.6	104	0.77	0.0	0.1	0.1	
	2055	64	9.5	99	0.77	0.0	0.1	0.1	
	2355	63	9.3	96	0.90	0.0	0.1	0.1	
6-10-60	0300	59	9.5	93	0.90	0.0	0.1	0.1	
	0625	59	9.6	94	0.65	0.0	0.0	0.0	
RANGE	MAXIMUM	70	10.1	107	0.90	0.0	0.1	0.2	
	MINIMUM	58	8.5	89	0.46	0.0	0.0	0.0	
AVERAGE		63.5	9.5	98	0.69	0.0	0.1	0.1	

STATION F16		MILE 207.1							
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-6-60	0945	62	9.9	101	0.61	0.0	0.1	0.1	
	1241	64	10.0	104	1.07	0.0	0.1	0.1	
	1540	64	10.0	104	0.56	0.0	0.1	0.1	
6-7-60	1820	65	10.7	113	0.55	0.0	0.1	0.1	
	2120	64	9.9	103	0.52	0.0	0.1	0.2	
	0045	63	9.9	102	0.49	0.0	0.1	0.2	
6-8-60	0320	63	9.8	101	0.64	0.0	0.1	0.1	
	0615	62	9.8	100	0.55	0.0	0.1	0.1	
	0925	61	10.0	101	0.58	0.0	0.1	0.1	
6-8-60	1240	62	10.3	105	0.74	0.0	0.1	0.1	
	1540	62	10.1	103	0.48	0.0	0.1	0.1	
	1820	64	10.2	106	0.56	0.0	0.1	0.1	
6-9-60	2120	64	10.0	104	0.66	0.0	0.1	0.1	
	0030	63	9.9	102	0.71	0.0	0.1	0.1	
	0335	62	9.9	101	0.52	0.0	0.1	0.1	
6-9-60	0630	62	9.9	101	0.52	0.0	0.1	0.1	
	0930	60.5	10.3	103	0.42	0.0	0.1	0.1	
	1240	62	10.4	106	0.42	0.0	0.1	0.1	
6-10-60	1540	64	10.1	105	0.64	0.0	0.1	0.1	
	1820	64	10.2	106	0.64	0.0	0.1	0.1	
	2120	64	10.0	104	0.84	0.0	0.1	0.1	
6-10-60	0030	63	9.8	101	0.84	0.0	0.1	0.1	
	0330	62	9.8	100	0.71	0.0	0.1	0.1	
	0630	61	9.9	100	0.71	0.0	0.1	0.1	
6-10-60	0930	61	10.0	101	0.67	0.0	0.1	0.1	
	1240	61	10.2	103	0.67	0.0	0.1	0.1	
	1540	62.5	10.3	105	0.77	0.0	0.1	0.1	
6-10-60	1820	63	10.2	105	0.77	0.0	0.1	0.1	
	2120	64	10.0	104	0.85	0.0	0.0	0.0	
	0030	63	9.8	101	0.85	0.0	0.0	0.0	
6-10-60	0330	62	9.9	101	0.64	0.0	0.1	0.1	
	0630	60.5	9.9	99	0.64	0.0	0.1	0.1	
RANGE	MAXIMUM	65	10.7	113	1.07	0.0	0.1	0.2	
	MINIMUM	60.5	9.8	99	0.42	0.0	0.0	0.0	
AVERAGE		62.5	10.0	103	0.64	0.0	0.1	0.1	

STATION F17		MILE 199.6							
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-6-60	0825	65	9.5	100	1.14 1.04	0.0	0.0	0.0	
	1143	64	9.7	101	1.02	0.0	0.1	0.1	
	1420	65	9.8	103	1.02	0.0	0.1	0.1	
6-7-60	1720	65	10.0	105	0.58	0.0	0.1	0.1	
	2010	65	9.9	104	0.58	0.0	0.1	0.1	
	2320	65	9.8	103	0.65	0.0	0.1	0.1	
6-7-60	0215	64	9.7	101	0.65	0.0	0.1	0.1	
	0500	64	9.7	101	0.64	0.0	0.1	0.1	
	0815	63	9.7	100	0.59	0.0	0.1	0.1	
6-8-60	1130	63	9.9	102	0.81	0.0	0.1	0.1	
	1420	64	10.1	105	0.65	0.0	0.1	0.1	
	1720	64.5	10.1	106	0.51	0.0	0.1	0.1	
6-8-60	2020	64	10.1	105	0.41	0.0	0.1	0.1	
	2320	64	9.9	103	0.61	0.0	0.1	0.1	
	0230	63	9.8	101	0.61	0.0	0.1	0.1	
6-9-60	0500	63	9.8	101	0.44	0.0	0.1	0.1	
	0815	62.5	9.8	100	0.44	0.0	0.1	0.1	
	1115	63	10.1	104	0.43	0.0	0.1	0.1	
6-9-60	1420	64	9.9	103	0.43	0.0	0.1	0.1	
	1720	64	10.1	105	0.45	0.0	0.1	0.1	
	2010	64	10.0	104	0.45	0.0	0.1	0.1	
6-10-60	2320	64	9.9	103	0.61	0.0	0.1	0.1	
	0215	63	9.8	101	0.61	0.0	0.1	0.1	
	0515	63	9.7	100	0.54	0.0	0.1	0.1	
6-10-60	0815	63	9.7	100	0.54	0.0	0.1	0.1	
	1115	63	9.8	101	0.60	0.0	0.0	0.0	
	1420	63.5	10.1	104	0.60	0.0	0.0	0.0	
6-10-60	1720	64	10.1	105	1.21	0.0	0.1	0.1	
	2010	64	10.1	104	1.21	0.0	0.1	0.1	
	2320	63.5	9.9	102	0.73	0.0	0.0	0.0	
6-10-60	0215	63	9.8	101	0.73	0.0	0.0	0.0	
	0515	62.5	9.7	99	0.73	0.0	0.0	0.1	
6-10-60	0815	62.5	9.7	99	0.73	0.0	0.0	0.1	
	0815	62.5	9.7	99	0.73	0.0	0.0	0.1	
RANGE	MAXIMUM	65	10.1	106	1.21	0.0	0.1	0.1	
	MINIMUM	62	9.5	99	0.41	0.0	0.0	0.0	
AVERAGE		63.5	9.9	102	0.69	0.0	0.1	0.1	

STATION F18		MILE 184.5							
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-6-60	0750	65	9.3	98	0.42 0.41	0.0	0.1	0.2	
	1052	66	9.4	100	0.76	0.0	0.1	0.1	
	1340	68	9.5	103	0.76	0.0	0.1	0.1	
6-7-60	1640	69	9.7	106	0.60	0.0	0.1	0.1	
	1925	68.5	9.9	109	0.54	0.0	0.1	0.1	
	2235	67	9.6	103	0.71	0.0	0.1	0.1	
6-7-60	0132	64	9.6	100	0.53	0.0	0.1	0.1	
	0425	64	9.4	98	0.67	0.0	0.1	0.1	
	0735	64	9.5	99	0.56	0.0	0.1	0.1	
6-8-60	1045	65	9.6	101	0.46	0.0	0.1	0.1	
	1340	68	9.8	107	0.49	0.0	0.1	0.1	
	1640	68	9.8	107	0.59	0.0	0.1	0.1	
6-8-60	1925	67.5	9.8	107	0.59	0.0	0.1	0.1	
	2235	64.5	9.8	103	1.01	0.0	0.1	0.1	
	0115	63	9.9	102	1.12	0.0	0.1	0.1	
6-9-60	0430	62.5	9.8	100	0.49	0.0	0.1	0.1	
	0735	63	9.7	100	0.49	0.0	0.1	0.1	
	1030	64	9.8	102	0.48	0.0	0.1	0.1	
6-9-60	1340	67	9.8	105	0.48	0.0	0.1	0.1	
	1640	68	9.9	108	0.59	0.0	0.0	0.0	
	1925	67.5	9.8	107	0.59	0.0	0.0	0.0	
6-10-60	2235	66	9.7	103	0.81	0.0	0.1	0.1	
	0130	63	9.7	100	0.81	0.0	0.1	0.1	
	0430	62.5	9.6	98	0.64	0.0	0.1	0.1	
6-10-60	0730	62	9.7	99	0.64	0.0	0.1	0.1	
	1030	64	9.7	101	0.66	0.0	0.2	0.2	
	1340	67	9.7	104	0.66	0.0	0.2	0.2	
6-10									

Table T-10

RESULTS OF ANALYSES  
UPPER REACH INTENSIVE SAMPLING PROGRAM  
OCTOBER 3 - 7, 1960

EXPLANATORY COMMENTS

1. Unless otherwise noted, the stations are on the Sacramento River.
2. Values shown in parenthesis and marked with an asterisk ( )\* appeared unrealistic and were not used in computing maximum, minimum and average values.
3. Values for biochemical oxygen demand (BOD) are reported in the following manner:

<u>Method</u>	<u>Example</u>	
	<u>Time</u>	<u>BOD</u>
a. Values shown in the example at right were obtained from duplicate analyses of a composite of the two samples collected at the specified times.	0105 0345	1.93 1.03
b. Two BOD values shown for one time indicates that duplicate analyses were made on a single sample collected at that time.	1915	1.27, 1.22
c. A single BOD value reported between two times indicates that the values was obtained from a composite of samples collected at those times.	1330 1620	1.25
d. A single value shown for a specific time is the BOD of the sample collected at that time.	1530	1.40

4. Values for ABS, O-PO<sub>4</sub>, and T-PO<sub>4</sub> were reported in the same manner as described for BOD results under sections 3. and d. of item 3.

REFERENCE NUMBERS

1. Redding Sewage Treatment Plant (influent), mile 293.8R. Sample collected at either 0745 and 1050.
2. Red Bluff Bridge, mile 244.1. Samples collected at 2150, October 3, and 0040, October 4 were composited.
3. Red Bluff Bridge, mile 244.1. Samples collected at 2400, October 3, and 0345, October 4 were composited.
4. Ord Ferry, mile 184.5. Samples collected at 0800 and 1355 were composited.
5. Ord Ferry, mile 184.5. Samples collected at 1055 and 1655 were composited.
6. Ord Ferry, mile 184.5. Questionable value.

TABLE T-10  
SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
UPPER REACH INTENSIVE SAMPLING PROGRAM  
OCTOBER 3-7, 1960

STATION Cypress Avenue Bridge (Bedding)						MILE 293.9			
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
10-3-60	0805	56	10.2	97	1.23	0.0	0.0	0.0	
	1045	56	10.9	104					
	1330 1640	57 56	11.1 10.8	107 103	1.44				
10-4-60	1950	56	10.2	97	0.91	0.0	0.0	0.0	
	2235	56	10.1	96					
	0230 0500	54.5 54.5	10.2 10.2	95 95	4.90				
10-5-60	0820	55.5	10.5	99	2.77	0.0	0.0	0.1	
	1115	56	11.0	105					
	1345 1640	56 (60)*	11.0 10.8	105 106	1.10 0.94				
10-6-60	1945	56.5	10.4	99	0.83	0.0	0.1	0.1	
	2245	55.5	10.1	95	0.78				
	0215 0520	54 54.5	10.6 10.3	98 96	2.74 2.72				
10-7-60	0805	55	10.4	97	3.38	0.0	0.1	0.1	
	1110		11.0		3.50				
	1350 1640	58 55.5	10.7 10.4	104 98	0.97				
10-8-60	1945	55	10.2	95	1.09	0.0	0.1	0.1	
	2245	55	10.2	95					
	0220 0510	57 57	10.2 10.2	98 98	3.19				
10-9-60	0800	55.5	10.2	96	3.18	0.0	0.0	0.0	
	1110	57	10.6	102					
	1315 1615	56 55	10.8 10.7	103 100	1.19 1.14				
10-10-60	1915	54.5	10.3	96	0.82	0.0	0.0	0.0	
	2250	54.5	10.2	95	0.82				
	0230 0520	54.5 54	10.3 10.0	96 93	3.02 3.05				
RANGE	MAXIMUM	58	11.1	107	4.90	0.0	0.1	0.1	
	MINIMUM	54	10.0	93	0.78	0.0	0.0	0.0	
AVERAGE		55.5	10.5	99	2.10	0.0	0.0	0.0	

STATION Redding Sewage Treatment Plant (Influent)						MILE 293.88			
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
10-3-60	1330				176	8.6	24	28	
	1930				205	4.3	20	23	
10-4-60	0145				48	1.5	16	16	
	0750				237	3.3	40	43	
10-5-60	1325				112	7.4	27	27	
	1930				114	5.8	21	26	
	0150				22	1.6	8.5	10	
10-6-60	0745 1050				(172) <sup>1</sup>	(2.5) <sup>1</sup>	(22) <sup>1</sup>	(28) <sup>1</sup>	
	1330				114	5.5	26	42	
	1930				156	11	21	23	
10-7-60	0150				40	1.7	24	28	
	0740				58	2.0	11	15	
	1330				139	6.3	28	36	
10-8-60	1930				134	6.3	21	22	
	0200				18				
RANGE	MAXIMUM				174	11	40	43	
	MINIMUM				18	1.5	8.5	10	
AVERAGE					130	4.8	22	26	

STATION Redding Sewage Treatment Plant (Effluent)						MILE 293.88			
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
10-3-60	0745	55			61	2.6	13	13	
	1030	76							
	1330 1625	79 78			152				
10-4-60	1930	76			150	6.2	18	23	
	2220	76							
	0145 0440	76 75			92				
10-5-60	0750	72			78	8.9	22	23	
	1100	76							
	1325 1625	78 78			100				
10-6-60	1930	78			98	6.8	24	25	
	2225	76							
	0150 0500	75 74			68				
10-7-60	0745	74			94	3.8	18	37	
	1050	76							
	1330 1620	76 78			144				
10-8-60	1930	78			140	1.7	23	25	
	2230	78							
	0150 0445	75 75			78				
10-9-60	0740	76			130	2.9	19	24	
	1055	76							
	1330 1635	78 78			159				
10-10-60	1930	76			131	6.4	26	28	
	2240	76							
	0200 0440	76 74			68				
RANGE	MAXIMUM	79			159	8.9	26	37	
	MINIMUM	72			61	1.7	13	13	
AVERAGE		76			109	4.9	20.4	24.8	

STATION Foot of Bonnyview School Road						MILE 291.7			
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
10-3-60	0850	54.5	10.7	100	1.06	0.0	0.0	0.1	
	1110	55	11.2	105					
	1400 1715	56 56	11.4 10.8	108 103	0.82				
10-4-60	2035	58	10.2	99	0.97	0.0	0.0	0.0	
	2310	55	10.1	94					
	0300 0530	54 54	10.3 10.2	94 94	0.82				
10-5-60	0815	54	10.6	98	0.74	0.0	0.0	0.0	
	1135	55	11.2	105					
	1420 1710	56.5 55	11.5 10.8	110 101	0.64 0.76				
10-6-60	2015	54.5	10.3	96	0.73	0.0	0.1	0.2	
	2310	54	10.1	94	0.60				
	0215 0540	53 53.5	10.3 10.3	94 94	0.89 0.72				
10-7-60	0840	54.5	10.5	98	0.70	0.0	0.1	0.2	
	1140	55	11.2	104	0.74				
	1415 1705	55 55	10.8 10.3	103 96	0.86				
10-8-60	2015	54	10.1	94	0.81	0.0	0.1	0.1	
	2305	54	10.0	93					
	0245 0530	54.5 54.5	10.1 10.1	94 94	0.83				
10-9-60	0820	54.5	10.4	97	0.62	0.0	0.0	0.1	
	1130	55	10.7	100					
	1410 1710	55.5 55	11.1 10.8	105 101	0.89 0.97				
10-10-60	2010	54.5	10.3	96	0.76	0.0	0.0	0.0	
	2310	54	10.3	95	0.77				
	0255 0550	54 54	10.2 10.1	94 93	0.72 0.81				
RANGE	MAXIMUM	58	11.5	110	1.06	0.0	0.1	0.2	
	MINIMUM	53	10.0	93	0.60	0.0	0.0	0.0	
AVERAGE		54.5	10.5	98	0.79	0.0	0.0	0.0	

TABLE T-10(Continued)

## SACRAMENTO RIVER WATER POLLUTION SURVEY

## RESULTS OF ANALYSES

## UPPER REACH INTENSIVE SAMPLING PROGRAM

OCTOBER 3-7, 1960

STATION: Above Clear Creek

MILE: 288.3

DATE	TIME PST	TEMP °F	O.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-3-60	0920 1140	54.5 55	10.6 11.2	99 105	0.72			
	1130 1815	56.5 56	11.5 10.8	110 103	0.92			
	2005 2340	55 55	10.2 10.1	95 94	0.75			
10-4-60	0315 0555	54 54	10.1 10.1	94 94	0.84			
	0905 1155	54.5 55	10.6 11.2	99 105	0.67			
	1505 1735	56.5 56	11.5 11.0	110 105	0.70 0.72			
10-5-60	2045 2335	55 54	10.3 10.1	96 94	0.60 0.69			
	0310 0605	53.5 53.5	10.1 10.2	92 93	0.68 0.84			
	0905 1159	54 55	10.4 11.3	96 106	0.55 0.57			
10-6-60	1435 1735	55 55	11.0 10.3	103 96	0.94			
	2010 2335	54.5 54	10.1 10.0	94 93	0.88			
	0310 0600	54.5 54.5	10.0 10.1	93 94	0.80			
10-7-60	0840 1155	54.5 55	10.2 10.7	95 100	0.94			
	1440 1745	56 55.5	11.2 10.9	107 103	0.95 0.94			
	2035 2340	55 54	10.3 10.1	96 94	0.70 0.72			
10-7-60	0315 0615	54 54	10.3 10.1	95 94	0.71 0.75			
	RANGE	MAXIMUM MINIMUM	56.5 53.5	11.5 10.0	110 92	0.95 0.55		
	AVERAGE		55	10.5	98	0.76		

STATION: Middle Stake Fish Weir

MILE: 285.9

DATE	TIME PST	TEMP °F	O.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-3-60	0810 1110	56 58	9.9 10.8	94 105	0.74			
	1325 1635	58 59	11.0 9.9	107 97	0.96			
	2025 2240	58 57.5	10.1 9.8	98 95	0.75			
10-4-60	0210 0450	55 55	10.0 10.1	93 94	0.91			
	0810 1110	56 58	10.1 10.5	96 102	0.70			
	1350 1645	58.5 59	11.0 11.0	108 108	0.66 0.76			
10-5-60	2000 2245	58.5 58	10.3 10.0	100 97	0.69 0.69			
	0210 0510	56 56	10.0 10.0	95 95	0.71 0.73			
	0810 1110	56 58	10.1 10.6	96 103	0.88 0.81			
10-6-60	1400 1645	58 58	10.7 10.3	104 100	0.74			
	2000 2245	58.5 58	9.8 9.7	96 94	0.78			
	0210 0510	56 57	10.0 10.1	95 97	0.89			
10-7-60	0800 1100	57 58	10.0 10.3	96 100	1.10			
	1355 1655	59 59	10.2 10.7	100 105	0.88 0.80			
	1955 2245	58.5 58	9.8 9.6	96 93	0.71 0.70			
10-7-60	0200 0500	55 56	10.0 10.1	93 96	1.24 1.27			
	RANGE	MAXIMUM MINIMUM	59 55	11.0 9.6	108 93	1.27 0.66		
	AVERAGE		57.5	10.2	98	0.83		

STATION: Riverview Ranch Road

MILE: 283.0

DATE	TIME PST	TEMP °F	O.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-3-60	0845 1145	56 58	9.9 10.8	94 105	0.80			
	1400 1710	58.5 59	11.1 11.1	109 109	2.22			
	2100 2318	56.5 57.5	10.2 10.0	100 97	0.71			
10-4-60	0245 0525	55 55	9.9 10.0	93 93	0.81			
	0845 1145	56 57	10.1 10.6	96 102	0.69			
	1430 1715	58 59	11.0 11.1	107 108	0.76 0.83			
10-5-60	2030 2315	58.5 58	10.3 9.9	101 96	0.59 0.70			
	0245 0545	56 56	9.9 10.0	94 95	0.69 0.80			
	0845 1145	56 58	10.1 10.6	96 103	0.79 0.76			
10-6-60	1450 1715	58.5 57.5	10.3 10.4	100 100	0.86			
	2040 2225	58 58	9.9 9.9	96 96	0.85			
	0245 0545	57 57	9.9 9.9	95 95	1.13			
10-7-60	0830 1130	57 58	10.0 10.3	96 100	0.55			
	1435 1720	59 59	10.5 10.7	103 105	0.91 0.85			
	2030 2315	58.5 58.5	10.3 9.9	100 97	0.80 0.70			
10-7-60	0230 0530	56 56	10.0 10.1	95 96	0.99 1.27			
	RANGE	MAXIMUM MINIMUM	59 55	11.1 9.9	109 93	2.22 0.55		
	AVERAGE		57.5	10.3	99	0.87		

STATION: Anderson - Palo Cedro Bridge

MILE: 279.6

DATE	TIME PST	TEMP °F	O.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-3-60	0915 1215	58 58	10.2 10.6	99 103	0.73			
	1425 1750	59 59.5	10.5 10.7	102 106	1.11			
	2125 2340	59 58	10.1 10.0	99 97	0.60			
10-4-60	0315 0555	55 56	10.0 10.0	93 95	0.97			
	0915 1215	56 58	10.1 10.6	96 103	0.74			
	1450 1740	59 59.5	11.1 11.0	109 109	0.74 0.75			
10-5-60	2100 2345	58.5 58	11.0 10.1	106 98	0.62 0.62			
	0315 0615	56 56	10.0 10.0	95 95	0.75 0.72			
	0915 1215	56 58	10.2 10.6	97 103	0.64 0.70			
10-6-60	1515 1740	58.5 57.5	9.9 10.6	97 103	0.56			
	2105 2345	58 58	9.8 (8.0)*	95 (78)*	0.95			
	0315 0600	57 57	9.7 9.7	93 93	0.88			
10-7-60	0900 1200	57 58	9.8 10.5	94 102	0.60			
	1455 1740	59 59	10.0 10.7	98 104	0.78 0.80			
	2050 2340	58.5 58	9.5 10.0	93 97	0.67 0.61			
10-7-60	0300 0600	56 56	10.0 10.0	95 95	1.43 1.50			
	RANGE	MAXIMUM MINIMUM	59.5 55	11.1 9.5	109 93	1.50 0.56		
	AVERAGE		57.5	10.1	98	0.80		

TABLE T-10 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

UPPER REACH INTENSIVE SAMPLING PROGRAM

OCTOBER 3-7, 1960

STATION		Bella Ferry Bridge								MILE 275.0			
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
10-3-60	0800		9.9										
	1100		10.2		0.69								
	1100 1700	57.5 57.5	10.7 11.0	104 107	1.93								
10-4-60	2005	57.5	10.8	105	1.06								
	2255	57	10.4	100									
	0200 0500	55 54	10.1 9.9	94 92	0.95								
10-5-60	0800 1100	54 56	10.0 10.3	93 98	0.94								
	1355 1700	57.5 58	10.8 11.1	105 108	0.52 0.80								
	2000 2300	57 57	10.9 10.5	105 101	1.04 1.03								
10-6-60	0200 0500	56 54	10.1 10.0	96 93	0.79								
	0800 1100	55 56	10.0 10.4	93 99	0.74 0.65								
	1400 1700	57 56.5	10.8 10.8	103 101	0.79								
10-7-60	1945 2300	56.5 56.5	10.6 10.1	101 96	1.35								
	0200 0500	56 56	9.8 9.9	93 94	0.36								
	0800 1100	56 57	9.8 10.1	93 97	1.06								
10-8-60	1355 1700	59.5 58.5	10.6 10.7	105 105	0.97 0.88								
	1950 2300	58 57	10.7 10.4	103 100	0.80 0.80								
	0200 0500	56 55	10.1 10.0	96 93	1.09 0.95								
10-9-60	0800	55	10.1	94	0.81 0.77								
	RANGE	MAXIMUM	59.5	11.1	108	1.93							
	MINIMUM	54	9.8	92	0.36								
AVERAGE		56.5	10.3	99	0.91								

STATION		Jellys Ferry Bridge								MILE 265.5			
DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
10-3-60	0840		9.9										
	1140		10.2		0.73								
	1450 1735	59 58	10.5 10.6	103 103	2.06								
10-4-60	2045	58	10.5	101	0.91								
	2325	58	10.3	100									
	0240 0540	57 56	10.0 10.0	96 95	0.68								
10-5-60	0840 1140	55 57	9.9 10.2	93 98	0.66								
	1435 1740	57.5 59	10.6 10.7	102 104	0.80 0.86								
	2030 2335	58 58	10.6 10.4	102 101	0.77 0.66								
10-6-60	0240 0540	57 56	10.1 10.0	97 95	0.81 0.78								
	0840 1140	56 56	9.9 10.2	94 97	0.64 0.64								
	1435 1735	57 57.5	10.5 10.5	101 102	0.84								
10-7-60	2030 2335	57 57	10.3 10.1	99 97	1.10								
	0240 0540	57 57	9.8 9.8	94 94	1.02								
	0840 1140	57 58	9.7 10.0	93 97	0.97								
10-8-60	1435 1735	60 60	10.3 10.2	103 102	1.00 1.02								
	2025 2335	59 58	10.2 10.1	100 98	0.71 0.79								
	0240 0540	57 56	10.1 10.0	97 95	0.90 0.95								
10-9-60	0840	56	9.8	93	0.68 0.64								
	RANGE	MAXIMUM	60	10.7	104	2.06							
	MINIMUM	55	9.7	93	0.64								
AVERAGE		57.5	10.2	98	0.86								

STATION		Bond Bridge								MILE 256.3			
DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
10-3-60	0705		9.9										
	1210		10.2		0.82								
	1515 1810	58 59	10.3 10.4	100 101	(2.58)*								
10-4-60	2115 2355	58 58	10.4 10.3	101 100	0.77								
	0310 0610	57 56	10.0 10.0	96 95	0.67								
	0910 1210	57 57	9.9 10.1	95 97	0.62								
10-5-60	1500 1815	57 58	10.4 10.5	100 101	0.65 0.70								
	2050 0005	57.5 57.5	10.4 10.2	101 99	0.60 0.62								
	0310 0610	58 57	10.1 10.0	98 96	0.53 0.61								
10-6-60	0910 1210	57 58	10.0 10.1	96 98	0.60 0.58								
	1500 1800	57 57	10.3 10.3	99 99	0.68								
	2110 0005	57 57.5	10.2 10.1	98 98	0.81								
10-7-60	0310 0610	57 58	9.9 9.8	95 95	0.88								
	0910 1210	58 58	9.8 9.9	95 96	1.02								
	1505 1800	60 60	10.1 10.1	101 101	0.88 0.84								
10-8-60	2055 0005	59 59	10.1 10.1	101 99	0.70 0.77								
	0310 0610	58 57	10.0 10.0	97 96	0.89 0.85								
	0910	57	9.9	95	0.43 0.48								
RANGE	MAXIMUM	60	10.5	101	1.02								
MINIMUM	56	9.8	95	0.43									
AVERAGE		58	10.1	98	0.71								

STATION		Red Bluff Bridge								MILE 244.1			
DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
10-3-60	0930		10.0	98									
	1230	58.5	10.2	102	1.93	0.0	0.0	0.1					
	1515 1815	60 59	10.2 10.1	102 99	1.59								
10-4-60	(2150) <sup>2</sup> (2400) <sup>3</sup>	60 58	9.9 10.1	99 98	(1.14) <sup>2</sup>	(0.0) <sup>2</sup>	(0.1) <sup>2</sup>	(0.1) <sup>2</sup>					
	(0040) <sup>2</sup> (0345) <sup>3</sup>	58 58	10.1 10.0	98 97	(1.21) <sup>3</sup>	(0.0) <sup>3</sup>	(0.0) <sup>3</sup>	(0.1) <sup>3</sup>					
	0645 0945	58 58	9.9 10.0	96 97	0.74								
10-5-60	1245 1540	59 59	10.2 10.2	100 100	0.55 0.60								
	1845 2125 0045	58 57.5 57	10.2 10.2 10.2	99 99 98	0.56 0.65	0.0	0.1	0.1					
	0345 0645	57 57	10.1 10.0	96 96	0.56 0.52								
10-6-60	0945 1245	58 58	10.1 10.2	98 99	0.59 0.67	0.0	0.1	0.1					
	1540 1830	58 57.5	10.2 10.1	99 98	0.96								
	2140 0035	57 57.5	10.2 10.1	98 98	0.71	0.0	0.1	0.1					
10-7-60	0345 0645	57 57	10.0 9.9	96 95	0.95								
	0945 1245	58 60	9.9 9.9	96 99	0.87	0.0	0.0	0.1					
	1535 1835	60 59.5	10.1 10.0	101 99	0.98 0.97								
10-8-60	2130 0035	59 59	10.0 10.0	98 98	0.72 0.71	0.0	0.1	0.1					
	0345 0645	59 58	9.9 10.0	97 97	0.86 0.81								
	0945	58	9.9	96	0.53 0.58								
RANGE	MAXIMUM	60	10.2	102	1.93	0.0	0.1	0.1					
MINIMUM	57	9.9	95	0.52	0.0	0.0	0.0	0.1					
AVERAGE		58.5	10.1	98	0.84	0.0	0.1	0.1					



TABLE T-10 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

UPPER REACH INTENSIVE SAMPLING PROGRAM

OCTOBER 3-7, 1960

STATION		Foot of Le Clair Avenue							MILE 235.2			
DATE	TIME PST	TEMP °F	D.O. mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l				
10-3-60	1030	58.5	10.1	99								
	1325	60	10.2	102	0.70							
10-4-60	1615	61	10.2	102	0.68							
	1930	60	10.0	100								
10-4-60	2245	59	10.0	98								
	0100	58	10.0	97	0.64							
10-5-60	0350	57.5	10.0	97	0.67							
	0650	57	10.1	97								
10-5-60	0930	58	10.1	98								
	1245	59.5	10.2	101	0.59							
10-5-60	1530	60	10.2	102	0.70							
	1830	59	10.1	99	0.66							
10-5-60	2140	59	10.0	98	0.83							
	0045	58	10.0	97	0.90							
10-6-60	0340	57	10.1	97	0.77							
	0640	57	10.1	97								
10-6-60	0940	58	10.1	98	0.64							
	1245	59.5	10.2	101	0.73							
10-6-60	1530	60	10.2	102	0.88							
	1845	59	10.0	98								
10-6-60	2200	58.5	9.9	97	0.80							
	0045	58.5	9.9	97								
10-6-60	0345	58	10.0	97	0.85							
	0700	58.5	10.1	99								
10-6-60	0955	59	10.1	99	0.87							
	1250	60.5	10.1	101								
10-6-60	1530	61	10.1	102	0.86							
	1830	61	9.9	100	0.86							
10-7-60	2145	60	9.8	98	0.93							
	0040	59.5	9.8	97	0.93							
10-7-60	0340	59	10.0	98	0.68							
	0635	59	10.0	98	0.65							
RANGE	MAXIMUM	61	10.2	102	0.93							
	MINIMUM	57	9.8	97	0.59							
AVERAGE		59	10.0	99	0.76							

STATION		Tubman Bridge							MILE 236.4			
DATE	TIME PST	TEMP °F	D.O. mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l				
10-3-60	0945	60	10.0	100								
	1240	62	10.1	103	0.81							
10-4-60	1535	61	10.1	102	0.59							
	1830	62	10.1	103								
10-4-60	2125	62	9.7	99	0.78							
	0035	60	9.8	98								
10-5-60	0340	60	9.7	97	0.65							
	0625	60	9.9	99								
10-5-60	0935	60	10.0	100	0.68							
	1235	61	10.1	102								
10-5-60	1535	61.5	10.1	102	0.63							
	1835	62	10.1	103	0.60							
10-5-60	2135	61	10.0	101	0.58							
	0030	59	9.9	97	0.57							
10-6-60	0335	60	9.8	98	0.75							
	0630	59	9.9	97	0.66							
10-6-60	0950	60	10.0	100	0.72							
	1230	60	10.2	102								
10-6-60	1535	60	10.2	102	0.76							
	1835	60	10.0	100								
10-6-60	2135	60	9.9	99	0.75							
	0030	60	9.8	98								
10-6-60	0355	60	9.6	96	0.60							
	0635	60	9.8	98								
10-6-60	0940	60	9.8	98	0.70							
	1240	62	9.6	98								
10-6-60	1530	63	10.1	104	0.95							
	1830	63	9.9	102	0.85							
10-7-60	2135	62	9.7	99	0.58							
	0030	62	9.7	99	0.58							
10-7-60	0030	60	9.7	97	0.61							
	0340	59	9.6	94								
10-7-60	0625	59	9.6	94	0.75							
	1010	59	9.6	94	0.75							
RANGE	MAXIMUM	63	10.2	104	0.95							
	MINIMUM	59	9.6	94	0.57							
AVERAGE		60.5	9.9	99	0.69							

STATION		Bear Chaglin Slough							MILE 224.4			
DATE	TIME PST	TEMP °F	D.O. mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l				
10-3-60	0912	60	9.9	99								
	1210	62	10.1	103	0.59							
10-3-60	1505	61	10.1	102	0.67							
	1800	61	10.1	102								
10-4-60	2055	62	9.9	101	0.61							
	2400	61	9.8	99								
10-4-60	0315	60	9.7	97	0.71							
	0600	60	9.7	97								
10-4-60	0910	60	9.8	98	0.72							
	1215	61	10.1	102								
10-5-60	1500	61	10.0	101	0.75							
	1805	62	10.1	103	0.65							
10-5-60	2105	62	9.9	101	0.64							
	2400	60	9.9	99	0.64							
10-5-60	0310	61	9.6	97	0.64							
	0610	60	9.7	97	0.78							
10-5-60	0910	60	9.9	99	0.72							
	1210	60	10.1	101	0.55							
10-6-60	1505	60	10.1	101	0.75							
	1805	60	10.1	101								
10-6-60	2105	60	9.8	98	0.75							
	2400	60	9.7	97								
10-6-60	0325	60	9.6	96	0.99							
	0615	60	9.6	96								
10-6-60	0915	60	9.7	97	0.69							
	1510	64	10.1	105	0.85							
10-6-60	1800	63	10.0	103	0.85							
	2100	63	9.8	101	0.53							
10-7-60	2400	62	9.7	99	0.79							
	0315	61	9.5	96	0.70							
10-7-60	0605	59	9.5	93	0.68							
	0920	59	9.5	93	0.70							
RANGE	MAXIMUM	64	10.1	105	0.99							
	MINIMUM	59	9.5	93	0.53							
AVERAGE		61	9.8	99	0.66							

STATION		Woodson Bridge							MILE 217.6			
DATE	TIME PST	TEMP °F	D.O. mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l				
10-3-60	0835	60	9.7	97	0.67							
	1130	62	9.9	101								
10-3-60	1430	61	9.9	100	0.64							
	1725	61	10.0	101								
10-4-60	2025	62	9.9	101	0.61							
	2325	62	9.7	99								
10-4-60	0235	59	9.5	93	0.62							
	0525	60	9.6	96								
10-5-60	0830	60	9.1	91	0.69							
	1130	61	9.8	99								
10-5-60	1430	61	10.1	102	0.87							
	1730	61	10.1	102	0.87							
10-5-60	2030	62										

TABLE T-10 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

**RESULTS OF ANALYSES**  
UPPER REACH INTENSIVE SAMPLING PROGRAM  
OCTOBER 3-7, 1960

STATION **Corning Sewage Treatment Plant (Influent)** MILE 217.4R

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-6-60	1800	--			98	5.1	29	39

STATION **Corning Sewage Treatment Plant (Effluent)** MILE 217.4R

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-4-60	1755	--			93	6.4	38	40
10-6-60	1800	78			122	4.3	28	29

STATION **Foot of Mollar Avenue** MILE 207.1

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-3-60	0935	61	---	---				
	1205	62	9.9	101	0.56			
	1510	62	10.1	103	0.72			
10-4-60	2140	61	9.9	100	0.61			
	2350	61	9.9	100				
	0245	61	9.9	100	0.86			
10-5-60	0600	61	9.6	97				
	0905	61	9.7	98	0.67			
	1200	61	9.9	100				
10-6-60	1455	62	10.2	104	0.69			
	1800	61	10.2	103	0.73			
	2110	61	10.2	103	0.53			
10-7-60	0010	61	9.9	100	0.54			
	0305	61	9.4	95	0.62			
	0605	61	9.7	98	0.71			
10-8-60	0910	61	9.8	99	0.74			
	1205	61	9.9	100	0.76			
	1455	61	9.9	100	0.95			
10-9-60	1750	60	9.8	98				
	2105	60	9.9	99	0.66			
	2355	60	9.7	97				
10-10-60	0315	61	9.5	96	0.81			
	0600	61	9.5	96				
	0905	61	9.6	97	0.82			
10-11-60	1155	62	9.7	99				
	1500	63	10.0	103	0.87			
	1750	63	9.9	102	0.99			
10-12-60	2100	62	9.8	100	0.52			
	2350	62	9.7	99	0.52			
	0305	62	9.7	99	0.81			
10-13-60	0305	62	9.5	97	0.80			
	0605	61	9.5	96	0.71			
	0900	61	9.5	96	0.61			
RANGE	MAXIMUM	63	10.2	104	0.99			
	MINIMUM	60	9.4	95	0.52			
AVERAGE		61.5	9.8	99	0.71			

STATION **Hamilton City Bridge** MILE 199.6

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-3-60	0855	61	9.8	99	0.73			
	1130	62	10.0	102				
	1430	63	10.0	103	0.65			
10-4-60	1730	63	10.0	103				
	2040	63	9.8	101	0.70			
	2320	61	9.7	98				
10-5-60	0215	61	9.7	98	0.65			
	0530	61	9.6	97				
	0830	61	9.7	98	0.70			
10-6-60	1120	62	10.1	103				
	1425	63	9.9	102	1.15			
	1725	63	10.1	104	1.13			
10-7-60	2040	62	9.8	100	0.60			
	2345	61	9.7	98	0.61			
	0240	61	9.7	98	0.69			
10-8-60	0545	61	9.7	98	0.67			
	0845	61	9.7	98	0.68			
	1130	62	9.8	100	0.80			
10-9-60	1430	62	9.7	99	0.80			
	1725	62	9.7	99				
	2030	62	9.6	98	0.65			
10-10-60	2320	61	9.6	98				
	0235	61	9.6	97	0.80			
	0530	61	9.6	97				
10-11-60	0835	61	9.7	98	0.85			
	1125	62	9.7	99				
	1425	63	9.7	100	0.84			
10-12-60	1720	63	9.8	101	0.87			
	2030	63	9.7	100	0.60			
	2325	62	9.6	98	0.61			
10-13-60	0240	62	9.5	97	0.70			
	0530	62	9.5	97	0.63			
	0830	62	9.5	97	0.60			
RANGE	MAXIMUM	63	10.1	104	1.15			
	MINIMUM	61	9.5	97	0.60			
AVERAGE		62	9.7	99	0.74			

STATION **Ord Ferry** MILE 184.5

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-3-60	0800 <sup>1</sup>	62	9.3	95	(0.81) <sup>4</sup>		(0.0) <sup>4</sup>	(0.0) <sup>4</sup>
	1055 <sup>2</sup>	62	9.8	100				
	1355 <sup>4</sup>	64	10.1	105	(1.01) <sup>5</sup>			
10-4-60	1655 <sup>2</sup>	64	9.9	103				
	2015	64	9.7	101	0.79	0.0	0.1	0.1
	2250	63	9.5	98				
10-5-60	0145	62	9.5	97	0.92			
	0455	62	9.5	97				
	0800	61	9.6	97	1.01	0.0	0.1	0.1
10-6-60	1050	62	9.8	100				
	1355	63	9.8	101	1.35			
	1650	64	10.0	104	1.35			
10-7-60	2005	64	9.8	102	0.74	0.0	0.0	0.1
	2310	63	9.6	99				
	0155	62	9.6	98	0.90			
10-8-60	0505	62	9.4	96	0.80			
	0800	61	9.6	97	0.96			
	1045	62	9.6	98	0.94			
10-9-60	1350	62	9.8	100	1.25	0.0	0.1	0.1
	1650	63	9.7	100				
	1955	63	9.5	98				
10-10-60	2245	63	9.4	97				
	0200	62	9.4	96	1.21	0.0	0.1	0.1
	0455	62	9.5	97				
10-11-60	0755	61	9.4	95	0.91	0.0	0.1	0.1
	1050	62	9.6	98				
	1350	63	9.8	101	0.79			
10-12-60	1650	64	9.9	103	0.73			
	2005	63	9.7	100	0.62			
	2250	63	9.7	99	0.62			
10-13-60	0155	63	9.5	98	0.77	0.0	(0.2) <sup>5</sup>	0.1
	0455	62	9.4	96	0.73			
	0755	62	9.4	96	0.80			
RANGE	MAXIMUM	64	10.1	105	1.35	0.0	(0.2) <sup>5</sup>	0.1
	MINIMUM	61	9.3	95	0.62	0.0	0.0	0.1
AVERAGE		62.5	9.6	99	0.90	0.0	0.1	0.1

Table T-11

RESULTS OF ANALYSES  
MIDDLE REACH INTENSIVE SAMPLING PROGRAM  
SEPTEMBER 12 - 16, 1960

EXPLANATORY COMMENTS

1. Unless otherwise noted, the stations are on the Sacramento River.
2. Values shown in parenthesis and marked with an asterisk ( )\* appeared unrealistic and were not used in computing maximum, minimum and average values.
3. Values for biochemical oxygen demand (BOD) and electrical conductance (EC) are results of analyses of single samples.

TABLE T-II  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
MIDDLE REACH INTENSIVE SAMPLING PROGRAM  
SEPTEMBER 12-16, 1960

STATION		MILE 184.5									
Ord Ferry		DATE	TIME PST	TEMP °F	D.O mg/l	O.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
9-12-60		0800	1050	64	9.5	99	0.40				125
				64	9.6	100	0.24				125
		1400	1710	66	9.8	104	0.49				125
9-13-60				67	9.6	103	0.82				125
				66	9.9	105	0.56				125
		0200	0450	65	9.6	101	(8.07)*				131
9-14-60				63	9.4	97	0.54				128
				64	9.6	100	0.55				---
		1415	1710	66	9.7	103	0.57				131
9-15-60				67	9.8	105	0.56				133
				66.5	9.6	103	0.40				135
		2305		65	9.5	100	0.63				135
9-16-60		0155	0455	64	9.2	96	0.53				130
				62	9.3	95	0.48				130
		0755	1120	62	9.6	98	0.59				130
9-17-60				63	9.6	99	0.52				130
				65.5	10.1	107	0.46				133
		1720		66	9.8	104	0.53				133
9-18-60				66	9.7	103	0.76				134
				65	9.5	100	0.50				138
		2010	2305	66	9.7	103	0.76				134
9-19-60				65	9.5	100	0.50				138
				63	9.5	98	0.52				134
		0500		62	9.6	98	0.62				133
9-20-60				62	9.5	97	0.56				134
				63	9.7	100	0.45				133
		1400	1710	64.5	9.9	104	0.41				130
9-21-60				65	10.0	105	0.45				130
				65	9.8	103	0.34				130
		2300		64	9.6	100	0.42				133
9-22-60		0155	0510	62	9.6	98	0.61				131
				61	9.6	97	0.29				134
RANGE	MAXIMUM	67	10.1	107	0.82					138	
	MINIMUM	61	9.2	95	0.24					124	
AVERAGE		64.5	9.6	101	0.51					131	

STATION		MILE 180.1									
Jacinto		DATE	TIME PST	TEMP °F	D.O mg/l	O.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
9-12-60		0835	1110	63	9.6	99					
				64	9.6	100					
		1440	1730	66	9.8	104					
9-13-60				67	9.7	104					
				66	9.4	100					
		2025	2330	67	9.7	104					
9-14-60				66	9.4	101					
				64	9.4	98					
		0825	1145	64	9.4	98					
9-15-60				64	9.8	105					
				64	9.6	105					
		1435	1730	67	9.8	105					
9-16-60				67	10.0	108					
				66	9.4	100					
		2050	2330	67	9.4	100					
9-17-60		0215	0515	64	9.3	97					
				63	9.6	99					
		0810	1140	67	9.4	101					
9-18-60				64	9.6	100					
				67	9.6	101					
		1430	1740	65.5	9.9	105					
9-19-60				66.5	10.0	108					
				66.5	9.6	98					
		2040	2325	66	9.3	98					
9-20-60		0210	0520	64	9.3	97					
				63	9.5	98					
		0805	1140	62	9.4	96					
9-21-60				63	9.7	100					
				63	9.7	100					
		1515	1735	64	9.8	102					
9-22-60				65	9.9	104					
				65	9.9	104					
		2055	2320	65	9.8	103					
9-23-60		0215	0530	63	9.3	96					
				61.5	9.4	95					
RANGE	MAXIMUM	67	10.0	108							
	MINIMUM	61.5	9.3	95							
AVERAGE		65	9.6	101							

STATION		MILE 180.0R									
Jacinto Slough		DATE	TIME PST	TEMP °F	D.O mg/l	O.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
9-12-60		1440		76	4.1	48	3.55				
9-13-60		1145		73	1.5	17					
9-14-60		1430		71	2.9	33	1.52				
9-15-60		2040		69	1.8	20					
9-16-60		1515		71	2.5	28	2.09				
9-17-60		2055		68	2.0	22	1.04				
9-18-60											
9-19-60											
9-20-60											
9-21-60											
9-22-60											
RANGE	MAXIMUM	76	4.1	48	3.55						
	MINIMUM	68	1.5	17	1.04						
AVERAGE		71.5	2.5	28	2.05						

STATION		MILE 168.6									
Butte City		DATE	TIME PST	TEMP °F	D.O mg/l	O.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
9-12-60		0920		64	9.4	98	0.44				
				65.5	9.8	104	0.44				
9-13-60		1520		67	9.8	105	0.57				
				67	9.8	105	0.54				
9-14-60		2105		67	9.6	103	0.26				
				67	9.6	103	0.41				
9-15-60		0300		66	9.4	99	0.87				134
				65	9.2	97	0.40				
9-16-60		0855		66	9.3	99	0.62				
				67	9.7	104	0.60				
9-17-60		1510		67	9.9	106	0.59				
				67	9.9	106	0.60				
9-18-60		2120		66.5	9.5	102	0.41				
				64	9.2	96	0.29				
9-19-60		0255		64	9.2	96	0.50				
				65	9.1	96	0.49				
9-20-60		0840		65	9.3	98	0.59				
				66	9.7	103	1.02				
9-21-60		1530		67	10.0	107	0.62				
				66.5	9.8	105	0.61				
9-22-60		2120		66	9.6	102	0.58				
				65	9.5	100	0.49				
9-23-60		0240		65	9.2	99	0.58				
				64.5	9.4	97	0.65				
9-24-60		0830		64	9.4	98	0.53				
				65	9.8	103	0.51				
9-25-60		1605		65.5	9.8	104	0.52				
				65	10.0	105	0.62				
9-26-60		2130		64.5	9.6	101	0.50				
				64	9.6	100	0.42				
9-27-60		0245		64	9.5	99	(2.18)*				
				63.5	9.3	96	0.72				
RANGE	MAXIMUM	67	10.0	107	1.02						
	MINIMUM	63.5	9.1	96	0.26						
AVERAGE		65.5	9.6	101	0.55						

TABLE T-II (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

MIDDLE REACH INTENSIVE SAMPLING PROGRAM

SEPTEMBER 12-16, 1960

STATION Above Canyon Landing		MILE 139.8									
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	% SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC × 10 <sup>4</sup> at 25°C		
9-12-60	0815	63	8.8	91							
	1140	66	8.9	95							
	1430	69	9.3	102							
9-13-60	1700	68	9.4	102							
	2000	69	9.5	102							
	2340	67	9.2	99							
	0225	67	9.1	98							
	0510	67	9.0	97							
	0810	67	9.1	98							
9-14-60	1105	68	9.0	98							
	1400	68	9.2	100							
	1730	68	9.3	101							
	2000	67	9.5	102							
	2250	67	9.5	102							
	0210	66	9.3	99							
9-15-60	0455	65	9.1	96							
	0805	65	9.1	96							
	1100	67	9.0	97							
	1405	67	9.2	99							
	1710	68	9.4	102							
	2000	67	9.2	99							
9-16-60	2255	66	9.3	99							
	0155	65	9.3	98							
	0455	64	9.0	94							
	0815	64	9.0	94							
	1110	66	9.1	97							
	1400	67	9.1	98							
RANGE	MAXIMUM	69	9.7	104							
	MINIMUM	63	8.8	91							
	AVERAGE	66.5	9.2	99							

STATION Colusa Bridge		MILE 144.1									
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	% SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC × 10 <sup>4</sup> at 25°C		
9-12-60	0850	65	9.0	95	0.37						
	1225	67	8.9	96	0.42						
	1510	68	9.1	99	0.53						
9-13-60	1740	69	9.2	101	0.90						
	2130	68	9.1	99	0.81						
	0015	68	9.4	102	0.53						
	0305	68	9.2	100	0.65						
	0650	67	9.3	100	0.56						
	0845	67	9.2	99	0.94						
9-14-60	1145	68	9.1	99	0.60						
	1450	69	9.2	100	0.69						
	1755	68	9.2	101	0.54						
	2050	68	9.1	99	1.02						
	2330	68	9.1	99	0.98						
	0250	67	9.2	99	0.96						
9-15-60	0530	66	9.3	99	0.61						
	0840	66	9.2	98	0.48						
	1150	67	9.1	98	0.38						
	1445	68	9.2	100	0.58						
	1745	68	9.2	100	0.59						
	2040	68	9.0	98	0.85						
9-16-60	2335	67	9.0	97	0.74						
	0235	66	9.0	96	1.24						
	0540	66	9.0	96	0.77						
	0845	65	9.3	98	0.73						
	1145	66	9.0	96	0.38						
	1445	67	9.2	99	0.60						
RANGE	MAXIMUM	69	9.4	102	1.26						
	MINIMUM	64	8.9	95	0.37						
	AVERAGE	67	9.2	99	0.70						

STATION Above Butte Slough		MILE 139.0									
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	% SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC × 10 <sup>4</sup> at 25°C		
9-12-60	0930	66	9.1	97	0.47				132		
	1310	68	8.9	97	0.76				132		
	1545	68	9.2	100	0.51				129		
9-13-60	1825	69	9.2	101	1.17				131		
	2220	68	9.1	99	0.66				129		
	0100	68	9.1	99	0.55				127		
	0345	68	9.1	99	0.75				134		
	0620	67	9.2	99	0.47				134		
	0915	67	9.2	99	0.69				---		
9-14-60	1225	68	9.1	99	0.58				---		
	1515	68	9.2	100	0.55				136		
	1825	69	9.1	100	0.50				139		
	2125	67	9.0	97	0.49				137		
	0010	68	9.2	100	0.71				137		
	0325	67	9.2	99	1.00				138		
9-15-60	0610	67	9.1	98	0.76				137		
	0910	67	9.2	99	0.82				138		
	1230	68	9.1	99	0.54				135		
	1520	68	9.0	98	0.58				138		
	1830	68	9.2	100	0.55				136		
	2120	68	8.9	97	0.45				138		
9-16-60	0010	67	8.9	96	0.60				146		
	0305	67	8.9	96	1.01				136		
	0610	66	8.9	95	0.83				135		
	0920	66	9.2	98	0.60				140		
	1225	67	9.1	98	0.40				140		
	1515	67	9.2	99	0.48				136		
RANGE	MAXIMUM	69	9.5	101	1.17				146		
	MINIMUM	65	8.9	95	0.39				127		
	AVERAGE	67.5	9.1	99	0.63				136		

STATION Butte Slough		MILE 148.9L									
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	% SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC × 10 <sup>4</sup> at 25°C		
9-12-60	0950	75	6.5	73	0.81				353		
	1330	76	6.1	72	1.32				358		
	1615	78	6.2	75	1.35				352		
9-13-60	1855	77	5.9	70	1.21				354		
	2245	77	6.0	72	1.11				354		
	0120	76	6.1	72	0.90				351		
	0407	76	6.5	74	0.97				348		
	0645	75	6.5	73	0.89				344		
	0935	75	6.1	71	1.22				348		
9-14-60	1250	75	5.9	69	1.33				365		
	1545	76	5.8	68	1.69				363		
	1850	75	5.7	66	1.29				356		
	2150	75	5.8	67	1.07				347		
	0035	75	6.3	73	1.34				347		
	0345	74	6.5	76	1.14				370		
9-15-60	0625	73	6.2	71	0.43				351		
	0930	74	6.2	72	1.84				340		
	1245	75	5.9	69	1.04				364		
	1550	75	5.8	67	1.21				353		
	1850	74	5.6	65	1.05				353		
	2145	73	5.6	64	0.97				364		
9-16-60	0030	73	6.0	69	1.00				341		
	0330	72	6.1	69	1.36				349		
	0635	71	6.2	70	1.16				349		
	0955	72	6.1	69	0.96				369		
	1250	73	6.0	69	1.27				371		
	1530	73	5.9	68	1.37				371		
RANGE	MAXIMUM	78	6.6	76	1.84				396		
	MINIMUM	70	5.6	64	0.43				340		
	AVERAGE	74	6.1	70	1.17				358		

TABLE T-II (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
MIDDLE REACH INTENSIVE SAMPLING PROGRAM  
SEPTEMBER 12-16, 1960

STATION Meridian		MILE 124.6							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
9-12-60	0810	64	9.2	96	0.46				
	1130	64	9.2	96	0.49				
	1415	68	9.3	101	0.53				
9-13-60	2020	68	9.3	101	0.43				
	2340	68	9.0	98	0.42				
	0208	67.5	9.1	99	0.48				
9-14-60	0449	67.5	8.6	93	1.50				
	0740	67	8.8	95	0.60				
	1110	68	9.0	98	0.55				
9-15-60	1400	68	9.2	100	0.61				
	1700	69	9.2	101	0.59				
	1950	69	9.1	100	0.49				
9-16-60	2302	69	9.3	102	0.51				
	0203	68	8.5	92	0.55				
	0449	68	9.4	102	0.64				
9-17-60	0807	68	8.5	92	0.49				
	1100	68	9.2	100	0.59				
	1350	68	9.1	99	0.50				
9-18-60	1725	69	9.1	100	0.65				
	2000	69	9.0	99	0.53				
	2250	68	9.1	98	0.53				
9-19-60	0155	67.5	8.7	95	0.56				
	0500	67	8.9	96	0.55				
	0745	67	9.0	97	0.56				
9-20-60	1100	67	9.2	99	0.51				
	1345	68	9.3	101	0.54				
	1715	68	9.2	100	0.53				
9-21-60	2000	68	9.1	99	0.54				
	2305	67	9.1	98	0.75				
	0205	67	9.0	97	1.04				
9-22-60	0505	66	9.2	98	0.47				
RANGE	MAXIMUM	69	9.4	102	1.50				
	MINIMUM	64	8.5	92	0.42				
AVERAGE		67.5	9.1	98	0.58				

STATION Above R. D. #70		MILE 124.3							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
9-12-60	0907	64	9.1	95	0.40				
	1230	64	9.2	96	0.53				142
	1520	68	9.4	102	0.44				140
9-13-60	1825	68	9.3	101	0.51				140
	2110	68	9.3	101	0.43				141
	0120	67.5	8.9	96	0.39				141
9-14-60	0300	68	8.8	96	0.29				148
	0525	67.5	9.0	97	0.38				139
	0915	68	8.9	97	0.45				145
9-15-60	1200	68	9.1	99	0.55				143
	1505	69	9.1	100	0.60				148
	1835	69	9.0	99	0.57				154
9-16-60	2110	68	9.0	98	0.50				146
	2345	68	8.8	96	0.47				144
	0315	68	8.7	95	0.97				148
9-17-60	0549	68	8.7	95	0.42				148
	0907	68	8.5	92	0.47				150
	1200	68	9.0	98	0.54				150
9-18-60	1520	69	9.0	99	0.62				147
	1815	69	9.0	99	0.60				151
	2125	68	9.0	98	0.57				154
9-19-60	2355	68	8.9	97	0.52				150
	0305	67.5	9.0	98	0.53				148
	0655	67	10.3	111	0.43				145
9-20-60	0900	67	9.1	98	0.47				152
	1230	68	9.1	99	0.48				153
	1500	68	9.2	100	0.46				153
9-21-60	1800	68	9.1	99	0.53				148
	2125	68	9.1	99	0.49				150
	0028	67	9.1	98	0.37				152
9-22-60	0310	66	9.7	103	0.34				152
	0640	66	(7.1)*	(76)*	0.31				150
RANGE	MAXIMUM	69	10.3	111	0.97				157
	MINIMUM	64	8.5	92	0.29				139
AVERAGE		68.5	9.1	98	0.49				148

STATION R. D. #70		MILE 124.2L							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
9-12-60	1220	76	6.5	76	1.55				629
	1505	77	7.5	89	1.70				628
	1805	78	7.5	90	1.72				633
9-13-60	2125	78	---	---	1.84				632
	0045	76	7.0	82	1.71				632
	0900	72.5	5.8	65	1.65				674
9-14-60	1150	77	6.6	79	2.14				642
	1455	77	7.4	88	2.44				653
	1820	77	7.7	92	2.65				667
9-15-60	2050	76	7.7	91	2.13				650
	0010	74	6.9	80	1.76				667
	0255	71.5	6.6	75	1.51				639
9-16-60	0530	69.5	5.9	66	1.60				639
	0848	69	6.4	70	1.34				727
	1145	72	6.5	74	1.97				680
9-17-60	1500	76	8.0	94	2.39				644
	1800	75	8.1	94	2.17				711
	2105	73	7.9	91	1.86				662
9-18-60	2335	74	6.9	80	1.53				659
	0248	69.5	6.9	77	1.48				658
	0545	67.5	6.4	70	1.55				642
9-19-60	0840	67	6.6	71	1.15				692
	1150	70	7.9	88	1.67				669
	1445	73	7.7	89	1.87				656
9-20-60	1745	73	8.5	98	1.90				656
	2110	73	7.7	89	1.89				648
	0007	68	7.1	77	1.66				740
9-21-60	0250	67.5	7.1	77	1.16				639
	0622	66	6.9	73	2.11				638
RANGE	MAXIMUM	78	8.5	98	2.65				740
	MINIMUM	66	5.8	65	1.15				628
AVERAGE		73	7.1	82	1.80				659

STATION At Wilkins Slough		MILE 118.1							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
9-12-60	1005	64	---	---					
	1308	69	9.1	100					
	1545	69	9.2	101					
9-13-60	1900	69	9.2	101					
	2230	68	9.2	100					
	0335	67.5	9.0	97					
9-14-60	0555	67.5	8.6	93					
	0950	68	8.3	90					
	1240	69	9.0	99					
9-15-60	1535	69	9.0	99					
	1900	69	9.1	100					
	2135	69	9.0	99					
9-16-60	0045	68	8.7	94					
	0345	68	8.8	96					
	0613	67.5	8.7	95					
9-17-60	0942	68	9.0	97					
	1245	69	8.8	97					
	1545	70	8.8	98					
9-18-60	1840	69	9.0	99					
	2145	69	9.2	101					
	0032	68	8.7	95					
9-19-60	0336	67.5	8.9	97					
	0634	67	8.7	94					
	0940	67	8.8	95					
9-20-60	1300	68	9.1	99					
	1635	69	9.1	100					
	1830	69	9.1	100					
9-21-60	2150	68	9.1	99					
	0105	67	9.2	99					
9-22-60	0350	67	9.0	96					
	0717	66	8.7	93					
RANGE	MAXIMUM	70	9.2	101					
	MINIMUM	64	8.3	90					
AVERAGE		68	8.9	97					

TABLE T-II (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

MIDDLE REACH INTENSIVE SAMPLING PROGRAM

SEPTEMBER 12-16, 1960

STATION		MILE 100.2									
Above R. D. #108		DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
9-12-60		0811		67.5	8.9	97	0.73				149
		1110		69	8.5	93	0.74				149
		1410		69	9.0	99	0.45				151
		1645		69	9.1	100	0.53				149
		2030		68.5	9.0	99	0.57				148
		2310		68	8.9	97	0.60				149
9-13-60		0130		68	8.5	92	0.40				146
		0530		66	9.3	99	0.66				155
		0815		68	---	--	0.29				154
		1050		68	---	--	0.47				156
		1410		69	9.0	99	0.46				154
		1700		68.5	8.9	98	0.57				152
		2010		68.5	9.0	99	0.57				152
		2305		68	8.9	97	0.75				156
9-14-60		0230		68	8.7	95	0.45				148
		0515		69	8.8	97	0.46				151
		0750		67	8.8	95	0.44				149
		1045		69	8.8	97	0.40				157
		1350		68.5	9.0	99	0.77				157
		1655		71	8.9	100	0.73				154
		2005		70	8.6	96	0.56				156
		2305		68	8.9	97	0.69				157
9-15-60		0215		68	8.8	96	0.52				157
		0513		68	8.9	97	0.58				156
		0720		68	8.8	96	0.66				158
		1100		68	8.8	96	0.62				158
		1400		68	8.9	97	0.51				156
		1625		68	9.3	101	0.53				154
		2010		68	8.9	97	0.53				159
		2305		67	9.0	97	0.34				156
9-16-60		0215		67	8.9	96	0.40				152
		0445		67	8.8	95	1.10				157
RANGE	MAXIMUM	71	9.3	101	1.10						159
	MINIMUM	66	7.8	92	0.29						146
AVERAGE		68	8.9	97	0.57						154

STATION		MILE 100.18									
R. D. #108		DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
9-12-60		0835		74	3.7	43	2.51				658
		1145		74	3.9	45	2.16				687
		1425		75	3.9	45	1.49				706
		1650		75.5	5.4	64	2.08				705
		2100		76	5.6	66	2.39				674
		2320		73	3.8	44	1.90				681
9-13-60		0200		72	3.1	35	1.89				681
		0600		71	3.4	38	2.91				713
		0830		71	---	--	1.89				705
		1110		72	---	--	2.27				703
		1425		73	4.2	48	2.24				698
		1710		74	3.8	44	2.81				695
		2025		72.5	3.5	40	2.30				676
		2325		72	3.4	39	1.84				693
9-14-60		0245		69	3.1	34	2.01				693
		0535		67	3.0	32	2.03				704
		0800		68	2.8	30	2.39				751
		1145		71	3.3	37	1.92				748
		1415		73	3.7	43	2.20				738
		1710		73	4.2	48	2.70				631
		2020		70	4.3	48	1.79				668
		2320		69	4.5	49	2.45				680
9-15-60		0225		68	4.1	45	1.13				638
		0530		64	4.2	44	2.26				598
		0730		67	4.4	47	2.46				572
		1120		69	4.6	51	2.29				654
		1415		71	4.6	52	2.60				619
		1635		70.5	5.4	61	2.30				636
		2025		67	4.9	53	1.87				638
		2315		66	4.7	50	2.03				725
9-16-60		0230		65	4.5	47	2.06				741
		0500		65	4.5	47	1.90				741
RANGE	MAXIMUM	76	5.6	66	2.91						751
	MINIMUM	64	2.8	30	1.13						572
AVERAGE		70.5	4.1	46	2.16						683

STATION		MILE 93.7									
Above R. D. #787		DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
9-12-60		0927		69	8.7	96	0.71				160
		1230		69	8.3	91	0.57				174
		1450		71	8.6	97	0.59				176
		1730		69.5	8.7	97	0.60				177
9-13-60		2130		69	9.2	101	0.44				167
		0000		67.5	7.4	80	0.55				166
		0230		66	(6.4)*	(68)*	0.44				161
		0615		68	8.7	95	0.36				161
		0850		71	---	--	0.48				171
		1230		69	---	--	0.54				170
		1450		68.5	8.8	97	0.50				164
		1740		68.5	8.8	97	0.53				169
9-14-60		2105		68	9.4	102	0.58				169
		0000		69	8.8	97	0.70				172
		0325		68	8.3	90	0.90				172
		0625		68	8.6	93	1.05				164
		0820		68	8.9	97	0.70				164
		1155		69	8.5	93	0.59				170
		1445		69	8.6	95	0.67				170
		1730		69	8.4	92	0.58				171
		2100		70	8.7	97	0.74				174
		2345		68	8.8	96	0.50				166
9-15-60		0310		68	8.5	92	1.22				166
		0600		68	8.5	92	1.04				171
		0820		68	8.5	92	0.61				172
		1145		68	8.6	93	0.51				169
		1510		70.5	8.8	99	0.54				166
		1710		68	8.9	97	0.50				168
		2055		66	8.9	95	---				164
		2350		67	8.9	96	0.48				172
9-16-60		0245		67	8.9	96	0.51				173
		0540		68	9.0	98	0.71				173
RANGE	MAXIMUM	71	9.4	102	1.22						177
	MINIMUM	66	7.4	80	0.36						160
AVERAGE		68.5	8.7	95	0.63						169

STATION		MILE 93.68									
R. D. #787		DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
9-12-60		0945		71	3.2	35	1.95				
		1315		73	3.8	44	2.03				
9-13-60		0300		70	4.2	47	2.25				
		0625		69	3.0	33	1.70				
		0900		72	---	--	2.17				
		1145		72	---	--	2.42				
		1500		74.5	4.3	50	2.89				
		1755		74	4.4	51	4.53				
9-14-60		2120		72	5.8	66	2.54				
		0010		70	5.2	58	2.05				
		0335		70	5.4	60	1.88				
		0640		70	4.5	50	2.67				
		0845		70	2.7	30	2.41				
		1205		71	3.8	43	2.29				
		1455		74	4.5	52	2.19				
		1750		74	2.4	28	2.63				
9-15-60		2120		72	2.0	23	2.14				
		0005		70	3.6	40	2.49				
		0320		---	---	--	1.97				
		0615		68							

TABLE T-II (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

MIDDLE REACH INTENSIVE SAMPLING PROGRAM

SEPTEMBER 12-16, 1960

STATION		Above Colusa Drain										MILE 90.5				
DATE	TIME PST	TEMP °F	D.O. mg/l	% SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C							
9-12-60	1010	68.5	8.8	97	0.56				160							
	1345	70	9.9	100	0.32				---							
	1610	68.5	8.5	93	0.69				175							
	1815	69.5	8.7	97	1.13				179							
9-13-60	2215	69	7.8	86	0.42				175							
	0110	67	7.8	84	0.32				167							
	0400	67	8.4	90	0.41				165							
	0700	68	---	---	0.43				162							
	0945	69	---	---	0.57				172							
	1320	69.5	9.2	102	0.56				168							
	1600	69	8.7	96	0.62				167							
	1820	68	8.8	96	0.59				168							
9-14-60	2200	67	8.8	95	0.49				178							
	0145	68	8.7	95	0.47				178							
	0350	67	8.7	94	0.71				168							
	0720	68	8.7	95	0.57				168							
	0930	69	8.7	96	0.52				172							
	1220	70	8.6	96	0.51				170							
	1550	69	8.6	95	0.64				178							
	1810	69	8.7	96	(7.00)*				173							
9-15-60	2155	68	8.7	95	0.55				166							
	0120	68	8.8	96	0.93				172							
	0330	68	8.7	95	0.65				171							
	0700	68	8.5	92	0.65				167							
	0900	68	8.5	92	0.70				165							
	1240	68	8.7	95	0.47				165							
	1545	69.5	8.0	89	0.67				166							
	1750	69	8.8	97	0.52				168							
9-16-60	2150	66	8.8	94	---				169							
	0015	68	8.9	97	0.53				170							
	0345	68	8.9	97	0.41				170							
	0600	68	8.8	96	0.67				170							
RANGE	MAXIMUM	70	9.2	102	1.23				179							
	MINIMUM	66	7.8	84	0.32				160							
AVERAGE		68.5	8.6	94	0.58				170							

STATION		Colusa Basin Drain										MILE 90.2R				
DATE	TIME PST	TEMP °F	D.O. mg/l	% SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C							
9-12-60	1015	73	7.4	85	1.16				460							
	1349	75	7.3	85	---				457							
	1615	75	7.3	85	1.23				448							
	1820	76	7.4	87	0.55				454							
9-13-60	2225	75	7.3	85	0.67				450							
	0120	74	7.3	86	1.15				457							
	0410	74	7.5	87	1.12				465							
	0710	72	---	---	1.28				459							
	0955	73	---	---	1.22				465							
	1330	74.5	7.9	92	0.93				455							
	1610	75	6.8	79	1.28				473							
	1830	75	7.2	84	1.24				468							
9-14-60	2210	75.5	7.3	86	1.26				432							
	0200	74	7.2	84	1.11				432							
	0400	73	7.5	86	1.22				442							
	0730	73	7.6	87	1.21				442							
	0950	72	7.5	85	1.14				464							
	1230	73	7.5	86	0.84				464							
	1605	73.5	7.5	86	1.06				452							
	1820	74	7.6	88	1.05				433							
9-15-60	2205	73.5	7.6	87	1.16				457							
	0140	73	7.5	86	1.09				457							
	0350	70	7.8	87	0.35				468							
	0710	71	7.7	87	1.24				463							
	0920	71	7.8	88	0.97				464							
	1250	71	8.0	90	0.95				467							
	1600	72	7.9	90	1.07				465							
	1800	72	8.0	91	0.98				495							
9-16-60	2205	66	8.0	85	(3.31)*				510							
	0030	69	8.0	88	0.94				487							
	0400	68	8.0	87	1.16				472							
	0610	69	7.9	87	1.07				494							
RANGE	MAXIMUM	76	8.0	92	1.28				510							
	MINIMUM	66	6.8	84	0.35				432							
AVERAGE		73	7.6	86	1.06				461							

STATION		Above Sacramento Slough										MILE 81.5				
DATE	TIME PST	TEMP °F	D.O. mg/l	% SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C							
9-12-60	0830	72	7.8	89	0.54				218							
	1215	70	7.9	88	0.67				220							
	1400	70	8.2	91	---				218							
	1700	70	8.4	93	0.59				218							
	2000	70	8.5	94	0.70				225							
	2330	70	8.3	92	0.42				225							
9-13-60	0210	70	---	---	0.47				232							
	0510	70	8.3	92	0.62				234							
	0800	70	8.4	93	0.57				223							
	1110	70	8.5	94	0.55				220							
	1400	71	8.4	94	0.71				224							
	2010	70	8.3	92	(4.45)*				226							
9-14-60	2320	70	8.4	93	0.54				217							
	0210	69	8.3	91	0.57				218							
	0515	69	8.4	92	0.76				209							
	0800	69	8.4	92	0.48				217							
	1100	70	8.0	89	(2.28)*				212							
	1410	71	8.8	99	0.72				212							
	1700	70	8.4	93	0.70				212							
	2000	69	8.7	96	0.62				221							
9-15-60	2315	69	8.4	92	0.58				222							
	0215	69	8.3	91	0.84				217							
	0530	69	8.4	92	0.62				218							
	0805	69	8.4	92	0.55				217							
	1100	69	8.5	93	0.74				213							
	1400	70	8.5	94	0.52				216							
	1700	70	8.5	94	0.76				208							
	2000	68	8.1	88	0.56				208							
9-16-60	2320	68	8.5	92	0.51				208							
	0220	68	8.5	92	0.55				204							
	0510	68	8.5	92	0.54				204							
	0715	68	8.6	93	0.57				204							
RANGE	MAXIMUM	72	8.8	99	0.76				234							
	MINIMUM	68	7.8	88	0.42				204							
AVERAGE		69.5	8.4	92.5	0.61				217							

STATION		Sacramento Slough										MILE 80.8L				
DATE	TIME PST	TEMP °F	D.O. mg/l	% SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C							
9-12-60	0845	74	6.1	70	1.16				468							
	1230	75	6.3	73	1.25				477							
	1430	76	6.5	76	0.89				479							
	1730	77	6.6	79	1.15				481							
	2030	76	6.5	76	1.05				465							
	2350	75	6.3	73	1.11				483							
9-13-60	0225	74	6.1	71	1.02				490							
	0520	74	6.1	71	0.92				488							
	0820	73	6.1	70	1.08				493							
	1140	74	6.2	72	1.50				494							
	1430	76	6.6	78	1.45				502							
	2040	75	6.7	78	2.44				495							
9-14-60	2345	74	6.4	74	1.05				499							
	0240	73	6.2	71	0.99				504							
	0545	73	6.2	71	1.10				504							
	0830	72	6.2	70	0.93				465							
	1130	73	6.3	72	1.63				465							
	1430	75	6.7	78	1.21				509							
	1730	75	6.8	79	1.42				509							
	2030	74	6.6	77	1.20				510							
9-15-60	2340	73	6.6	76	0.99				486							
	0240	72	6.5	74	1.10				498							
	0550	71	6.5	73	1.03				486							
	0830	70	6.4	71	1.05				495							
	1130	71	6.7	75	1.07				510							
	1430	72	6.9	78	1.27				520							
	1730	73	7.0	80	1.27				520							
	2030	72	6.9	78	1.01				519							
9-16-60	2345	71	6.7	75	1.00				520							

TABLE T-II (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
MIDDLE REACH INTENSIVE SAMPLING PROGRAM  
SEPTEMBER 12-16, 1960

STATION Feather River		MILE 79.9									
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C		
9-12-60	0900	77	8.0	95	1.05				131		
	1245	80	8.9	110	1.16				131		
	1500	82	8.3	106	1.08				132		
9-13-60	1800	82	8.8	110	1.16				133		
	2100	78	8.3	100	0.87				133		
	0005	76	8.1	95	0.99				134		
9-14-60	0245	75	8.0	92	---				140		
	0545	75	8.3	97	1.03				130		
	0945	75	8.1	94	1.17				146		
9-14-60	1200	78	8.3	102	1.14				138		
	1500	81	8.6	108	1.36				136		
	2115	76	8.3	98	2.09				135		
9-14-60	0015	75	8.2	95	1.02				133		
	0300	74	8.0	93	1.09				136		
	0600	74	7.9	92	1.01				138		
9-14-60	0900	74	8.1	94	1.00				136		
	1800	76	8.6	101	1.78				136		
	1500	80	8.7	107	1.31				134		
9-15-60	1800	79	8.6	105	1.31				132		
	2100	74	8.5	99	1.13				138		
	0000	72	8.4	95	1.39				138		
9-15-60	0255	72	8.3	94	1.10				137		
	0610	72	8.2	93	1.17				136		
	0850	71	8.4	94	1.06				140		
9-15-60	1800	74	8.7	101	1.87				137		
	1500	76	9.0	106	---				142		
	1800	75	9.0	105	1.33				142		
9-16-60	2100	72	8.8	102	0.90				140		
	0000	70	8.7	97	1.01				140		
	0300	70	8.6	96	0.90				144		
9-16-60	0605	70	8.4	93	1.00				136		
	0735	69	8.6	94	0.88				140		
RANGE	MAXIMUM	82	9.0	110	2.09				146		
	MINIMUM	69	7.9	92	0.87				130		
AVERAGE		75	8.4	99	1.18				137		

STATION Above Prichard Lake Pump		MILE 77.9									
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C		
9-12-60	1800	71	8.1	90	0.66				238		
	1330	74	8.2	95	0.79				233		
	1600	74	8.2	95	0.62				234		
9-13-60	1900	72	8.1	92	0.58				234		
	2145	70	8.1	90	0.61				235		
	0030	70	8.0	89	0.67				250		
9-13-60	0315	70	8.0	89	0.62				234		
	0615	70	8.0	89	0.39				244		
	0930	70	8.2	91	0.58				238		
9-14-60	1250	72	8.3	94	0.68				246		
	1600	72	8.1	92	0.79				238		
	2200	71	8.3	96	1.35				248		
9-14-60	0045	70	8.3	92	0.56				248		
	0330	69	8.1	89	0.68				240		
	0630	70	8.0	89	0.65				247		
9-14-60	0933	70	8.1	90	0.62				234		
	1300	70	8.2	91	1.80				235		
	1600	72	8.4	95	0.81				241		
9-15-60	1845	70	8.3	92	0.73				241		
	2150	70	8.3	92	0.83				243		
	0015	69	8.3	91	0.56				242		
9-15-60	0330	69	8.3	91	0.76				236		
	0630	69	8.3	91	0.64				229		
	0930	69	8.2	90	0.57				231		
9-15-60	1300	70	8.2	91	0.65				239		
	1600	70	8.4	93	0.66				242		
	1900	70	8.4	93	0.77				236		
9-16-60	2200	68	8.5	92	0.33				232		
	0030	68	8.4	91	0.49				223		
	0325	68	8.3	90	0.61				225		
9-16-60	0645	68	8.4	91	0.99				226		
	0750	68	8.4	91	0.64				226		
RANGE	MAXIMUM	74	8.3	96	1.80				258		
	MINIMUM	68	7.9	88	0.39				223		
AVERAGE		70	8.2	91	0.72				239		

STATION Kibbena Ferry		MILE 71.8									
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C		
9-12-60	0830	71	8.3	96							
	1100	72	8.3	94							
	1400	73	8.4	97							
9-13-60	1700	73	8.6	99							
	2010	73	8.3	95							
	2305	73	8.4	97							
9-13-60	0200	73	8.0	92							
	0500	71	8.0	90							
	0800	71	8.1	91							
9-14-60	1100	72	8.1	92							
	1400	73	8.3	95							
	1710	73	8.4	97							
9-14-60	2000	73	8.2	94							
	2305	73	8.0	92							
	0200	72	8.1	92							
9-14-60	0510	71	7.1	80							
	0800	71	8.1	91							
	1140	72	8.2	93							
9-15-60	1425	72	8.4	95							
	1715	73	8.3	95							
	2000	72	8.3	94							
9-15-60	2305	70	8.1	90							
	0200	70	7.6	84							
	0500	70	8.0	89							
9-15-60	0800	69	8.1	89							
	1100	70	8.3	92							
	1400	71	8.3	93							
9-16-60	1700	71	8.5	96							
	2000	71	8.2	92							
	2355	69	8.1	89							
9-16-60	0200	69	8.2	90							
	0500	68	8.4	91							
RANGE	MAXIMUM	73	8.6	99							
	MINIMUM	68	7.1	80							
AVERAGE		71.5	8.2	92							

STATION R. P. #1000 (S)		MILE 66.1									
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C		
9-12-60	0900	74	5.8	67							
	1120	76	7.3	86							
	1420	79	9.1	111							
9-13-60	1720	79	9.0	110							
	2030	77	8.4	100							
	2300	74	7.2	83							
9-13-60	0230	73	6.1	70							
	0520	71	5.7	64							
	0820	71	5.6	63							
9-14-60	1120	75	7.3	85							
	1420	77	8.9	106							
	1730	76	7.4	87							
9-14-60	2020	75	7.9	92							
	2320	72	6.3	74							
	0220	71	6.4	72							
9-14-60	0530	69	5.9	65							
	0820	70	6.1	68							
	1155	74	8.0	93							
9-15-60	1450	75	8.2	95							
	1730	75	7.9	92							
	2020	70	7.3	85							
9-15-60	2330	71	7.5	84							
	0230	68	7.4	80							

TABLE T-11 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
MIDDLE REACH INTENSIVE SAMPLING PROGRAM  
SEPTEMBER 12-16, 1960

STATION		MILE 66.6									
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x10 <sup>6</sup> at 25°C		
9-12-60	0800	72	7.8	89	0.84				247		
	1120	72	7.9	90	0.85				241		
	1400	73	8.2	94	0.70				239		
9-13-60	0200	73	8.1	93	1.07				234		
	0500	73	8.0	91	0.51				232		
	0800	72	8.1	93	0.65				240		
9-14-60	0200	72	8.2	93	0.76				237		
	0500	72	8.0	91	0.63				247		
	0800	71	8.0	90	0.70				248		
9-15-60	0200	71	8.3	93	0.74				239		
	0500	71	8.2	92	0.76				236		
	0800	70	8.3	92	0.73				242		
9-16-60	0200	70	8.4	93	0.84				236		
	0500	70	8.3	92	0.57				236		
RANGE	MAXIMUM	74	8.8	101	1.15				248		
	MINIMUM	70	7.8	89	0.44				222		
AVERAGE		72	8.3	93	0.78				239		

STATION		MILE 61.54									
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x10 <sup>6</sup> at 25°C		
9-12-60	0920	73	4.8	55	1.44				536		
	1145	75	4.8	56	1.88				542		
	1435	77	4.9	58	2.88				551		
9-13-60	0200	74	3.6	42	1.17				547		
	0500	73	4.4	51	1.31				543		
	0825	72	4.2	48	1.34				533		
9-14-60	0200	73	5.1	59	1.21				568		
	0500	72	4.0	45	1.46				553		
	0800	75	4.4	51	1.46				586		
9-15-60	0200	71	4.3	48	1.37				576		
	0500	69	4.8	53	1.51				531		
	0800	70	4.7	52	1.61				531		
9-16-60	0200	68	4.5	49	1.27				566		
	0500	67	5.2	56	1.63				547		
	0800	70	5.5	60	1.96				578		
9-16-60	0200	66	5.5	59	1.51				568		
	0500	68	5.8	63	1.22				565		
RANGE	MAXIMUM	79	6.3	70	2.88				586		
	MINIMUM	66	3.3	39	1.17				531		
AVERAGE		71.5	4.8	54	1.66				558		

STATION		MILE 60.8									
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x10 <sup>6</sup> at 25°C		
9-12-60	0815	72	7.9	90	0.68				250		
	1130	73	7.9	91	1.06				243		
	1410	73	8.2	94	0.73				235		
9-13-60	0215	73	8.1	93	0.64				235		
	0515	72	8.2	93	0.68				229		
	0810	74	8.1	94	0.76				235		
9-14-60	0215	72	8.1	92	0.66				236		
	0510	72	8.1	92	0.71				249		
	0815	71	8.1	91	0.77				248		
9-15-60	0220	71	8.5	96	0.71				222		
	0515	71	8.4	94	0.60				245		
	0815	70	8.2	91	0.75				236		
9-16-60	0225	70	8.4	93	0.43				233		
	0515	70	8.3	92	0.79				238		
RANGE	MAXIMUM	74	8.6	97	1.12				254		
	MINIMUM	70	7.8	90	0.54				222		
AVERAGE		72	8.2	94	0.77				239		

STATION		MILE 60.64									
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x10 <sup>6</sup> at 25°C		
9-12-60	0825	74	4.1	48	---				380		
	1135	73	2.5	29	3.00				435		
	1415	66	3.3	35	3.14				423		
9-13-60	0230	78	4.4	53	2.90				408		
	0530	78	5.0	60	1.78				408		
	0825	77	3.0	36	1.29				410		
9-14-60	0220	74	2.8	33	2.60				400		
	0520	72	2.2	25	2.74				376		
	0825	71	1.8	20	3.24				402		
9-15-60	0230	71	2.9	33	3.00				397		
	0520	70	2.5	28	2.56				396		
	0825	68	1.9	21	2.86				395		
9-16-60	0235	70	3.3	37	3.14				419		
	0525	68	2.9	32	2.78				399		
RANGE	MAXIMUM	78	5.0	60	4.28				435		
	MINIMUM	66	1.8	20	1.29				376		
AVERAGE		72.5	3.2	36	3.03				404		

TABLE T-II (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
MIDDLE REACH INTENSIVE SAMPLING PROGRAM  
SEPTEMBER 12-16, 1960

STATION		American River										MILE 60.4L		
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	D-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>4</sup> at 25°C					
9-12-60	0840	68	8.3	90	---				56.0					
	1140	69	8.6	93	0.65				56.0					
	1423	72	8.9	101	0.60				33.0					
9-13-60	2040	69	9.1	100	0.59				57.0					
	2340	68	8.9	97	0.53				61.0					
	0240	67	8.8	95	0.51				58.6					
9-14-60	0540	66	8.5	90	0.57				55.2					
	0830	67	8.6	92	0.50				56.7					
	1135	69	8.8	97	0.63				58.6					
9-15-60	1420	70	9.1	101	0.77				54.8					
	1645	72	9.4	107	0.85				57.0					
	2040	70	9.2	102	0.71				60.2					
9-16-60	2335	68	9.1	99	0.84				61.3					
	0235	67	8.9	96	0.55				59.8					
	0535	66	8.7	93	0.68				68.8					
9-15-60	0835	66	8.7	93	0.61				60.0					
	1120	67	8.9	96	0.36				58.1					
	1415	70	9.1	101	0.76				59.3					
9-15-60	1700	70	9.3	103	0.86				55.6					
	2005	70	9.0	100	0.79				59.6					
	2340	68	9.1	99	0.90				62.8					
9-15-60	0245	67	9.0	97	0.82				62.1					
	0535	65	8.9	94	0.73				62.4					
	0833	65	8.8	93	0.62				58.0					
9-16-60	1125	66	9.0	96	0.61				59.8					
	1450	69	9.3	104	0.78				59.1					
	1650	70	9.7	108	0.77				59.8					
9-16-60	1955	70	9.4	104	0.73				61.3					
	2335	67	9.2	99	0.74				60.3					
	0250	65	9.0	95	(0.09) <sup>o</sup>				60.8					
9-16-60	0540	64	9.0	94	0.63				61.3					
RANGE	MAXIMUM	72	9.7	108	0.90				62.8					
	MINIMUM	64	8.3	90	0.36				33.0					
AVERAGE		68	9.0	98	0.68				58.8					

STATION		At Miller Park										MILE 58.2		
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	D-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>4</sup> at 25°C					
9-12-60	0920	72	7.5	85	0.75				208					
	1150	73	7.9	91	0.78				222					
	1435	74	8.2	95	0.74				224					
9-13-60	1735	73	8.3	95	0.82				219					
	2100	73	8.3	93	1.11				218					
	0010	72	8.2	93	0.63				219					
9-14-60	0305	72	8.3	94	0.64				218					
	0555	72	8.3	94	0.63				209					
	0850	73	8.1	93	0.61				216					
9-14-60	1150	72	8.2	93	1.17				236					
	1435	73	8.2	94	0.88				232					
	1700	73	8.3	95	1.29				238					
9-14-60	2100	72	8.3	94	0.86				224					
	2355	72	8.3	94	0.80				225					
	0310	72	8.1	92	0.66				236					
9-15-60	0550	71	8.1	91	0.71				217					
	0850	71	8.0	90	0.74				226					
	1140	72	8.2	93	0.72				226					
9-15-60	1440	72	8.4	95	1.53				247					
	1720	72	8.4	95	0.81				225					
	2020	72	8.3	94	0.85				231					
9-15-60	0005	71	8.4	94	0.84				216					
	0300	71	8.4	94	0.83				222					
	0550	70	8.4	93	0.86				212					
9-16-60	0855	70	8.3	92	0.70				212					
	1135	70	8.3	92	0.83				226					
	1500	70	8.3	94	0.69				226					
9-16-60	1710	71	8.6	97	1.07				229					
	2013	70	8.4	93	0.74				226					
	2335	70	8.7	97	0.68				208					
9-16-60	0310	70	8.6	96	0.50				218					
	0600	69	8.3	93	0.67				213					
RANGE	MAXIMUM	74	8.7	97	1.33				247					
	MINIMUM	69	7.3	85	0.50				208					
AVERAGE		71.3	8.3	93	0.82				223					

Table T-12

RESULTS OF ANALYSES  
MIDDLE REACH INTENSIVE SAMPLING PROGRAM  
MAY 8 - 12, 1961

EXPLANATORY COMMENTS

1. Unless otherwise noted, the stations are on the Sacramento River.
2. Values for biochemical oxygen demand (BOD) and electrical conductance (EC) are results of analyses of single samples.

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

MIDDLE REACH INTENSIVE SAMPLING PROGRAM

MAY 8-12, 1961

STATION		MILE 184.5									
Ord Perry		DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	D-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
5-8-61		0710	1125	56	10.3	98					
		1520	1910	61	10.3	104					
5-9-61		2315	0250	59	10.2	100					
		0640	1100	58	9.9	96					
5-10-61		1455	1845	61	10.1	102					
		2315	0250	58	10.2	99					
5-10-61		0655	1225	57	10.0	96					
		1520	1855	60	9.8	94					
5-11-61		2320	0255	57	10.3	99					
		0655	1125	56	10.2	97					
5-12-61		1450	1850	57	10.2	98					
		2320	0255	60	10.5	105					
RANGE		MAXIMUM	MINIMUM	61	55	10.7	9.8	107	94		
AVERAGE				58		10.2		99			

STATION		MILE 180.1									
Jacinto		DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	D-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
5-8-61		0735	1150	56	10.1	96					
		1545	1930	62	10.7	109					
5-9-61		2340	0320	59	10.2	100					
		0700	1115	58	10.0	97					
5-10-61		1510	1905	57	9.9	95					
		2335	0320	59	10.2	100					
5-10-61		0725	1245	57	9.6	92					
		1540	1910	60	10.3	103					
5-11-61		2340	0315	58	10.3	100					
		0720	1150	56	10.3	98					
5-12-61		1310	1910	59	10.5	103					
		2345	0315	58	10.4	99					
RANGE		MAXIMUM	MINIMUM	62	55	10.7	9.6	109	92		
AVERAGE				58		10.2		100			

STATION		MILE 168.6									
Butte City		DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	D-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
5-8-61		0805	1215	56	10.2	97					
		1610	2005	61	10.6	106					
5-9-61		0015	0350	60	9.9	99					
		0730	1140	58	10.0	97					
5-10-61		1340	1935	59	9.9	96					
		2400	0350	58	10.2	103					
5-10-61		0805	1315	60	10.1	101					
		1615	1945	61	10.3	103					
5-11-61		0005	0345	59	9.9	97					
		0810	1220	58	10.0	96					
5-12-61		0810	1220	57	10.1	97					
		1545	1940	59	10.3	103					
RANGE		MAXIMUM	MINIMUM	61	56	10.6	9.7	106	94		
AVERAGE				59		10.1		99			

STATION		MILE 159.0									
Above Compton Landing		DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	D-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
5-8-61		0845	1250	58	10.9	106					
		1640	2040	60	10.1	101					
5-9-61		0045	0415	60	10.2	102					
		0820	1215	59	10.1	99					
5-10-61		1610	2010	61	10.0	101					
		0045	0425	59	9.8	96					
5-10-61		0900	1340	59	9.8	96					
		1645	2015	60	10.1	101					
5-11-61		0035	0415	59	9.9	97					
		0840	1250	58	10.0	98					
5-12-61		0840	1250	58	9.9	96					
		1620	2010	60	10.1	100					
RANGE		MAXIMUM	MINIMUM	61	56	10.9	9.6	106	94		
AVERAGE				59		10.1		99			

TABLE T-12 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

MIDDLE REACH INTENSIVE SAMPLING PROGRAM

MAY 8-12, 1961

STATION Colusa Bridge		MILE 144.1							
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
5- 8-61	0950	61	9.9	100					
	1335	62	10.1	103					
	1715	61	10.1	102					
	2110	60	9.9	99					
5- 9-61	0125	59	9.9	97					
	0540	59	9.9	97					
	0855	61	9.9	100					
	1250	61	9.8	99					
5-10-61	1635	61	9.7	98					
	2040	60	10.0	100					
5-10-61	0125	60	9.8	98					
	0500	59	9.7	95					
	0935	60	9.9	99					
	1405	61	9.7	98					
5-11-61	1710	60	9.8	98					
	2050	59	9.9	97					
5-11-61	0105	59	9.9	97					
	0450	59	9.9	97					
	0910	60	9.9	99	1.11				
	1330	60	9.8	98	1.99				
5-12-61	1655	60	9.9	99	1.63				
	2045	59	9.9	97	2.88				
5-12-61	0115	58	10.2	99	1.32				
	0505	58	10.1	98	1.00				
RANGE	MAXIMUM	62	10.2	103	2.88				
	MINIMUM	58	9.7	95	1.00				
AVERAGE		60	9.9	99	1.66				

STATION Above Butte Slough		MILE 139.0							
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
5- 8-61	0730	59	10.3	101					
	1140	61	9.9	100					
	1535	61	9.9	100					
	1935	61	9.9	100					
5- 9-61	2305	60	9.7	97					
	0330	59	9.8	96					
	0715	59	9.7	95					
	1150	60	9.9	99					
5-10-61	1530	61	9.9	100					
	1935	61	9.7	98					
5-10-61	2330	60	9.7	97					
	0335	60	9.7	97					
	0740	60	9.6	96					
	1150	61	9.7	98					
5-11-61	1540	61	9.8	99					
	1935	61	9.7	98					
5-11-61	2320	60	9.7	97					
	0400	59	9.8	96					
	0730	59	9.7	95					
	1230	60	9.8	98					
5-12-61	1545	61	9.9	100					
	1925	60	9.8	98					
5-12-61	0020	60	9.5	95					
	0320	58	9.5	92					
RANGE	MAXIMUM	61	10.3	101					
	MINIMUM	58	9.5	92					
AVERAGE		60	9.8	98					

STATION Butte Slough		MILE 138.9L							
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
5- 8-61	0745	66	8.0	85					
	1200	65	8.0	84					
	1525	66	8.4	89					
	1930	66	7.8	83					
5- 9-61	2330	66	7.9	84					
	0340	65	7.8	82					
5-10-61	0730	65	7.8	82					
	1140	66	7.8	83					
5-10-61	1525	66	7.7	82					
	1930	68	7.7	84					
5-10-61	2340	66	7.6	81					
	0350	65	7.5	79					
5-11-61	0730	65	7.5	79					
	1135	65	7.6	80					
5-11-61	1530	67	7.7	83					
	1930	65	7.8	82					
5-11-61	2330	65	7.8	82					
	0410	64	8.0	83					
5-12-61	0745	63	8.1	84	2.60			244	
	1210	64	8.0	83	2.55			243	
5-12-61	1530	64	8.1	84	2.17			237	
	1920	64	8.1	84	2.34			239	
5-12-61	0030	62	7.8	79	2.80			245	
	0330	63	7.8	80	2.23			248	
RANGE	MAXIMUM	68	8.4	89	2.80			248	
	MINIMUM	62	7.5	79	2.17			237	
AVERAGE		65	7.8	83	2.45			243	

STATION Meridian		MILE 134.6							
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
5- 8-61	0835	59	9.7	95					
	1250	61	9.8	99					
	1645	62	9.9	101					
	2030	61	9.9	100					
5- 9-61	2350	60	9.8	98					
	0400	59	9.7	95					
5-10-61	0755	59	9.8	96					
	1220	61	9.7	98					
5-10-61	1555	62	9.9	101					
	2005	62	9.6	98					
5-10-61	2400	60	9.5	95					
	0415	59	9.6	94					
5-11-61	0755	60	9.6	96					
	1235	61	9.6	97					
5-11-61	1610	62	9.6	98					
	2000	61	9.7	98					
5-11-61	2350	60	9.6	96					
	0430	59	9.7	95					
5-12-61	0830	60	9.6	96					
	1250	61	9.7	98					
5-12-61	1605	61	9.8	99					
	2130	61	9.6	97					
5-12-61	0100	60	9.5	95					
	0355	59	9.5	93					
RANGE	MAXIMUM	62	9.9	101					
	MINIMUM	59	9.5	93					
AVERAGE		60	9.7	97					

TABLE T-12 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

MIDDLE REACH INTENSIVE SAMPLING PROGRAM

MAY 8-12, 1961

STATION Above R. D. #70		MILE 124.3									
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C		
5-8-61	0945	60	9.4	94							
	1405	62	9.8	100							
	1740	62	9.9	101							
	2130	61	9.7	98							
5-9-61	0115	61	9.5	96							
	0500	60	9.9	99							
	0900	60	9.6	96							
	1340	61	9.8	99							
5-10-61	0115	61	9.6	97							
	0515	61	9.5	96							
	0900	60	9.5	95							
	1350	61	9.7	98							
5-11-61	1755	61	9.6	97							
	2105	62	9.7	99							
5-11-61	0105	60	9.5	95							
	0535	60	9.7	97							
	0955	61	9.6	97	0.81					142	
	1400	61	9.7	98	1.11					141	
5-12-61	1715	61	9.7	98	0.80					141	
	2200	61	9.6	97	0.68					140	
	0210	59	9.4	92	0.82					141	
	0510	58	9.4	91	1.14					143	
RANGE	MAXIMUM	62	9.9	101	1.14					143	
	MINIMUM	58	9.4	91	0.68					140	
AVERAGE		61	9.6	97	0.89					141	

STATION R. D. #70		MILE 124.2									
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C		
5-8-61	0925	64	7.5	78							
	1340	68	8.5	92							
	1725	69	8.7	96							
	2115	67	8.3	89							
5-9-61	0015	66	8.0	85							
	0420	65	7.6	80							
	0825	64	7.7	80							
	1250	68	8.7	95							
5-10-61	1625	68	9.0	98							
	2030	66	8.7	93							
5-10-61	0030	65	8.0	84							
	0440	63	7.6	78							
	0820	63	7.7	79							
	1240	67	8.7	94							
5-11-61	1640	68	9.2	100							
	2025	66	9.0	96							
5-11-61	0020	64	7.7	80							
	0455	62	8.5	87							
	0900	62	8.1	83	2.56					625	
	1315	67	9.0	97	3.22					625	
5-12-61	1630	66	9.1	97	2.92					609	
	2055	65	8.4	88	2.65					603	
5-12-61	0125	63	7.9	81	2.88					651	
	0425	61	7.4	75	3.11					649	
RANGE	MAXIMUM	69	9.2	100	3.22					651	
	MINIMUM	61	7.4	75	2.56					603	
AVERAGE		65	8.3	88	2.89					627	

STATION At Wilkins Slough		MILE 118.1									
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C		
5-8-61	1020	60	9.6	96							
	1440	61	9.8	99							
	1805	61	9.8	99							
	2205	62	9.8	100							
5-9-61	0140	61	9.6	97							
	0515	61	9.7	98							
	0940	61	9.8	99							
	1410	61	9.7	98							
5-10-61	1735	61	9.7	98							
	2140	61	9.6	97							
5-10-61	0135	61	9.5	96							
	0535	61	9.5	96							
	0930	61	9.5	96							
	1400	61	9.7	98							
5-11-61	1730	61	9.6	97							
	2125	--	---	--							
5-11-61	0125	60	9.4	94							
	0550	60	9.4	94							
	1015	61	9.6	97							
	1425	61	9.7	98							
5-12-61	1740	61	9.7	98							
	2220	60	9.5	95							
5-12-61	0230	60	9.2	92							
	0530	59	9.4	92							
RANGE	MAXIMUM	62	9.8	100							
	MINIMUM	59	9.2	92							
AVERAGE		61	9.6	97							

STATION Above R. D. #108		MILE 100.2									
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C		
5-8-61	0855	60	9.5	95							
	1250	63	9.4	97							
	1655	63	9.6	99							
	2105	62	9.5	97							
5-9-61	0055	62	9.7	99							
	0455	60	9.6	96							
	0855	61	9.7	98							
	1250	62	9.5	97							
5-10-61	1635	62	9.4	96							
	2045	61	9.5	96							
5-10-61	0045	61	9.6	97							
	0455	60	9.5	95							
	0855	61	9.6	97							
	1240	62	9.4	96							
5-11-61	1640	62	9.5	97							
	2040	61	9.3	94							
5-11-61	0055	60	9.5	95							
	0445	60	9.6	96							
	0835	60	9.6	96	0.70					145	
	1240	61	9.5	96	0.98					141	
5-12-61	1640	62	9.5	96	0.50					145	
	2040	61	9.4	95	0.66					145	
5-12-61	0120	60	9.6	96	0.66					145	
	0510	60	9.6	96	0.67					145	
RANGE	MAXIMUM	63	9.7	99	0.98					145	
	MINIMUM	60	9.3	94	0.50					141	
AVERAGE		61	9.5	96	0.70					144	

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

MIDDLE REACH INTENSIVE SAMPLING PROGRAM

MAY 8-12, 1961

STATION R. D. #108		MILE: 100.1R							
DATE	TIME PST	TEMP °F	O.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
5-8-61	1305	66	7.1	76					
	1720	68	7.7	84					
5-9-61	2120	67	7.5	81					
	0515	65	7.1	75					
	0915	65	7.2	76					
5-10-61	1300	67	7.7	83					
	1645	67	7.9	85					
	2056	66	7.8	83					
5-11-61	0100	66	7.5	80					
	0505	64	7.2	75					
	0905	64	7.2	75					
5-12-61	1250	64	7.4	77					
	1650	65	7.8	82					
	2050	64	7.9	82					
5-11-61	0105	64	7.6	79					
	0455	62	7.8	80					
	0845	63	7.5	77	4.10			564	
5-12-61	1255	63	7.6	78	3.52			545	
	1650	63	7.9	81	3.13			526	
	2050	63	8.1	84	2.75			518	
5-12-61	0135	62	7.6	78	3.41			507	
	0530	60	7.6	76	3.50			534	
RANGE	MAXIMUM	68	8.1	85	4.10			564	
	MINIMUM	60	7.1	75	2.75			507	
AVERAGE		64	7.6	79	3.40			532	

STATION Above R. D. #787		MILE: 93.7							
DATE	TIME PST	TEMP °F	O.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
5-8-61	0940	61	9.4	95					
	1325	63	9.5	98					
5-9-61	1750	63	9.5	98					
	2150	62	9.4	96					
	0120	62	9.5	97					
5-10-61	0535	61	9.4	95					
	0945	61	9.5	96					
	1350	63	9.5	98					
5-11-61	1725	62	9.5	97					
	2130	62	9.4	96					
	0130	61	9.5	96					
5-12-61	0535	61	9.3	94					
	0930	61	9.3	94					
	1330	62	9.4	96					
5-11-61	1730	62	9.3	95					
	2140	61	9.3	94					
	0140	61	9.4	95					
5-12-61	0520	61	9.2	93					
	0935	61	9.2	93	1.21			201	
	1330	62	9.4	96	0.90			158	
5-12-61	1730	61	9.4	95	0.63			157	
	2130	61	9.4	95	0.60			156	
	0205	61	9.5	96	0.59			157	
	0550	60	9.3	93	0.92			195	
RANGE	MAXIMUM	63	9.5	98	1.21			201	
	MINIMUM	60	9.2	93	0.59			156	
AVERAGE		62	9.4	95	0.81			171	

STATION R. D. #787		MILE: 93.6R							
DATE	TIME PST	TEMP °F	O.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
5-8-61	0955	62	5.8	59					
	1335	68	6.7	73					
5-9-61	1800	67	No flow	71					
	2205	67	6.6	71					
	0155	66	6.1	65					
5-10-61	0550	64	5.8	60					
	0955	65	5.7	60					
	1350	65	No flow						
5-11-61	1735	67	6.8	73					
	2130	67	No flow						
	0140	65	6.7	71					
5-12-61	0545	65	No flow						
	0940	63	5.9	61					
	1340	64	6.5	68					
5-11-61	1740	65	6.6	69					
	2150	63	6.9	71					
	0150	60	No flow	68					
5-12-61	0535	60	6.8	68					
	0945	66	No flow		2.87			502	
	1340	66	7.3	73					
5-12-61	1740	64	7.4	77	2.68			521	
	2130	64	No flow		2.24			500	
	0225	60	7.2	72	2.24			500	
	0550	60	No flow						
RANGE	MAXIMUM	68	7.4	77	2.87			521	
	MINIMUM	60	5.7	59	2.24			500	
AVERAGE		64	6.6	68	2.60			508	

STATION Above Colusa Drain		MILE: 90.5							
DATE	TIME PST	TEMP °F	O.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
5-8-61	1025	62	9.3	95					
	1400	62	9.3	95					
5-9-61	1840	62	9.4	96					
	2230	62	9.5	97					
	0230	62	9.4	96					
5-10-61	0615	61	9.4	95					
	1040	61	9.4	95					
	1445	62	9.5	97					
5-11-61	1805	62	9.5	97					
	2225	62	9.2	94					
	0210	61	9.4	95					
5-12-61	0610	61	9.3	94					
	1010	61	9.3	94					
	1420	61	9.4	95					
5-11-61	1820	61	9.4	95					
	2220	61	9.3	94					
	0215	61	9.4	95					
5-12-61	0610	61	9.3	94					
	1015	61	9.2	93	1.26			1.13	
	1410	61	9.2	93					
5-12-61	1810	61	9.3	94	0.55			0.55	
	2200	61	9.3	94					
	0255	61	9.4	95	0.88			1.12	
	0620	60	9.3	93					
RANGE	MAXIMUM	62	9.5	97	1.26			1.13	
	MINIMUM	60	9.2	93	0.55			0.55	
AVERAGE		61	9.4	95	0.92				

TABLE T-12 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
MIDDLE REACH INTENSIVE SAMPLING PROGRAM  
MAY 8-12, 1961

STATION Colusa Basin Drain										MILE 90.28			
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	D-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C				
5-8-61	1035	64	8.6	89									
	1405	66	8.3	88									
	1845	66	8.5	90									
	2235	66	8.5	90									
5-9-61	0840	66	8.5	90									
	0620	64	8.6	90									
	1050	64	8.5	89									
	1450	65	8.3	87									
5-10-61	1810	66	8.3	88									
	2230	66	8.3	88									
5-10-61	0220	65	8.3	87									
	0615	65	8.3	87									
	1015	65	8.2	86									
	1425	65	8.2	86									
5-11-61	1825	65	8.3	87									
	2230	65	8.4	88									
5-11-61	0225	64	8.5	89									
	0615	63	8.7	90									
	1025	63	8.8	91	2.81								
	1420	63	8.6	89	3.30				207				
5-12-61	1820	64	8.7	91	2.79				240				
	2210	63	8.8	91	2.82				240				
5-12-61	0305	62	8.8	90	2.87				218				
	0640	61	8.8	89	3.06				218				
RANGE	MAXIMUM	66	8.8	91	3.30								
	MINIMUM	61	8.2	86	2.79								
AVERAGE		64	8.5	89	2.94								

STATION Above Sacramento Slough										MILE 81.5			
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C				
5-8-61	0835	62	9.0	92									
	1315	63	9.1	94									
	1700	63	9.0	93									
	2045	63	8.8	91									
5-9-61	0035	62	9.4	96									
	0450	62	9.3	95									
	0935	63	8.9	92									
	1330	63	9.1	94									
5-10-61	1720	63	9.0	93									
	2115	62	8.8	90									
5-10-61	0030	62	8.9	91									
	0438	62	8.9	91									
	0853	63	9.0	93									
	1245	63	9.0	93									
5-11-61	1640	63	8.9	92									
	2100	61	8.9	90									
5-11-61	0033	61	9.0	91									
	0433	61	9.0	91									
	0824	62	9.0	92	1.01				207				
	1240	62	9.2	94	1.13				205				
5-12-61	1720	62	9.0	92	1.46				240				
	2105	62	8.9	91	1.20				240				
5-12-61	0055	61	9.1	92	1.01				218				
	0505	61	9.1	92	1.20				218				
RANGE	MAXIMUM	63	9.4	96	1.46				240				
	MINIMUM	61	8.8	90	1.01				205				
AVERAGE		62	9.0	92	1.17				221				

STATION Sacramento Slough										MILE 80.84			
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	D-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C				
5-8-61	0852	64	6.8	71									
	1330	66	8.7	93									
	1710	67	7.3	78									
	2100	67	7.7	83									
5-9-61	0055	66	6.9	73									
	0500	66	6.8	72									
	0952	67	6.9	74									
	1340	68	7.1	77									
5-10-61	1745	68	7.2	78									
	2125	68	7.1	77									
5-10-61	0045	66	6.7	71									
	0450	66	6.6	70									
	0901	66	6.6	70									
	1255	66	6.8	72									
5-11-61	1645	67	7.0	75									
	2115	66	7.5	80									
5-11-61	0050	65	7.1	75									
	0445	63	7.1	73									
	0839	64	7.0	73	2.19				544				
	1255	65	7.2	76	2.08				541				
5-12-61	1735	65	7.7	81	2.30				514				
	2120	65	7.5	79	2.03				510				
5-12-61	0115	64	7.5	78	1.80				512				
	0517	63	7.2	74	2.14				511				
RANGE	MAXIMUM	68	8.7	93	2.30				541				
	MINIMUM	63	6.6	70	1.80				510				
AVERAGE		66	7.2	76	2.09				520				

STATION Feather River										MILE 79.94			
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C				
5-8-61	0915	59	9.8	96									
	1350	62	9.6	98									
	1718	63	9.6	99									
	2125	63	9.3	96									
5-9-61	0110	62	9.4	96									
	0510	60	9.4	94									
	1002	61	9.6	97									
	1350	63	9.4	97									
5-10-61	1755	63	9.3	96									
	2140	64	9.1	95									
5-10-61	0110	62	9.1	93									
	0502	60	9.2	92									
	0912	61	9.5	96									
	1305	61	9.5	96									
5-11-61	1700	62	9.5	97									
	2125	61	9.2	93									
5-11-61	0102	60	9.4	94									
	0457	58	9.4	91									
	0853	59	9.7	95	0.70				0.96				
	1310	60	9.6	96	0.70				0.96				
5-12-61	1755	60	9.6	96	0.71				0.71				
	2135	59	9.5	93	0.71				0.71				
5-12-61	0135	57	9.9	95	0.50				0.78				
	0528	56	10.0	95	0.50				0.78				
RANGE	MAXIMUM	64	10.0	99	0.96								
	MINIMUM	56	9.1	91	0.50								
AVERAGE		61	9.5	95	0.73								

TABLE T-12 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

MIDDLE REACH INTENSIVE SAMPLING PROGRAM

MAY 8-12, 1961

STATION <u>Below Hatones Cross Canal</u>						MILE <u>79.0</u>				
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C	
5-8-61	0942	62	9.0	92						
	1405	63	9.4	97						
	1730	64	9.4	98						
	2140	63	9.1	94						
5-9-61	0125	62	8.9	91						
	0522	61	9.3	94						
	1025	62	9.2	94						
	1400	63	9.1	94						
5-10-61	1805	63	9.0	93						
	2150	64	8.8	92						
	0120	62	8.8	90						
	0520	63	8.7	90						
	0930	62	8.9	91						
	1315	63	8.7	90						
5-11-61	1720	63	8.9	92						
	2135	61	8.8	89						
	0115	61	8.9	90						
	0509	60	9.0	90						
	0910	61	9.1	92	0.98				201	
	1325	63	9.0	93	0.96				121	
5-12-61	1805	62	9.1	93	0.88				158	
	2145	61	9.0	91	1.09				244	
	0153	60	9.3	93	0.74				180	
	0540	60	9.2	92	0.89				191	
RANGE	MAXIMUM	64	9.4	98	1.09				244	
	MINIMUM	60	8.7	89	0.74				121	
AVERAGE		62	9.0	92	0.92				183	

STATION <u>Elkhorn Ferry</u>						MILE <u>71.0</u>				
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C	
5-8-61	0800	61	9.3	94						
	1200	63	9.2	95						
	1600	65	9.3	98						
	2030	63	8.5	88						
5-9-61	2400	63	9.2	95						
	0400	63	9.0	93						
	0800	63	9.0	93						
	1200	65	9.0	95						
5-10-61	1540	64	9.1	95						
	2000	64	9.0	94						
	2400	63	9.0	93						
	0400	63	9.0	93						
	0800	63	9.0	93						
	1200	63	9.0	93						
5-11-61	1600	64	9.2	96						
	1955	62	8.9	91						
	2400	62	9.0	92						
	0400	61	9.0	91						
	0750	62	9.0	92						
	1200	62	9.0	92						
5-12-61	1600	63	9.1	94						
	2000	62	9.1	93						
	0020	62	9.1	93						
	0420	61	9.1	92						
RANGE	MAXIMUM	65	9.3	98						
	MINIMUM	61	8.5	88						
AVERAGE		63	9.0	93						

STATION <u>R. D. 1000 (No. 3)</u>						MILE <u>66.3L</u>				
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C	
5-8-61	1825	68	8.4	91						
	2230	67	8.4	90						
5-9-61	0215	65	8.2	86						
	0600	64	7.5	78						
5-11-61	1100	68	8.9	97						
	1500	68	10.2	111	7.37				292	
	1925	66	9.3	99	6.30				274	
	2240	65	9.0	95	5.60				280	
5-12-61	0247	63	8.0	82	4.65				282	
	0628	62	7.8	80	4.96				282	
RANGE	MAXIMUM	68	10.2	111	7.37				292	
	MINIMUM	62	7.5	78	4.65				274	
AVERAGE		66	8.6	91	5.78				282	

STATION <u>Bryte</u>						MILE <u>62.6</u>				
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C	
5-8-61	1047	62	9.2	94						
	1520	63	9.3	96						
	1900	63	9.4	97						
	2300	62	9.2	94						
5-9-61	0310	62	9.1	93						
	0640	62	9.0	92						
	1130	63	9.1	94						
	1525	65	9.2	97						
5-10-61	1930	64	9.1	95						
	2245	63	8.9	92						
	0222	62	9.0	92						
	0638	62	8.8	90						
5-11-61	1112	63	8.9	92						
	1515	63	8.9	92						
	1900	63	9.0	93						
	2250	63	9.0	93						
5-12-61	0215	61	9.1	92						
	0608	61	8.9	90						
	1030	62	9.0	92	0.96					
	1540	63	9.1	94	1.08					
5-12-61	2005	62	9.1	93	0.94					
	2310	62	9.4	96	0.89					
	0323	60	9.2	92	0.75					
	0710	60	9.1	91	1.37					
RANGE	MAXIMUM	65	9.4	97	1.37					
	MINIMUM	60	8.8	90	0.75					
AVERAGE		62	9.1	93	1.00					

Table T-13

RESULTS OF ANALYSES  
 LOWER REACH INTENSIVE SAMPLING PROGRAM  
 JUNE 20 - 24, 1960

EXPLANATORY COMMENTS

1. Unless otherwise noted, the stations are on the Sacramento River. The numerical designation of the stations was an arbitrary method of identifying the stations during the sampling program.
2. Values shown in parenthesis and marked with an asterisk ( )\* appeared unrealistic and were not used in computing maximum, minimum and average values.
3. Values for biochemical oxygen demand (BOD) are reported in the following manner:

<u>Method</u>	<u>Example</u>	
	<u>Time</u>	<u>BOD</u>
a. Values shown in the example at right were obtained from duplicate analyses of a composite of the two samples collected at the specified times.	0105	1.95
	0345	1.03
b. Two BOD values shown for one time indicates that duplicate analyses were made on a single sample collected at that time.	1915	1.27, 1.22
c. A single BOD value reported between two times indicates that the value was obtained from a composite of samples collected at those times.	1330	1.25
	1620	
d. A single value shown for a specific time is the BOD of the sample collected at that time.	1530	1.40

4. Values for ABS, O-PO<sub>4</sub>, and T-PO<sub>4</sub> were reported in the same manner as described for BOD results under sections c. and d. of item 3.
5. Results of analyses of samples collected at sewage treatment plants are reported on page T-123.

TABLE T-13  
SACRAMENTO RIVER WATER POLLUTION SURVEY  
RESULTS OF ANALYSES  
LOWER REACH INTENSIVE SAMPLING PROGRAM

JUNE 20-24, 1960

STATION A62.6 MILE 62.6										STATION: Batomas East Main Drain (Back Borrow Pit) MILE 60.61									
DATE	TIME PST	TEMP °F	D.O mg/l	O.D % SAT	5 Day BOD mg/l	ABS mg/l	D-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x10 <sup>3</sup> at 25°C	DATE	TIME PST	TEMP °F	D.O mg/l	O.D % SAT	5 Day BOD mg/l	ABS mg/l	D-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-20-60	0815	73	7.9	91	1.68		0.0	0.2	0.2	196	6-20-60	1045	73	4.5	13	2.0	5.6	5.6	
	1112	73	8.2	94	1.03		0.0	0.2	0.2	197		1700	78	8.5	102	16	1.4	6.1	6.1
	2310	71	8.3	94	1.20		0.0	0.2	0.2	190		2240	73	5.3	61	14	0.9	7.3	9.0
6-21-60	0202	70	8.1	90	0.96		0.0	0.2	0.2	190	6-21-60	0450	69	3.3	36	11	0.7	8.0	11
	0459	71	8.1	91	1.04		0.0	0.2	0.2	192		1045	71	5.3	60	13	1.0	6.7	8.0
	0800	71	8.3	93	0.95		0.0	0.2	0.2	192		1640	80	9.2	114	12	0.9	7.3	8.3
	1110	71	8.2	92	0.92		0.0	0.2	0.2	200		2255	72	5.3	60	13	1.1	8.0	8.2
	1706	73	8.3	94	0.98		0.0	0.2	0.2	205									
6-22-60	2016	73	8.4	97	1.25		0.0	0.2	0.2	205	6-22-60	0445	74	3.1	36	6	0.8	(0.3)	(0.3)
	2301	72	8.3	94	1.08		0.0	0.2	0.2	209		1045	76	6.5	76	11	0.3	7.8	8.4
	0201	74	8.3	97	0.90		0.0	0.1	0.2	201		1645	83	13.7	173	12	0.7	9.5	9.5
	0502	72	8.2	92	0.92		0.0	0.1	0.2	197		2245	80	6.9	85	11	0.8	8.9	9.8
	0800	71	8.2	92	0.84		0.0	0.2	0.2	207									
6-23-60	1107	71	8.2	92	0.84		0.0	0.2	0.2	201	6-23-60	1040	77	5.7	68	5.84	0.7	8.4	8.6
	1412	72	8.4	95	1.24		0.0	0.1	0.2	199		1640	84	11.6	119	10	0.7	8.4	8.5
	1713	73	8.4	97	1.15		0.0	0.2	0.2	202		2245	80	6.4	79	7.6	0.9	8.8	8.8
	2017	73	8.4	97	1.08		0.0	0.2	0.2	201									
	2302	73	8.4	97	0.99		0.0	0.2	0.2	204		6-24-60	0445	76	2.6	31	6.0	0.7	8.2
6-24-60	0202	73	8.3	95	0.95		0.0	0.2	0.2	204									
	0502	74	8.2	95	0.89		0.0	0.2	0.2	207									
	0802	72	7.9	90	1.04		0.0	0.2	0.2	202									
	1118	72.5	8.1	92	1.03		0.0	0.2	0.2	202									
	1412	73	8.2	94	1.00		0.0	0.2	0.2	201									
6-24-60	1702	73.5	8.2	94	1.08		0.0	0.2	0.2	201									
	2006	74	8.3	97	0.81		0.0	0.2	0.2	201									
	2302	71.5	8.3	94	0.89		0.0	0.2	0.2	202									
	0202	72.5	8.1	92	0.74		0.0	0.2	0.2										
	0502	73	8.0	92	0.75		0.0	0.2	0.2										
RANGE	MAXIMUM	74	8.4	97	1.68	0.0	0.2	0.2	209	RANGE	MAXIMUM	84	13.7	173	16	2.0	9.5	11.0	
	MINIMUM	70	7.9	90	0.74	0.0	0.1	0.2	190		MINIMUM	69	2.6	31	5.84	0.3	5.6	5.6	
AVERAGE		72.5	8.2	94	1.03	0.0	0.2	0.2	200	AVERAGE		76.5	6.5	79	10	0.9	7.3	7.9	

STATION: A60.5 MILE 60.5									
DATE	TIME PST	TEMP °F	D.O mg/l	O.D % SAT	5 Day BOD mg/l	ABS mg/l	D-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-20-60	0840	73	8.0	92					
	1117	73	8.1	93					
	1425	73	8.3	95					
6-21-60	1718	73	8.4	97					
	2041	73	8.2	94					
	2330	71	8.3	93					
	0215	70	8.2	91					
	0511	72	8.1	92					
6-22-60	0815	72	8.2	93					
	1124	71.5	8.2	93					
	1416	72	8.5	97					
	1715	73	8.4	97					
	2028	73	8.4	97					
6-23-60	2315	72	8.4	95					
	0216	72	8.3	94					
	0512	72	8.1	92					
	0816	71	8.6	97					
	1116	71.5	8.3	94					
6-24-60	1422	72	8.5	97					
	1721	72	8.5	97					
	2027	73	8.4	97					
	2316	73	8.5	98					
	0215	73	8.2	94					
6-24-60	0529	72	8.1	92					
	0814	73	8.1	93					
	1128	73	8.2	94					
	1420	73	8.2	94					
	1711	73.5	8.5	98					
6-24-60	2017	73.5	8.3	95					
	2318	71	8.5	96					
	0219	72	8.1	92					
	0514	73	8.0	92					
RANGE	MAXIMUM	73.5	8.6	98					
	MINIMUM	70	8.0	91					
AVERAGE		72	8.3	95					

STATION: American River MILE 60.41									
DATE	TIME PST	TEMP °F	D.O mg/l	O.D % SAT	5 Day BOD mg/l	ABS mg/l	D-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-20-60	1015	61	9.2	93	2.98		0.0	0.0	0.0
	1630	64	8.7	91	4.62		0.1	0.1	0.1
	2215	62	8.4	86	2.65		0.1	0.1	0.1
6-21-60	0425	60	9.0	90	4.98		0.1	0.2	0.2
	1015	60	9.0	90	5.88		0.1	0.0	0.3
	1615	64	8.9	93	5.97		0.1	0.1	0.1
	2215	62	8.9	91	2.46		0.1	0.1	0.2
	0415	59	13.8	135	1.46		0.0	0.1	0.1
6-22-60	1020	59	11.1	109	1.48		0.1	0.0	0.0
	1615	63	13.0	134	2.65		0.0	0.1	0.1
	2215	62	13.1	134	1.98		0.0	0.1	0.1
	0440	59	13.1	128	5.74		0.1	0.1	0.1
	1015	59	13.5	132	4.30		0.0	0.0	0.0
6-23-60	1615	63	13.3	137	3.43		0.0	0.0	0.0
	2215	62	13.5	138	1.76		0.0	0.1	0.1
	0415	58	11.0	136	1.70		0.1	0.1	0.1
	1015	58	11.0	136	0.96		0.1	0.1	0.1
	1615	63	13.3	137	0.96		0.1	0.1	0.1
RANGE	MAXIMUM	64	14.0	138	5.97	0.1	0.2	0.3	
	MINIMUM	58	8.4	86	0.96	0.0	0.0	0.0	
AVERAGE		61	11.3	114	3.10	0.1	0.1	0.1	

TABLE T-13 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 LOWER REACH INTENSIVE SAMPLING PROGRAM  
 JUNE 20-24, 1960

STATION A58.2		MILE 58.2							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-20-60	0850	72	7.8	89	1.18	0.0	0.2	0.2	
	1129	71	8.4	94	1.18	0.0	0.2	0.2	
	1435	70	8.6	96	1.08	0.0	0.1	0.2	
6-21-60	2053	70	8.7	97	1.01	0.0	0.2	0.2	
	2340	69	8.7	96	1.07	0.0	0.2	0.2	
	0230	69	8.6	95	0.91	0.0	0.1	0.2	
6-22-60	0522	68	8.7	95	0.83	0.0	0.1	0.2	
	0830	69	8.7	96	1.00	0.0	0.1	0.1	
	1136	68	8.6	93	0.98	0.0	0.1	0.1	
6-23-60	1430	69	8.9	98	1.07	0.0	0.1	0.2	
	1727	69.5	8.9	99	1.01	0.0	0.1	0.2	
	2043	69	8.9	98	0.97	0.0	0.2	0.2	
6-24-60	2330	68	8.8	96	0.97	0.0	0.2	0.2	
	0230	68	8.8	96	0.84	0.0	0.1	0.2	
	0525	68	8.7	95	0.87	0.0	0.1	0.2	
6-25-60	0826	66	9.1	97	1.07	0.0	0.2	0.2	
	1131	68	8.7	95	0.92	0.0	0.2	0.2	
	1435	68	8.9	97	1.06	0.0	0.1	0.2	
6-26-60	1732	69	9.0	99	0.96	0.0	0.1	0.2	
	2048	69	9.0	99	1.49	0.0	0.2	0.2	
	2331	69	9.2	101	1.79	0.0	0.2	0.2	
6-27-60	0232	68.5	8.8	97	0.84	0.0	0.1	0.2	
	0537	68	8.7	95	0.88	0.0	0.1	0.2	
	0832	67	8.8	95	0.86	0.0	0.2	0.2	
6-28-60	1139	68	8.7	95	0.86	0.0	0.2	0.2	
	1433	69	8.7	96	0.79	0.0	0.2	0.2	
	1726	70	8.9	99	0.91	0.0	0.2	0.2	
6-29-60	2030	69	9.0	99	0.77	0.0	0.1	0.1	
	2330	68.5	9.1	100	0.77	0.0	0.1	0.1	
	0232	68	8.9	97	0.67	0.0	0.2	0.2	
0531	68	8.7	95	0.65	0.0	0.2	0.2		
RANGE	MAXIMUM	72	9.2	101	1.79	0.0	0.2	0.2	
	MINIMUM	66	7.8	89	0.65	0.0	0.1	0.1	
AVERAGE		68.5	8.8	97	0.98	0.0	0.2	0.2	

STATION A56.7		MILE 56.7							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-20-60	0900	70	8.2	91					
	1148	70	8.3	92					
	1445	71	8.5	96					
6-21-60	1742	71	8.6	97					
	2101	70	8.7	97					
	2350	69	8.7	96					
6-22-60	0213	68	8.6	93					
	0547	69	8.6	95					
	0845	69	8.7	96					
6-23-60	1145	68.5	8.6	95					
	1439	69	8.8	97					
	1736	70	8.7	97					
6-24-60	2052	69.5	8.9	99					
	2345	69	(9.7)	(107)					
	0245	68	8.8	96					
6-25-60	0545	68	8.7	95					
	0843	67	8.8	95					
	1140	68	8.7	95					
6-26-60	1444	68.5	8.8	97					
	1739	69	8.9	98					
	2105	69	8.9	98					
6-27-60	2345	68	9.2	100					
	0247	69	9.0	99					
	0546	68.5	8.9	98					
6-28-60	0844	67.5	8.9	97					
	1147	68.5	8.8	97					
	1442	69	8.8	97					
6-29-60	1735	69.5	8.8	98					
	2038	69.5	8.7	97					
	2342	67	9.1	98					
6-30-60	0213	68	8.9	97					
	0544	69	8.9	98					
RANGE	MAXIMUM	71	9.2	100					
	MINIMUM	67	8.2	91					
AVERAGE		69	8.8	97					

STATION A55.5		MILE 55.5							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-20-60	0918	71	8.4	94					
	1200	71	8.2	92					
	1453	71	8.5	96					
6-21-60	1748	71	8.4	94					
	2107	71	8.6	97					
	0000	69.5	8.7	97					
6-22-60	0251	69	8.5	93					
	0556	69	8.5	93					
	0857	69	8.8	97					
6-23-60	1153	68.5	8.6	95					
	1446	69	8.7	96					
	1748	69.5	8.8	97					
6-24-60	2101	69.5	8.9	99					
	2354	69	8.9	98					
	0250	68	8.9	97					
6-25-60	0555	69	8.8	97					
	0854	67	8.9	96					
	1146	67.5	8.7	95					
6-26-60	1450	68.5	8.8	97					
	1745	69	8.8	97					
	2111	69	8.9	98					
6-27-60	2356	68	9.0	98					
	0256	69	9.2	101					
	0554	69	8.8	97					
6-28-60	0854	68.5	8.8	97					
	1153	68	8.7	95					
	1447	69	8.7	96					
6-29-60	1741	69.5	8.8	98					
	2048	69.5	8.8	98					
	2351	69	8.9	98					
6-30-60	0254	68.5	8.8	97					
	0552	68.5	8.7	96					
RANGE	MAXIMUM	71	9.2	101					
	MINIMUM	67	8.2	92					
AVERAGE		69	8.7	96					

STATION A54.2		MILE 54.2							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-20-60	0920	70	8.5	94	0.85	0.0	0.1	0.1	
	1211	71	8.3	93	0.85	0.0	0.1	0.1	
	1504	71	8.3	93	0.78	0.0	0.1	0.2	
6-21-60	1800	71	8.5	96	0.81	0.0	0.1	0.2	
	2124	70.5	8.5	96	0.98	0.0	0.2	0.2	
	0015	69.5	8.6	96	0.90	0.0	0.2	0.2	
6-22-60	0301	69	8.6	95	0.96	0.0	0.2	0.2	
	0604	70	8.6	96	0.86	0.0	0.2	0.2	
	0909	69	8.6	95	(0.05) (0.02)	0.0	0.1	0.1	
6-23-60	1203	68.5	8.6	95					
	1457	69	8.7	96	0.93	0.0	0.1	0.2	
	1755	69.5	8.7	97	0.91	0.0	0.1	0.2	
6-24-60	2113	69.5	8.7	97	1.03	0.0	0.1	0.2	
	0012	69	8.8	97	1.03	0.0	0.1	0.2	
	0306	68	8.9	97	0.89	0.0	0.1	0.2	
6-25-60	0609	69	8.7	96	0.56	0.0	0.1	0.2	
	0909	68	8.8	96	0.93	0.0	0.2	0.2	
	1156	67.5	8.6	93	0.86	0.0	0.2	0.2	
6-26-60	1501	68.5	8.8	97	0.92	0.0	0.1	0.1	
	1757	68.5	8.8	97	0.92	0.0	0.1	0.1	
	2122	69	8.8	97	1.11	0.0	0.1	0.2	
6-27-60	0011	69	9.0	99	0.99	0.0	0.1	0.2	
	0309	69	8.9	98	0.99	0.0	0.2	0.2	
	0602	69	8.9	98	1.00	0.0	0.2	0.2	
6-28-60	0909	69	8.8	97	0.80	0.0	0.2	0.2	
	1201	68	8.7	95	0.68	0.0	0.2	0.2	
	1459	69	8.7	96	0.81	0.0	0.2	0.2	
6-29-60	1753	69.5	8.7	97	0.74	0.0	0.2	0.2	
	2058	69.5	8.7	97	0.76	0.0	0.2	0.2	
	0009	67	9.0	97	0.76	0.0	0.2	0.2	
6-30-60	0310	68	8.9	97	0.88	0.0	0.2	0.2	
	0609	68	8.8	96	0.78	0.0	0.2	0.2	
RANGE	MAXIMUM	71	9.0	99	1.11	0.0	0.2	0.2	
	MINIMUM	67	8.3	93	0.56	0.0	0.1	0.1	
AVERAGE		69	8.7	96	0.83	0.0	0.2	0.2	

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

LOWER REACH INTENSIVE SAMPLING PROGRAM

JUNE 20-24, 1960

STATION: A53.2 MILE: 53.2

DATE	TIME PST	TEMP °F	O.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0930	72	8.2	93				
	1219	71	8.4	94				
6-21-60	1513	71	8.2	92				
	1810	71.5	8.4	95				
6-21-60	2135	71	8.4	94				
	0020	70	8.5	94				
6-21-60	0315	70	8.4	93				
	0617	70	8.4	93				
6-21-60	0917	69	8.6	95				
	1215	69	8.6	95				
6-22-60	1506	69	8.6	95				
	1803	69.5	8.7	97				
6-22-60	2122	70	8.6	96				
	0025	69	8.8	97				
6-22-60	0317	68	8.7	95				
	0616	69	8.7	96				
6-22-60	0917	68	8.7	95				
	1203	68	8.7	95				
6-23-60	1513	68.5	8.7	96				
	1803	69	8.7	96				
6-23-60	2129	69	8.7	96				
	0020	69	8.9	98				
6-23-60	0317	69	8.8	97				
	0617	68.5	8.8	97				
6-23-60	0918	69	8.8	97				
	1209	69	8.7	96				
6-24-60	1505	69	8.7	96				
	1758	69.5	8.7	97				
6-24-60	2106	69.5	8.7	97				
	0024	69.5	8.8	98				
6-24-60	0320	68	8.8	96				
	0618	68	8.7	95				
RANGE	MAXIMUM	72	8.9	98				
	MINIMUM	68	8.2	92				
AVERAGE		69.5	8.6	96				

STATION: A52.3 MILE: 52.3

DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0935	72	(7.3)*	(83)*				
	1226	71	8.4	94				
6-21-60	1527	71.5	8.3	94				
	1815	71.5	8.4	95				
6-21-60	2145	71	8.3	93				
	0027	70	8.4	93				
6-21-60	0325	69.5	8.3	92				
	0626	70	8.5	94				
6-21-60	0930	70	---	---				
	1223	69	8.6	95				
6-22-60	1512	69	8.7	96				
	1810	69.5	8.6	96				
6-22-60	2129	69.5	8.6	96				
	0035	73	8.7	100				
6-22-60	0330	69	8.6	95				
	0624	68	---	---				
6-22-60	0925	68	8.7	95				
	1208	68.5	8.5	93				
6-23-60	1520	68.5	8.7	96				
	1809	69	8.7	96				
6-23-60	2136	69	8.6	95				
	0031	68.5	8.7	96				
6-23-60	0326	68	8.8	96				
	0625	68.5	8.7	96				
6-23-60	0926	69	8.9	98				
	1214	69.5	8.7	97				
6-24-60	1510	69	8.8	97				
	1804	69	8.7	96				
6-24-60	2115	69.5	8.6	96				
	0028	69	8.7	96				
6-24-60	0328	68	8.7	95				
	0625	69	8.7	96				
RANGE	MAXIMUM	73	8.9	100				
	MINIMUM	68	8.3	92				
AVERAGE		69.5	8.6	95				

STATION: B50.8 MILE: 50.8

DATE	TIME PST	TEMP °F	O.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0910	69.5	9.5	106	1.3			
	1211	70	8.5	94	1.4	0.0	0.2	0.2
6-21-60	1505	69	8.5	93	1.87			
	1752	70.5	8.5	96	1.85	0.1	0.3	0.4
6-21-60	2052	69	8.1	89	2.37			
	0010	(65)*	8.3	(87)*	2.38	0.0	0.4	0.4
6-21-60	0315	68	8.3	90	1.82			
	0600	68.5	8.3	91	1.81	0.0	0.4	0.4
6-21-60	0900	69	8.6	95	1.70			
	1142	69.5	9.0	100	1.70	0.0	0.3	0.3
6-21-60	1500	69	8.7	96	2.95			
	1740	69	8.6	95	2.95	0.0	0.3	0.3
6-22-60	2117	68.5	8.5	93	2.78			
	0009	68	8.6	93	2.72	0.1	0.3	0.3
6-22-60	0345	68	8.6	93	2.4			
	0700	68	8.6	93	2.3	0.0	0.3	0.4
6-22-60	1139	69	8.6	95	2.09			
					2.07	0.0	0.2	0.3
6-22-60	1859	69	8.7	96	2.07			
	1847	68.5	8.5	93	2.07	0.0	0.3	0.3
6-23-60	2031	68.5	8.7	96	1.88			
	0005	68.5	8.5	93	1.65	0.0	0.3	0.3
6-23-60	0405	68	8.6	93	1.66			
	0610	68	8.6	93	1.65	0.0	0.3	0.3
6-23-60	0900	69	8.7	96	2.22			
	1126	68	8.9	97	2.23	0.0	0.3	0.3
6-23-60	1443	69.5	8.7	97	1.72			
	1803	69	8.8	97	1.72	0.0	0.3	0.3
6-24-60	2040	68.5	8.5	93	2.16			
	2350	68	8.5	92	2.21	0.0	0.4	0.4
6-24-60	0310	68	8.5	92	2.17			
	0600	68	8.5	92	2.25	0.0	0.4	0.4
6-24-60	0855	68	8.4	91	3.08			
					3.02	0.0	0.4	0.4
RANGE	MAXIMUM	70.5	9.5	106	3.08	0.1	0.4	0.4
	MINIMUM	68.5	8.1	89	1.3	0.0	0.2	0.2
AVERAGE		68.5	8.6	94	2.12	0.0	0.3	0.3

STATION: B49.8 MILE: 49.8

DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0920	70	---	---				
	1216	69.5	8.5	94				
6-21-60	1512	70.5	8.5	96				
	1800	71	8.5	96				
6-21-60	2105	70.5	8.3	93				
	0020	68	8.2	89				
6-21-60	0330	69	8.3	91				
	0610	68.5	8.4	92				
6-21-60	0910	69	8.5	93				
	1152	69	8.7	96				
6-22-60	1509	69.5	8.9	99				
	1752	69	8.9	98				
6-22-60	2130	68	8.5	92				
	0024	68	8.1	88				
6-22-60	0355	68	8.5	92				
	0715	68	8.5	92				
6-23-60	1149	69.5	8.7	97				
	1508	69	8.8	97				
6-23-60	1852	68.5	8.6	95				
	2041	68.5	8.7	96				
6-23-60	0015	68	8.5	92				
	0415	68	8.5	92				
6-23-60	0615	68	8.5	92				
	0907	69	8.7	96				
6-23-60	1136	69	8.8	97				
	1451	70	8.9	99				
6-24-60	1812	69	8.7	96				
	2054	68	8.7	95				
6-24-60	0005	68	8.5	92				
	0320	68	8.5	92				
6-24-60	0607	68	8.4	91				
	0902	68.5	8.5	93				
RANGE	MAXIMUM	71	8.9	99				
	MINIMUM	68	8.1	88				
AVERAGE		69	8.6	94				

TABLE T-13 (Continued)

## SACRAMENTO RIVER WATER POLLUTION SURVEY

## RESULTS OF ANALYSES

## LOWER REACH INTENSIVE SAMPLING PROGRAM

JUNE 20-24, 1960

STATION B46.4		MILE 46.4						
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0935	69.5	8.3	92				
	1221	70.5	8.6	97				
	1535	71	8.5	96				
	1806	71	8.5	96				
6-21-60	2117	69	8.2	90				
	0030	69	8.2	90				
	0340	69	8.0	88				
	0615	68	8.1	88				
	0915	69	8.4	92				
	1201	69	8.8	97				
	1517	70	8.7	97				
	1802	69.5	8.8	98				
6-22-60	2142	68	8.6	93				
	0037	68	8.5	92				
	0405	68	8.5	92				
	0735	68	8.4	91				
	1156	69	8.7	97				
	1517	69.5	9.0	100				
6-23-60	1857	68.5	8.7	96				
	2050	68	8.6	93				
	0025	68	8.5	92				
	0425	67.5	8.4	91				
	0619	68	8.3	90				
	0914	69	8.6	95				
	1143	69	8.8	97				
	1455	70.5	8.7	98				
6-24-60	1819	69.5	8.8	98				
	2102	67.5	8.6	93				
	0015	68	8.4	91				
	0330	68	8.4	91				
	0615	68	8.4	91				
	0909	68.5	8.4	92				
RANGE	MAXIMUM	71	9.0	100				
	MINIMUM	67.5	8.0	88				
AVERAGE		69	8.5	94				

STATION B47.1		MILE 47.1						
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0945	70.5	8.3	93				
	1227	70	8.5	94				
	1540	70.5	8.6	97				
	1811	71	8.4	94				
6-21-60	2126	69.5	8.2	91				
	0040	69	8.2	90				
	0350	69	7.8	86				
	0625	69	8.2	90				
	0920	69	8.3	91				
	1208	69.5	8.7	97				
	1525	71	8.7	98				
	1809	70	8.6	96				
6-22-60	2150	68.5	8.3	91				
	0045	68	8.3	90				
	0410	67.5	8.5	92				
	0750	68	8.3	90				
	1203	69	8.7	96				
	1523	71	8.8	99				
6-23-60	1902	70	8.3	92				
	2059	68	---	--				
	0040	68	8.4	91				
	0430	67.5	8.3	90				
	0625	68	8.4	91				
	0921	69	8.5	93				
	1149	70	8.8	98				
	1502	70.5	8.9	100				
6-24-60	1823	70.5	8.8	99				
	2111	67.5	8.6	93				
	0030	68	8.4	91				
	0337	68	8.3	90				
	0620	68	8.2	89				
	0915	68.5	8.4	92				
RANGE	MAXIMUM	71	8.9	100				
	MINIMUM	67.5	7.8	86				
AVERAGE		69	8.4	93				

STATION B46.3		MILE 46.3						
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0955	69.5	8.0	89	1.8	0.0	0.4	0.4
	1231	70.5	8.3	93	1.6	0.0	0.4	0.4
	1545	71	8.3	93	1.20	0.0	0.2	0.4
	1824	70.5	8.4	94	1.28	0.0	0.2	0.4
6-21-60	2134	68.5	8.2	90	2.06	0.0	0.4	0.4
	0045	69	7.9	87	2.01	0.0	0.4	0.4
	0355	69	7.8	86	1.88	0.0	0.4	0.5
	0630	69.5	7.7	86	1.81	0.0	0.4	0.5
	0955	69.5	8.1	90	2.22	0.1	0.4	0.4
	1215	69.5	8.6	96	2.12	0.0	0.4	0.4
6-22-60	1532	70.5	8.5	96	1.62	0.0	0.2	0.3
	1814	70	8.6	96	1.62	0.0	0.2	0.3
	2155	69	8.4	92	1.62	0.0	0.2	0.2
	0052	68	8.3	90	1.55	0.0	0.2	0.2
	0415	68	8.1	88	1.8	0.0	0.3	0.4
	0800	68	8.1	88	1.6	0.0	0.3	0.4
	1207	69.5	8.4	93	2.11	0.0	0.4	0.4
					2.09	0.0	0.4	0.4
	1529	70	8.6	96	1.60	0.0	0.2	0.3
	1904	69.5	8.7	97	1.60	0.0	0.2	0.3
6-23-60	2107	68.5	8.6	95	1.60	0.0	0.3	0.3
	0110	67.5	---	--	1.51	0.0	0.3	0.3
	0435	67.5	8.2	89	1.43	0.0	0.3	0.4
	0630	68	8.1	88	1.37	0.0	0.3	0.4
	0926	69	8.3	91	2.07	0.0	0.3	0.3
	1256	70	8.7	97	2.13	0.0	0.3	0.3
6-24-60	1506	71	8.9	100	1.42	0.0	0.3	0.3
	1837	70.5	8.7	98	1.42	0.0	0.3	0.3
	2120	68.5	8.5	93	1.49	0.0	0.3	0.3
	0036	68	8.4	91	1.42	0.0	0.3	0.3
	0345	68	8.2	89	1.56	0.0	0.4	0.4
	0626	68	8.1	88	1.44	0.0	0.4	0.4
	0921	68.5	8.2	90	1.70	0.0	0.4	0.4
					1.65	0.0	0.4	0.4
RANGE	MAXIMUM	71	8.9	100	2.22	0.1	0.4	0.5
	MINIMUM	67.5	7.7	86	1.20	0.0	0.2	0.2
AVERAGE		69	8.3	92	1.69	0.0	0.3	0.4

STATION B45.1		MILE 45.1						
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	1005	70.5	8.1	91				
	1238	70.5	8.2	92				
	1553	71.5	8.6	98				
	1837	71.5	8.5	97				
6-21-60	2147	70	8.2	91				
	0055	69	7.9	87				
	0405	69	7.8	86				
	0640	69	7.8	86				
	1005	69.5	8.1	90				
	1225	70	8.7	97				
6-22-60	1541	71	8.6	97				
	1825	70.5	8.6	97				
	2206	68	8.4	91				
	0105	68	8.2	89				
	0425	68	8.0	87				
	0930	68.5	8.2	90				
	1224	69.5	8.4	93				
	1539	71	8.6	97				
6-23-60	1911	70	8.6	96				
	2122	69	8.5	93				
	0120	67.5	---	--				
	0440	67	8.2	88				
	0636	68	8.0	87				
	0932	69	8.3	91				
6-24-60	1205	70	8.6	96				
	1514	70.5	8.6	97				
	1859	70	8.6	96				
	2135	68.5	8.5	93				
	0017	68	8.3	90				
	0355	68	8.2	89				
	0636	68	8.2	89				
	0931	68	8.2	89				
RANGE	MAXIMUM	71.5	8.7	98				
	MINIMUM	67	7.8	86				
AVERAGE		69.5	8.3	92				

SACRAMENTO RIVER WATER POLLUTION SURVEY

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STATION: B43.4 MILE: 43.4

DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	1015	70	7.8	87	1.4	0.0	0.4	0.4
	1248	71	8.0	90	1.5	0.0	0.4	0.4
	1600	71.5	8.5	97	1.43	0.0	0.3	0.3
	1843	71.5	8.5	97	1.46	0.0	0.3	0.3
6-21-60	2159	71	8.3	93	1.23; 1.31	0.0	0.3	0.3
	0105	69	8.0	88	---	---	---	---
	0415	69.5	7.9	88	1.42	0.0	0.3	0.4
	0650	69	7.5	82	1.43	0.0	0.3	0.4
	1010	69.5	7.7	86	1.60	0.0	0.4	0.4
	1234	70	8.6	96	1.65	0.0	0.4	0.4
	1551	71	8.3	93	1.70	0.0	0.3	0.4
	1834	70.5	8.2	92	1.75	0.0	0.3	0.4
6-22-60	2217	69	8.3	91	1.46	0.0	0.3	0.3
	0118	68.5	8.1	89	1.39	0.0	0.3	0.3
	0430	68	7.9	86	1.37	0.0	0.3	0.3
					1.37	0.0	0.3	0.3
	0950	68.5	8.0	88	1.76	0.0	0.3	0.3
	1233	69	8.3	91	1.67	0.0	0.3	0.3
	1547	70.5	8.3	93	1.61	0.0	0.3	0.3
	1936	70	8.5	94	1.61	0.0	0.3	0.3
6-23-60	2145	69.5	8.4	93	1.30	0.0	0.2	0.3
	0135	68	8.0	87	1.36	0.0	0.2	0.3
	0445	67.5	8.2	89	1.19	0.0	0.3	0.3
	0645	68	8.0	87	1.14	0.0	0.3	0.3
	0940	69	8.1	89	1.51	0.0	0.3	0.3
	1208	70	8.3	92	1.55	0.0	0.3	0.3
	1520	70.5	8.4	94	1.70	0.0	0.3	0.3
	1907	69.5	8.4	93	1.70	0.0	0.3	0.3
6-24-60	2150	68	8.4	91	1.08; 0.97	0.0	0.3	0.3
	0100	68	8.3	90	---	---	---	---
	0405	68	8.1	88	1.24	0.0	0.3	0.3
	0645	68	8.2	89	1.18	0.0	0.3	0.3
	0940	68	8.1	88	1.49	0.0	0.4	0.4
					1.55	0.0	0.4	0.4
RANGE	MAXIMUM	71.5	8.6	97	1.76	0.0	0.4	0.4
	MINIMUM	67.5	7.5	82	0.97	0.0	0.2	0.3
AVERAGE		69.5	8.2	90	1.44	0.0	0.3	0.3

STATION: B42.1 MILE: 42.1

DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	1025	70	7.9	88				
	1254	70	8.1	90				
	1607	71	8.3	93				
	1850	71	8.4	94				
6-21-60	2210	70	8.3	92				
	0115	69	8.0	88				
	0420	69	7.9	87				
	0700	69.5	7.6	84				
	1025	69.5	7.7	86				
	1242	70	8.0	89				
	1600	71.5	8.0	91				
	1844	70.5	8.1	91				
6-22-60	2228	69	8.3	91				
	0130	69	8.1	89				
	0440	68	8.0	87				
	1000	68.5	8.0	88				
	1240	69	8.4	92				
	1555	70.5	8.4	94				
6-23-60	1922	70	8.4	93				
	2158	69.5	8.3	92				
	0150	68	8.3	90				
	0450	68	8.1	88				
	0652	68	8.1	88				
	0946	69	7.9	87				
	1226	70	8.1	90				
	1528	71.5	8.5	97				
	1913	70	8.3	92				
	2200	69	8.4	92				
6-24-60	0110	68.5	8.2	90				
	0410	68	8.2	89				
	0654	68	8.2	89				
	0948	68	8.2	89				
RANGE	MAXIMUM	71.5	8.5	97				
	MINIMUM	68	7.6	84				
AVERAGE		69.5	8.1	90				

STATION: B41.1 MILE: 41.1

DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	1035	69.5	8.0	89				
	1302	70.5	8.2	92				
	1614	71	8.5	96				
	1857	71	8.3	93				
6-21-60	2224	70	8.1	90				
	0130	70	8.1	90				
	0430	69.5	8.0	89				
	0710	69	7.8	86				
	1035	70	7.7	86				
	1250	70	8.0	89				
	1610	72.5	8.4	95				
	1857	70.5	8.2	92				
6-22-60	2241	69.5	8.1	90				
	0150	69.5	8.1	90				
	0450	68.5	8.1	89				
	1005	68.5	7.8	86				
	1247	69.5	8.2	91				
	1602	71.5	8.4	95				
	1928	70	8.1	90				
	2220	69	8.3	91				
6-23-60	0210	69	8.1	89				
	0455	68.5	8.2	90				
	0705	68.5	8.1	89				
	0955	68.5	8.0	88				
	1235	70	8.3	92				
	1538	71	8.5	96				
	1921	70	8.6	96				
	2213	69	8.6	95				
6-24-60	0125	68.5	8.3	91				
	0420	68.5	8.1	89				
	0704	68	8.2	89				
	0958	68.5	8.3	91				
RANGE	MAXIMUM	72.5	8.6	96				
	MINIMUM	68	7.7	86				
AVERAGE		69.5	8.2	91				

STATION: B39.8 MILE: 39.8

DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	1045	69	7.9	87	1.3	0.0	0.3	0.3
	1311	70.5	7.9	89	1.3	0.0	0.3	0.3
	1623	70.5	8.3	93	1.44	0.0	0.3	0.3
	1902	71	8.2	92	1.44	0.0	0.3	0.3
6-21-60	2234	70.5	8.3	93	1.13	0.0	0.3	0.3
	0135	70	8.1	90	1.20	0.0	0.3	0.3
	0435	69.5	8.0	89	1.32; 1.24	0.0	0.3	0.3
	0715	70	7.9	88	1.24; 1.42	0.0	0.2	0.4
	1040	70	7.6	84	1.58	0.0	0.4	0.4
	1256	70.5	7.9	89	1.58	0.0	0.4	0.4
	1618	72.5	8.0	91	1.51	0.1	0.4	0.4
	1904	71	8.2	92	1.51	0.1	0.4	0.4
6-22-60	2249	69.5	8.0	89	1.33	0.0	0.3	0.3
	0200	69.5	---	---	1.46	0.0	0.3	0.3
	0455	69	8.0	88	1.00; 1.29	0.0	0.3	0.3
	1010	69	7.8	86	1.31; 1.16	0.0	0.4	0.4
	1252	69.5	8.0	89	0.67	0.0	0.3	0.3
					0.64	0.0	0.3	0.3
	1610	71.5	8.4	95	1.48	0.0	0.3	0.3
	1932	70	8.3	92	1.58	0.0	0.3	0.3
6-23-60	2224	69.5	8.2	91	1.38	0.0	0.3	0.3
	0220	69	8.2	90	1.44	0.0	0.3	0.3
	0500	68	8.1	88	1.04	0.0	0.3	0.3
	0710	69	8.1	89	0.98	0.0	0.3	0.3
	1000	69	8.1	89	1.34	0.0	0.3	0.3
	1240	70	8.0	89	1.28	0.0	0.3	0.3
6-24-60	1550	71	8.3	93	1.60	0.1	0.3	0.3
	1929	70	8.6	96	1.60	0.1	0.3	0.3
	2222	69	8.0	88	---	0.0	0.3	0.3
	0135	68.5	8.3	91	---	0.0	0.3	0.3
	0430	68	8.1	88	1.05	0.0	0.3	0.3
	0713	69	8.1	89	1.14	0.0	0.3	0.3
	1010	68.5	8.2	90	1.23	0.0	0.3	0.3
					1.24	0.0	0.3	0.3
RANGE	MAXIMUM	72.5	8.6	96	1.60	0.1	0.4	0.4
	MINIMUM	68	7.6	84	0.64	0.0	0.2	0.3
AVERAGE		69.5	8.1	90	1.29	0.0	0.3	0.3

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STATION C38.6		MILE 38.6						
DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0920	70	7.6	84				
	1222	70	7.7	86				
	1500	71	7.9	89				
6-21-60	0255	70	7.0	78				
	0605	70	5.8	64				
	2109	70	8.2	91				
6-22-60	0255	69	8.4	92				
	0527	69	8.4	92				
	0845	70	6.1	68				
6-23-60	0315	69	7.2	79				
	0540	70	7.4	82				
	0901	70	7.8	87				
6-24-60	0524	70	8.4	93				
	0852	70	8.3	92				
RANGE	MAXIMUM	71	8.5	94				
	MINIMUM	68	5.8	64				
AVERAGE		70	7.8	86				

STATION C37.2		MILE 37.2						
DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0929	70	7.6	84	----	0.0	0.3	0.3
	1230	70	7.9	88	----	0.0	0.3	0.3
	1509	71	7.9	89	1.20	0.0	0.3	0.3
6-21-60	0239	70	7.9	88	2.87	0.0	0.3	0.3
	0620	70	7.2	80	2.88	0.0	0.3	0.3
	2122	70	7.7	86	1.69	0.0	0.3	0.4
6-22-60	0308	69	6.5	71	2.34	0.1	0.3	0.4
	0537	69	7.8	86	1.6	0.0	0.4	0.4
	0855	71	8.1	91	1.68	0.0	0.3	0.3
6-23-60	1500	71	7.8	88	2.21	0.0	0.3	0.4
	1733	71	7.8	88	2.13	0.0	0.3	0.4
	2110	70	7.9	88	(0.03) (0.11)	0.0	0.3	0.3
6-24-60	0325	69	7.1	78	2.50	0.0	0.3	0.3
	0547	70	7.1	79	2.45	0.0	0.3	0.3
	0908	70	8.1	90	1.06	0.0	0.3	0.3
6-24-60	1512	71	7.9	89	1.11	0.0	0.4	0.4
	1741	71	8.0	90	1.11	0.0	0.4	0.4
	2039	70	8.1	90	1.31	0.0	0.3	0.3
6-24-60	0311	70	6.5	72	1.42	0.0	0.3	0.4
	0631	70	7.3	81	1.36	0.0	0.3	0.4
	0901	70	8.4	93	1.24	0.0	0.3	0.3
RANGE	MAXIMUM	71	8.4	93	2.88	0.1	0.4	0.4
	MINIMUM	69	6.5	71	1.06	0.0	0.3	0.3
AVERAGE		70	7.6	85	1.70	0.0	0.3	0.3

STATION C35.9		MILE 35.9						
DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0940	70	7.8	87				
	1237	71	7.8	88				
	1518	72	8.1	92				
6-21-60	0246	70	7.7	86				
	0630	70	6.1	68				
	2138	72	7.7	88				
6-22-60	0320	70	6.1	68				
	0548	70	7.2	80				
	0906	71	7.4	83				
6-23-60	1225	70	7.9	88				
	0337	69	7.7	85				
	0554	70	7.7	86				
6-24-60	1209	70	8.1	90				
	1748	71	8.2	92				
	0321	69	7.6	84				
RANGE	MAXIMUM	72	8.2	92				
	MINIMUM	69	6.1	68				
AVERAGE		70.5	7.6	85				

STATION C34.4		MILE 34.4						
DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0947	71	7.8	88	1.4	0.0	0.3	0.3
	1250	71	8.1	91	1.4	0.0	0.3	0.3
	1521	72	8.2	93	1.50	0.0	0.2	0.2
6-21-60	0217	70	7.7	86	2.34	0.0	0.3	0.3
	0645	71	7.2	81	2.28	0.0	0.3	0.3
	2352	70	6.7	74	0.8	0.0	0.3	0.3
6-22-60	0326	71	7.2	81	1.67	0.0	0.3	0.3
	0645	71	7.7	87	1.67	0.0	0.3	0.3
	2144	70	7.5	83	1.8	0.0	0.4	0.4
6-23-60	0325	69	6.2	75	1.8	0.0	0.4	0.4
	0558	70	6.2	69	1.8	0.0	0.4	0.4
	0916	71	7.7	87	1.78	0.0	0.2	0.2
6-24-60	1241	70	7.9	88	1.84	0.0	0.2	0.2
	1513	71	7.8	88	1.64	0.0	0.3	0.3
	1745	72	7.9	90	1.64	0.0	0.3	0.3
6-23-60	2138	70	7.7	86	1.59	0.0	0.3	0.3
	0346	69	6.6	73	1.63	0.0	0.3	0.3
	0600	70	6.8	76	0.98	0.0	0.3	0.3
6-24-60	0924	70	8.5	94	1.17	0.0	0.3	0.3
	1219	70	8.0	89	1.17	0.0	0.3	0.3
	1528	71	8.1	91	1.18	0.0	0.3	0.3
6-24-60	2107	69	7.9	87	1.48	0.0	0.3	0.3
	0013	70	8.3	92	1.48	0.0	0.3	0.3
	0130	69	5.9	65	1.01	0.0	0.3	0.3
RANGE	MAXIMUM	72	8.5	94	2.34	0.1	0.4	0.4
	MINIMUM	69	5.9	65	0.8	0.0	0.2	0.2
AVERAGE		70.5	7.6	85	1.40	0.0	0.3	0.3

TABLE T-13 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

**RESULTS OF ANALYSES**  
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STATION: C33.5		MILE: 33.5							
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-20-60	0955	71	7.5	84					
	1257	72	8.0	91					
	1534	72	7.6	86					
	1841	72	8.1	92					
6-21-60	2125	70	7.6	84					
	0006	71	7.8	88					
	0334	70	7.4	82					
	0649	71	7.6	85					
6-22-60	2154	70	7.5	83					
	0032	69	7.5	82					
	0330	70	6.8	76					
	0606	70	6.5	72					
	0924	71	7.2	81					
	1147	70	7.8	87					
	1527	71	8.0	90					
	1751	72	8.0	91					
6-23-60	2149	70	7.7	86					
	0351	70	7.5	83					
	0608	70	6.8	76					
	0930	70	7.6	84					
	1230	71	7.9	89					
	1535	72	8.0	91					
	1802	70	7.9	88					
	2116	70	8.0	89					
6-24-60	0019	70	7.9	88					
	0337	69	7.4	81					
	0650	69	7.5	82					
	0925	70	7.9	88					
RANGE	MAXIMUM	72	8.1	92					
	MINIMUM	69	6.5	72					
AVERAGE		70.5	7.6	85					

STATION: C32.5		MILE: 32.5							
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-20-60	1002	72	7.9	90	2.0	0.0	0.4	0.4	
					2.0				
	1304	72	8.1	92	1.1	0.0	0.2	0.2	
					1.1				
	1540	73	8.6	99	1.67	0.0	0.3	0.4	
	1850	72	8.1	92	1.67				
6-21-60	2134	70	8.0	89	1.96	0.0	0.3	0.3	
	0014	71	7.9	89	1.82				
	0342	70	7.7	86	1.8	0.0	0.3	0.3	
	0655	70	7.6	84	1.8				
6-22-60	2203	70	7.5	83	1.82	0.1	0.2	0.2	
	0041	70	7.4	82	1.89				
	0342	70	6.5	72	1.6	0.0	0.4	0.4	
	0614	70	5.3	59	1.8				
	0932	71	5.9	66	1.67	0.0	0.0	0.0	
	1152	70	7.8	87	1.74				
	1532	72	8.0	91	1.72	0.0	0.3	0.3	
	1756	71	8.1	91	1.65				
	2157	70	7.7	86	1.38	0.0	0.3	0.3	
					1.39				
6-23-60	0410	70	7.1	79	1.8	0.0	0.3	0.3	
	0614	70	7.7	86	1.7				
	0942	70	7.4	82	1.26, 1.28	0.0	0.3	0.3	
	1236	72	7.8	89					
	1541	72	8.0	91	1.55	0.1	0.2	0.3	
	1808	72	8.2	93	1.55				
	2126	70	7.9	88	0.88	0.0	0.3	0.3	
					0.90				
6-24-60	0027	70	7.9	88	0.92	0.0	0.4	0.4	
					0.93				
	0345	69	4.8	53	1.05	0.0	0.3	0.3	
	0656	69	7.6	84	0.98				
	0945	70	7.8	87	1.38	0.0	0.4	0.4	
					1.20				
RANGE	MAXIMUM	73	8.6	99	2.20	0.1	0.4	0.4	
	MINIMUM	69	4.8	53	0.88	0.0	0.0	0.0	
AVERAGE		70.5	7.5	84	1.53	0.0	0.3	0.3	

STATION: C34.6		MILE: 34.6							
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-20-60	1008	72	7.4	84					
	1312	72	7.9	90					
	1549	72	8.2	93					
	1854	72	8.2	93					
6-21-60	2141	70	7.9	88					
	0022	71	7.5	84					
	0350	70	7.8	87					
	0701	70	7.3	81					
6-22-60	2211	70	7.5	83					
	0047	69	6.1	67					
	0350	70	6.2	69					
	0622	70	5.8	64					
	0940	71	6.7	75					
	1158	71	7.7	87					
	1536	72	8.1	92					
	1801	72	8.0	91					
6-23-60	0416	70	7.5	83					
	0620	70	7.3	81					
	0952	70	8.3	92					
	1243	72	7.8	89					
	1548	71	8.0	90					
	1815	72	8.2	93					
6-24-60	2133	69	8.0	88					
	0032	69	7.6	84					
	0350	69	7.9	87					
	0701	69	8.1	89					
	0951	70	8.1	90					
RANGE	MAXIMUM	72	8.3	93					
	MINIMUM	69	5.8	64					
AVERAGE		70.5	7.6	85					

STATION: C30.1		MILE: 30.1							
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-20-60	1017	72	7.4	84	1.8	0.1	0.4	0.4	
	1321	72	7.6	86	1.7				
	1556	73	7.9	91	1.32	0.0	0.2	0.4	
	1903	72	8.2	93	1.32				
6-21-60	2151	70	8.0	89	2.35	0.0	0.2	0.2	
	0033	71	7.7	87	2.47				
	0401	70	7.7	86	1.55	0.0	0.2	0.3	
	0710	70	7.8	87	1.55				
6-22-60	2220	70	7.8	87	1.72	0.1	0.3	0.3	
	0058	71	5.7	64	2.00				
	0400	70	7.0	78	2.1	0.0	0.3	0.4	
	0633	70	6.1	68	1.9				
	0951	71	7.3	82	1.97	0.0	0.4	0.4	
	1207	71	7.5	84	1.64				
	1544	72	7.9	90	1.84	0.0	0.3	0.3	
	1807	72	8.0	91	1.74				
6-23-60	0420	70	6.6	73	1.5	0.0	0.3	0.3	
	0628	70	5.6	62	1.6				
	1000	70	7.6	84	1.34	0.0	0.3	0.3	
	1252	72	7.7	88	1.30				
	1555	72	7.8	89	1.18	0.0	0.3	0.3	
	1823	72	8.0	91	1.18				
6-24-60	2145	70	8.0	89	1.30	0.0	0.3	0.3	
	0044	70	7.9	88	1.13				
	0400	69	7.7	85	1.06	0.0	0.3	0.3	
	0705	69	7.5	82	1.06				
	1000	70	7.9	88	1.07	0.0	0.3	0.3	
					1.05				
RANGE	MAXIMUM	73	8.2	93	2.47	0.1	0.4	0.4	
	MINIMUM	69	5.6	62	1.05	0.0	0.2	0.2	
AVERAGE		71	7.5	84	1.56	0.0	0.3	0.3	

TABLE T-13 (Continued)  
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STATION C28.4		MILE 28.4						
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	1025	72	7.4	84				
	1330	72	7.4	84				
	1603	73	7.7	89				
6-21-60	1911	72	8.1	92				
	2200	70	8.1	90				
	0016	71	7.5	86				
6-22-60	0414	70	8.0	89				
	0720	70	7.5	83				
	2232	70	--	--				
6-23-60	0109	69	8.3	91				
	0414	70	6.9	77				
	0616	78	5.7	63				
6-24-60	1004	71	7.8	88				
	1216	71	7.5	82				
	1551	72	7.7	88				
6-25-60	1813	72	7.9	90				
	0433	70	7.0	78				
	0637	70	7.1	79				
6-26-60	1006	70	7.7	85				
	1306	72	7.6	86				
	1618	72	7.9	90				
6-27-60	1832	71	7.9	89				
	2153	69	7.8	79				
	0054	70	8.2	91				
6-28-60	0411	69	7.9	87				
	0710	70	7.4	82				
	1008	70	7.5	83				
RANGE	MAXIMUM	73	8.3	92				
	MINIMUM	69	5.7	63				
AVERAGE		70.5	7.6	84				

STATION C/27.4		MILE 27.4								
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC 10 <sup>3</sup> at 25°C	
6-20-60	0750	72	7.0	80	1.09	0.98	0.0	0.3	0.3	170
	1120	73	8.3	95						
	1400	73	7.7	89	1.24	1.24	0.0	0.4	0.4	172
6-21-60	1650	73	7.6	88						
	1955	72	7.5	85	1.06					170
	2245	71	8.2	92	1.12					
6-22-60	0155	72	7.8	89	0.97	0.99	0.0	0.2	0.3	167
	0445	71.5	7.8	89						
	0815	71.5	7.7	88	1.20					167
6-23-60	1055	71	7.3	82	1.18					
	1350	72	7.6	86	1.25					162
	1650	73	7.9	91	1.33					
6-24-60	2000	72	7.8	89	1.25					158
	2300	72	7.9	90	1.15					
	0230	72	7.8	89	1.45					
6-25-60	0610	72	7.4	84	1.25**					
	0840	72	7.0	80	1.24					165
	1110	72	7.0	80	1.24					
6-26-60	1350	72	7.3	83	1.28					169
	1556	72	7.7	88	2.16					
	1819	72	7.8	89	2.16					
6-27-60	0441	71.5	<7.6	<86	1.2					
	0643	70	7.7	86	1.0					
	1014	70	7.5	83	2.33					157
6-28-60	1317	72	7.6	86	2.42					
	1625	71	7.8	88	1.26					157
	1839	71	7.9	89	1.16					
6-29-60	2203	70	7.9	88	1.00					158
	0102	70	7.9	88	0.98					
	0418	69	8.0	88	0.57					157
6-30-60	0716	70	7.5	83	0.53					
	1014	70	7.9	88	1.07					160
					1.01					
RANGE	MAXIMUM	73	8.3	95	2.42	0.0	0.4	0.4	172	
	MINIMUM	69	7.0	80	0.53	0.0	0.2	0.3	157	
AVERAGE		71.5	7.7	87	1.27	0.0	0.3	0.3	164	

\*\* BOD values are averages of duplicate analyses of single samples.

STATION D26.8		MILE 26.8						
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0800	72	7.0	86				
	1130	73	7.1	82				
	1410	73	7.5	86				
6-21-60	1700	73	7.7	89				
	2010	72	7.5	85				
	2300	71	7.8	88				
6-22-60	0205	72	7.3	83				
	0455	71.5	7.7	88				
	0820	71	7.6	85				
6-23-60	1105	71	7.3	82				
	1400	72	7.4	84				
	1700	73	7.8	90				
6-24-60	2010	72	7.8	89				
	2310	72	7.9	90				
	0210	72	7.6	86				
6-25-60	0615	72	7.4	84				
	0850	71.5	7.4	84				
	1120	72	6.8	77				
6-26-60	1400	74	7.2	84				
	1700	73	7.3	84				
	1950	72	7.3	83				
6-27-60	2300	72	7.6	86				
	0200	72	7.3	83				
	0500	72	7.3	83				
6-28-60	0800	70.5	7.3	82				
	1100	71	7.5	84				
	1400	72	7.4	84				
6-29-60	1700	72	7.4	84				
	2000	72	7.5	85				
	2300	71.5	7.7	88				
6-30-60	0200	71	7.5	84				
	0510	71	7.6	85				
RANGE	MAXIMUM	74	7.9	90				
	MINIMUM	70.5	6.8	77				
AVERAGE		72	7.5	85				

STATION D25.5		MILE 25.5						
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0815	72	7.1	81	1.11	0.0	0.3	0.3
	1135	72.5	7.3	83	1.14			
	1420	73	7.4	85	1.30			
6-21-60	1710	73	7.8	90	1.35			
	2020	72	7.6	86	1.18			
	2310	73	7.5	86	1.26			
6-22-60	0215	72	7.4	84	1.1			
	0505	72	7.3	83	1.2			
	0830	71	7.7	87	1.10			
6-23-60	1115	71	7.5	84	1.10			
	1410	72	7.8	89	1.14			
	1710	73	8.3	95	1.14			
6-24-60	2020	72	7.6	86	1.59			
	2320	72	7.9	90	1.57			
	0300	72	7.9	90	1.5			
6-25-60	0620	72	7.5	85	1.5			
	0855	71.5	7.2	82	1.23			
	1130	72	6.8	77	1.19			
6-26-60	1410	74	7.6	88	1.28			
	1710	73	7.7	89	1.28			
	2000	72	7.4	84	1.07			
6-27-60	2320	72	7.7	88	1.03			
	0210	72	7.2	82	1.8			
	0505	72.5	7.5	85	1.6			
6-28-60	0805	70.5	7.4	83	1.08			
	1110	71	7.5	84	1.08			
	1410	73	7.4	85	1.17			
6-29-60	1710	72	7.5	85	1.17			
	2010	72	7.4	84	1.22			
	2305	71.5	7.6	86	1.10			
6-30-60	0205	71	7.5	84	1.47			
	0525	71	7.7	87	1.64			
RANGE	MAXIMUM	74	8.3	95	1.64	0.0	0.4	0.4
	MINIMUM	70.5	6.8	77	1.03	0.0	0.2	0.2
AVERAGE		72	7.5	86	1.27	0.0	0.3	0.3

TABLE T-13 (Continued)  
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STATION D24.3		MILE 24.3							
DATE	TIME PST	TEMP °F	O.O mg/l	O.O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-20-60	0830	72.5	7.2	82					
	1150	73	7.2	83					
	1428 1720	73 73	7.7 7.9	89 91					
6-21-60	2030	73	7.4	85					
	2330	72	7.4	84					
	0230 0515	72	7.7 7.6	88 86					
6-22-60	0840	71.5	7.9	90					
	1125	72	7.5	85					
	1420 1720	72 74	7.8 8.5	89 99					
6-23-60	2030	72	7.9	90					
	2340	72	7.7	88					
	0325 0635	72.5	8.1 7.8	92 89					
6-24-60	0905	72	7.4	84					
	1135	72	6.8	77					
	1420 1720	75 74	7.3 8.1	85 94					
6-25-60	2030	73	7.4	85					
	2335	72	7.4	84					
	0225 0520	72.5	7.6 7.9	86 91					
6-26-60	0815	71	7.5	84					
	1120	71	7.7	87					
	1425 1725	73 72	7.6 7.8	87 89					
6-27-60	2025	72	7.8	89					
	2320	71.5	7.6	86					
	0220 0540	71.5	7.8 7.9	89 90					
RANGE	MAXIMUM	75	8.5	99					
	MINIMUM	71	6.8	77					
AVERAGE		72.5	7.6	87					

STATION D23.3		MILE 23.3							
DATE	TIME PST	TEMP °F	O.O mg/l	O.O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-20-60	1200	73	7.3	84					
	1440 1730	73 73	7.8 8.0	90 92					
	2040 2350	73 72	7.4 7.5	85 85					
6-21-60	0240 0525	72	8.0 7.6	90 86					
	0850 1135	71.5 72	7.8 7.6	89 86					
	1430 1730	74 73	8.0 8.7	92 101					
6-22-60	2040 2350	73	8.0 7.9	92 91					
	0340 0640	73 72	7.8 7.9	90 90					
	0915 1145	72	7.6 7.1	86 81					
6-23-60	1430 1730	74 73	7.6 8.6	88 100					
	2040 2345	73 73	7.8 7.5	90 86					
	0235 0525	73 73	8.0 8.1	92 93					
6-24-60	0825 1135	72.5 71	7.3 7.3	83 82					
	1435 1735	72 73	7.7 8.0	88 92					
	2035 2330	73 71.5	8.0 7.5	92 85					
6-25-60	0230 0550	72 72.5	7.9 8.3	90 94					
RANGE	MAXIMUM	74	8.7	101					
	MINIMUM	71	7.1	81					
AVERAGE		72.5	7.8	89					

STATION D22.3		MILE 22.3							
DATE	TIME PST	TEMP °F	O.O mg/l	O.O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-20-60	0900	73	7.2	83					
	1210	73	7.4	85					
	1450 1740	74 74	7.7 8.1	90 94					
6-21-60	2050	73	7.6	87					
	0000	72	7.7	88					
	0255 0530	72.5	7.9 7.7	90 88					
6-22-60	0900 1145	71.5 72	7.8 7.8	89 89					
	1440 1740	73 74	8.2 9.0	94 105					
	2050 0005	73 72.5	8.2 8.1	94 92					
6-23-60	0355 0650	73 73	8.4 8.0	97 92					
	0920 1150	72	7.8 7.3	89 84					
	1445 1740	74 74	7.8 8.9	91 103					
6-24-60	2050 2355	73 73	7.9 7.7	91 89					
	0245 0535	73.5	8.4 8.4	97 97					
	0830 1145	72.5 71	7.5 7.3	85 82					
6-25-60	1450 1745	74 74	7.8 8.4	90 96					
	2045 2340	73	8.2 7.7	94 88					
	0245 0600	73 73	8.7 8.7	100 100					
RANGE	MAXIMUM	74	9.0	105					
	MINIMUM	71	7.2	82					
AVERAGE		73	8.0	92					

STATION D21.1		MILE 21.1							
DATE	TIME PST	TEMP °F	O.O mg/l	O.O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
6-20-60	0915	73	7.2	83					
	1220	73.5	7.6	87					
	1500 1750	74 74	7.9 8.1	92 94					
6-21-60	2100 0020	73 72.5	7.8 7.9	90 90					
	0305 0540	72.5	8.2 7.9	93 96					
	0910 1155	72 73	7.7 7.8	88 90					
6-22-60	1450 1750	75	8.1 8.9	93 103					
	2100 0015	73 73	8.2 8.1	94 93					
	0410 0700	73 73	8.7 8.2	100 94					
6-23-60	0930 1200	72.5	8.0 7.4	91 85					
	1455 1750	74 75	8.3 9.4	97 109					
	2100 0005	73 73	8.3 8.1	95 93					
6-24-60	0300 0545	73.5	9.0 8.8	103 101					
	0840 1155	73 72	7.9 7.5	91 85					
	1455 1755	73 75	8.0 9.2	92 107					
6-25-60	2055 2350	73	8.5 8.0	98 90					
	0255 0610	73.5	8.9 8.9	102 102					
RANGE	MAXIMUM	75	9.4	109					
	MINIMUM	72	7.2	83					
AVERAGE		73	8.2	94					

TABLE T-13 (Continued)

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STATION D20.1					MILE 20.1			
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0930	73	7.2	83				
	1230	73.5	7.7	89				
	1510	74	8.1	94				
	1750	74	8.4	98				
6-21-60	2110	73	8.0	92				
	0030	72.5	8.0	91				
	0315	73	8.2	94				
	0555	73	8.0	92				
	0920	72	7.7	88				
	1205	73	7.9	91				
	1500	74	8.5	99				
	1800	75	9.1	106				
6-22-60	2110	73	8.4	97				
	0025	73	8.4	97				
	0420	73	8.9	102				
	0705	73	8.3	95				
	0940	72.5	8.2	93				
	1205	74	7.8	91				
	1505	74	8.6	100				
	1800	75	9.5	110				
6-23-60	2105	74	8.7	101				
	0020	73.5	8.4	97				
	0310	74	9.4	109				
	0555	73.5	9.2	106				
	0850	73	8.3	95				
	1205	72	7.6	86				
	1505	74	8.4	98				
	1805	75	9.8	115				
6-24-60	2105	74	8.9	103				
	0000	73	8.3	95				
	0305	73.5	9.4	104				
	0620	73.5	9.2	106				
RANGE	MAXIMUM	75	9.8	115				
	MINIMUM	72	7.2	83				
AVERAGE		73.5	8.4	98				

STATION D18.8					MILE 18.8			
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0935	73.5	7.2	83	1.28	0.0	0.3	0.3
	1240	74	8.0	93	1.28	0.0	0.3	0.3
	1515	74	8.6	100	1.92	0.0	0.3	0.3
	1810	75	8.7	101	1.77	0.0	0.3	0.3
6-21-60	2120	73	7.9	91	1.48	0.0	0.3	0.3
	0040	73	8.3	95	1.48	0.0	0.3	0.3
	0330	73	8.4	97	1.7	0.0	0.3	0.3
	0605	73	8.2	94	1.7	0.0	0.3	0.3
	0925	72	7.8	89	1.30	0.0	0.3	0.5
	1215	73	7.9	91	1.19	0.0	0.3	0.5
	1510	74	8.9	103	1.68	0.0	0.3	0.3
	1810	75	9.3	108	1.57	0.0	0.3	0.3
6-22-60	2120	73	8.4	97	1.50	0.1	0.3	0.3
	0040	73.5	8.9	102	1.40	0.0	0.3	0.3
	0715	73	8.7	100	1.38	0.0	0.3	0.3
					1.39	0.0	0.3	0.3
	0945	73	8.2	94	1.41	0.0	0.3	0.3
	1215	74	8.2	95	1.28	0.0	0.3	0.3
	1515	74	9.1	106	1.93	0.0	0.1	0.1
	1810	75	9.7	113	1.93	0.0	0.1	0.1
6-23-60	2110	74	9.1	106	3.44	0.0	0.2	0.3
	0030	74	9.2	107	3.48	0.0	0.2	0.3
	0320	74	9.3	108	2.3	0.0	0.2	0.3
	0605	74	9.2	107	2.3	0.0	0.2	0.3
	0900	73.5	8.5	98	1.41	0.0	0.3	0.3
	1215	73	7.8	90	1.44	0.0	0.3	0.3
	1515	75	8.9	103	2.00	0.0	0.3	0.3
	1815	75	10.2	119	2.00	0.0	0.3	0.3
6-24-60	2115	75	9.5	110	1.81	0.1	0.3	0.3
	0010	74	8.6	102	1.89	0.0	0.3	0.3
	0320	73.5	8.8	101	1.74	0.0	0.2	0.3
	0635	73.5	9.0	103	1.72	0.0	0.2	0.3
RANGE	MAXIMUM	75	10.2	119	3.48	0.1	0.3	0.5
	MINIMUM	72	7.2	83	1.19	0.0	0.1	0.1
AVERAGE		74	8.7	100	1.73	0.0	0.3	0.3

STATION E17.5					MILE 17.5			
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0715	74	7.3	85				
	1016	74	7.3	85				
	1316	74	8.2	95				
	1616	73	9.1	105				
	1916	72	8.9	101				
	2216	71	8.5	96				
6-21-60	0755	73	8.0	92				
	1016	71	8.1	91				
	1316	73	9.1	105				
	1616	74	9.6	112				
	1916	73	9.3	107				
	2225	73	8.8	101				
6-22-60	0115	71	8.9	100				
	0445	72	8.2	93				
	0730	72	8.5	97				
	1016	72	8.5	97				
	1316	75	9.4	109				
	1616	75	9.8	114				
	1916	75	9.8	114				
	2215	73	9.4	108				
6-23-60	0130	74	9.5	118				
	0430	73	8.2	94				
	0745	73	9.2	106				
	1016	73	8.7	100				
	1316	74	8.7	102				
	1616	75	10.1	117				
	1916	73	9.3	107				
	2215	72	9.6	109				
RANGE	MAXIMUM	76	10.1	117				
	MINIMUM	71	7.3	85				
AVERAGE		73	8.9	102				

STATION E15.1					MILE 15.1			
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0730	74	8.3	97	1.6	0.0	0.3	0.3
	1030	73	8.1	93	1.8	0.0	0.3	0.3
	1330	72	8.8	100	1.83	0.0	0.3	0.3
	1630	72	8.8	100	1.68	0.0	0.3	0.3
	1930	72	9.1	103	1.8	0.0	0.3	0.3
	2235	70	8.5	94	1.8	0.0	0.3	0.3
6-21-60	0800	72	8.5	97	1.55	0.0	0.3	0.4
	1030	72	8.4	95	1.56	0.0	0.3	0.4
	1330	75	9.4	109	2.03	0.1	0.3	0.3
	1630	74	8.8	102	1.83	0.0	0.3	0.3
	1930	72	9.5	108	2.00	0.0	0.2	0.3
	2235	73	9.3	107	1.88	0.0	0.2	0.3
6-22-60	0200	70	8.0	89	1.5	0.0	0.3	0.4
	0455	71	8.0	90	1.4	0.0	0.3	0.4
	0735	73	8.6	99	2.29	0.0	0.2	0.3
	1030	73	8.8	101	2.29	0.0	0.2	0.3
	1330	76	10.0	118	2.17	0.0	0.3	0.3
	1630	74	9.0	105	2.40	0.0	0.3	0.3
	1930	73	8.3	95	1.86	0.0	0.3	0.3
	2235	74	9.9	115	1.96	0.0	0.3	0.3
6-23-60	0150	72	8.4	95	1.22	0.0	0.3	0.3
	0440	72	8.1	92	1.19	0.0	0.3	0.3
	0755	73	8.7	100	1.80	0.0	0.3	0.3
	1030	73	9.4	108	1.71	0.0	0.3	0.3
	1330	77	9.9	118	1.47	0.0	0.3	0.3
	1630	74	8.7	101	1.55	0.0	0.3	0.3
	1930	72	8.7	99	1.96	0.0	0.3	0.3
	2235	71	9.2	103	1.67	0.0	0.3	0.3
RANGE	MAXIMUM	77	10.0	118	2.40	0.1	0.3	0.4
	MINIMUM	70	8.0	89	1.19	0.0	0.2	0.3
AVERAGE		73	8.8	101	1.78	0.0	0.3	0.3

TABLE T-13 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
LOWER REACH INTENSIVE SAMPLING PROGRAM  
JUNE 20-24, 1960

STATION: E13.4 MILE: 13.4

DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0740	72	7.8	89	1.6	0.0	0.3	0.3
	1040	72	8.2	93	1.6			
	1340	72	8.4	95	1.54	0.0	0.3	0.5
6-21-60	1640	71	8.5	96	1.47			
	1940	70	8.2	91	1.8	0.0	0.3	0.4
	2250	67	8.3	89	1.8			
6-22-60	0810	71	8.1	91	1.22	0.0	0.3	0.3
	1040	73	8.3	95	1.30			
	1340	73	9.0	103	2.26	0.0	0.3	0.3
6-23-60	1640	76	9.7	114	2.26			
	1940	72	8.7	99	1.76	0.0	0.3	0.3
	2250	71	8.2	92	1.78			
6-24-60	0215	68	7.9	86	1.4	0.0	0.3	0.3
	0505	71	7.8	88	1.4			
	0740	72	8.0	91	1.65	0.0	0.3	0.3
6-25-60	1040	73	8.6	99	1.65			
	1340	77	9.5	113	1.64	0.0	0.3	0.3
	1640	73	8.2	94	1.56			
6-26-60	1940	73	8.4	97	1.26	0.0	0.3	0.3
	2255	72	8.3	94	1.27			
	0210	71	8.0	90	0.97	0.0	0.2	0.2
6-27-60	0450	71	7.7	87	0.97			
	0800	73	8.2	94	3.50	0.0	0.2	0.2
	1040	74	8.9	103	3.48			
6-28-60	1340	74	8.7	101	1.24	0.0	0.3	0.3
	1640	73	8.1	93	1.24			
	1940	71	8.1	91	1.34	0.0	0.2	0.2
2300	71	8.5	96	1.36				
RANGE	MAXIMUM	77	9.7	114	3.50	0.0	0.3	0.5
	MINIMUM	67	7.7	85	0.97	0.0	0.2	0.2
AVERAGE		72	8.4	95	1.65	0.0	0.3	0.3

STATION: E11.1 MILE: 11.1

DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0752	72	7.9	90				
	1052	71	8.2	92				
	1352	71	8.4	94				
6-21-60	1652	71	8.5	96				
	1952	71	8.3	93				
	2252	68	8.3	90				
6-22-60	0815	72	8.1	92				
	1052	72	8.3	94				
	1352	72	8.8	100				
6-23-60	1652	74	9.6	112				
	1952	72	9.3	106				
	2312	70	8.1	90				
6-24-60	0225	69	7.9	87				
	0515	69	7.8	86				
	0750	72	8.0	91				
6-25-60	1052	74	8.4	98				
	1352	77	9.3	111				
	1652	73	8.4	108				
6-26-60	1952	72	8.1	92				
	2310	71	8.0	90				
	0220	70	8.0	89				
6-27-60	0500	70	7.8	87				
	0805	72	8.1	92				
	1052	73	9.1	105				
6-28-60	1352	73	8.2	94				
	1652	72	8.2	93				
	1952	71	7.9	89				
0015	69	8.2	90					
RANGE	MAXIMUM	77	9.6	112				
	MINIMUM	68	7.8	86				
AVERAGE		71.5	8.4	95				

STATION: E9.5 MILE: 9.5

DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0802	71	7.7	87	1.32	0.0	0.3	0.3
	1102	70	8.1	90	1.27			
	1402	70	8.4	93	1.25	0.0	0.2	0.3
6-21-60	1702	70	8.4	93	1.25			
	2002	70	8.4	93	1.4	0.0	0.3	0.3
	2315	66	8.4	91	1.4			
6-22-60	0825	70	8.1	90	1.81	0.0	0.3	0.3
	1102	71	9.4	106	1.73			
	1402	73	8.6	99	1.80	0.1	0.2	0.3
6-23-60	1702	72	8.9	101	1.68			
	2002	70	8.1	90	1.34	0.0	0.2	0.2
	2328	69	8.2	90	1.40			
6-24-60	0235	68	7.7	84	1.1	0.0	0.3	0.3
	0525	69	7.8	86	1.1			
	0800	70	7.9	88	1.36	0.0	0.2	0.3
6-25-60	1102	73	8.2	94	1.20			
	1402	77	9.5	113	1.32	0.0	0.2	0.3
	1702	73	9.0	103	1.32			
6-26-60	2002	70	7.9	88	1.09	0.0	0.2	0.3
	2325	70	8.2	91	1.07			
	0235	69	7.8	86	0.87	0.0	0.3	0.3
6-27-60	0510	69	7.7	85	0.84			
	0815	70	7.8	87	1.05	0.0	0.3	0.3
	1102	73	8.3	95	1.07			
6-28-60	1402	73	7.8	90	1.03	0.0	0.3	0.3
	1702	71	8.1	91	1.03			
	2002	70	7.8	87	1.06	0.1	0.3	0.3
					0.98			
RANGE	MAXIMUM	77	9.5	113	1.81	0.1	0.3	0.3
	MINIMUM	68	7.7	84	0.84	0.0	0.2	0.2
AVERAGE		70.5	8.2	92	1.26	0.0	0.3	0.3

STATION: E6.5 MILE: 6.5

DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
6-20-60	0814	70	8.0	89				
	1119	70	8.2	91				
	1414	69	8.3	91				
6-21-60	1719	69	8.4	92				
	2019	69	8.4	92				
	0835	70	8.2	91				
6-22-60	1119	69	8.4	92				
	1414	70	8.6	96				
	1719	70	8.6	96				
6-23-60	2019	68	8.1	88				
	0010	69	8.3	91				
	0250	68	7.6	83				
6-24-60	0535	69	7.9	87				
	0810	70	8.0	89				
	1119	72	8.4	95				
6-25-60	1414	71	8.3	93				
	1719	73	8.8	101				
	2019	69	7.9	87				
6-26-60	0000	68	7.8	85				
	0250	69	7.6	84				
	0525	69	7.7	85				
6-27-60	0825	70	7.9	88				
	1119	70	8.2	91				
	1414	70	8.2	91				
6-28-60	1719	71	7.9	89				
	2019	69	7.8	86				
RANGE	MAXIMUM	73	8.8	101				
	MINIMUM	68	7.6	83				
AVERAGE		69.5	8.1	90				

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

LOWER REACH INTENSIVE SAMPLING PROGRAM

JUNE 20-24, 1960

STATION 24.0										MILE 4.6			
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
6-20-60	0834	69	8.0	88	1.0 1.0	0.0	0.2	0.2					
	1134	69	8.2	90	1.37 1.28	0.1	0.3	0.3					
	1434 1734	69 68	8.3 8.4	91 91	1.23 1.23	0.1	0.2	0.2					
	2034	69	8.3	91	1.21 0.86	0.1	0.2	0.4					
6-21-60	0845 1134	69 69	8.2 8.1	90 89	1.06 1.06	0.1	0.2	0.3					
	1434 1734	73 70	8.0 8.0	92 89	1.40 1.46	0.2	0.2	0.3					
6-22-60	2034 0020	69 68	8.3 8.0	91 87	1.28 1.28	0.1	0.2	0.2					
	0300 0545	69 69	7.6 7.8	84 86	1.3 1.1	0.1	0.2	0.2					
6-23-60	0820 1134	70 72	8.2 8.9	91 101	1.26	0.0	0.2	0.2					
	1434 1734	73 71	8.3 7.9	95 89	1.38 1.38	0.1	0.2	0.2					
	2034 0010	70 68	8.0 7.8	89 85	0.96 0.95	0.1	0.2	0.2					
	0300 0535	69 69	7.4 7.7	81 85	0.87 0.80	0.1	0.2	0.2					
	0835 1134	70 71	7.9 8.2	88 92	0.89 0.90	0.0	0.3	0.3					
	1434 1734	70 71	8.0 7.6	89 85	1.04 0.94	0.1	0.2	0.2					
	2034	70	7.5	83	1.10 1.10	0.0	0.2	0.2					
RANGE	MAXIMUM	73	8.9	101	1.46	0.2	0.3	0.4					
	MINIMUM	68	7.4	81	0.80	0.0	0.2	0.2					
AVERAGE		70	8.0	89	1.13	0.1	0.2	0.2					

STATION West Sacramento Sewage Treatment Plant										MILE 58.0R			
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
6-20-60	1130	76	3.1					5.9	28	28			
	1730	72	2.9					12.4	41	41			
	2315	75	2.6					9.5	32	35			
6-21-60	0520	73	2.6					6.2	47	64			
	1115	77	1.9					7.6	22	26			
6-22-60	1715	79	2.3					8.0	33	33			
	2325	76	2.2					11.1	27	27			
	1120	77	5.4					15	22	22			
	1720	78	3.8					8.2	30	31			
	2315	76	2.8					6.6	27	27			
6-23-60	1120	78	5.4					4.8	24	24			
	1715	80	4.0					8.7	33	35			
6-24-60	2315	74	3.6					6.8	26	26			
	0515	74	4.3					7.0	23	24			
RANGE	MAXIMUM	80	5.4					15	47	64			
	MINIMUM	72	1.9					4.8	22	22			
AVERAGE		76	3.35					7.5	30	32			

STATION Sacramento Sewage Treatment Plant										MILE 54.1L			
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
6-21-60	Hourly Composite 24 Hour				85								
6-22-60	Hourly Composite 24 Hour				80								
6-23-60	Hourly Composite 24 Hour				85	2.0							
6-24-60	Hourly Composite 24 Hour				101	2.5							

STATION Meadowview Sewage Treatment Plant										MILE 47.7L			
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
6-20-60	Composite 0800-0900							140					
	1000-1200												
	1300-1400												
6-23-60	Composite 0800-0900							147					
	1000-1200												

STATION Isleton Sewage Treatment Plant										MILE 18.1L			
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
6-21-60	Hourly Composite 0600 to 1500				72	2.5	16	19					
6-23-60	Hourly Composite 0600 to 1500				47	4.2	21	23					

STATION Rio Vista Sewage Treatment Plant										MILE 11.6R			
DATE	TIME PST	TEMP °F	D O mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
6-21-60	Hourly Composite 0600 to 1500				68		4.9	18	21				
6-23-60	Hourly Composite 0600 to 1500				51		2.5	19	20				

Table T-14

RESULTS OF ANALYSES  
 LOWER REACH INTENSIVE SAMPLING PROGRAM  
 AUGUST 29 - SEPTEMBER 2, 1960

EXPLANATORY COMMENTS

1. Unless otherwise noted, the stations are on the Sacramento River. The numerical designation of the stations was an arbitrary method of identifying the stations during the sampling program.
2. Values shown in parenthesis and marked with an asterisk ( )\* appeared unrealistic and were not used in computing maximum, minimum and average values.
3. Values for biochemical oxygen demand (BOD) are reported in the following manner:

	<u>Method</u>	<u>Example</u>	
		<u>Time</u>	<u>BOD</u>
a.	Values shown in the example at right were obtained from duplicate analyses of a composite of the two samples collected at the specified times	0150	1.93
		0345	1.03
b.	A single BOD value reported between two times indicates that the values was obtained from a composite of samples collected at those times.	1330	
		1620	1.25
c.	A single value shown for a specific time is the BOD of the sample collected at that time.	1530	1.40

4. Values for ABS, O-PO<sub>4</sub>, and T-PO<sub>4</sub> were reported in the same manner as described for BOD results under sections b. and c. of item 3.

TABLE T-14  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

LOWER REACH INTENSIVE SAMPLING PROGRAM

AUGUST 29-SEPTEMBER 2, 1960

STATION A62.6		MILE 62.6							
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	1023	68	8.4	91	1.19 0.66	0.0	0.2	0.2	
	1323 1623	69 70	8.3 8.5	91 94	0.80 0.84	0.0	0.2	0.2	
	1923 2223	69 69	8.6 8.5	95 93	1.17 1.11	0.0	0.2	0.2	
8-30-60	0122 0420	70 69	8.3 8.3	92 91	1.09 0.99	0.0	0.2	0.2	
	0703 1020	70 69	8.4 8.2	93 90	0.94 0.94	0.0	0.2	0.2	
	1323 1623	69 70	8.5 8.5	93 94	1.00 0.90	0.0	0.1	0.1	
	1923 2223	69 70	8.5 8.3	93 92	0.92 0.86	0.0	0.2	0.2	
8-31-60	0117 0435	-- 69	8.3 8.4	-- 92	0.94 0.90	0.0	0.2	0.2	
	0723 1023	69 69	8.3 8.3	91 91	0.85 0.81	0.0	0.1	0.1	
	1323 1623	69 70	8.4 8.5	92 94	0.83 0.93	0.0	0.2	0.2	
9-1-60	1923 2223	70 69	8.5 8.4	94 92	0.63 0.63	0.0	0.2	0.2	
	0123 0423	69 69	8.8 8.2	97 90	0.65 0.60	0.0	0.2	0.2	
	0723 1023	-- 68	8.2 8.3	-- 90	0.54 0.67	0.0	0.2	0.2	
9-2-60	1323 1623	69 70	8.4 8.5	92 94	0.53 0.59	0.0	0.2	0.2	
	1923 2223	70 69	8.5 8.4	94 92	0.70 0.69	0.0	0.2	0.2	
	0135 0423	69 69	8.4 8.3	92 91	0.87 0.92	0.0	0.2	0.2	
	1030	69	8.4	92	0.60 0.56	0.0	0.2	0.2	
RANGE	MAXIMUM	70	8.8	97	1.19	0.0	0.2	0.2	
	MINIMUM	68	8.2	90	0.53	0.0	0.1	0.1	
AVERAGE		69	8.4	92	0.82	0.0	0.2	0.2	

STATION Natoma Main Drain		MILE 61.51							
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-30-60	1615	72	7.9	90	3.61	0.1	0.2	0.2	
	2215	70	7.3	81	2.1	0.0	0.3	0.3	
8-31-60	0505	69	6.4	70	2.3	0.0	0.2	0.2	
	1010	--	7.6	--	2.33 2.39	0.1	0.2	0.2	
9-1-60	1615	71	8.3	93	3.43	0.0	0.2	0.2	
	2215	70	7.0	78	0.9	0.0	0.3	0.3	
	0420	70	6.1	68	1.09	0.0	0.3	0.3	
	----	70	6.6	73	----	---	---	---	
9-2-60	1615	71	8.3	93	2.18	0.0	0.2	0.3	
	2215	70	7.2	80	1.61 1.55	0.0	0.3	0.3	
	0415	70	6.8	76	1.81	0.1	0.2	0.3	
RANGE	MAXIMUM	72	8.3	93	3.61	0.1	0.3	0.3	
	MINIMUM	69	6.1	68	0.9	0.0	0.2	0.2	
AVERAGE		70.5	7.2	80	2.11	0.0	0.2	0.3	

STATION Natoma East Main Drain (Back Borrow Pit)		MILE 60.61							
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	1040	72	3.3	38	5.5	1.0	5.3	5.9	
	1655	75	4.7	55	5.7	0.3	(42)*	(43)*	
	2235	72	3.3	38	6.24	0.4	5.5	6.1	
8-30-60	1040	72	4.2	48	5.98	1.1	7.0	7.1	
	1645	74	7.1	83	6.53	0.5	5.9	5.9	
	2245	72	3.6	41	4.0	0.9	7.2	7.3	
8-31-60	0440	68	1.9	21	3.72	0.3	6.9	7.2	
	1040	71	4.1	46	4.99 4.89	1.2	8.6	9.1	
	1640	73	6.1	70	5.39	1.0	7.1	7.5	
	2240	70	3.1	34	4.65	0.9	(18)*	(18)*	
9-1-60	0440	68	1.6	17	4.26	0.9	8.5	8.5	
	1040	72	3.8	43	3.75	1.0	7.0	8.5	
	1645	73	5.3	61	4.34	1.0	7.3	7.9	
9-2-60	2245	70	2.7	30	3.42	1.1	4.9	8.4	
	0440	66	2.0	21	5.80	0.2	5.8	7.9	
	1040	72	3.6	41	3.68	0.9	6.0	8.4	
RANGE	MAXIMUM	75	7.1	83	6.53	1.2	8.6	9.1	
	MINIMUM	66	1.6	17	3.42	0.2	4.9	5.9	
AVERAGE		71	3.8	43	4.87	0.8	6.6	7.6	

STATION A60.5		MILE 60.5							
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	1007 1307	68 69	8.3 8.4	90 92					
	1607 1907	70 70	8.5 8.6	94 96					
8-30-60	2207 0105	70 69	8.4 8.4	93 92					
	0355 0656	69 70	8.4 8.3	92 92					
8-31-60	1005 1307	69 69	8.3 8.5	91 93					
	1607 1907	70 70	8.6 8.7	96 97					
	2207 0102	69 69	8.4 8.4	92 92					
	0407 0707	69 69	8.3 8.3	91 91					
9-1-60	1000 1307	69 69	8.4 8.4	92 92					
	1607 1907	70 69	8.3 8.5	92 93					
	2207 0107	69 69	8.4 8.3	92 91					
	0402 0707	68.5 68.5	8.3 8.2	91 90					
9-2-60	0958 1307	(65.5) 69	8.2 8.4	(87) 92					
	1607 1907	70 70	8.6 8.5	96 94					
	2207 0123	69 70	8.4 8.4	92 93					
	0403 1023	69 69	8.3 8.3	91 91					
RANGE	MAXIMUM	70	8.7	97					
	MINIMUM	68	8.2	90					
AVERAGE		69	8.4	92					

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STATION American River		MILE 60.4 <sup>1</sup>							
DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	1015	67	9.1	98	0.86 0.79	0.0	0.0	0.2	
	1615	72	9.1	103	6.47 6.70	0.2	0.1	0.5	
	2215	65	9.0	95	5.44 5.02	0.2	0.1	0.2	
8-30-60	0415	63	9.1	94	1.26 1.22	0.0	0.2	0.2	
	1015	67	8.8	95	1.16 1.14	0.0	0.1	0.1	
	1615	69.5	8.8	98	1.27 1.24	0.0	0.1	0.1	
8-31-60	2220	67	8.7	94	1.04 0.94	0.0	0.2	0.2	
	0415	63	8.8	91	1.47 1.40	0.1	0.2	0.3	
	1015	68	8.6	93	2.34 2.08	0.1	0.2	0.2	
9-1-60	1615	69	8.7	96	1.85 1.89	0.1	0.1	0.1	
	2215	66	8.4	89	2.30 2.31	0.2	0.2	0.2	
	0415	63	8.4	87	1.14 0.95	0.1	0.2	0.3	
9-2-60	1015	68	8.5	92	----	---	---	---	
	1615	70.5	8.6	97	1.83 1.77	0.1	0.2	0.3	
	2215	65	8.7	92	1.89 1.87	0.1	0.1	0.2	
9-2-60	0415	63	8.7	89	6.59 6.52	0.1	0.2	0.2	
	1015	69	8.7	96	0.55 0.93	0.1	0.2	0.2	
RANGE	MAXIMUM	72	9.1	103	6.70	0.2	0.2	0.5	
	MINIMUM	63	8.4	87	0.55	0.0	0.0	0.1	
AVERAGE		66.5	8.7	94	2.32	0.1	0.2	0.2	

STATION A58.2		MILE 58.2							
DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0944	69	8.4	92	1.17 1.14	0.0	0.1	0.1	
	1244 1544	69 69	8.7 8.5	96 93	1.19 1.25	0.0	0.2	0.2	
	1844 2144	70 69	8.6 8.6	96 95	0.87 0.82	0.0	0.2	0.2	
8-30-60	0044** 0340	69 68	8.5 8.4	93 91	0.92 0.93	0.0	0.2	0.2	
	0640 0940	69 68	8.4 8.3	92 90	1.00 0.95	0.0	0.1	0.1	
	1244 1544	69 69	8.5 8.6	93 95	0.90 0.90	0.0	0.1	0.1	
8-31-60	1844 2144	70 69	8.6 8.6	96 95	0.91 0.91	0.0	0.2	0.2	
	0044** 0344	69 69	8.4 ---	92 --	1.01 0.97	0.0	0.2	0.2	
	0644 0944	69 69	8.4 8.5	92 93	0.96 0.98	0.0	0.2	0.2	
9-1-60	1244 1544	69 69	8.4 8.3	92 91	0.97 1.06	0.0	0.2	0.2	
	1844 2144	69 69	8.5 8.4	93 92	0.74 0.75	0.0	0.1	0.1	
	0044 0344	69 69	8.3 8.3	91 91	0.60 0.59	0.0	0.2	0.2	
9-2-60	0644 0944	68 68	8.2 8.4	89 91	0.77 0.87	0.0	0.2	0.2	
	1244 1544	69 70	8.4 8.5	92 94	0.67 0.68	0.0	0.2	0.2	
	1844 2144	70 69	8.5 8.5	94 93	1.00 0.90	0.0	0.2	0.2	
9-2-60	0115 0348	69 69	8.5 8.5	93 93	0.83 0.79	0.0	0.2	0.2	
	1011	68	8.4	91	0.64 0.55	0.0	0.2	0.2	
RANGE	MAXIMUM	70	8.7	96	1.25	0.0	0.2	0.2	
	MINIMUM	68	8.2	89	0.55	0.0	0.1	0.1	
AVERAGE		69	8.5	93	0.89	0.0	0.2	0.2	

\*\* Sample was not used in a composite for duplicate analyses.

STATION: West Sacramento Sewage Treatment Plant		MILE 58.0R							
DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	1120	79			104	8.8	29	33	
	1720	80			153	13	5.8	12	
	2320	77			136	12	36	37	
8-30-60	1120	78			90.5	8.0	24	28	
	1720	80			120	12	41	43	
	2325	78			97	14	30	34	
8-31-60	0520	74			117	8.2	28	34	
	1120	78			107	6.6	26	29	
	1720	79			---	9.2	40	44	
9-1-60	2320	76			90	8.0	31	36	
	0520	74			124	8.0	31	34	
	1120	78			98	6.7	24	28	
9-2-60	1710	77			141	9.7	39	42	
	2320	77			133	10	32	38	
	0520	72			107	8.8	32	36	
	1120	78			116	5.6	27	31	
RANGE	MAXIMUM	80			153	14	41	44	
	MINIMUM	72			90	5.6	5.8	12	
AVERAGE		77			115.5	9.3	30	34	

STATION: A56.7		MILE 56.7							
DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0930 1230	69 69	8.4 8.4	92 92					
	1530 1830	69 70	8.4 8.6	92 96					
	2130 0030	69 68	8.5 8.5	93 92					
8-30-60	0328 0632	68 70	---	-- 93					
	0927 1230	69 69	8.4 8.4	92 92					
	1530 1830	69 69	8.5 8.6	93 95					
8-31-60	2130 0030	69 69	8.4 8.4	92 92					
	0330 0630	69 68	8.3 8.3	91 90					
	0930 1230	69 69	8.5 8.4	93 92					
9-1-60	1530 1830	69 69	8.3 8.5	91 93					
	2130 0030	69 69	8.4 8.3	92 91					
	0330 0630	69 68	8.3 8.2	91 89					
9-2-60	0930 1230	68.5 69	8.3 8.3	91 91					
	1530 1830	70 70	8.4 8.5	93 94					
	2130 0109	69 69	8.2 8.5	90 93					
	0335 0818	69 68	8.5 8.3	93 90					
RANGE	MAXIMUM	70	8.6	96					
	MINIMUM	68	8.2	89					
AVERAGE		69	8.4	92					

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STATION A52.5		MILE 55.5						
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0918	69	8.4	92				
	1218	69	8.4	92				
	1518	70	8.4	93				
	1818	69	8.8	97				
8-30-60	2118	69	8.5	93				
	0018	69	8.4	92				
	0315	69	8.5	93				
	0625	70	8.4	93				
	0917	69	8.4	92				
	1218	69	8.4	92				
8-31-60	1518	69	8.4	92				
	1818	69	8.5	93				
	2118	69	8.5	93				
	0018	69	8.4	92				
	0318	69	8.4	92				
	0618	69	8.3	91				
	0918	68.5	8.4	92				
	1218	69	8.4	92				
9-1-60	1518	69	8.4	92				
	1818	69	8.5	93				
	2118	69	8.3	91				
	0018	69.5	8.9	99				
	0318	69	8.3	91				
	0618	69	8.2	90				
	0918	68.5	8.9	98				
	1218	69	8.3	91				
9-2-60	1518	70	8.4	93				
	1818	70	8.5	94				
	2118	69	8.3	91				
	0106	69	8.4	92				
	0325	69	8.4	92				
	0800	68	8.4	91				
RANGE	MAXIMUM	70	8.9	99				
	MINIMUM	68	8.2	90				
AVERAGE		69	8.4	93				

STATION A52.2		MILE 54.2						
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0903	69	8.4	92	2.01		0.2	0.2
	1203	69	8.3	91	2.80		0.2	0.2
	1503	69	8.3	91	1.10		0.2	0.2
	1803	69	9.0	99	1.07		0.2	0.2
8-30-60	2103	69	8.5	93	1.03		0.2	0.2
	0003	69	8.3	91	0.94		0.2	0.2
	0309	69	8.4	92	1.03		0.2	0.2
	0617	70	8.5	94	1.03		0.2	0.2
	0908	69	8.4	92	0.89		0.2	0.2
	1203	69	8.4	92	0.96		0.2	0.2
8-31-60	1503	69	8.4	92	0.96		0.2	0.2
	1803	69	8.4	92	0.98		0.2	0.2
	2103	69	8.5	93	0.93		0.2	0.2
	0003	69	8.4	92	1.01		0.2	0.2
	0306	69	8.3	91	1.01		0.2	0.2
	0604	69	8.3	91	0.88		0.2	0.2
	0903	68.5	8.4	92	0.98		0.2	0.2
	1203	69	8.4	92	1.06		0.2	0.2
9-1-60	1503	69	8.4	92	0.98		0.2	0.2
	1803	69	8.3	91	1.06		0.2	0.2
	2103	69	8.3	91	0.69		0.2	0.2
	0003	69	8.3	91	0.67		0.2	0.2
	0303	69	8.2	90	0.73		0.2	0.2
	0603	69	8.2	90	0.73		0.2	0.2
	0907	69	8.2	91	0.66		0.2	0.2
	1203	69	8.3	91	0.66		0.2	0.2
9-2-60	1503	70	8.3	92	0.72		0.2	0.2
	1803	70	8.3	92	0.68		0.2	0.2
	2103	69	8.3	91	0.65		0.2	0.2
	0100	69	8.3	91	0.65		0.2	0.2
	0315	69	8.4	92	0.85		0.2	0.2
	0742	68	8.4	91	0.87		0.2	0.2
RANGE	MAXIMUM	70	9.0	99	2.80	0.1	0.2	0.2
	MINIMUM	68	8.2	90	0.55	0.0	0.2	0.2
AVERAGE		69	8.4	92	0.96	0.0	0.2	0.2

STATION Sacramento Sewage Treatment Plant		MILE 54.11						
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0930	79						
	1530	81						
	2130	80						
	24 Hour Composite				136	4.7	16	18
8-30-60	0330	78						
	0930	79						
	1535	81						
	2130	81						
8-31-60	24 Hour Composite				178	3.1	12	14
	0330	78						
	0930	79						
	1530	80						
9-1-60	2130	80						
	24 Hour Composite				205	3.8	14	16
	0330	78						
	0930	79						
9-2-60	1530	80.5						
	2130	79.5						
	24 Hour Composite				195	3.2	14	20
	0330	78						
	0930	78						
					195	3.2	14	20
RANGE	MAXIMUM				205	4.7	16	20
	MINIMUM				136	3.1	12	14
AVERAGE					178.5	3.7	14	17

STATION A52.2		MILE 53.2						
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0855	69	8.3	91				
	1153	70	8.4	93				
	1453	70	8.3	92				
	1753	70	8.9	99				
8-30-60	2053	68	8.4	91				
	2353	68	8.3	90				
	0258	69	8.3	91				
	0608	70	8.3	92				
8-31-60	0900	69	8.3	91				
	1153	70	8.3	92				
	1453	69	8.3	91				
	1753	69	8.4	92				
9-1-60	2053	69	8.4	92				
	2353	69	8.2	90				
	0258	69	8.2	90				
	0554	69	8.3	91				
9-2-60	0853	68	8.3	91				
	1153	69	8.3	91				
	1453	69	8.3	91				
	1753	69	8.3	91				
9-1-60	2053	70	8.2	91				
	2354	69	8.2	90				
	0253	68	8.1	89				
	0553	69	8.2	90				
9-2-60	0857	69	8.3	91				
	1153	69	8.4	92				
	1453	70	8.2	91				
	1753	70	8.4	93				
9-2-60	2053	69	8.3	91				
	0053	69	8.3	91				
	0305	69	8.3	91				
	0730	68	8.4	91				
RANGE	MAXIMUM	70	8.9	99				
	MINIMUM	68	8.1	89				
AVERAGE		69	8.3	91				

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STATION: A52.3 MILE: 52.3

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0846	69	---	--				
	1146	69	8.5	93				
	1443 1743	70	8.4 8.9	93 98				
8-30-60	2043	67	8.3	89				
	2340	68	8.2	89				
	0245 0600	68 70	8.2 8.3	89 92				
8-31-60	0853	69	8.3	91				
	1143	69	8.3	91				
	1443 1743	69 69	8.3 8.3	91 91				
9-1-60	2043	68	8.3	90				
	2343	69	8.3	91				
	0250 0543	69 69	8.2 8.3	90 91				
9-2-60	0843	69	8.3	91				
	1143	69	8.4	92				
	1443 1743	69 69	8.4 8.3	92 91				
9-1-60	2043	70	8.2	91				
	2350	69	8.2	90				
	0243 0543	69 69	8.1 8.1	89 89				
9-2-60	0850 1143	68.5 69	(7.2)* 8.3	(79)* 91				
	1443 1743	70 70	8.2 8.2	91 91				
	2043 0050	69 69	8.3 8.2	91 90				
9-2-60	0259 0646	69 68	8.3 8.3	91 90				
	RANGE	MAXIMUM MINIMUM	70 67	8.9 8.1	98 89			
AVERAGE		69	8.3	91				

STATION: B50.8 MILE: 50.8

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	1055	69.5	8.5	94				
	1338	69.5	8.5	99	1.7	0.0	0.3	0.3
8-30-60	1700	69.5	(11.5)*	(128)*				
	2003	68.5	8.8	97	4.08	0.1	0.3	0.4
	2238	68	8.3	90	3.76	0.1	0.4	0.4
8-31-60	0135	68	8.2	89	3.80			
	0440	68	8.4	91	2.83	0.0	0.3	0.3
	0730	68.5	8.4	92	2.73			
8-31-60	1050	69	8.6	95	2.62	0.0	0.3	0.3
	1347	69.5	8.5	94	2.56			
	1646	69.5	8.5	94	3.51	0.0	0.3	0.4
8-31-60	2010	68	8.4	91	3.48			
	2253	67.5	8.4	91	3.52	0.1	0.3	0.3
	0145	68	8.3	90	3.49			
8-31-60	0450	68.5	8.3	91	2.25	0.1	0.4	0.4
	0758	69	8.4	92				
	1047	69.5	8.4	93	1.92	0.0	0.2	0.2
9-1-60	1356	70	8.7	97	1.90			
	1650	69.5	8.5	94	3.13	0.1	0.3	0.4
	1952	68	8.4	91	3.19			
9-1-60	2249	68	8.4	91	2.98	0.0	0.4	0.4
	0200	68	8.3	90	2.91			
	0455	69	8.3	91	4.77	0.1	0.5	0.5
9-2-60	0800	69	8.3	91	4.77			
	1100	69	8.5	93	1.83	0.0	0.3	0.3
	1358	69.5	8.6	96	1.98			
9-2-60	1655	69	8.5	93	3.47	0.1	0.4	0.4
	2003	68	8.4	91	3.48			
	2256	68	8.2	89	2.68	0.0	0.4	0.4
9-2-60	0155	68.5	8.5	93	2.73			
	0455	68	8.3	90	2.85	0.1	0.4	0.4
9-2-60	0802	68	8.5	92	2.85			
	RANGE	MAXIMUM MINIMUM	70 67.5	8.9 8.2	99 89	4.77 1.7	0.1 0.0	0.5 0.2
AVERAGE		68.5	8.4	92	3.03	0.1	0.3	0.4

STATION: B49.8 MILE: 49.8

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	1040	69.5	8.5	94				
	1330	70	8.4	93				
8-30-60	1650	69.5	8.5	94				
	1955	68.5	8.3	91				
	2232	68	8.2	89				
8-31-60	0125	68	8.2	89				
	0430	68	8.2	89				
	0720	68.5	8.3	91				
8-31-60	1035	69	8.5	93				
	1345	70	8.5	94				
	1635	69.5	8.5	94				
8-31-60	2001	69	8.4	92				
	2245	67.5	8.4	91				
	0135	68	8.1	88				
8-31-60	0442	68	8.1	88				
	0744	69	8.3	91				
	1035	69	8.4	92				
9-1-60	1349	70	8.6	96				
	1641	69.5	8.5	94				
	1943	68	8.4	91				
9-1-60	2238	68	8.2	89				
	0150	68	8.2	89				
	0443	69	8.2	90				
9-2-60	0750	69	8.3	91				
	1047	69	8.5	93				
	1349	70	8.5	94				
9-2-60	1642	70	8.5	94				
	1958	68.5	8.3	91				
	2244	68	8.2	89				
9-2-60	0148	68.5	8.4	92				
	0448	68	8.5	92				
9-2-60	0732	68.5	8.4	92				
	RANGE	MAXIMUM MINIMUM	70 67.5	8.6 8.1	96 88			
AVERAGE		69	8.4	92				

STATION: B48.4 MILE: 48.4

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	1026	69	8.5	93				
	1319	70	8.7	97				
8-30-60	1636	69.5	8.3	92				
	1945	69	8.3	91				
	2221	68	8.3	90				
8-31-60	0110	68	8.1	88				
	0415	68	8.1	88				
	0705	68.5	8.4	92				
8-31-60	1025	68.5	8.5	93				
	1333	70	8.5	94				
	1624	69.5	8.6	96				
8-31-60	1948	69	8.4	92				
	2234	68.5	8.4	92				
	0123	68.5	8.1	89				
8-31-60	0430	68	7.6	83				
	0733	69	8.2	90				
	1025	69.5	8.4	93				
9-1-60	1339	70	8.5	94				
	1629	69	8.4	93				
	1932	70	8.5	93				
9-1-60	2224	68.5	8.2	90				
	0134	68	8.1	88				
	0432	69	8.1	89				
9-2-60	0734	69	8.1	89				
	1035	69	8.3	91				
	1333	70	8.3	92				
9-2-60	1632	70	8.5	94				
	1951	68	8.3	90				
	2234	68	8.2	89				
9-2-60	0134	68.5	8.2	90				
	0433	68	8.3	90				
9-2-60	0733	67.5	8.2	89				
	RANGE	MAXIMUM MINIMUM	70 67.5	8.7 7.6	97 83			
AVERAGE		69	8.3	91				

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

LOWER REACH INTENSIVE SAMPLING PROGRAM

AUGUST 29-SEPTEMBER 2, 1960

STATION Meadowview Beverage Treatment Plant					MILE 47.74			
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0905	73						
	1505	86						
	2105	72						
8-30-60	0305	69						
	0905	74						
	1505	81			88	24		
8-31-60	0305	74						
	0905	74						
	1505	79.5						
9-1-60	0305	79						
	0905	74			(Composited from 0300 to 1200) 127			
	1505	77.5						
9-2-60	0305	72						
	0905	74						
RANGE	MAXIMUM	86			127	24		
	MINIMUM	69			88	12		
AVERAGE		75			107.5	18		

STATION 447.1					MILE 47.1			
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	1020	69.5	8.4	93				
	1305	70	8.5	94				
8-30-60	1630	70	8.7	97				
	1937	69	8.3	91				
	2214	68	8.2	89				
	0058	68	8.1	88				
8-31-60	0405	68	7.9	86				
	0657	68.5	8.1	89				
	1010	69.5	8.0	89				
	1318	70	8.5	94				
	1618	70	8.5	94				
	1935	69.5	8.4	93				
9-1-60	2219	69	8.2	90				
	0112	68.5	8.0	88				
	0418	68	7.8	85				
	0720	69	8.0	88				
9-2-60	1006	69	8.2	90				
	1323	70	8.4	93				
	1619	70	8.5	94				
	1919	69	8.5	93				
9-1-60	2212	69	8.1	89				
	0123	68	8.0	87				
	0421	69	7.8	86				
	0725	69	8.1	89				
9-2-60	1015	69	8.3	91				
	1323	69.5	8.3	92				
	1624	70	8.5	94				
	1938	68	8.3	90				
9-2-60	2223	68	8.2	89				
	0123	68.5	8.1	89				
9-2-60	0422	68	8.0	87				
	0722	68	8.1	88				
RANGE	MAXIMUM	70	8.7	97				
	MINIMUM	68	7.8	85				
AVERAGE		69	8.2	90				

STATION 446.2					MILE 46.2			
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0949	69	8.2	90				
	1252	70	8.3	92	1.5	0.1	0.3	0.3
8-30-60	1610	70	8.6	96	2.15	0.1	0.3	0.3
	1922	69	8.3	91	2.10			
	2202	69	8.1	89	2.60	0.0	0.3	0.3
	0045	68	8.0	87	2.55			
8-31-60	0353	68	8.0	87	4.08	0.1	0.4	0.4
	0645	68	7.9	86	3.74			
	1000	69	8.1	89	2.33	0.0	0.3	0.3
	1308	70.5	8.3	93	2.31			
	1612	70	8.5	94	2.25	0.0	0.2	0.3
	1917	69.5	8.3	92	2.30			
9-1-60	2204	69	8.0	88	2.45	0.1	0.3	0.3
	0101	68.5	7.8	86	2.42			
	0406	68	7.6	83	3.2	0.1	0.4	0.4
	0708	68	7.8	85				
9-2-60	0956	69	8.2	90	1.94	0.0	0.3	0.3
	1311	71	8.4	94	1.89			
	1609	70.5	8.3	93	1.72	0.1	0.3	0.3
	1907	69	8.5	93	1.69			
	2206	69	8.1	89	2.26	0.1	0.4	0.4
	0112	69	7.8	86	2.11			
9-2-60	0412	69	7.8	86	2.23	0.1	0.4	0.4
	0715	69	7.8	86	2.21			
	1002	69	7.9	87	2.20	0.0	0.4	0.4
	1313	70	8.2	91	2.13			
	1615	70	8.3	92	2.02	0.1	0.2	0.3
	1919	69	8.2	90	1.98			
9-2-60	2211	68.5	8.1	89	2.48	0.0	0.3	0.3
	0113	69	8.0	88	2.46			
9-2-60	0407	68	7.9	86	2.15	0.0	0.4	0.4
	0713	68	8.0	87	2.12			
RANGE	MAXIMUM	71	8.6	96	4.08	0.1	0.4	0.4
	MINIMUM	68	7.6	83	1.5	0.0	0.2	0.3
AVERAGE		69	8.1	89	2.27	0.1	0.3	0.3

STATION 445.1					MILE 45.1			
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0943	69	8.1	89				
	1242	70	8.2	91				
8-30-60	1602	70	8.4	93				
	1917	69.5	8.3	92				
	2153	69	8.3	91				
	0035	69	8.0	88				
8-31-60	0345	68	8.1	88				
	0639	68	7.6	83				
	0950	68.5	7.9	87				
	1254	70	8.2	91				
	1607	70	8.2	91				
	1907	70	8.2	91				
9-1-60	2156	69	8.1	89				
	0055	68.5	7.8	86				
	0355	68.5	7.7	85				
	0700	67.5	7.5	82				
9-2-60	0938	68.5	7.8	86				
	1249	70.5	8.0	90				
	1600	70.5	8.2	92				
	1858	69.5	8.3	92				
	2152	69	8.1	89				
	0100	69	7.8	86				
9-2-60	0404	69	7.6	84				
	0703	69	7.6	84				
	0955	69	7.7	85				
	1302	70	8.2	91				
	1601	70	8.2	91				
	1903	69.5	8.1	90				
9-2-60	2156	69	8.0	88				
	0055	69	7.9	87				
9-2-60	0359	68	7.6	83				
	0654	68	7.6	83				
RANGE	MAXIMUM	70.5	8.4	93				
	MINIMUM	67.5	7.5	82				
AVERAGE		69	8.0	88				

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

LOWER REACH INTENSIVE SAMPLING PROGRAM

AUGUST 29-SEPTEMBER 2, 1960

STATION: B43.4 MILE: 43.4

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0935	68.5	7.9	87	1.4	0.1	0.4	0.4
	1233	70	8.0	89	1.63	0.1	0.3	0.3
8-30-60	2145	69	8.2	90	1.69	0.0	0.3	0.3
	0025	69	8.1	89	1.79	0.0	0.3	0.3
	0335	68.5	7.7	85	2.16	0.1	0.3	0.3
	0630	68	7.7	84	2.15	0.1	0.3	0.3
8-31-60	0935	69	7.3	80	2.92	0.1	0.4	0.4
	1240	70	7.8	87	2.92	0.1	0.4	0.4
	1556	70.5	7.8	88	2.01	0.0	0.3	0.3
	1845	70	8.1	90	2.01	0.0	0.3	0.3
9-1-60	2145	69	8.1	89	1.89	0.1	0.2	0.3
	0045	69	7.9	87	1.89	0.1	0.2	0.3
	0343	68.5	7.5	82	1.59	0.1	0.4	0.4
	0650	68	7.3	79	1.59	0.1	0.4	0.4
9-1-60	0930	68.5	7.4	81	2.38	0.0	0.4	0.4
	1237	69.5	7.7	86	2.35	0.0	0.4	0.4
	1536	70	7.8	87	1.62	0.1	0.3	0.3
	1840	70	8.2	91	1.59	0.1	0.3	0.3
9-2-60	2138	69	7.8	86	1.39	0.0	0.3	0.3
	0044	69	7.8	86	1.47	0.0	0.3	0.3
	0351	69	7.7	85	1.81	0.1	0.4	0.4
	0644	69	7.2	79	1.74	0.1	0.4	0.4
9-2-60	0944	69	7.5	82	2.21	0.1	0.4	0.5
	1245	70	7.5	83	2.24	0.1	0.4	0.5
	1544	70	7.5	83	2.07	0.1	0.3	0.4
	1844	70	7.9	88	2.00	0.1	0.3	0.4
9-2-60	2143	69	7.9	87	1.40	0.0	0.2	0.3
	0043	69	7.7	85	1.44	0.0	0.2	0.3
	0348	68.5	7.5	82	1.76	0.0	0.3	0.4
	0641	68	7.1	77	1.71	0.0	0.3	0.4
RANGE	MAXIMUM	70.5	8.2	91	2.92	0.1	0.4	0.5
	MINIMUM	68	7.1	77	1.39	0.0	0.2	0.3
AVERAGE		69	7.7	85	1.90	0.1	0.3	0.4

STATION: American Crystal Sugar Company Discharge MILE: 43.3

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	1400	97	0	0	(1010)*	0.2	6.8	8.3
	2000	96	0	0	555	0.6	5.5	8.1
8-30-60	0225	94	0	0	471	0.2	0.1	0.2
	0800	94	0	0	483	0.2	2.0	4.2
	1400	94	0	0	489	0.2	2.7	7.7
	1945	96	0	0	444	0.2	0.4	0.4
8-31-60	0205	94	0	0	530	0.3	1.2	4.9
	0810	94	0	0	528	0.2	8.3	9.0
	1350	95	0	0	490	0.1	2.3	3.4
	1930	94	0	0	458	0.1	2.8	3.2
9-1-60	0205	92	0	0	428	0.2	1.8	3.8
	0800	92	0	0	444	0.1	1.2	1.4
	1400	93	0	0	434	0.3	1.6	1.8
	2000	92	0	0	477	0.2	2.3	2.7
9-2-60	0150	90	0	0	404	0.1	3.3	7.9
	0800	88	0	0	477	0.2	7.2	8.3
RANGE	MAXIMUM	97	0	0	555	0.6	8.3	9.0
	MINIMUM	88	0	0	404	0.1	0.1	0.2
AVERAGE		93.5	0	0	474	0.2	3.1	4.7

STATION: B42.1 MILE: 42.1

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0930	68.5	7.9	87				
	1226	69.5	7.5	83				
8-30-60	1545	70	8.0	89				
	1903	70	8.1	90				
	2137	69	7.9	87				
	0020	69	8.0	88				
8-31-60	0325	68.5	7.8	86				
	0621	68	7.4	80				
	0927	68.5	7.3	80				
	1228	70	7.0	78				
9-1-60	1537	70.5	7.5	84				
	1836	70	8.0	89				
	2138	69.5	7.8	87				
	0040	69	7.5	82				
9-2-60	0330	69	7.6	84				
	0625	68	7.2	78				
	0925	68.5	7.3	80				
	1230	70	7.1	79				
9-2-60	1528	70	7.3	81				
	1828	70	7.8	87				
	2129	69.5	7.8	87				
	0035	69	7.6	84				
9-2-60	0345	69	7.7	85				
	0632	69	7.1	78				
	0933	69	7.3	80				
	1233	69.5	7.2	80				
9-2-60	1535	70.5	7.1	80				
	1835	70	7.6	84				
	2134	69	7.8	86				
	0033	69	7.5	82				
9-2-60	0340	69	7.7	85				
	0633	68	7.3	80				
RANGE	MAXIMUM	70.5	8.1	90				
	MINIMUM	68	7.0	78				
AVERAGE		69	7.6	83				

STATION: B41.1 MILE: 41.1

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0920	68.5	8.0	88				
	1218	69.5	7.9	88				
8-30-60	1536	69.5	7.7	86				
	1856	69.5	7.9	88				
	2126	68	7.9	86				
	0005	69	7.8	86				
8-31-60	0315	68.5	7.6	84				
	0612	68	7.3	79				
	0915	68.5	7.3	80				
	1215	69	7.4	81				
9-1-60	1530	70	6.9	77				
	1820	70	7.6	84				
	2128	69	7.5	82				
	0030	69	7.4	81				
9-2-60	0325	69	7.1	78				
	0620	68.5	7.3	80				
	0917	69	7.0	77				
	1210	69.5	7.2	80				
9-2-60	1515	70	6.5	72				
	1817	69.5	7.4	82				
	2120	69.5	7.4	82				
	0020	69	7.4	81				
9-2-60	0335	69	7.5	82				
	0621	69	7.6	84				
	0917	69	7.2	79				
	1224	69	7.4	81				
9-2-60	1525	70	7.5	83				
	1822	70	6.6	73				
9-2-60	2122	69	7.3	80				
	0020	69	7.4	81				
9-2-60	0331	69	7.5	82				
	0620	68	7.4	80				
RANGE	MAXIMUM	70	8.0	88				
	MINIMUM	68	6.5	72				
AVERAGE		69	7.4	81				

SACRAMENTO RIVER WATER POLLUTION SURVEY

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LOWER REACH INTENSIVE SAMPLING PROGRAM

AUGUST 29-SEPTEMBER 2, 1960

STATION B39.8		MILE 39.8											
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
8-29-60	0909	68.5	7.7	85	1.25	0.0	0.2	0.3					
	1208	69.5	7.8	87									
	1530	69.5	7.5	83									
8-30-60	2117	68.5	7.6	84	1.77	0.0	0.3	0.3					
	2355	69	7.7	85									
	0300	68.5	7.5	82									
8-31-60	0605	68	7.3	79	2.01	0.1	0.3	0.3					
	0905	68.5	7.1	78									
	1158	69.5	7.3	81									
8-31-60	1524	70	7.2	80	2.62	0.1	0.4	0.4					
	1809	70	7.2	80									
	2120	68	7.4	80									
8-31-60	0020	69	7.1	78	2.16	0.1	0.3	0.3					
	0315	69	7.4	81									
	0609	69	7.4	81									
8-31-60	0908	69	6.9	76	2.00	0.0	0.3	0.3					
	1202	70	6.9	77									
	1507	69.5	7.1	79									
8-31-60	1807	69.5	6.8	76	2.40	0.1	0.4	0.4					
	2109	69	7.3	80									
	0009	69	7.1	78									
9-1-60	0325	69	7.5	82	1.45	0.0	0.3	0.3					
	0612	69	7.3	80									
	0905	69	7.0	77									
9-1-60	1209	69	7.4	81	1.97	0.0	0.3	0.4					
	1517	69.5	7.5	83									
	1808	69.5	7.0	78									
9-2-60	2113	69	7.0	77	1.54	0.0	0.3	0.3					
	0008	69	7.2	79									
	0320	69	7.1	78									
9-2-60	0609	68.5	7.0	77	1.55	0.0	0.3	0.3					
	RANGE	MAXIMUM	70	7.8					87	2.63	0.1	0.4	0.4
	MINIMUM	68	6.8	76					1.25	0.0	0.2	0.3	
AVERAGE		69	7.3	80	1.92	0.0	0.3	0.3					

STATION C38.6		MILE 38.6							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0929	68	7.5	82					
	1238	69	7.6	84					
	1531	69	7.6	84					
8-30-60	1835	69.5	7.5	83					
	2153	69	7.4	81					
	0046	68	7.4	80					
8-31-60	0343	67	7.6	82					
	0609	68	7.5	82					
	0934	67	7.2	77					
8-31-60	1240	70	7.1	79					
	1533	69.5	6.9	77					
	1828	69.5	6.4	71					
8-31-60	2133	69	6.6	73					
	0048	68	6.6	72					
	0355	67	7.1	76					
9-1-60	0552	69	7.0	77					
	0949	69	7.0	77					
	1254	70	7.0	78					
9-1-60	1526	69.5	6.9	77					
	1831	69	6.0	66					
	2137	68	6.8	74					
9-1-60	0030	68	6.5	71					
	0330	67	6.9	74					
	0557	69	7.2	79					
9-2-60	0923	68	6.9	75					
	1250	70	6.9	77					
	1532	70	7.0	78					
9-2-60	1835	70	7.0	78					
	2136	68	6.6	72					
	0030	68	6.6	72					
9-2-60	0345	68	6.0	65					
	0626	67	7.3	78					
	RANGE	MAXIMUM	70	7.6					84
MINIMUM	67	6.0	65						
AVERAGE		68.5	7.0	77					

STATION C37.2		MILE 37.2							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0915	68	7.5	82	1.15	0.0	0.3	0.3	
	1222	69.5	7.5	83					
	1518	69	7.7	85					
8-30-60	1823	69	7.3	80	1.64	0.1	0.3	0.3	
	2143	69	7.2	79					
	0028	67	7.2	77					
8-31-60	0333	67	7.3	78	2.24	0.0	0.2	0.2	
	0559	67	7.3	78					
	0920	69	7.4	81					
8-31-60	1226	70	7.4	82	2.57	0.1	0.3	0.4	
	1522	69.5	7.0	78					
	1814	69	6.6	73					
8-31-60	2122	69	6.2	68	2.89	0.1	0.4	0.4	
	0034	67	6.1	66					
	0340	66	6.9	73					
8-31-60	0547	68	7.2	78	2.16	0.1	0.3	0.3	
	0938	69	7.1	78					
	1247	70.5	7.2	81					
9-1-60	1513	69.5	7.0	78	1.85	0.1	0.3	0.3	
	1821	69	6.9	76					
	2124	68	5.9	64					
9-1-60	0022	67	6.0	65	2.88	0.1	0.4	0.5	
	0321	68	6.2	67					
	0550	68	7.0	76					
9-2-60	0915	68	7.1	77	1.73	0.0	0.3	0.3	
	1238	69	7.1	78					
	1522	70	7.1	79					
9-2-60	1823	70	7.0	78	1.84	0.1	0.3	0.3	
	2122	68	6.5	71					
	0023	68	6.1	66					
9-2-60	0335	67	6.5	70	1.37	0.0	0.3	0.4	
	0605	67	6.9	74					
	RANGE	MAXIMUM	70.5	7.7					85
MINIMUM	66	5.9	64	1.15	0.0	0.2	0.2		
AVERAGE		68.5	6.9	76	2.11	0.1	0.3	0.3	

STATION C35.9		MILE 35.9							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0907	68	7.4	80					
	1213	69.5	7.6	84					
	1511	69	7.6	84					
8-30-60	1816	69	7.7	85					
	2132	69	7.5	82					
	0014	67	7.2	77					
8-31-60	0324	67	7.3	78					
	0552	68	8.1	88					
	0909	69	7.6	84					
8-31-60	1218	70	7.5	83					
	1513	70	7.2	80					
	1807	69	7.0	77					
8-31-60	2111	69	6.8	75					
	0023	68	6.8	74					
	0320	67	6.3	68					
9-1-60	0541	68	7.0	76					
	0932	69	7.1	78					
	1239	70.5	7.3	82					
9-1-60	1505	70	7.1	79					
	1812	69	6.9	76					
	2117	68	6.7	73					
9-1-60	0011	68	6.0	65					
	0311	67	5.7	61					
	0546	68	6.6	72					
9-2-60	0907	68	7.0	76					
	1226	70	7.4	82					
	1517	70	7.4	82					
9-2-60	1814	69.5	7.0	78					
	2113	67.5	7.0	76					
	0013	68	6.9	75					
9-2-60	0320	68	6.5	71					
	0558	67	6.4	69					
	RANGE	MAXIMUM	70.5	8.1					88
MINIMUM	67	5.7	61						
AVERAGE		68.5	7.1	77					

TABLE T-14 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

LOWER REACH INTENSIVE SAMPLING PROGRAM

AUGUST 29-SEPTEMBER 2, 1960

STATION: C34.4 MILE: 34.4

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0855	68	7.1	77	1.4	0.0	0.3	0.3
	1200	70	7.5	83				
	1500	69.5	7.5	83	1.45	0.1	0.2	0.2
8-30-60	1803	69	7.7	85	1.41			
	2122	69	7.4	81	3.14	0.0	0.2	0.2
	2359	68	7.5	82	3.14			
8-31-60	0312	68	7.1	77	2.52	0.0	0.3	0.3
	0544	68	7.6	83	2.43			
	0858	69	7.4	81	1.97	0.1	0.3	0.3
8-31-60	1208	70.5	7.6	85	2.01			
	1453	70	7.4	82	1.82	0.0	0.3	0.3
	1758	69.5	7.1	79	1.81			
8-31-60	2058	68.5	7.0	77	2.25	0.1	0.3	0.3
	0010	68	7.0	76	2.20			
	0314	67	6.2	67	2.45	0.1	0.4	0.4
8-31-60	0533	68	6.4	70				
	0919	68	7.0	76	1.99	0.0	0.3	0.3
	1231	70.5	7.3	82	2.00			
8-31-60	1458	70.5	7.3	82	1.53	0.1	0.2	0.3
	1802	69	7.0	77	1.50			
	2106	69	6.7	74	2.41	0.1	0.3	0.4
9-1-60	0000	67	6.6	71				
	0303	68	6.4	70	2.25	0.0	0.4	0.4
	0540	68	5.8	63	2.21			
9-1-60	0859	68	7.1	77	2.00	0.0	0.3	0.3
	1217	69	7.1	78	1.82			
	1508	70	7.4	82	1.41	0.1	0.3	0.3
9-2-60	1805	70	7.3	81	1.42			
	2103	68	6.9	75	1.98	0.0	0.3	0.3
	0003	68	6.8	74	1.99			
9-2-60	0310	66	6.6	70	2.04	0.0	0.3	0.4
	0551	67	5.9	63	2.05			
RANGE	MAXIMUM	70.5	7.7	85	3.14	0.1	0.4	0.4
	MINIMUM	66	5.8	63	1.4	0.0	0.2	0.2
AVERAGE		68.5	7.0	77	2.02	0.0	0.3	0.3

STATION: Butte Slough MILE: 34.2R

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-30-60	0634	68	7.4	80	2.48	0.0	0.3	0.3
	1000	68	8.2	89	1.96	0.1	0.3	0.3
	1500	70	7.4	82	1.43	0.0	0.3	0.3
8-31-60	0611	68	6.3	68	1.71	0.1	0.3	0.4
	1225	71	---	---	---	---	---	---
	1755	69	7.0	77	1.44	0.0	0.3	0.3
9-1-60	0609	67	5.8	62	2.74	0.0	0.4	0.4
	1209	70	7.1	79	1.01	0.0	0.3	0.3
	1504	72	6.9	78	0.92	---	---	---
9-1-60	1758	70	6.9	77	1.23	0.0	0.3	0.4
					1.23			
RANGE	MAXIMUM	72	8.2	89	2.74	0.1	0.4	0.4
	MINIMUM	67	5.8	62	0.92	0.0	0.3	0.3
AVERAGE		69.5	7.0	77	1.71	0.0	0.3	0.3

STATION: C33.5 MILE: 33.5

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0846	68	7.2	78				
	1148	70.5	7.2	81				
	1453	70	7.5	83				
8-30-60	1753	69.5	7.5	83				
	2110	69	7.4	81				
	2347	68	7.2	78				
8-30-60	0303	68	7.2	78				
	0538	68	7.1	77				
	0849	69	7.6	84				
8-31-60	1201	70.5	7.5	84				
	1448	70	7.5	83				
	1750	69.5	7.2	80				
8-31-60	2050	69	7.0	77				
	0002	68	7.1	77				
	0304	68	6.7	73				
8-31-60	0529	68	6.0	65				
	0911	69	7.2	79				
	1216	70	7.1	79				
8-31-60	1449	70	---	---				
	1748	69	7.1	78				
	2058	69	6.8	75				
9-1-60	2352	67	6.6	71				
	0255	68	6.4	70				
	0537	67	5.7	61				
9-1-60	0851	69	6.8	75				
	1202	70	7.1	79				
	1457	70	7.2	80				
9-2-60	1751	69.5	7.3	81				
	2057	68	7.0	76				
	2354	67	6.8	73				
9-2-60	0300	67	6.0	65				
	0544	67	6.5	70				
RANGE	MAXIMUM	70.5	7.6	84				
	MINIMUM	67	5.7	61				
AVERAGE		68.5	7.0	77				

STATION: Steamboat Slough MILE: 32.6R

DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	2057	69.5	7.0	78	2.16	0.1	0.2	0.2
					2.19			
8-30-60	0135	68	7.2	78	---	---	---	---
	0645	68	7.3	79	2.24	0.1	0.3	0.3
	1014	(63)*	7.2	74	2.04	0.1	0.4	0.4
8-31-60	1150	70	7.2	80	---	---	---	---
	1437	70	7.4	82	1.36	0.0	0.2	0.2
	1741	70	7.3	81	---	---	---	---
8-31-60	2039	69.5	7.4	82	---	---	---	---
	0622	68	5.8	63	2.21	0.1	0.4	0.4
	1207	69.5	6.3	70	1.29	0.0	0.4	0.4
8-31-60	1439	70	6.9	77	---	---	---	---
	1738	69.5	7.2	80	1.25	0.0	0.3	0.3
	2050	69	7.0	77	1.22			
9-1-60	0619	67	5.9	63	---	---	---	---
	1152	69	6.5	71	1.30	0.0	0.4	0.4
	1450	70	6.2	69	1.13	0.0	0.3	0.4
9-1-60	1743	70	6.9	77	1.06			
	2049	67.5	7.0	76	---	---	---	---
					1.18	0.0	0.3	0.3
RANGE	MAXIMUM	70	7.4	82	2.24	0.1	0.4	0.4
	MINIMUM	67	5.8	63	1.06	0.0	0.2	0.2
AVERAGE		68.5	6.9	75	1.60	0.0	0.3	0.3

TABLE T-14 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

LOWER REACH INTENSIVE SAMPLING PROGRAM

AUGUST 29-SEPTEMBER 2, 1960

STATION C32.5		MILE 32.5							
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0838 1238	68 71	7.0 7.2	76 81	2.1	0.1	0.3	0.3	
	1441 1742	70 69.5	7.3 7.5	81 83	1.43 1.43	0.1	0.2	0.2	
	2043 2337	70 68	7.2 7.4	80 80	2.35 2.32	0.1	0.2	0.2	
8-30-60	0255 0533	68 68	7.2 7.1	78 77	1.80 2.76	0.0	0.3	0.3	
	0837 1141	68 70.5	7.5 7.5	82 84	1.45 1.40	0.1	0.3	0.3	
	1428 1733	70 70	7.4 7.4	82 82	1.57 1.60	0.0	0.3	0.3	
8-31-60	2029 2355	69.5 68	7.3 7.1	81 77	1.43 1.34	0.1	0.3	0.3	
	0256 0524	67 68	6.9 6.0	74 65	1.6	0.1	0.4	0.4	
	0902 1148	68 69.5	7.0 6.6	76 73	1.42 1.41	0.0	0.3	0.3	
9-1-60	1433 1729	70 69.5	7.1 7.2	79 80	1.42 1.38	0.1	0.3	0.3	
	2041 2345	69.5 68	7.0 6.4	78 71	1.38 1.34	0.1	0.3	0.4	
	0248 0533	68 67	6.5 6.1	71 66	1.85 1.92	0.1	0.4	0.4	
9-2-60	0844 1142	69 70	6.4 6.9	70 77	1.40 1.33	0.0	0.3	0.4	
	1443 1735	71 70	6.6 7.1	74 79	1.36 1.34	0.1	0.3	0.3	
	2043 2346	68 68	7.0 6.9	76 75	1.30 1.15	0.0	0.3	0.3	
	0254 0540	67 66	6.7 6.7	72 71	1.57 1.66	0.0	0.3	0.3	
RANGE	MAXIMUM MINIMUM	71 66	7.5 6.0	84 65	2.76 1.15	0.1 0.0	0.4 0.2	0.4 0.2	
AVERAGE		68.5	7.0	77	1.59	0.1	0.3	0.3	

STATION C31.6		MILE 31.6							
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0829 1129	68 69.5	6.8 7.2	74 80					
	1433 1737	70 70	7.0 7.5	78 83					
	2033 2321	69 68	7.4 7.2	81 78					
8-30-60	0247 0528	68 68	7.2 7.0	78 76					
	0830 1133	68 69.5	7.3 7.5	79 83					
	1423 1725	70 70	7.4 7.5	82 83					
8-31-60	2022 2347	69.5 68	7.2 7.2	80 78					
	0248 0519	67 68	6.9 6.5	74 71					
	0850 1137	69 69.5	6.4 7.0	70 78					
9-1-60	1427 1723	70.5 69.5	7.1 7.2	80 80					
	2033 2340	70 68	6.9 6.6	77 72					
	0242 0530	68 67	6.5 6.2	71 67					
9-2-60	0837 1136	68 70	5.9 7.0	64 78					
	1436 1728	70 70	7.0 7.2	78 80					
	2036 2340	68 68	7.2 6.9	78 75					
	0249 0535	67 67	6.7 6.6	72 71					
RANGE	MAXIMUM MINIMUM	70.5 67	7.5 5.9	83 64					
AVERAGE		69	7.0	76					

STATION C30.1		MILE 30.1							
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0819 1114	66 69.5	6.6 6.9	70 77	1.3	0.1	0.4	0.4	
	1420 1724	69.5 70	7.1 7.3	79 81	1.44 1.44	0.1	0.2	0.2	
	2021 2313	69 69	7.4 7.0	81 77	2.96 3.00	0.1	0.2	0.3	
8-30-60	0237 0521	68 68	7.1 7.3	77 79	2.17 2.12	0.0	0.2	0.2	
	0815 1122	68 70	7.1 7.4	77 82	1.45 1.45	0.1	0.3	0.3	
	1413 1715	70 70	7.4 7.4	82 82	0.95 0.97	0.0	0.3	0.3	
8-31-60	2011 2336	69.5 68	7.3 7.1	81 77	1.54 1.49	0.1	0.3	0.3	
	0237 0513	67 67	5.2 6.8	56 73	1.35	0.1	0.3	0.3	
	0825 1125	68 69.5	5.9 6.8	64 76	1.62 1.57	0.0	0.3	0.3	
9-1-60	1417 1714	70.5 69.5	7.1 7.0	80 78	----	---	---	---	
	2018 2327	69.5 68	7.0 4.6	78 50	1.50 1.55	0.1	0.3	0.3	
	0234 0527	68 68	6.7 6.4	73 70	1.32 1.32	0.1	0.3	0.3	
9-2-60	0826 1128	68 70	6.0 6.4	65 71	1.41 1.38	0.0	0.3	0.4	
	1427 1720	70 70	7.1 7.0	79 78	(0.23) (0.20)	0.0	0.3	0.3	
	2026 2330	69 68	7.0 7.1	77 77	1.11 1.11	0.0	0.3	0.3	
	0236 0530	67 68	6.8 6.6	73 72	1.36 1.20	0.0	0.3	0.3	
RANGE	MAXIMUM MINIMUM	70.5 66	7.4 4.6	82 50	3.00 0.95	0.1 0.0	0.4 0.2	0.4 0.2	
AVERAGE		68.5	6.8	75	1.45	0.1	0.3	0.3	

STATION C28.4		MILE 28.4							
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0806 1103	67 69.5	6.4 6.5	69 72					
	1408 1713	69.5 70	6.9 7.1	77 79					
	2010 2304	69.5 69	7.0 7.1	78 78					
8-30-60	0222 0510	67 68	7.2 7.3	77 79					
	0800 1110	68 70	7.2 7.1	78 79					
	1403 1705	70 70	7.4 7.4	82 82					
8-31-60	2002 2324	70 67	7.4 7.4	82 80					
	0223 0504	68 68	7.1 7.1	77 77					
	0817 1106	68 69.5	7.0 5.9	76 66					
9-1-60	1404 1706	70.5 69.5	6.8 7.1	76 79					
	2009 2314	69.5 68	6.9 6.7	77 73					
	0226 0517	68 68	6.7 6.5	73 71					
9-2-60	0812 1118	68 70	6.4 5.8	70 64					
	1415 1708	70 70	6.3 6.9	70 77					
	2018 2316	70 68	6.9 7.0	77 76					
	0221 0521	68 68	6.8 6.5	74 71					
RANGE	MAXIMUM MINIMUM	70.5 67	7.4 5.8	82 64					
AVERAGE		69	6.9	76					

TABLE T-14 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

LOWER REACH INTENSIVE SAMPLING PROGRAM

AUGUST 29-SEPTEMBER 2, 1960

STATION: C-D-27.4 MILE 27.4

DATE	TIME PST	TEMP °F	O.O mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0935	69	6.7	74				
	1240	70	6.3	70	1.45	0.1	0.3	0.4
	1545 1850	70	6.8 6.9	76 77	1.46 1.46	0.0	0.3	0.3
8-30-60	2150 0110	70	6.9 7.2	77 79	1.43 1.43	0.0	0.3	0.3
	0410 0655	-- 69.5	7.3 7.2	-- 80	1.35 1.23	0.1	0.2	0.3
	0950 1235	69.5 71	7.3 7.2	81 81	1.33 1.35	0.1	0.3	0.3
8-31-60	1550 1850	71 70	7.3 7.4	82 82	1.38 1.35	0.0	0.3	0.3
	2145	70	7.2	80	1.31 1.69	0.1	0.4	0.4
	0630	70	6.9	77	1.05	0.1	0.3	0.4
9-1-60	0910 1245	69 70	6.5 6.4	71 71	1.89 1.81	0.0	0.3	0.3
	1655	69.5	6.7	74	1.18 1.16	0.1	0.3	0.4
	2000 2302	70 69	6.9 6.7	77 74	1.17 1.17	0.0	0.3	0.3
9-2-60	0217 0506	68 68	6.5 6.5	71 71	1.10 1.00	0.0	0.3	0.4
	0804 1103	69 69	6.4 6.3	70 69	0.92 0.92	0.0	0.3	0.3
	1403 1700	70 70	5.8 6.4	64 71	1.33 1.33	0.2	0.5	0.5
9-2-60	2008 2306	70 68	6.9 6.9	77 75	1.01 0.93	0.0	0.3	0.3
	0210 0514	68 67	6.8 6.7	74 72	1.02 0.57	0.0	0.2	0.3
RANGE	MAXIMUM	71	7.4	82	1.89	0.2	0.5	0.5
	MINIMUM	67	5.8	64	0.57	0.0	0.2	0.3
AVERAGE		69.5	6.8	75	1.26	0.1	0.3	0.3

STATION: D26.8 MILE 26.8

DATE	TIME PST	TEMP °F	O.O mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0930 1230	69 70	6.6 6.5	73 72				
	1530 1840	70 70	6.5 6.9	72 77				
8-30-60	2145 0105	70 69	6.6 7.0	73 77				
	0400 0650	-- 69.5	7.3 7.3	-- 81				
8-31-60	0940 1225	70 71	7.2 7.4	80 83				
	1540 1840	71 70	7.2 7.4	81 82				
	2130 0625	70 70	7.1 6.9	79 77				
9-1-60	0900 1235	69 70	6.8 6.9	75 77				
	1520 1820	71 70	7.1 6.7	80 74				
9-1-60	0045 0340	70 69.5	7.0 6.8	78 76				
	0640 0910	69 70.5	6.5 6.3	71 71				
9-2-60	1215 1530	70 70	6.2 6.8	69 76				
	0305 0600	68.5 --	6.5 6.9	71 --				
9-2-60	0905 1215	70 70	6.8 6.4	76 71				
RANGE	MAXIMUM	71	7.4	83				
	MINIMUM	68.5	6.2	69				
AVERAGE		70	6.8	76				

STATION: D25.5 MILE 25.5

DATE	TIME PST	TEMP °F	O.O mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0925 1220	69 71	6.6 7.1	73 80	0.7	0.1	0.3	0.3
	1520 1830	70 70	6.5 7.1	72 79	1.43 1.45	0.0	0.3	0.4
8-30-60	2135 0055	70 69	6.9 6.6	77 73	1.46 1.46	0.0	0.3	0.3
	0350 0640	-- 70	7.2 7.0	-- 78	1.36 1.33	0.1	0.2	0.2
8-31-60	0930 1215	70 71	7.2 7.3	80 82	1.33 1.35	0.1	0.2	0.2
	1530 1830	71 71	7.5 7.2	84 81	1.36 1.32	0.0	0.3	0.3
	2120	70	7.3	81	1.26 1.29	0.1	0.3	0.3
9-1-60	0620	70	6.8	76	1.56 1.51	0.1	0.3	0.4
	0855 1225	69 70	6.9 6.9	77 77	1.31 1.36	0.0	0.3	0.3
	1510 1810	72 70	7.4 6.8	84 76	1.50	0.1	0.3	0.3
9-2-60	0035	70	7.4	82	0.93 0.88	0.0	0.3	0.3
	0335 0635	70 70	6.8 6.6	76 73	1.26 1.18	0.0	0.3	0.4
	0900 1205	69.5 70	6.5 6.6	72 73	1.29 1.20	0.0	0.3	0.3
9-2-60	1515	70	7.0	78	1.51 1.46	0.1	0.2	0.3
	0300 0550	68 --	7.2 6.8	78 --	0.50 0.52	0.0	0.3	0.3
9-2-60	0855 1205	70 70	6.9 6.6	77 73	1.17 1.13	0.0	0.3	0.4
RANGE	MAXIMUM	72	7.5	84	1.56	0.1	0.3	0.4
	MINIMUM	68	6.5	72	0.50	0.0	0.2	0.2
AVERAGE		70	7.0	77	1.24	0.0	0.3	0.3

STATION: D24.3 MILE 24.3

DATE	TIME PST	TEMP °F	O.O mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
8-29-60	0910 1210	70 71	6.5 7.4	72 83				
	1510 1820	70 70	6.6 7.1	73 79				
8-30-60	2125 0040	70 69	7.1 7.1	79 78				
	0340 0625	-- 70	7.0 7.3	-- 81				
8-31-60	0925 1205	70 71	7.3 7.3	81 82				
	1520 1820	71 71	7.5 7.1	84 80				
	2110 0610	70 70	7.5 7.0	83 78				
9-1-60	0850 1210	70 70	6.9 7.1	77 79				
	1455 1800	72 70	7.6 6.5	86 72				
9-1-60	0025 0325	70 69	7.7 7.3	86 80				
	0610 0850	70 70	6.9 6.4	77 71				
9-2-60	1155 1505	70 70	6.5 7.3	72 81				
	0250 0545	68 --	7.3 7.0	79 --				
9-2-60	0840 1155	70 71	7.0 6.6	78 74				
RANGE	MAXIMUM	72	7.7	86				
	MINIMUM	68	6.4	71				
AVERAGE		70	7.1	79				

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STATION D23.3		MILE 23.3							
DATE	TIME PST	TEMP °F	D.O mg/l	O.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0905	69	6.4	70	1.0	0.1	0.3	0.3	
	1155	71	7.3	82					
	1500	71	6.8	76	1.34	0.0	0.2	0.2	
	1815	70	6.9	77	1.29				
8-30-60	2120	70	7.5	83	1.75	0.0	0.2	0.3	
	0030	70	7.2	80	1.73				
	0330	--	6.8	--	1.42	0.1	0.3	0.3	
	0620	70	7.1	79	1.37				
	0915	70	7.1	79	1.01	0.0	0.3	0.3	
	1200	70	7.5	83	1.02				
	1510	71	7.5	84	1.39	0.0	0.2	0.2	
	1810	71	7.3	82	1.32				
	2055	70	7.5	83	1.31	0.1	0.3	0.3	
					1.31				
8-31-60	0605	70	7.1	79	1.41	0.1	0.3	0.3	
					1.40				
	0840	70	6.9	77	1.07	0.0	0.3	0.3	
	1155	70	7.1	79	1.04				
	1445	72	7.6	86	1.31	0.1	0.3	0.3	
	1750	71	7.1	80	1.31				
9-1-60	0015	70	7.8	87	0.99	0.0	0.3	0.3	
					1.00				
	0315	70	7.5	82	2.08	0.0	0.3	0.3	
	0600	70	6.5	72	2.03				
	0840	70	6.6	73	1.46	0.0	0.3	0.3	
	1145	70	6.5	72	1.44				
9-2-60	1455	70	7.6	84	1.45	0.1	0.2	0.3	
					1.44				
	0245	68.5	7.4	81	0.59	0.0	0.3	0.3	
	0540	--	6.9	--	0.56				
	0830	70	6.9	77	1.29	0.0	0.3	0.3	
	1145	71	6.8	76	1.16				
RANGE	MAXIMUM	72	7.8	87	2.08	0.1	0.3	0.3	
	MINIMUM	68.5	6.4	70	0.56	0.0	0.2	0.2	
AVERAGE		70	7.1	79	1.29	0.0	0.3	0.3	

STATION D22.3		MILE 22.3							
DATE	TIME PST	TEMP °F	D.O mg/l	O.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0855	69.5	6.4	71					
	1145	71	7.7	87					
	1445	71	7.1	80					
	1805	71	7.1	80					
8-30-60	2110	71	8.1	91					
	0020	70	7.6	84					
	0320	--	7.0	--					
	0610	70	7.1	79					
	0910	70	7.2	80					
	1150	71	7.1	80					
8-31-60	1500	71	8.0	90					
	1800	71	7.5	84					
	2050	70	7.5	83					
	0600	70	7.2	80					
	0830	70	7.2	80					
	1145	70	7.3	81					
9-1-60	1440	71	7.9	89					
	1740	71	7.3	82					
	0010	70	8.3	92					
	0300	69.5	7.8	87					
	0530	69.5	7.2	80					
	0835	70	6.8	76					
9-2-60	1135	70	6.6	73					
	1445	70	8.1	90					
	0235	68.5	8.0	88					
	0520	--	7.4	--					
	0825	70	7.0	78					
	1135	71	7.0	79					
RANGE	MAXIMUM	71	8.3	92					
	MINIMUM	68.5	6.4	71					
AVERAGE		70.5	7.4	82					

STATION D21.1		MILE 21.1							
DATE	TIME PST	TEMP °F	D.O mg/l	O.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0845	70	7.1	79	1.1	0.1	0.2	0.2	
	1130	72	7.9	90					
	1435	71	7.1	80	1.17	0.1	0.3	0.3	
	1758	71	7.2	81	1.73				
8-30-60	2100	71	8.2	92	(0.31)	0.1	0.0	0.1	
	0010	71	8.2	92	(0.39)				
	0310	--	7.0	--	1.40	0.1	0.2	0.2	
	0600	70	6.8	76	1.89				
	0900	70	7.0	78	1.36	0.1	0.3	0.3	
	1145	71	7.3	82	1.36				
	1450	71	7.4	83	1.56	0.0	0.2	0.2	
	1750	71	7.5	84	1.53				
	2045	70	7.7	86	1.43	0.1	0.2	0.3	
					1.38				
8-31-60	0550	70	7.4	82	1.43	0.1	0.2	0.3	
					1.43				
	0820	70	7.1	79	1.30	0.0	0.3	0.3	
	1130	71	7.4	83	1.27				
	1430	72	8.4	95	1.90	0.1	0.2	0.2	
	1730	71	7.6	85	1.89				
9-1-60	0005	70	8.5	94	1.39	0.0	0.2	0.3	
					1.41				
	0245	69	8.1	89	1.09	0.0	0.3	0.3	
	0525	70	7.3	81	1.12				
	0830	70	6.5	72	1.19	0.0	0.3	0.3	
	1125	70	6.8	76	1.17				
9-2-60	1435	70	8.2	91	1.62	0.1	0.3	0.3	
					1.55				
	0225	68	8.3	90	0.60	0.0	0.2	0.3	
	0515	--	7.6	--	0.51				
	0815	70	7.2	80	1.06	0.0	0.3	0.3	
					1.12				
	1125	71	7.0	79					
RANGE	MAXIMUM	72	8.5	95	1.90	0.1	0.3	0.3	
	MINIMUM	68	6.5	72	0.51	0.0	0.0	0.1	
AVERAGE		70.5	7.5	84	1.34	0.1	0.2	0.3	

STATION D20.1		MILE 20.1							
DATE	TIME PST	TEMP °F	D.O mg/l	O.O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0840	70	7.7	86					
	1115	71	8.0	90					
	1425	71	7.3	82					
	1750	71	7.4	83					
8-30-60	2055	71	8.5	96					
	0005	70	8.5	94					
	0300	--	7.5	--					
	0550	70	6.9	77					
	0855	70	7.1	79					
	1140	71	7.6	85					
8-31-60	1440	71	7.8	88					
	1740	71	7.6	85					
	2035	70	8.0	89					
	0545	70	7.5	83					
	0815	70	7.2	80					
	1125	70	7.8	87					
9-1-60	1420	71	8.7	98					
	1720	71	7.9	89					
	0000	70	8.6	96					
	0240	69.5	8.4	93					
	0520	70	7.8	87					
	0820	70	6.8	76					
9-2-60	1115	70	7.1	79					
	1425	71	8.4	94					
	0215	68.5	8.6	95					
	0510	--	7.8	--					
	0805	70	7.2	80					
	1115	71	7.0	79					
RANGE	MAXIMUM	71	8.7	98					
	MINIMUM	68.5	6.8	76					
AVERAGE		70.5	7.7	87					

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STATION D18.8		MILE 18.8							
DATE	TIME PST	TEMP °F	O.O mg/l	O.O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0825	70	7.8	87	1.45	0.1	0.3	0.3	
	1105	71	7.9	89	1.73	0.1	0.2	0.2	
	1410	71	7.9	89	1.67	0.1	0.2	0.2	
8-30-60	1740	72	7.9	90					
	2045	71	8.7	98	2.61	0.0	0.2	0.2	
	2345	71	8.5	96	2.64	0.0	0.2	0.2	
	0245	--	7.8	--	1.80	0.1	0.2	0.2	
8-31-60	0540	70	7.0	78	1.85	0.1	0.2	0.2	
	0845	70	7.2	80	1.76	0.1	0.2	0.2	
	1135	71	7.9	89	1.75	0.1	0.2	0.2	
	1430	71	8.1	91	1.80	0.0	0.2	0.2	
9-1-60	1730	71	7.7	87	1.78	0.0	0.2	0.2	
	2025	70	8.4	93	2.14	0.1	0.2	0.2	
					2.04				
	0535	70	7.4	82	1.64	0.1	0.2	0.2	
9-1-60	0810	69	7.4	81	1.45	0.0	0.2	0.2	
	1115	70	7.9	88	1.45	0.0	0.2	0.2	
	1410	71	8.7	98	2.32	0.1	0.2	0.3	
	1710	71	8.3	93	2.22	0.1	0.2	0.3	
9-2-60	2350	70	8.8	98	1.72	0.0	0.3	0.3	
					1.69				
	0225	69.5	8.6	96	1.82	0.0	0.2	0.3	
	0510	69.5	7.9	88	1.77	0.0	0.2	0.3	
9-2-60	0815	70.5	7.2	81	1.30	0.0	0.3	0.3	
	1105	70	7.6	84	1.18	0.0	0.3	0.3	
	1415	71	8.7	98	2.50	0.0	0.2	0.2	
	0205	68	8.6	93	0.92	0.0	0.2	0.2	
9-2-60	0500	68.5	8.1	89	0.87	0.0	0.2	0.2	
	0755	70	7.3	81	1.65	0.0	0.3	0.3	
1105	70	7.4	82	1.65	0.0	0.3	0.3		
RANGE	MAXIMUM	72	8.8	98	2.64	0.1	0.3	0.3	
	MINIMUM	68	7.0	78	0.87	0.0	0.2	0.2	
AVERAGE		70.5	8.0	89	1.78	0.0	0.2	0.2	

STATION Isleton Sewage Treatment Plant		MILE 18.11							
DATE	TIME PST	TEMP °F	O.O mg/l	O.O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	1230	77			--	2.8	16	18	
	1845	74			59	0.2	22	26	
8-30-60	0030	72			78	5.9	23	24	
	0645	74			63	4.9	21	22	
	1230	74			57	5.3	21	22	
8-31-60	1815	74			79	4.5	23	24	
	0030	72			76	4.8	21	23	
	0630	74			76	5.4	20	22	
9-1-60	1205	74			(>1100)*	4.1	20	21	
	1800	72			--	4.5	48	49	
	0025	72			60	5.5	20	20	
9-1-60	0635	72			36	4.1	17	19	
	1210	73			55	4.7	16	17	
	1805	72			--	4.8	22	23	
9-2-60	0025	72			70	5.4	21	23	
	0615	71			54	5.2	21	26	
RANGE	MAXIMUM	77			79	5.9	48	49	
	MINIMUM	71			36	0.2	16	17	
AVERAGE		73			64	4.5	22	24	

STATION D17.5		MILE 17.5							
DATE	TIME PST	TEMP °F	O.O mg/l	O.O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0800	70	8.9	99					
	1055	71	8.5	96					
8-30-60	1355	72	8.7	99					
	1730	72	8.2	93					
	2335	71	8.8	99					
8-31-60	0235	--	8.3	--					
	0530	70	7.5	83					
	1420	71	8.5	96					
9-1-60	1725	71	8.2	92					
	2015	70	8.7	97					
	0800	69	7.6	84					
9-1-60	1105	70	8.1	90					
	1400	71	9.1	102					
	1655	71	8.6	97					
9-2-60	2340	71	8.4	94					
	0215	70	8.2	91					
	0505	69.5	8.3	92					
9-2-60	0805	70	7.6	84					
	1055	70	7.7	86					
	1410	70	8.9	99					
9-2-60	0155	68	8.3	90					
	0455	68.5	8.5	93					
	0740	70	7.5	83					
1055	70	7.4	82						
RANGE	MAXIMUM	72	9.1	102					
	MINIMUM	68	7.4	82					
AVERAGE		70.5	8.3	92					

STATION E15.1		MILE 15.1							
DATE	TIME PST	TEMP °F	O.O mg/l	O.O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	1030	72	8.1	92	1.61	0.1	0.3	0.3	
	1450	72	8.5	97	1.63	0.1	0.2	0.2	
8-30-60	1725	71.5	8.8	100	2.63	0.1	0.2	0.2	
	2045	68	8.2	89	1.65	0.0	0.2	0.2	
	2343	67	7.9	85	1.75	0.0	0.2	0.2	
8-31-60	0315	69	8.1	89	1.17	0.2	0.1	0.1	
	0800	71	7.8	88	1.11	0.1	0.2	0.2	
	1108**	71	8.1	91	1.47	0.1	0.2	0.2	
8-31-60	1400	--	(6.2)*	--	1.57	0.1	0.2	0.2	
	1650	--	8.2	--	2.03	0.0	0.2	0.2	
	2020	65	8.0	84	2.17	0.0	0.2	0.2	
9-1-60	2305	64	8.0	83	2.04	0.1	0.2	0.2	
	0217	68	8.1	88	1.41	0.1	0.3	0.3	
	0520**	68	8.1	88	1.50	0.1	0.3	0.3	
9-1-60	0756	68	7.7	84	1.29	0.0	0.2	0.2	
	1050	68.5	8.3	91	1.25	0.0	0.2	0.2	
	1355	65	8.5	89	2.06	0.1	0.3	0.3	
9-1-60	1630	65	9.1	96	1.87	0.1	0.3	0.3	
	1928	65	8.7	92	1.73	0.0	0.3	0.3	
	2245	--	8.2	--	1.55	0.0	0.3	0.3	
9-2-60	0152**	70.5	8.1	91	1.92	0.0	0.3	0.3	
	0432	70	8.2	91	1.95	0.0	0.3	0.3	
	0802	70	8.0	89	0.99	0.0	0.3	0.3	
9-2-60	1058**	70.5	8.6	97	0.95	0.0	0.3	0.3	
	1357	71.5	8.6	98	1.92	0.0	0.3	0.3	
	1647	70.5	8.7	98	1.87	0.0	0.3	0.3	
9-2-60	1955	69.5	9.0	100	1.19	0.0	0.2	0.3	
	2302	69	8.3	91	1.39	0.0	0.2	0.3	
	0137	68	8.3	90	0.61	0.0	0.2	0.2	
0420	67.5	7.5	82	0.58	0.0	0.2	0.2		
0728	69.5	8.3	92	1.38	0.0	0.3	0.3		
RANGE	MAXIMUM	72	9.1	100	2.63	0.2	0.3	0.3	
	MINIMUM	64	7.5	82	0.58	0.0	0.1	0.1	
AVERAGE		69	8.3	91	1.59	0.0	0.2	0.2	

\*\* Sample was not used in a composite for duplicate analyses.

TABLE T-14 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
LOWER REACH INTENSIVE SAMPLING PROGRAM  
AUGUST 29-SEPTEMBER 2, 1960

STATION		MILE 13.4							
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	1020	71	8.0	90	1.43 1.37	0.1	0.2	0.4	
	1430 1707	71 70.5	8.3 7.9	93 89	2.29 2.24	0.0	0.2	0.3	
	2020 2320	67 67	7.9 6.6	85 71	1.27 1.27	0.0	0.2	0.2	
8-30-60	0255 0543**	69 69	7.8 7.6	86 84	1.19 1.10	0.0	0.2	0.2	
	0746 1057	70 70	8.0 8.1	89 90	1.54 1.68	0.1	0.2	0.2	
	1342 1634	72 ---	6.0 8.3	68 ---	1.87 1.75	0.0	0.2	0.2	
	2000 2250	65 64	8.0 8.0	84 83	1.58 1.51	0.1	0.3	0.3	
8-31-60	0158 0506**	68 68	7.9 8.0	86 87	1.37 1.30	0.1	0.2	0.2	
	0745 1037	68 69.5	8.0 8.1	87 90	1.19 1.21	0.0	0.3	0.3	
	1340 1614	65 65	8.0 8.4	84 88	1.66 1.76	0.1	0.3	0.3	
	1912 2230	65 ---	8.1 7.9	85 ---	1.15 1.13	0.0	0.2	0.2	
9-1-60	0135 0420	70 69.5	8.0 8.1	89 90	0.98 0.99	0.0	0.2	0.2	
	0750 1046	70 71	8.0 8.2	89 92	1.10 1.11	0.0	0.3	0.3	
	1340 1632	71 70.5	8.3 8.3	93 93	1.27 1.28	0.0	0.2	0.3	
	1940 2245	69 69	8.4 8.2	92 91	1.00 0.94	0.0	0.2	0.3	
9-2-60	0125 0409	68 67	8.3 8.1	90 87	(0.46)* (0.25)*	0.0	0.2	0.2	
	0717	68.5	8.2	90	1.35 1.35	0.0	0.3	0.4	
RANGE	MAXIMUM	72	8.4	93	2.29	0.1	0.3	0.4	
	MINIMUM	64	6.0	68	0.94	0.0	0.2	0.2	
AVERAGE		68.5	8.0	87	1.32	0.0	0.2	0.3	

\*\* Sample was not used in a composite for duplicate analyses.

STATION		MILE 11.6R							
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	1200	84			126	12	45	58	
	1700	80			55	0.1	18	21	
8-30-60	2330	76			102	7.4	22	22	
	0545	76			86	4.6	17	18	
	1200	68			114	9.3	30	32	
	1740	76			27	14	18	18	
8-31-60	2330	74			78	6.2	18	20	
	0530	74			74	5.2	16	18	
	1045	(95)*			94	5.7	24	28	
9-1-60	1510	76			49	6.0	19	21	
	0000	74			72	8.1	23	25	
	0600	73			74	5.4	19	22	
	1100	74			59	8.1	26	29	
	1710	75			39	5.1	19	21	
9-2-60	2330	75			107	6.4	22	24	
	0545	73			59	5.4	16	21	
RANGE	MAXIMUM	84			126	14	45	58	
	MINIMUM	68			27	0.1	16	18	
AVERAGE		75			76	6.8	22	25	

STATION		MILE 11.1							
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	1000 1400	68.5 71	7.9 ---	87 --					
	1655 2005	70.5 67	8.2 8.1	92 87					
8-30-60	2307 0225	67 69	6.8 7.7	73 85					
	0734 1037	69.5 70	7.9 8.0	88 89					
	1332 1622	72 ---	8.0 8.1	91 --					
8-31-60	1946 2237	66 64	8.3 8.2	88 85					
	0147 0459	67 68	7.9 7.9	85 86					
	0737 1027	67.5 69	8.0 8.2	87 90					
	1330 1604	65 64	5.4 8.1	57 84					
9-1-60	1905 2223	65 --	8.1 8.3	85 --					
	0124 0408	70 70	8.0 7.9	89 88					
	0736 1032	69 70	8.0 8.3	88 92					
	1330 1620	70 70.5	8.3 8.5	92 96					
9-2-60	1930 2237	69 68	8.4 8.3	92 90					
	0115 0357	68 67	8.2 8.1	89 87					
	0710	69	8.2	90					
RANGE	MAXIMUM	72	8.5	96					
	MINIMUM	64	5.4	57					
AVERAGE		68.5	7.9	86					

STATION		MILE 9.5							
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0950	67	7.9	85	0.99 1.02	0.1	0.2	0.2	
	1336 1636	69.5 69.5	---	-- 91	1.50 1.55	0.1	0.2	0.2	
8-30-60	1946 2243	66 66	7.8 6.2	83 66	1.12 1.11	0.1	0.2	0.2	
	0207 0520	67 68	7.8 7.7	84 84	1.36 1.27	0.1	0.2	0.2	
	0714 1020	69 70	7.9 8.2	87 91	1.22 1.22	0.1	0.2	0.2	
	1315 1610	70.5 ---	7.1 8.2	80 --	1.57 1.51	0.0	0.2	0.2	
8-31-60	1930 2223	---	7.9 7.3	-- 76	1.34 1.26	0.1	0.2	0.2	
	0130	66	8.0	85	1.24 1.20	0.1	0.2	0.2	
	0447**	67	7.8	84					
	0717 1015	68 68	8.0 8.1	87 88	0.80 0.84	0.1	0.2	0.2	
	1315 1548	65 65	8.1 8.1	85 85	1.09 1.14	0.1	0.2	0.2	
9-1-60	1848 2206	64 ---	8.3 8.1	86 --	0.97 0.95	0.1	0.2	0.2	
	0108 0355	69 68	8.1 8.1	89 88	0.65 0.63	0.1	0.2	0.3	
	0725 1020	69 70	7.9 8.0	87 89	1.27 1.28	0.0	0.3	0.3	
	1315 1605	70 70	8.2 8.2	91 91	0.91	0.1	0.2	0.2	
	1916 2220	69 69	8.3 8.2	92 90	0.69 0.64	0.0	0.2	0.2	
9-2-60	0058 0347	68 67	8.2 8.2	89 88	(0.10)* (0.10)*	0.1	0.2	0.2	
	0655	69	8.0	88	1.06 0.99	0.0	0.3	0.3	
RANGE	MAXIMUM	70.5	8.3	92	1.57	0.1	0.3	0.3	
	MINIMUM	64	6.2	66	0.63	0.0	0.2	0.2	
AVERAGE		68	7.9	86	1.05	0.1	0.2	0.2	

\*\* Sample was not used in a composite for duplicate analyses

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

LOWER REACH INTENSIVE SAMPLING PROGRAM

AUGUST 29-SEPTEMBER 2, 1960

STATION: 86.5		MILE: 8.5							
DATE	TIME PST	TEMP °F	O.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0941	68	7.7	84					
	1315	69.5	---	---	1.28	0.2	0.2	0.2	
	1617	69	8.5	93					
	1930	66.5	7.7	83					
8-30-60	2213	67	6.5	70					
	0138	67	7.8	84					
	0500	69	7.9	87					
	0652	68	8.1	88					
	1000	68	8.0	87					
	1255	--	7.1	--					
	1542	--	8.4	--					
	1900	--	8.8	--					
8-31-60	2201	64	8.0	83					
	0112	67	7.8	84					
	0700	67.5	8.2	89					
	0951	68	8.1	88					
	1255	64	5.7	59					
	1528	64.5	8.2	86					
	1830	64	8.8	92					
	2145	--	6.8	--					
9-1-60	0045	69	8.1	89					
	0338	68	8.2	89					
	0703	69	8.1	89					
	1002	69.5	8.3	92					
	1255	69.5	8.4	93					
	1545	69.5	8.2	91					
9-2-60	1900	69	8.4	92					
	0043	68.5	8.2	90					
	0333	67	8.1	87					
	0643	68	8.1	88					
RANGE	MAXIMUM	69.5	8.8	93					
	MINIMUM	64	5.7	59					
AVERAGE		67.5	7.9	86					

STATION: 4.0		MILE: 4.0							
DATE	TIME PST	TEMP °F	O.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
8-29-60	0922	67	7.9	85	2.47	0.3	0.2	0.2	
	1240	69.5	8.0	--	1.67	0.2	0.1	0.1	
	1600	68	---	87	1.71	0.2	0.1	0.1	
	1912	67	7.8	84	1.88	0.2	0.1	0.1	
8-30-60	2150	67	7.9	85	1.92	0.2	0.1	0.1	
	0115**	67	---	--					
	0445	67	8.0	86	1.18	0.2	0.1	0.1	
	0640	68	8.0	87	1.17	0.2	0.1	0.1	
	0942	68	7.9	86	(4.17)*	0.2	0.1	0.1	
	1230	--	(4.9)*	--	1.60	0.1	0.2	0.3	
	1525	--	8.2	--	1.49	0.1	0.2	0.3	
	1850	--	6.9	--	1.58	0.3	0.1	0.1	
8-31-60	2143	64	8.0	85	1.67	0.2	0.1	0.1	
	0055	67	8.0	86	1.72	0.3	0.1	0.1	
	0646	66	8.1	86	0.89	0.2	0.2	0.2	
	0942	67	7.8	84	0.89	0.2	0.2	0.2	
	1335	63	7.9	81	1.53	0.3	0.1	0.2	
	1510	65	6.9	73	1.53	0.3	0.1	0.2	
	1817	64	8.0	83	1.43	0.2	0.1	0.1	
	2135	65	6.9	73	1.48	0.2	0.1	0.1	
9-1-60	0029	69.5	8.3	92	1.27	0.2	0.1	0.1	
	0318	68	8.1	88	1.18	0.2	0.1	0.1	
	0645	68.5	8.1	89	1.02	0.1	0.2	0.2	
	0944	69	8.2	90	0.93	0.1	0.2	0.2	
	1238	70	---	--	1.55	0.3	0.1	0.2	
	1523	70	8.1	90	1.44	0.3	0.1	0.2	
9-2-60	1845	69	8.5	93	0.86	0.1	0.1	0.1	
	2200	67.5	8.3	90	0.95	0.1	0.1	0.1	
	0025	68.5	8.2	90	1.77	0.2	0.1	0.1	
	0322	67.5	8.1	88	0.88	0.2	0.1	0.1	
	0630	68	8.2	89	0.77	0.1	0.2	0.3	
					0.71				
RANGE	MAXIMUM	70	8.5	93	2.47	0.3	0.2	0.3	
	MINIMUM	63	6.9	73	0.71	0.1	0.1	0.1	
AVERAGE		67.5	7.8	86	1.41	0.2	0.1	0.2	

Table T-15

RESULTS OF ANALYSES  
 LOWER REACH INTENSIVE SAMPLING PROGRAM  
 OCTOBER 24 - 28, 1960

EXPLANATORY COMMENTS

1. Unless otherwise noted, the stations are on the Sacramento River.
2. Values shown in parenthesis and marked with an asterisk ( )\* appeared unrealistic and were not used in computing maximum, minimum and average values.
3. Values for biochemical oxygen demand (BOD) are reported in the following manner:

<u>Method</u>	<u>Example</u>	
	<u>Time</u>	<u>BOD</u>
a. A single BOD value reported between two times indicates that the value was obtained from a composite of samples collected at those times.	1330	1.25
	1620	
b. A single value shown for a specific time is the BOD of the sample collected at that time.	1530	1.40

4. Values for ABS, O-PO<sub>4</sub>, and T-PO<sub>4</sub> were reported in the same manner as described for BOD results under item 3.
5. Values for electrical conductance (EC) are results of analyses of single samples.

TABLE T-15  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
LOWER REACH INTENSIVE SAMPLING PROGRAM  
OCTOBER 24-28, 1960

STATION At Bryce Laboratory										MILE 62.6			
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C				
10-24-60	1050	61	9.3	94	0.90				197				
	1438	62	8.0	82									
	1700	62	8.0	82									
10-25-60	2330	61	8.5	86	0.63				177				
	0457	59	9.1	89	1.23				177				
	0746	59	9.2	90					179				
10-26-60	1030	60	9.5	95	1.13				181				
	1410	61.5	7.5	76					196				
	1642	61.5	8.9	90	1.64				192				
10-27-60	2007	61	7.9	80	1.45				182				
	2257	60.5	9.0	90					176				
	0154	60	9.8	98					179				
10-28-60	0620	59	9.3	91	1.02				179				
	0820	59	9.5	93					185				
	1130	61.5	9.2	93	1.40				192				
10-29-60	1435	61	9.3	94	1.70				198				
	1725	61	8.9	90					181				
	2039	60	9.3	93									
10-30-60	2330	59.5	9.2	91	1.36				178				
	0137	58.5	9.5	93					177				
	0442	58	9.5	92	(8.49)*				185				
10-31-60	0724	57	9.5	91	1.85				181				
	1033	59	9.6	94					183				
	1342	59.5	9.4	93					193				
10-32-60	1830	59.5	8.8	87	1.86				189				
	2045	59	9.7	95					189				
	2255	59	9.2	90	1.21				179				
10-33-60	0152	58.5	9.6	93	2.68				179				
	0448	57.5	9.5	92					180				
	0743	57	9.7	93					186				
RANGE	MAXIMUM	62	9.8	98	2.68				197				
	MINIMUM	57	7.5	76	0.63				176				
AVERAGE		59.7	9.1	90	1.34				184				

STATION Natomas Main Canal										MILE 61.5L			
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C				
10-24-60	1140	61	4.0	40	7.50				341				
	1750	62	5.0	51						369			
	2355	62.5	3.5	36						358			
10-25-60	0545	61	2.9	29	5.42				327				
	1140	59	4.5	44					314				
	1740	60	5.6	56	2.92				307				
10-26-60	2345	61	3.4	34	3.28				386				
	0540	59	3.4	33					301				
	1040	59	4.4	43	6.82				250				
10-27-60	1745	61	4.8	48	4.51				253				
	2345	60	3.7	37					248				
	0540	56	3.9	37	5.30				254				
10-28-60	1130	57	4.8	46	4.42				266				
	1745	58.5	6.0	59	4.65				248				
	2345	59	4.3	42	3.24				281				
10-29-60	0540	56.5	3.9	38	2.96				281				
RANGE	MAXIMUM	62.5	6.0	59	7.50				369				
	MINIMUM	56	2.9	29	2.92				248				
AVERAGE		59.5	4.3	42	4.85				295				

STATION Natomas East Main Drain (Beck Borrow Pit)										MILE 60.6L			
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
10-24-60	1034	58.5	4.0	39	2.25								
	1427	60	3.8	38									
	1647	60	4.3	42									
10-25-60	2315	60	4.9	49	5.28								
	0427	58	5.0	49									
	0710	58	4.9	48									
10-26-60	1010	58	4.8	47	4.91								
	1353	60	4.0	40									
	1620	61	4.7	47	6.25								
10-27-60	2235	59.5	5.6	55	6.61								
	0133	59.5	5.9	58									
	0604	57	4.3	41	5.17								
10-28-60	0803	58	4.1	40	5.28								
	1118	60.5	3.6	36									
	1412	60	4.6	46									
10-29-60	1705	59.5	6.4	63	7.47								
	2020	59	4.6	45									
	2300	58.5	5.6	55	5.41								
10-30-60	0120	57	4.8	46	5.46								
	0423	56.5	4.5	43									
	0710	56	4.5	43									
10-31-60	1020	57.5	4.1	40	4.92								
	1330	58	5.1	50									
	1805	58	6.0	58	4.30								
10-32-60	2035	58	6.8	66	3.47								
	2240	57	6.2	60									
	0135	57	5.4	52									
0427	55	5.0	47	2.36									
0725	55.5	4.6	43										
RANGE	MAXIMUM	61	6.8	66	7.47								
	MINIMUM	55	3.6	36	2.36								
AVERAGE		57.5	4.9	48	4.99								

STATION Upstream from Mouth of American River										MILE 60.5			
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
10-24-60	0940	62	9.2	94									
	1417	62	7.9	81									
	1640	61	8.1	83									
10-25-60	2305	61	8.9	90	9.2								
	0431	60	9.2	92									
	0718	60	9.2	92									
10-26-60	1016	61	9.3	94	8.9								
	1400	61.5	7.9	80									
	1630	61.5	7.8	79	9.5								
10-27-60	2000	61	8.9	90	8.9								
	2345	60.5	9.5	95									
	0145	60.5	9.5	95									
10-28-60	0600	59	9.1	89	9.6								
	0810	59	9.2	90									
	1125	61.5	9.5	96	9.6								
10-29-60	1420	61	9.3	94	9.6								
	1715	61	9.2	92									
	2028	60.5	9.2	92									
10-30-60	2310	59.5	9.6	95	9.6								
	0125	59	9.6	94									
	0430	57	9.5	91	9.6								
10-31-60	0716	57.5	9.5	92	9.3								
	1023	59	9.5	94									
	1333	59.5	9.5	94									
10-32-60	1815	59.5	9.9	98	9.7								
	2038	59	7.7	75									
	2245	59	9.7	95	9.5								
0145	58.5	9.5	93										
0433	58	9.6	93	9.6									
0730	57.5	9.5	92										
RANGE	MAXIMUM	62	9.9	98									
	MINIMUM	57	7.7	75									
AVERAGE		60	9.1	91									

TABLE T-15 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
LOWER REACH INTENSIVE SAMPLING PROGRAM  
OCTOBER 24-28, 1960

STATION American River										MILE 60.4				
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C					
10-24-60	1115	64	10.2	106	1.85				83.6					
	1730	67	10.5	113	2.91				70.0					
	2335	64	9.6	100	1.39				92.8					
10-25-60	0515	64	9.0	94	1.32				85.1					
	1110	64	9.7	101	4.97				112					
	1715	66	10.2	109	1.28				84.2					
	2315	65	9.5	100	1.47				140					
10-26-60	0510	63	8.9	92	2.87				70.0					
	1115	63	9.6	99	3.28				74.0					
	1715	64	10.0	104	1.96				91.0					
	2315	64	9.2	96	3.33				77.3					
10-27-60	0510	58	9.2	89	3.61				73.0					
	1110	61	9.8	99	1.72				80.5					
	1715	64	10.2	106	1.72				98.7					
	2315	63	9.4	97	2.49				72.2					
10-28-60	0515	59.5	9.0	89	2.12				75.3					
RANGE	MAXIMUM	67	10.5	113	4.97				140					
	MINIMUM	58	8.9	89	1.28				70.0					
AVERAGE		63	9.6	100	2.55				86					

STATION At Foot of Broadway - Miller Park										MILE 58.2				
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C					
10-24-60	1022	61.5	9.3	94	0.87									
	1400	62	6.9	70										
	1629	62	7.9	81	0.66									
	2248	61	8.5	86	0.69									
10-25-60	0418	60.5	9.3	93	1.63									
	0658	60	9.2	92										
	1000	61	9.3	94	1.45									
	1338	61.5	8.5	86										
10-26-60	1615	61.5	8.5	86	1.22									
	1937	61	8.9	90										
	2218	61	9.4	95	1.89									
	0122	60.5	9.3	93										
10-27-60	0543	61	9.4	95	1.25									
	0752	60	9.2	92										
	1058	62	9.3	95	1.61									
	1400	61	8.6	87										
10-28-60	1655	61	9.3	94	1.68									
	2003	60.5	7.5	75										
	2247	60	9.5	95	1.92									
	0105	59.5	9.4	93										
10-27-60	0411	59	9.4	92	1.84									
	0656	58	9.4	91										
	1004	59	9.4	92	1.57									
	1318	59.5	9.6	95										
10-28-60	1750	59.5	9.8	97	1.66									
	2020	59.5	10.1	100										
	2230	59	8.5	83	2.00									
	0117	59	9.6	94										
10-28-60	0418	57.5	9.5	92	3.74									
	0714	57	9.5	91										
RANGE	MAXIMUM	62	10.1	100	3.74									
	MINIMUM	57	6.9	70	0.66									
AVERAGE		60	9.1	90	1.60									

STATION West Sacramento Sewage Treatment Plant										MILE 58.0R				
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C					
10-24-60	1210	74			123				1490					
	1825	74			184				1510					
10-25-60	0025	74			134				1210					
	0620	72			106				1130					
	1210	73			115	6.2	25	29	1290					
10-26-60	1820	73			164				1510					
	0025	73			131				1280					
	0630	72			145				1160					
	1210	74			161				1410					
10-27-60	1820	73			203				1540					
	0015	72			141				1320					
	0630	70			156				1220					
	1215	73			137				1670					
10-28-60	1815	73.5			166				1510					
	0015	73			158				1220					
	0620	70			114				1160					
RANGE	MAXIMUM	74			203				1670					
	MINIMUM	70			106				1160					
AVERAGE		72.5			146				1355					

STATION At Beacons #53 and #54										MILE 56.7				
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C					
10-24-60	1012	61.5	9.5	96										
	1330	62	9.0	92										
	1622	62	8.2	84										
10-25-60	2113	61.5	7.4	75										
	2235	61.5	9.3	94										
	0406	60	9.3	93										
	0650	60	9.2	92										
10-26-60	0954	60.5	9.4	94										
	1333	61.5	7.7	78										
	1607	62	9.0	92										
	1930	61	9.0	91										
10-27-60	2210	61	7.9	80										
	0115	60.5	9.3	93										
	0535	60.5	9.3	93										
	0743	60.5	9.1	91										
10-28-60	1054	62	9.4	96										
	1336	61	9.0	91										
	1647	61	9.5	96										
	1957	60.5	9.2	92										
10-27-60	2238	60	9.8	98										
	0055	60	9.4	94										
	0405	59	9.4	92										
	0654	58.5	9.5	93										
10-28-60	0957	59	9.5	93										
	1312	59.5	9.4	93										
	1745	59.5	9.9	98										
	2012	59	9.1	90										
10-28-60	2220	59	9.6	94										
	0112	59	9.6	94										
	0413	58	9.6	93										
10-28-60	0709	58	9.5	92										
RANGE	MAXIMUM	62	9.9	98										
	MINIMUM	58	7.4	75										
AVERAGE		60	9.2	92										

TABLE T-15 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

**RESULTS OF ANALYSES**  
LOWER REACH INTENSIVE SAMPLING PROGRAM  
OCTOBER 24-28, 1960

STATION: At Beacon #51 - Captains Table					MILE: 55.5			
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-24-60	1006	62	9.3	95				
	1317	62	8.8	90				
10-25-60	1613	61.5	7.5	76				
	2100	61.5	8.2	83				
	2225	61.5	8.8	89				
	0358	60.5	9.1	91				
10-26-60	0647	60	9.3	93				
	0948	61	9.3	94				
	1327	62	7.5	77				
	1558	62	8.2	84				
	1925	61	7.0	71				
	2205	61	8.6	87				
10-27-60	0110	61	9.3	94				
	0528	60.5	9.1	91				
	0738	59.5	9.4	93				
	1049	62	9.4	96				
10-28-60	1329	61.5	9.0	91				
	1640	61	9.6	97				
	1947	60.5	9.4	94				
	2230	60	9.4	94				
	0051	59.5	9.5	94				
	0355	58.5	9.4	92				
10-28-60	0650	58.5	9.4	92				
	0954	59.5	9.4	93				
	1305	59.5	9.4	93				
	1705	59.5	9.7	96				
	2006	59	9.5	93				
	2215	59	8.4	82				
10-28-60	0107	58.5	9.5	93				
	0409	58	9.6	93				
	0703	58	9.5	92				
RANGE	MAXIMUM	62	9.7	97				
	MINIMUM	58	7.0	71				
AVERAGE		60	9.0	90				

STATION: At Wheelers Landing					MILE: 54.2			
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-24-60	0952	61.5	9.3	94	1.28			
	1305	62	8.6	88				
10-25-60	1603	62	7.0	71	0.93			
	2048	61.5	8.5	86				
10-25-60	2210	61.5	8.9	90	0.75			
	0348	60.5	9.2	92	1.82			
	0641	60.5	9.2	92				
	0944	61	9.3	94	1.57			
10-26-60	1310	62	7.5	77				
	1547	62	8.2	84	1.38			
	1908	61	8.0	81				
	2158	61	6.2	63	1.47			
	0103	60.5	9.4	94				
	0520	61	9.2	93	1.18			
10-27-60	0733	60.5	9.1	91				
	1045	61.5	9.3	94	1.60			
	1322	61.5	8.9	90				
	1630	61	8.6	87	2.55			
	1940	60.5	9.3	93				
	2220	60	9.2	92	1.64			
10-28-60	0043	59.5	9.4	93				
	0350	59.5	9.4	93	1.48			
	0645	59	9.5	93				
	0950	59	9.5	93	1.91			
	1255	60.5	9.2	92				
	1654	60	8.0	80	1.71			
10-28-60	1955	59.5	9.2	91				
	2205	59	8.4	82	2.18			
	0059	58.5	9.6	94				
	0404	58	9.5	92	2.57			
	0657	58	9.4	91				
RANGE	MAXIMUM	62	9.6	94	2.57			
	MINIMUM	58	6.2	63	0.75			
AVERAGE		60.2	8.8	88	1.61			

STATION: Sacramento Sewage Treatment Plant					MILE: 54.1L				
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
10-24-60	1030	74			156				666
	1635	76			128				732
	2250	75.5			115				686
10-25-60	0435	73.5			124				681
	1025	75			139	3.2	11	15	672
	1630	74			122	4.2	19	23	704
10-26-60	2230	76			162				746
	0420	74			143				664
	1030	76			164				687
10-27-60	1630	76			172				769
	2230	75.5			141				775
	0430	75			167				681
10-28-60	1030	76			140				652
	1630	75			147				722
	2230	75.5			157				732
	0430	76			154				711
RANGE	MAXIMUM	76			172				775
	MINIMUM	73.5			115				652
AVERAGE		75			146				705

STATION: At Brickyard					MILE: 53.2			
DATE	TIME PST	TEMP °F	D.O mg/l	D.O % SAT	S Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-24-60	0946	62	9.2	94				
	1247	62	8.3	85				
10-25-60	1550	62	7.6	78				
	2033	61.5	8.7	88				
10-26-60	0340	60.5	9.1	91				
	0637	60.5	9.2	92				
	0940	61	9.3	94				
	1253	62	8.7	89				
10-27-60	1537	62	8.5	87				
	1855	61.5	8.4	85				
	2145	61	8.0	81				
	0055	61	9.1	92				
10-28-60	0512	61	9.1	92				
	0725	60.5	9.1	91				
	1034	61.5	9.2	93				
	1310	62	9.1	93				
10-28-60	1620	61	9.1	92				
	1928	60.5	9.0	90				
	2208	60.5	9.4	94				
	0035	59	9.3	91				
10-28-60	0347	59.5	9.3	92				
	0637	59	9.3	91				
	0943	59	9.4	92				
	1247	61	9.2	93				
10-28-60	1643	60	9.5	95				
	1945	59.5	9.3	92				
	2154	59	8.0	78				
	0050	58.5	9.5	93				
10-28-60	0356	58.5	9.5	93				
	0652	58	9.5	92				
RANGE	MAXIMUM	62	9.5	95				
	MINIMUM	58	7.6	78				
AVERAGE		60.5	9.0	90				

TABLE T-15 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
LOWER REACH INTENSIVE SAMPLING PROGRAM  
OCTOBER 24-28, 1960

STATION At Beacons #42 and #43					MILE 52.3			
DATE	TIME PST	TEMP °F	D O mg/l	% SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-24-60	0943	62	9.3	95				
	1245	62	9.0	92				
	1540	62	8.2	84				
	2023	61.5	7.8	79				
10-25-60	0330	60.5	9.1	91				
	0630	60.5	9.1	91				
	0930	60.5	8.7	87				
	1245	62.5	8.5	87				
	1530	62	8.0	82				
	1845	61.5	5.7	58				
10-26-60	2136	61	7.1	72				
	0050	61	9.1	92				
	0505	61	9.0	91				
	0720	60	9.2	92				
	1030	61.5	9.4	95				
	1304	61.5	9.0	91				
	1612	61.5	10.4	105				
	1923	60.5	9.4	94				
10-27-60	2200	60.5	9.5	95				
	0030	60.5	9.2	92				
	0337	58.5	9.2	90				
	0633	59	9.3	91				
	0935	59	9.5	93				
	1243	59	9.2	93				
	1640	60	9.4	94				
	1940	59.5	8.8	87				
10-28-60	2150	59	9.5	93				
	0045	59	9.2	90				
	0350	58.5	9.4	92				
	0645	58	9.4	91				
RANGE	MAXIMUM	62.5	10.4	105				
	MINIMUM	58	5.7	58				
AVERAGE		60.5	8.9	89				

STATION At Beacon #37					MILE 50.8			
DATE	TIME PST	TEMP °F	D O mg/l	% SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-24-60	1217	62	9.2	94				
	1732	62	9.2	94	1.91			
10-25-60	2205	61.5	9.1	92				
	0005	61	9.1	92				
	0240	61	9.2	93				
	0527	61	9.1	92				
	0818	60.5	9.1	91				
	1127	62	9.1	93				
	1427	62	9.3	95				
	1714	62	9.3	95				
10-26-60	2102	62	9.2	94	2.44			
	2345	61	9.2	93				
	0240	61	9.1	92				
	0615	61	9.2	93				
	0848	61	9.3	94				
	1147	61.5	9.5	96				
10-27-60	1437	62	9.5	97				
	1747	61	9.4	95				
	2058	60.5	9.3	93	2.37			
	2332	60	9.3	93				
	0242	60	9.2	92				
	0540	60	9.2	92				
10-28-60	0814	60	9.3	93				
	1114	60	9.4	94				
	1423	60.5	9.6	96	3.07			
	1728	60	9.5	95				
	2040	59.5	9.4	93	2.73			
	2338	59	9.4	92				
	0224	59	9.4	92	2.62			
	0524	59	9.4	92				
RANGE	MAXIMUM	62	9.6	97	3.07			
	MINIMUM	59	9.1	91	1.91			
AVERAGE		61	9.3	93	2.57			

STATION At Beacon #35					MILE 49.8			
DATE	TIME PST	TEMP °F	D O mg/l	% SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-24-60	1210	62	9.2	94				
	1724	62	9.2	94				
	2157	61.5	9.1	92				
	2359	61.5	9.1	92				
10-25-60	0233	61	9.1	92				
	0522	61	9.0	91				
	0811	61	9.1	92				
	1122	62	9.1	93				
	1420	62	9.3	95				
	1706	62	9.3	95				
	2054	62	9.1	93				
	2337	61	9.2	93				
10-26-60	0224	61	9.1	92				
	0612	61	9.2	93				
	0838	61	9.2	93				
	1135	61.5	9.3	94				
	1429	62	9.5	97				
	1737	61	9.4	95				
	2048	61	9.4	95				
	2323	60	9.3	93				
10-27-60	0249	60	9.1	91				
	0532	60	9.4	94				
	0807	60	9.3	93				
	1108	60	9.4	94				
	1413	61	9.5	96				
	1718	60	9.4	94				
10-28-60	2032	59.5	9.4	93				
	2327	59.5	9.3	92				
	0216	59	9.3	91				
	0516	59	9.3	91				
	0818	59	9.3	91				
RANGE	MAXIMUM	62	9.5	97				
	MINIMUM	59	9.0	91				
AVERAGE		61	9.3	93				

STATION At Beacon #33					MILE 48.4			
DATE	TIME PST	TEMP °F	D O mg/l	% SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-24-60	1158	62	9.1	93				
	1716	62	9.1	93				
	2147	62	8.9	91				
	2352	61.5	9.0	91				
10-25-60	0224	61	9.0	91				
	0514	61	9.0	91				
	0806	60.5	9.1	91				
	1113	61.5	9.0	91				
	1413	62	9.3	95				
	1658	62	9.2	94				
	2043	62	9.0	92				
	2323	61	9.0	91				
10-26-60	0218	61	9.0	91				
	0605	61	9.0	91				
	0828	61	9.1	92				
	1126	62	9.1	93				
	1420	62	9.4	96				
	1727	61	9.4	95				
	2040	61	9.3	94				
	2314	60	9.3	93				
10-27-60	0230	60	9.2	92				
	0521	60	9.2	92				
	0800	60	9.2	92				
	1055	60	9.3	93				
	1404	61	9.4	95				
	1712	60	9.5	95				
10-28-60	2024	60	9.4	94				
	2317	60	9.3	93				
	0207	59	9.3	91				
	0508	59	9.3	91				
	0811	59	9.3	91				
RANGE	MAXIMUM	62	9.5	96				
	MINIMUM	59	8.9	91				
AVERAGE		61	9.2	93				

TABLE T-15 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
LOWER REACH INTENSIVE SAMPLING PROGRAM  
OCTOBER 24-28, 1960

STATION Meadowview Sewage Treatment Plant									
MILE 47.11									
DATE	TIME PST	TEMP °F	D.O mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
10-24-60	1005	74			196				1097
	1610	74			175				960
	2230	73			166				879
10-25-60	0410	72			137				956
	1005	72			179	10	42	48	1020
	1605	74			168	15	55	63	921
10-26-60	2205	73			162				824
	0400	71			148				856
	1000	70			191				873
10-27-60	1605	71			236				870
	2205	70			160				791
	0405	70			160				814
10-28-60	1000	70			158				874
	1605	72.5			164				839
	2200	72			153				732
10-28-60	0405	70			145				753
RANGE	MAXIMUM	74			236	15	55	63	1097
	MINIMUM	70			137	10	42	48	732
AVERAGE		72			169	13	49	56	879

STATION At Beacon #30									
MILE 47.1									
DATE	TIME PST	TEMP °F	D.O mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
10-24-60	1145	62	9.0	92					
	1708	62	9.1	93					
	2137	62	8.9	91					
10-25-60	2344	62	9.0	92					
	0215	61.5	9.0	91					
	0506	61	8.8	89					
10-26-60	0800	61	8.9	90					
	1108	62	9.0	92					
	1407	62	9.2	94					
10-27-60	1652	62	9.2	94					
	2035	61	8.9	91					
	2313	61	8.8	89					
10-28-60	0200	61	9.0	91					
	0600	61	9.0	91					
	0815	61	9.0	91					
10-28-60	1120	61.5	9.0	92					
	1412	62	9.3	95					
	1717	61	9.4	95					
10-28-60	2030	61	9.3	94					
	2306	60.5	9.2	92					
	0225	60	9.2	92					
10-28-60	0512	60	9.2	92					
	0757	60	9.1	91					
	1047	60.5	9.2	92					
10-28-60	1353	61	9.3	94					
	1703	60.5	9.4	94					
	2013	60	9.3	93					
10-28-60	2307	60	9.2	92					
	0200	59.5	9.2	91					
	0501	59	9.2	90					
10-28-60	0803	59	9.2	90					
RANGE	MAXIMUM	62	9.4	95					
	MINIMUM	59	8.8	89					
AVERAGE		61	9.1	92					

STATION: Downstream from Freeport Bridge									
MILE 46.3									
DATE	TIME PST	TEMP °F	D.O mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
10-24-60	1120	62	9.0	92					
	1700	62	9.1	93					
10-25-60	2100	62	---	--	1.77				
	2326	62	8.9	91	2.20				
	0155	61.5	8.9	90					
10-26-60	0448	61	8.7	88	3.68	0.1	0.4	0.6	
	0750	61	8.7	88					
	1048	61.5	8.7	88	2.02	0.0	0.3	0.5	
10-27-60	1358	62	9.1	93					
	1640	62	9.2	94	1.64				
	2018	62	9.0	92					
10-28-60	2301	62	8.8	90	2.15				
	0150	61	9.0	91					
	0528	61	9.0	91	2.93				
10-28-60	0758	61	9.0	91					
	1104	61.5	9.1	92					
	1353	62	9.2	94					
10-28-60	1656	61	9.4	95	1.88				
	2013	61	9.3	94					
	2255	60.5	9.2	92					
10-28-60	0202	60	9.0	90					
	0455	60	9.0	90					
	0745	60	9.1	91					
10-28-60	1040	60	9.2	92	2.78				
	1346	61.5	9.3	94					
	1652	60.5	9.4	94	1.88				
10-28-60	2004	60	9.3	93					
	2258	60	9.2	92	2.11				
	0152	59.5	9.1	90					
10-28-60	0450	59	9.1	89	3.26				
	0755	59	9.1	89					
RANGE	MAXIMUM	62	9.4	95	3.68	0.1	0.4	0.6	
	MINIMUM	59	8.7	88	1.64	0.0	0.3	0.5	
AVERAGE		61	9.1	91	2.36	0.1	0.4	0.6	

STATION: At Beacon #26									
MILE 45.1									
DATE	TIME PST	TEMP °F	D.O mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
10-24-60	1110	62	8.9	91					
	1653	62	9.0	92					
	2048	62	9.0	92					
10-25-60	2318	62	8.8	90					
	0148	61.5	8.6	87					
	0440	61	8.9	90					
10-26-60	0745	61	8.6	87					
	1042	61.5	8.6	87					
	1347	62	8.7	89					
10-27-60	1633	62	9.0	92					
	2010	62	8.7	89					
	2253	61	8.8	89					
10-28-60	0144	61	8.7	88					
	0515	61	8.8	89					
	0748	61	8.8	89					
10-28-60	1057	61.5	8.8	90					
	1343	62	9.0	92					
	1647	61.5	9.3	94					
10-28-60	2004	61	9.3	94					
	2247	60.5	9.2	92					
	0153	60.5	8.8	88					
10-28-60	0449	60	9.0	90					
	0737	59.5	9.1	90					
	1034	60	9.1	91					
10-28-60	1337	61	9.2	93					
	1643	61	9.3	94					
	1956	60	9.2	92					
10-28-60	2254	60	9.2	92					
	0142	60	9.0	90					
	0443	59	9.0	89					
10-28-60	0747	59	9.1	90					
RANGE	MAXIMUM	62	9.3	94					
	MINIMUM	59	8.6	87					
AVERAGE		61	9.0	90					

TABLE T-15 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
LOWER REACH INTENSIVE SAMPLING PROGRAM  
OCTOBER 24-28, 1960

STATION At Beacon #25		MILE 43.4							
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	O <sub>2</sub> % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>3</sup> at 25°C
10-24-60	1055	62	8.6	88					
	1643	62	8.8	90					
	2032	62	9.9	101	2.20				
10-25-60	2305	62	8.6	88					
	0140	61.5	8.4	85					
	0430	61	8.6	87					
	0733	61	8.5	86					
	1030	61.5	8.4	85					
	1338	62	8.5	87					
10-26-60	1624	62	8.8	90					
	2000	62	8.4	86	2.26				
	2240	62	8.4	86					
	0136	61	8.6	87					
	0500	61	8.6	87					
	0735	61	8.6	87					
10-27-60	1047	61.5	8.7	88					
	1333	62	8.6	88					
	1636	61.5	9.0	91					
	1953	61	9.0	91	1.91				
	2236	61	9.0	91					
	0142	60.5	8.8	88					
10-28-60	0440	60	8.7	87					
	0729	59.5	8.9	88					
	1025	60	8.9	89					
	1328	62	9.1	93	2.64				
	1632	61	9.1	92					
	1947	60	9.1	91	2.13				
10-28-60	2038	60	9.0	90					
	0132	60	8.9	89	1.57				
	0433	59.5	8.8	87					
	0737	59	8.9	87	2.22				
RANGE	MAXIMUM	62	9.9	101	2.64				
	MINIMUM	59	8.4	85	1.57				
AVERAGE		61	8.8	89	2.13				

STATION American Crystal Sugar Company at Clarksburg		MILE 43.95							
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>3</sup> at 25°C
10-24-60	1540	98	0	0	357				
	2200	96	0	0	250				1410
	0400	99.5	0	0	304				1420
10-25-60	0855	99.5	0	0	471				1380
	1700	94	0	0	(55) <sup>a</sup>				1340
	2145	95	0	0	292				1360
	0245	97.5	0	0	373				
	0853	98	0	0	437				1300
	1435	93	0	0	532				1230
10-27-60	2135	98.5	0	0	318				1270
	0300	98	0	0	331				1270
	0855	--	0	0	327				1270
	1420	89.5	0	0	268				1240
	2055	90	0	0	336				1210
	0230	92	0	0	302				1250
10-28-60	0830	94	0	0	349				1350
RANGE	MAXIMUM	99.5	0	0	532				1420
	MINIMUM	89.5	0	0	250				1210
AVERAGE		95.5	0	0	350				1307

STATION Clarksburg (opposite landing)		MILE 42.1							
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>3</sup> at 25°C
10-24-60	1045	62	8.6	88					
	1635	62	8.7	89					
	2017	62	8.6	88					
10-25-60	2258	62	8.5	87					
	0128	61.5	8.6	87					
	0423	61	8.4	85					
	0727	61	8.6	87					
	1023	61.5	8.5	86					
	1330	62.5	8.3	85					
10-26-60	1615	62	8.6	88					
	1950	61	8.3	84					
	2230	61	8.2	83					
	0127	61	8.5	86					
	0450	61	8.4	85					
	0727	61	8.5	86					
10-27-60	1026	62	8.5	87					
	1322	62	8.6	88					
	1628	61.5	8.8	89					
	1945	61	8.9	90					
	2228	61	8.7	88					
	0132	60.5	8.7	87					
10-28-60	0432	60	8.7	87					
	0720	60	8.9	89					
	1019	60	9.0	90					
	1323	61	9.0	91					
	1622	61	8.9	90					
	1738	60.5	9.0	90					
10-28-60	2226	60.5	8.9	89					
	0125	60	8.7	87					
	0426	59.5	8.8	87					
	0729	59	8.8	86					
RANGE	MAXIMUM	62.5	9.0	91					
	MINIMUM	59	8.2	83					
AVERAGE		61	8.7	87					

STATION 1.0 Mile Downstream from Clarksburg at Landing at right bank.		MILE 41.1							
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>3</sup> at 25°C
10-24-60	1034	62	8.6	88					
	1625	62	8.6	88					
	2003	62	8.7	89					
10-25-60	2250	62	8.5	86					
	0120	61.5	8.6	87					
	0417	61.5	8.5	86					
	0719	61	8.3	84					
	1012	61	8.4	85					
	1321	62.5	8.3	85					
10-26-60	1609	62	8.2	84					
	1943	61.5	7.8	79					
	2211	61	7.8	79					
	0120	61	7.8	79					
	0440	61	8.5	86					
	0718	61	8.3	84					
10-27-60	1036	62	8.3	85					
	1313	62	8.5	87					
	1617	62	8.4	86					
	1934	61	8.6	87					
	2218	61	8.5	86					
	0118	60.5	8.3	83					
10-28-60	0421	60	8.8	88					
	0714	60	8.7	87					
	1013	60	8.9	89					
	1314	61.5	9.0	91					
	1613	61	8.8	89					
	1930	60	8.9	89					
10-28-60	2016	60	8.8	88					
	0117	60	8.6	86					
	0419	60	8.7	87					
	0721	59	8.7	85					
RANGE	MAXIMUM	62.5	9.0	91					
	MINIMUM	59	7.8	79					
AVERAGE		61	8.5	86					

TABLE T-15 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
LOWER REACH INTENSIVE SAMPLING PROGRAM  
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STATION: Merritt Island Landing at dirt boat ramp MILE: 39.8

DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-24-60	1020	62	8.0	82				
	1606 1944	62 62	8.3 7.1	85 72	1.57			
10-25-60	2240 0110	62 61.5	8.1 8.4	83 85				
	0407 0710	61.5 61	8.4 8.3	85 84				
10-26-60	1005 1305	61 63	8.6 8.2	87 85				
	1600 1930	62 62	8.1 7.9	83 81	2.20			
10-27-60	2208 0110	61 61	7.8 7.9	79 80				
	0425 0707	61 61	8.4 8.2	85 83				
10-28-60	1009 1300	62 62	8.1 8.2	83 84				
	1605 1922	62 61.5	8.3 8.9	85 90	2.98			
10-29-60	2206 0107	61 60	7.6 8.1	77 81				
	0406 0705	60 60	8.4 8.4	84 84				
10-30-60	1004 1304	60 62	8.5 8.8	85 90	2.15			
	1604 1918	61 60	8.7 8.6	88 86	2.27			
10-31-60	2204 0106	60 60	8.4 8.4	84 84	2.01			
	0410 0710	60 59.5	8.4 8.6	84 85	1.91			
RANGE	MAXIMUM	63	8.9	90	2.98			
	MINIMUM	59.5	7.1	72	1.57			
AVERAGE		61	8.3	84	2.15			

STATION: Hood (opposite warehouse on left bank) MILE: 38.6

DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-24-60	1035 1358	62 62.5	8.2 8.7	84 89				
	1655 2258	63 62	8.6 8.1	89 83				
10-25-60	0145 0717	60 62	8.3 8.4	83 86				
	1719 2255	62 62	7.9 7.3	81 74				
10-26-60	0245 0443	63 62	7.8 8.4	80 86				
	0754 1032	61 62	8.2 8.3	83 85				
10-27-60	1338 1615	62 62	8.3 8.5	85 87				
	1921 ----	61 60	8.2 8.1	83 81				
10-28-60	0212 0433	60 60	8.2 8.3	82 83				
	0720 1013	60 61	8.6 8.6	86 87				
10-29-60	1320 1607	62 61	8.9 9.2	91 93				
	2000 2215	60 60	8.4 8.3	84 83				
10-30-60	0145 0430	60 60	8.2 8.3	82 83				
	0650	59	8.5	84				
RANGE	MAXIMUM	63	9.2	93				
	MINIMUM	59	7.3	74				
AVERAGE		61	8.3	84				

STATION: At Tide Gage MILE: 37.2

DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
10-24-60	1025 1338	62 63	8.2 8.3	84 86	1.79				
	1641	63	8.6	89	1.59				
10-25-60	2310 0137	62 62	8.2 8.0	84 82	1.86				
	0535 0708	60 61	8.2 8.4	82 85	2.30				
10-26-60	1703 1952	62 62	8.3 8.3	85 85	1.57				
	2240 0235	62 62	8.2 8.2	84 84	2.43				
10-27-60	0434 0745	62 61	7.9 8.2	81 83	2.34				
	1021 1330	62.5 63	8.4 8.6	86 89	1.91				
10-28-60	1600 1906	62 61	8.2 8.3	84 84	2.42				
	2250 0202	61 60.5	8.2 7.5	83 75	2.45				
10-29-60	0423 0710	60 60	8.3 8.5	83 85	2.37				
	1007 1310	61 62	9.2 8.8	93 90	1.60				
10-30-60	1602 1953	61 60	8.4 8.5	85 85	1.82				
	2205 0135	60 60	8.4 8.0	84 80	2.32				
10-31-60	0422 0644	60 59.5	8.1 8.3	81 82	3.02				
	RANGE	MAXIMUM	63	9.2	93	3.02			
	MINIMUM	59.5	7.5	75	1.57				
AVERAGE		61.5	8.3	84	2.10				

STATION: At Beacon MILE: 35.9

DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l
10-24-60	1017 1326	62 62.5	7.9 8.3	81 85				
	1626 2238	63 62	8.3 8.1	86 83				
10-25-60	0128 0519	60 60	8.1 8.1	81 81				
	0703 1650	62 62	8.1 8.1	83 83				
10-26-60	1943 0224	62 62	8.2 8.0	84 82				
	0424 0739	62 61	6.5 7.7	66 78				
10-27-60	1014 1320	62.5 62	7.9 8.2	81 84				
	1553 1855	62 61	8.4 8.2	86 83				
10-28-60	2235 0150	61 60.5	8.0 8.1	81 81				
	0414 0702	60 60	7.7 8.0	77 80				
10-29-60	1000 1300	61.5 62	8.5 8.8	86 90				
	1551 1940	61 60	9.0 8.5	91 85				
10-30-60	2157 0124	60 60	8.3 8.3	83 83				
	0413 0638	59.5 59	8.0 8.1	79 79				
RANGE	MAXIMUM	63	9.0	91				
	MINIMUM	59	6.5	66				
AVERAGE		61	8.1	82				

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

LOWER REACH INTENSIVE SAMPLING PROGRAM

OCTOBER 24-28, 1960

STATION		South End of Courtland					MILE 34.4		
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
10-24-60	1006	62	7.8	80	1.99				
	1310	63	8.0	82					
10-25-60	1613	63	8.3	86	1.46				
	2225	62	8.1	83	1.70				
	0118	61	8.1	82					
10-26-60	0510	60	8.1	81	2.40				
	0655	62	8.1	83					
	1633	62	8.2	84	1.33				
1927	62	8.1	83						
10-27-60	0214	62	8.1	83	2.51				
	0414	62	6.8	69	2.27				
	0732	61	7.5	76					
10-28-60	1007	62.5	7.9	81	2.07				
	1305	62	9.0	92					
	1540	62	8.5	87	1.62				
1845	61	8.2	83						
10-29-60	2220	61	8.0	81	1.81				
	0140	60	8.1	81					
	0405	60	7.7	77	2.63				
0654	59.5	7.8	77						
10-30-60	0952	61	8.2	83	1.86				
	1250	62	8.6	88					
	1540	61	8.6	87	1.62				
1934	60	8.3	83						
10-31-60	2145	60	8.2	82	1.71				
	0114	60	8.1	81					
	0403	60	8.0	80	2.85				
0633	59.5	7.8	77						
RANGE	MAXIMUM	63	9.0	92	2.85				
	MINIMUM	59.5	6.8	69	1.33				
AVERAGE		61	8.1	82	1.92				

STATION		0.1 Mile Downstream from Paintersville Bridge					MILE 33.5		
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
10-24-60	0958	62	7.4	76					
	1302	63	7.8	80					
10-25-60	1602	63	8.3	86					
	2215	62	7.8	80					
	0110	60	7.9	79					
0457	60	8.1	81						
10-26-60	0649	61	7.9	80					
	1623	62	8.2	84					
	1921	62	8.2	84					
0206	63	8.1	84						
10-27-60	0405	63	7.8	80					
	0727	61	7.3	74					
	1002	62	7.5	77					
1302	61.5	7.7	78						
10-28-60	1533	62	8.1	83					
	1833	61	8.3	84					
	2215	60	8.3	83					
0135	60	7.6	76						
10-29-60	0455	59.5	8.2	81					
	0648	60	7.7	77					
	0947	61	8.3	84					
1245	61	8.2	83						
10-30-60	1535	61	8.1	82					
	1928	60	8.5	85					
	2139	60	8.3	83					
0105	60	8.0	80						
10-31-60	0355	60	8.3	83					
	0628	59.5	7.8	77					
RANGE	MAXIMUM	63	8.5	86					
	MINIMUM	59.5	7.3	74					
AVERAGE		61	8.0	80					

STATION		0.1 Mile Downstream from Head of Steamboat Slough					MILE 32.5		
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
10-24-60	0945	62	8.1	83	2.12				
	1230	63	7.7	79					
10-25-60	1551	63	8.0	82	1.60				
	2028	62	7.6	78					
	2203	62	7.8	80	1.95				
0055	60	7.9	79						
10-26-60	0445	60	8.1	81	3.52				
	0632	61	8.0	81					
	1611	62	8.0	82	1.28				
1911	62	7.8	80						
10-27-60	0149	62	7.9	81	1.28				
	0358	63	8.0	82	1.97				
	0720	61	8.6	87					
10-28-60	0956	61	7.7	78	1.88				
	1251	62	7.6	78					
	1524	62	7.8	80	1.71				
1823	61	7.7	78						
10-29-60	2200	61	7.8	79	1.63				
	0125	60	8.2	82					
	0346	60.5	8.1	81	2.57				
0642	60	7.3	73						
10-30-60	0942	60.5	7.8	78	1.92				
	1233	61	8.2	83					
	1525	61	7.7	78	1.78				
1920	60	8.6	86						
10-31-60	2133	60	7.6	76	1.67				
	0058	60	8.4	84					
	0348	60	8.1	81	2.09				
0624	59	7.8	76						
RANGE	MAXIMUM	63	8.6	87	3.52				
	MINIMUM	59	7.3	73	1.28				
AVERAGE		61	7.9	80	2.09				

STATION		Powerline					MILE 31.6		
DATE	TIME PST	TEMP °F	O O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	
10-24-60	0932	62	7.8	80					
	1226	63	7.5	77					
10-25-60	1541	63	8.0	82					
	1855	62	7.7	79					
	2153	62	7.7	79					
0045	59	7.6	75						
10-26-60	0631	62	7.8	79					
	1600	61	8.0	82					
	1904	62	7.9	81					
0141	62	7.9	81						
10-27-60	0350	63	7.9	81					
	0713	61	7.8	79					
	0956	61	7.5	76					
1345	62	7.6	78						
10-28-60	1515	62	7.8	80					
	1815	61	8.0	81					
	2145	61	7.9	80					
0120	60.5	8.2	82						
10-29-60	0339	60.5	7.8	78					
	0634	60	7.7	77					
	0933	60.5	7.5	75					
1226	61	7.9	80						
10-30-60	1518	61	8.0	81					
	1913	60.5	8.4	84					
	2124	60	8.5	85					
0050	60	8.2	82						
10-31-60	0339	60	7.9	79					
	0620	59	8.2	80					
RANGE	MAXIMUM	63	8.5	85					
	MINIMUM	59	7.5	75					
AVERAGE		61	7.9	80					

TABLE T-15 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
LOWER REACH INTENSIVE SAMPLING PROGRAM  
OCTOBER 24-28, 1960

STATION		Vorden (opposite brick buildings on left bank)						MILE 30.1		
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l		
10-24-60	0926 1220	62 (65)	8.0 7.7	82 81	2.87					
	1525 1837	63 62	7.6 7.5	78 77	1.79					
10-25-60	2137 0035	62 60	7.4 7.5	76 75	2.13					
	0355 0622	60 61	7.7 7.9	77 80	3.72					
	1543 1850	63 62	7.8 7.7	80 79	1.44					
10-26-60	0130	62	7.8	80	0.97					
	0340 0706	63 61	7.9 7.9	81 80	2.23					
	0944 1330	61.5 62	7.8 8.1	79 83	2.09					
10-27-60	1505 1802	62 61	7.9 7.8	81 79	1.49					
	2130 0110	61 60.5	7.7 7.7	78 77	4.85					
	0325 0624	60.5 60	7.9 7.9	79 79	2.30					
	0922 1215	61 61	7.8 7.6	79 77	2.22					
	1510 1905	61 60	8.0 8.0	81 80	1.79					
10-28-60	2117 0035	60 60	8.1 8.1	81 81	2.44					
	0330 0613	60 59.5	8.1 8.0	81 79	1.88					
RANGE	MAXIMUM	63	8.1	83	4.85					
	MINIMUM	59.5	7.4	75	0.97					
AVERAGE		61.5	7.8	79	2.28					

STATION		Towers						MILE 28.4		
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l		
10-24-60	0917 1210	63 64	8.3 7.8	86 81						
	1515 1822	63 62	7.7 7.4	79 76						
10-25-60	2120 0025	62 60	7.4 7.7	76 77						
	0328 0610	59 59	7.7 7.7	75 75						
	1525 0120	62 62	7.6 7.7	78 79						
10-26-60	0330 0658	63 61	7.8 7.8	80 79						
	0937 1210	62 62	8.0 8.1	82 83						
	1500 1752	62 61	8.0 7.8	82 79						
10-27-60	2119 0100	61 60.5	7.9 7.5	80 75						
	0315 0615	60 60	7.9 7.8	79 78						
	0912 1206	61 62	7.4 8.1	75 83						
10-28-60	1505 1857	61 60	8.0 7.7	81 77						
	2110 0024	60 60	8.0 7.6	80 76						
	0318 0605	60 59	8.0 8.1	80 79						
RANGE	MAXIMUM	64	8.3	86						
	MINIMUM	59	7.4	75						
AVERAGE		61	7.8	79						

STATION		At Locke						MILE 27.4		
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C	
10-24-60	1115 1330	62.5 63	7.9 7.8	81 80	1.87					
	2215 0230	61.5 62	7.3 7.5	74 77	1.25				207	
10-25-60	0740	61.5	7.4	75	1.18	0.1	0.3	0.4	188	
	0945 1235	62.5 63	7.3 7.8	74 80	1.19	0.0	0.2	0.3	193	
	2000	62.5	7.6	78	1.15				181	
10-26-60	2235 0135	61 62	7.6 7.5	77 77	0.99					
	0425 0705	62 62	7.9 7.9	81 81	1.32					
	1005 1230	62 62.5	7.9 7.8	81 80	1.24					
10-27-60	1525 1840	62 61	7.7 7.6	79 77	1.42				189 181	
	2200 0115	60.5 61.5	7.4 7.7	74 78	1.19				183 185	
	0440 0745	61.5 61	7.6 7.9	77 80	1.54				183	
	1355	60.5	8.1	81	1.16				186	
	1525 1835	61 60	7.9 7.3	80 73	1.73				200 186	
10-28-60	2140 0100	60.5 60.5	7.5 7.7	75 77	1.50				182 177	
	0345 0730	60.5 60.5	8.1 8.3	81 83	1.73				186 176	
RANGE	MAXIMUM	63	8.3	83	1.87				207	
	MINIMUM	60	7.3	73	0.99				176	
AVERAGE		61.5	7.7	78	1.36				185	

STATION		Downstream from Walnut Grove Bridge						MILE 26.8		
DATE	TIME PST	TEMP °F	O <sub>2</sub> mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l		
10-24-60	1100 1320	62 62	7.8 7.9	80 81						
	2210 0220	62 62	7.4 7.4	76 76						
10-25-60	0700 0940	62.5 62.5	7.3 7.1	74 72						
	1225 1955	62.5 61	7.5 7.1	77 72						
	2230 0125	61.5 62	7.4 7.6	75 78						
10-26-60	0415 0650	62 62	7.6 7.6	78 78						
	0955 1225	62 62.5	7.7 7.9	79 81						
	1520 1835	62 61	7.9 7.7	81 78						
10-27-60	2150 0110	61 61.5	7.7 7.4	78 75						
	0430 0730	61.5 78	7.8 7.5	79 --						
	1350 1520	61 60.5	7.9 7.8	80 78						
10-28-60	1830 2135	60.5 60.5	7.6 7.8	76 78						
	0050 0340	60 60.5	7.8 7.7	78 77						
	0725	60.5	8.0	80						
RANGE	MAXIMUM	62.5	8.0	81						
	MINIMUM	60	7.1	72						
AVERAGE		61.5	7.6	77						

TABLE T-15 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

LOWER REACH INTENSIVE SAMPLING PROGRAM

OCTOBER 24-28, 1960

STATION 1.0 Mile Downstream from Deegan										MILE 25.5			
DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
10-24-60	1055	62	7.1	72	1.37								
	1310	62	7.6	78									
10-25-60	2200	62	7.2	73	1.17								
	0210	62	7.4	76									
	0630	62	7.3	74		1.32							
10-26-60	0935	62	6.9	70	1.19								
	1220	63	7.1	73									
	1945	60.5	7.1	71		1.17							
	2220	61	7.3	74		0.91							
	0115	62	7.5	77									
10-27-60	0410	62	7.5	77	1.29								
	0645	62	7.5	77									
	0950	62	7.7	79		1.04							
	1220	62	7.5	77									
	1515	62.5	8.0	82		1.40							
	1830	61.5	7.9	80									
	2145	61.5	7.6	77			1.20						
10-28-60	0420	61.0	7.9	80	1.50								
	0725	61	7.9	80									
	1345	61	7.5	76		1.53							
	1515	61	7.8	79									
	1820	60	7.9	79		1.54							
10-28-60	2125	60.5	7.8	78	1.43								
	0040	60	7.7	77									
	0330	60	7.5	75		1.55							
0700	60.5	8.2	82										
RANGE	MAXIMUM	63	8.2	82	1.55								
	MINIMUM	60	6.9	70	0.91								
AVERAGE		61	7.5	77	1.31								

STATION At Ryde										MILE 24.3			
DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
10-24-60	1050	62	7.2	73									
	1305	62	7.4	76									
10-25-60	2145	62	7.1	72									
	0800	62	7.5	74									
	0635	62	7.2	73									
10-26-60	0930	62	7.2	73									
	1210	61	7.2	74									
	1935	61	7.4	75									
	2210	61	7.5	76									
	0110	62	7.6	78									
10-27-60	0355	62	7.5	77									
	0635	61.5	7.5	76									
	0940	62	7.6	78									
	1215	62	7.8	80									
	1510	62.5	7.8	80									
	1820	61.5	7.9	80									
	2135	61	7.9	80									
10-28-60	0055	61.5	7.7	78									
	0410	61.5	7.7	78									
	0710	61	7.5	76									
	0935	61	7.6	77									
	1340	60.5	7.6	76									
10-28-60	1510	60.5	7.9	79									
	1815	60.5	7.9	79									
	2120	60	7.5	75									
10-28-60	0030	60	7.5	75									
	0320	60.5	8.1	81									
	0630	60.5	7.7	77									
RANGE	MAXIMUM	63	8.1	81									
	MINIMUM	60	7.1	72									
AVERAGE		61.5	7.6	77									

STATION Rhed										MILE 23.3			
DATE	TIME PST	TEMP °F	D.O. mg/l	O.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
10-24-60	1040	61.5	7.5	76	1.79								
	1300	62	7.3	74									
10-25-60	2135	61.5	7.9	80	1.24								
	0150	62	7.3	74									
	0630	62	7.2	73		1.41							
10-26-60	0920	63	7.1	73	1.12								
	1205	63	7.6	78									
	1930	61	7.6	77		1.28							
	2205	60.5	7.7	77		0.94							
	0100	62	7.3	74									
10-27-60	0345	62	7.5	77	1.23								
	0630	61.5	7.7	78									
	0930	62	8.8	90		1.18							
	1210	62	7.6	78									
	1505	62.5	7.7	79		1.20							
	1815	61.5	7.7	78									
	2130	61	8.0	81			1.10						
10-28-60	0045	61.5	7.4	75	1.60								
	0400	61.5	7.6	77									
	0700	61	7.4	75									
	0925	61	7.6	77		1.28							
	1335	60.5	7.9	79									
10-28-60	1505	60	7.5	75	1.34								
	1810	60.5	7.8	78									
	2115	60	7.6	76		1.43							
10-28-60	0020	60	8.0	80	1.35								
	0310	60.5	7.7	77									
	0640	60.5	7.7	77									
RANGE	MAXIMUM	63	8.8	90	1.79								
	MINIMUM	60	7.1	73	0.94								
AVERAGE		61	7.6	77	1.30								

STATION Warehouse										MILE 22.3			
DATE	TIME PST	TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l					
10-24-60	1035	61.5	8.4	85									
	1250	62	7.3	74									
10-25-60	2125	61.5	7.7	78									
	0130	62	7.3	74									
	0620	62	7.5	77									
10-26-60	0915	62.5	7.3	74									
	1200	62	7.4	76									
	2200	61	7.6	77									
	0050	62	7.3	74									
	0340	61.5	7.9	80									
10-27-60	0620	61.5	7.5	76									
	0920	62	7.6	78									
	1205	62	7.7	79									
	1500	62.5	7.9	81									
	1810	61.5	7.7	78									
	2125	61	7.8	79									
	0035	61	8.1	82									
0355	61.5	7.5	76										
10-28-60	0650	61	7.5	76									
	0915	61	7.4	75									
	1500	60.5	7.8	78									
	1805	60.5	7.6	76									
	2110	60	7.8	78									
10-28-60	0010	60	8.1	81									
	0305	60	8.1	81									
	0635	60.5	7.6	76									
RANGE	MAXIMUM	62.5	8.4	85									
	MINIMUM	60	7.3	74									
AVERAGE		61.5	7.7	78									



TABLE T-15 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 LOWER REACH INTENSIVE SAMPLING PROGRAM  
 OCTOBER 24-28, 1960

STATION At Tide Gage - Sileton										MILE 17.5				
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>3</sup> at 25°C					
10-24-60	1005	61	8.3	84										
	1225	61.5	8.0	81										
10-25-60	2050	60.5	9.1	91										
	0020	62	8.3	85										
10-26-60	0600	62	7.2	73										
	0850	61.5	8.6	87										
10-27-60	1135	62	7.9	81										
	2125	60.5	8.9	89										
10-28-60	0000	61	7.9	80										
	0300	62	7.4	76										
10-29-60	0555	61.5	7.5	76										
	0845	62	7.9	81										
10-30-60	1140	61.5	8.9	90										
	1435	62	7.8	80										
10-31-60	1740	62	8.2	84										
	2105	61	8.4	85										
10-11-60	2355	61.5	8.0	81										
	0320	61.5	7.8	79										
10-12-60	0555	61.5	8.0	81										
	1440	60.5	8.2	82										
10-13-60	1740	60	8.4	84										
	2050	60.5	8.3	83										
10-14-60	2340	60.5	9.0	90										
	0235	60.5	8.4	84										
10-15-60	0555	60.5	7.9	79										
RANGE	MAXIMUM	62	9.1	91										
	MINIMUM	60	7.2	73										
AVERAGE		61	8.2	83										

STATION At Beacon										MILE 15.1				
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>3</sup> at 25°C					
10-24-60	0920	60	8.9	89	2.32				173					
	1215	60	8.7	87					190					
10-25-60	1445	62	9.2	94	1.87				185					
	1745	60	9.4	94					201					
10-26-60	2105	60	9.1	91	1.36				185					
	0005	60	8.5	85					174					
10-27-60	0255	61	7.8	79	1.78				155					
	0520	60	7.7	77					170					
10-28-60	0855	60	8.9	89	1.27				188					
	1200	60	8.8	88					190					
10-29-60	1450	61	8.7	88	1.50				182					
	1740	60	9.4	94					185					
10-30-60	2135	60	9.2	92	1.20				188					
	0000	60	9.1	91					185					
10-31-60	0300	61	8.0	81	1.05				185					
	0510	61	7.7	78					191					
10-11-60	0850	60	8.9	89	1.32				179					
	1157	60	9.2	92					192					
10-12-60	1515	61	8.7	88	1.72				189					
	1815	60	9.5	95					188					
10-13-60	2120	60	9.2	92	1.41				185					
	0000	60	9.1	91					185					
10-14-60	0305	60	8.1	81	1.26				181					
	0500	59	8.9	87	1.40				187					
10-15-60	1150	60	9.0	90					186					
	1450	60	9.4	94	1.48				193					
10-16-60	1745	60	8.5	85					185					
	2055	60	9.3	93	1.14				185					
10-17-60	2345	60	9.1	91										
	0300	60	8.4	84	1.64									
10-18-60	0550	60	8.0	80										
RANGE	MAXIMUM	62	9.5	95	2.32				201					
	MINIMUM	59	7.7	77	1.05				155					
AVERAGE		60	8.8	88	1.48				184					

STATION Buildings - right bank										MILE 11.4				
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>3</sup> at 25°C					
10-24-60	0910	60	8.8	88					190					
	1145	61	8.7	88	1.43				191					
10-25-60	1435	61	9.2	94	1.67				191					
	1735	61	8.9	90					179					
10-26-60	2050	60	8.8	88	1.22				188					
	2350	60	8.8	88					174					
10-27-60	0240	60	8.8	88	1.37				177					
	0510	60	8.7	87					275					
10-28-60	0845	59	8.8	86	1.24				193					
	1140	60	8.8	88					193					
10-29-60	1440	60	8.9	89	1.14				190					
	1725	60	9.1	91					185					
10-30-60	2120	60	9.0	90	1.03				190					
	2350	60	8.8	88					185					
10-31-60	0245	60	8.6	86	1.26				182					
	0455	60	8.4	84					185					
10-11-60	0840	60	8.7	87	1.30				182					
	1143	60	8.8	88					190					
10-12-60	1500	60	8.9	89	1.70				188					
	1800	60	9.0	90					185					
10-13-60	2105	60	9.1	91	1.31				185					
	2340	60	8.9	89					185					
10-14-60	0255	60	8.6	86	1.90				185					
	0850	60	8.8	88					182					
10-15-60	1139	60	9.1	91	1.48				190					
	1435	60	9.2	92	1.43				193					
10-16-60	1730	60	9.0	90					190					
	2040	59	9.2	90	1.33				187					
10-17-60	2330	59	--	--										
	0245	60	8.8	88	1.63									
10-18-60	0540	59	8.5	83										
RANGE	MAXIMUM	62	9.2	94	1.90				275					
	MINIMUM	59	8.4	83	1.03				174					
AVERAGE		60	8.9	88	1.40				190					

STATION Rio Vista Sewage Treatment Plant										MILE 11.66				
DATE	TIME PST	TEMP °F	D O mg/l	O O % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>3</sup> at 25°C					
10-25-60	1130	72			124	10	36	39	1290					
	1940	70			90	6.8	22	26	1130					
10-26-60	0025	72			92				1080					
	0705	72			82				1110					
10-27-60	1200	73			175				1320					
	1920	71			90				1170					
10-28-60	0047	71			127				1180					
	0707	72			90				1150					
10-29-60	1200	73			131				1310					
	1900	72			89				1300					
10-30-60	0025	72			94				1140					
	0650	72	0		78				1110					
RANGE	MAXIMUM	73			175				1320					
	MINIMUM	70			78				1080					
AVERAGE		72			105				1185					

TABLE T-15 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
**RESULTS OF ANALYSES**  
 LOWER REACH INTENSIVE SAMPLING PROGRAM  
 OCTOBER 24-28, 1960

STATION		MILE 11.1							
Windmill - left bank		TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
10-24-60	0900	61	8.7	87					190
	1137	61	8.8	89					194
	1425	61	9.2	93					195
10-25-60	1725	60	9.1	91					364
	2040	60	9.0	90					261
	2340	60	8.8	88					186
10-26-60	0227	60	8.7	87					167
	0500	60	8.7	87					179
	0830	59	8.8	86					256
10-27-60	1130	60	9.0	90					193
	1430	60	9.1	91					193
	1715	60	9.2	92					258
10-28-60	2110	60	9.0	90					261
	2340	60	9.0	90					188
	0235	60	8.7	87					185
10-29-60	0445	60	8.7	87					185
	0830	60	8.8	88					203
	1135	60	9.0	90					210
10-30-60	1450	60	9.1	91					190
	1750	60	9.3	93					190
	2055	59	9.2	90					278
10-31-60	2330	59	9.1	89					190
	0240	60	8.7	87					185
	0843	60	9.0	90					183
10-32-60	1128	60	9.1	91					238
	1430	61	9.5	96					185
	1715	60	9.3	93					185
10-33-60	2030	59	9.3	93					232
	2320	59	9.3	91					239
	0230	59	8.9	87					
RANGE	MAXIMUM	61	9.5	96					364
	MINIMUM	59	8.7	86					167
AVERAGE		60	9.0	90					213

STATION		MILE 9.5							
At Beacon		TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
10-24-60	0840	60	8.8	88					308
	1122	61	8.9	90	2.73				313
	1410	61	9.2	93					313
10-25-60	1715	60	8.9	89	2.32				442
	2030	60	9.0	90	1.24				334
	2330	60	8.9	89					250
10-26-60	0210	60	8.7	87	1.53				178
	0445	60	8.7	87					190
	0820	59	8.8	86	1.54				405
10-27-60	1115	60	8.9	89	1.02				302
	1415	60	9.1	91					302
	1705	60	9.1	91	1.02				424
10-28-60	2055	60	8.9	89	0.75				495
	2330	60	9.0	90					359
	0220	60	8.7	87	1.04				190
10-29-60	0430	60	8.8	88					188
	0820	60	8.9	89	1.06				354
	1118	60	9.1	91					359
10-30-60	1435	60	9.2	92	1.22				285
	1735	60	9.2	92					344
	2040	60	9.1	91	0.51				442
10-31-60	2310	59	9.1	89					369
	0220	60	9.1	91	1.42				190
	0827	60	9.0	90	1.53				225
10-32-60	1115	60	9.0	90					375
	1415	60	9.3	93	1.36				215
	1705	60	9.3	93					253
10-33-60	2020	59	9.3	91	1.23				358
	2305	59	9.2	90					344
	0215	59	9.1	89	1.46				
RANGE	MAXIMUM	61	9.3	93	2.73				495
	MINIMUM	59	8.7	86	0.51				178
AVERAGE		60	9.0	90	1.37				314

STATION		MILE 6.5							
Powerline - gas well		TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
10-24-60	1103	61	8.8	89					626
	1355	61	9.0	91					509
	1700	61	8.6	87					2326
10-25-60	2010	60	8.7	87					2606
	2305	60	8.8	88					750
	0153	60	8.9	89					521
10-26-60	0427	60	8.8	88					349
	0805	59	8.8	86					1194
	1100	60	8.8	88					1179
10-27-60	1400	60	9.1	91					635
	1645	61	8.7	88					2123
	2035	60	8.6	86					2751
10-28-60	2305	60	8.9	89					1179
	0205	60	8.9	89					590
	0420	60	9.0	90					495
10-29-60	0805	60	8.7	87					1456
	1100	61	8.7	88					2220
	1405	60	9.1	91					635
10-30-60	1715	60	9.2	92					952
	2020	60	8.9	89					2251
	2250	59	8.9	87					1568
10-31-60	0200	59	9.0	90					583
	0819	60	8.9	89					728
	1100	60	8.7	87					1876
10-32-60	1355	60	9.2	92					635
	1645	60	9.3	93					459
	2005	60	8.8	88					1651
10-33-60	2250	60	8.7	87					2098
	0200	60	8.8	88					
	0455	60	9.1	91					
RANGE	MAXIMUM	61	9.3	93					2751
	MINIMUM	59	8.6	86					349
AVERAGE		60	8.9	89					1248

STATION		MILE 4.0							
Powerline - Mayberry Slough		TEMP °F	D.O. mg/l	D.O. % SAT	5 Day BOD mg/l	ABS mg/l	O-PO <sub>4</sub> mg/l	T-PO <sub>4</sub> mg/l	EC x 10 <sup>6</sup> at 25°C
10-24-60	1042	60	8.8	88	2.66				2476
	1335	61	8.8	89	1.22				1285
	1640	62	8.4	86					4016
10-25-60	1955	61	8.5	86	1.36				4884
	2245	60	8.7	87					2063
	0140	60	8.7	87	1.68				880
10-26-60	0407	60	8.8	88					774
	0750	60	8.4	84	1.69				3537
	1040	62	8.3	85					3013
10-27-60	1345	60	8.9	89	1.19				2035
	1630	61	8.5	86					3489
	2020	61	8.7	88	(0.36)*				4884
10-28-60	2245	60	8.7	87					2476
	0145	60	8.7	87	0.73				1376
	0410	60	8.8	88					627
10-29-60	0755	61	8.2	83	1.40				3053
	1045	61	8.4	85					3539
	1355	61	9.0	91	1.40				2035
10-30-60	1700	60	8.9	89					2751
	2005	60	8.8	88	0.97				3537
	2230	60	8.8	88					2751
10-31-60	0140	60	8.7	87	1.76				1651
	0807	60	8.4	84	1.76				2358
	1145	61	8.5	86					3053
10-32-60	1340	60	9.0	90	1.18				2381
	1630	60	9.2	92					812
	1945	60	8.5	85	1.27				3095
10-33-60	2235	60	8.4	84					3641
	0140	60	8.6	86	1.94				2050
	0430	60	8.8	88					985
RANGE	MAXIMUM	62	9.2	92	2.66				4884
	MINIMUM	59	8.2	83	0.73				627
AVERAGE		60.5	8.7	87	1.48				2467



TABLE T-16 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES—SACRAMENTO RIVER  
1960-1961

River Mile	207.1		207.1		139.0		100.2		100.2		100.2		100.2		100.2		100.2	
	Date Collected	10-5-60	10-6-60	9-15-60	9-15-60	9-15-60	9-15-60	9-15-60	9-15-60	9-15-60	9-15-60	9-15-60	9-15-60	9-15-60	9-15-60	9-15-60	9-15-60	9-15-60
Time (P.M.)	2355	2355	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350
Discharge cfs—mean daily	2355	2355	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350	2350
Temp. by	62	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
Instantaneous	62	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63	63
Dissolved Oxygen, ppm	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Field	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
Lab.	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7	7.7
EC x 10 <sup>6</sup> at 25°C	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124
Constituents in	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Total Dissolved Solids	90	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91	91
Sulfate	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25
Calcium	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Magnesium	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Sulfate	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Potassium	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Iron (total)																		
Aluminum																		
Chromium																		
Copper																		
Lead																		
Manganese																		
Total Solids	1.23	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26
Carbonate	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bicarbonate	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
Sulfate	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Chloride	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3	4.3
Nitrate	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total Anions	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26
Boron	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
Total Hardness (as CaCO <sub>3</sub> )	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6	4.6
Percent Sodium	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
River Mile																		
Date Collected																		
Time (P.M.)																		
Discharge cfs—mean daily																		
Temp. by																		
Instantaneous																		
Dissolved Oxygen, ppm																		
Field																		
Lab.																		
EC x 10 <sup>6</sup> at 25°C																		
Constituents in																		
Total Dissolved Solids																		
Sulfate																		
Calcium																		
Magnesium																		
Sulfate																		
Potassium																		
Iron (total)																		
Aluminum																		
Chromium																		
Copper																		
Lead																		
Manganese																		
Total Solids																		
Carbonate																		
Bicarbonate																		
Sulfate																		
Chloride																		
Nitrate																		
Total Anions																		
Boron																		
Total Hardness (as CaCO <sub>3</sub> )																		
Percent Sodium																		





SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES—SACRAMENTO RIVER

1960-1961

River Mile Date Collected Date of Analysis Temperature Dissolved Oxygen, ppm pH Turbidity, NTU Constituents in Analysis	7/1 10-25-60 10-25-60 63																		
	mg/l	mg/l	mg/l																
Aluminum	0.70	0.65	1.1	0.70	1.4	0.70	1.4	0.70	1.4	0.70	1.4	0.70	1.4	0.70	1.4	0.70	1.4	0.70	1.4
Ammonia	0.26	0.63	1.1	0.40	1.1	0.40	1.1	0.40	1.1	0.40	1.1	0.40	1.1	0.40	1.1	0.40	1.1	0.40	1.1
Boron	0.14	0.13	0.1	0.14	0.1	0.14	0.1	0.14	0.1	0.14	0.1	0.14	0.1	0.14	0.1	0.14	0.1	0.14	0.1
Bromine	0.01	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1
Calcium	1.2	1.0	1.6	1.0	1.5	1.0	1.5	1.0	1.5	1.0	1.5	1.0	1.5	1.0	1.5	1.0	1.5	1.0	1.5
Chloride	0.01	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1
Copper	0.01	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1
Fluoride	0.01	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1
Iron	0.01	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1
Manganese	0.01	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1
Nitrate	0.01	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1
Nitrite	0.01	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1
Phosphate	0.01	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1
Sulfate	0.01	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1	0.01	0.1
Total Dissolved Solids	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Total Solids	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

\* Composite of Two Samples.

TABLE T-16 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY  
RESULTS OF ANALYSES—SACRAMENTO RIVER  
1960-1961

Date Collected	Time of Day	Location	Depth	7-4		9-1-60		9-1-60		9-1-60		9-2-60		9-2-60		9-5		8-30-60		8-30-60		8-30-60		
				mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l
Water Collected	0237	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	
Discharge, cfs-10 min	2302	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	
Temperature	61	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	
Dissolved Oxygen, ppm	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	
pH	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	
EC x 10 <sup>3</sup> at 25°C	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	
Total Dissolved Solids	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Sulfate	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	
Cations																								
Calcium	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
Magnesium	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Sodium	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
Potassium	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
Iron (Total)																								
Aluminum																								
Zinc																								
Chloride																								
Copper																								
Lead																								
Manganese																								
Nitrate																								
Total Anions	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
Carbonate																								
Bicarbonate																								
Sulfate																								
Chloride																								
Fluoride																								
Nitrate																								
Total Hardness (as CaCO <sub>3</sub> )	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	
Total Hardness (as CaCO <sub>3</sub> )	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
Percent Sodium	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Date Collected	Time of Day	Location	Depth	4-0		9-1-60		9-1-60		9-1-60		9-2-60		9-2-60		9-5		8-30-60		8-30-60		8-30-60		
				mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l	me/l	mg/l
Water Collected	0237	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	
Discharge, cfs-10 min	2302	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	
Temperature	61	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	70	
Dissolved Oxygen, ppm	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	11.8	
pH	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	7.3	
EC x 10 <sup>3</sup> at 25°C	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	
Total Dissolved Solids	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	
Sulfate	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	21	
Cations																								
Calcium	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
Magnesium	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Sodium	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
Potassium	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
Iron (Total)																								
Aluminum																								
Zinc																								
Chloride																								
Copper																								
Lead																								
Manganese																								
Nitrate																								
Total Anions	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
Carbonate																								
Bicarbonate																								
Sulfate																								
Chloride																								
Fluoride																								
Nitrate																								
Total Hardness (as CaCO <sub>3</sub> )	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	
Total Hardness (as CaCO <sub>3</sub> )	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
Percent Sodium	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	

TABLE T-17

## SACRAMENTO RIVER WATER POLLUTION SURVEY

## QUALITY CROSS-SECTIONS - SACRAMENTO RIVER

1960-1961

River Mile	Location	Date	Time (PST)	Discharge, Mean Daily (cfs)	Location of Sampling Point		Depth of Water (feet)	Temp. (°F)	Dissolved Oxygen		ECx10 <sup>6</sup> at 25°C	pH					
					Laterally	Depth (feet)			(ppm)	(% Sat.)							
308	Keswick Reservoir above Spring Creek	9-28-60	1340			1/2	5	34	54.5	9.3	87		7.3				
			1350			1/2	20	54.5	9.4	88		7.4					
			1400			1/2	34	54.5	9.4	88							
305.9	600 Yards Upstream from Keswick Dam	4-10-61	1740	6,000		L-1/8	2	30	53.5	11.0	101	121	7.2				
			1745			L-1/8	25	49	11.0	96	121	7.2					
			1705			L-1/4	2	68	53	10.8	99	123	7.2				
			1710			L-1/4	55	49	10.5	91	123	7.1					
			1640			1/2	2	75	53	10.5	96	121	7.1				
			1640			1/2	50	49	10.7	93	111	7.1					
			1725			R-1/4	2	70	49	10.9	95	123	7.2				
			1720			R-1/4	60	49	10.7	--	123	7.1					
			1735			R-1/8	2	48	53	11.0	101	121	7.3				
			1730			R-1/8	43	49	10.7	93	123	7.3					
			305.7			Keswick Reservoir above Spring Creek	1-20-60				L-1/4	25	50				
	1/2	25		144													
	1/2	45		144													
	R-1/4	25		145													
2-16-60	1330	5,640		L-1/4	21		25	48	10.0	88	128						
	1415			L-1/4	3		48	10.1	89	122							
	1430			1/2	20		49	10.1	90	122							
	1425			1/2	3		48	10.1	89	122							
301.2	Upstream from Keswick Dam	5-26-60	1030			1/2	4	49	10.7	93	119	6.8					
			1055			1/2	35	52	10.3	93		7.1					
			1115			1/2	65	50	10.7	94		7.0					
			1040			1/2	98	50	10.4	92		7.2					
			1150			1/2		56.5	9.1	86		7.3					
		9-28-60	1215			1/2	25	54.5	9.1	85	7.3						
			1210			1/2	50	54	9.0	84	7.3						
			1159			1/2	80	54	9.0	84	7.3						
			297.7			Above Redding Diversion Dam	1-20-60				L-1/4	2					143
											1/2						143
2-17-60	4,650	0815	R-1/4								145						
		0830	L-1/4	2-3	7	47	11.6	100	134								
		0849	1/2	2-3	5	47	11.7	101	135								
			R-1/4	2-3	6	47	11.6	100	135								
285.9	Above Churn Creek	2-17-60	1350	4,650		L-1/4	1-2	3-4	49	11.6	102	137					
			1335			1/2	3-4		11.6	102	131						
			1400			R-1/4	1-2	2-3		11.2	99	133					
283.0	Anderson Bridge	1-20-60				L-1/4		2				146					
						1/2	3				145						
						R-1/4	3-4				146						
275.0	Balls Ferry Bridge	1-21-60				L-1/4		7				147					
						1/2	8				151						
						R-1/4	10				147						
		2-17-60	1545			L-1/4	2-3	5	49	11.6	102	148					
			1555			1/2	2-3	6	49	11.5	101	147					
			1600			R-1/4	2-3	7		11.4	100	148					
256.3	At Bend Bridge	1-21-60				L-1/4						149					
						1/2						147					
						R-1/4					147						
		2-18-60	0815			L-1/4	2-3	5-6	48	11.2	97	157					
			0820			1/2	2-3	5-6	48	11.2	97	155					
			0910			R-1/4	1-2	3-4	48	11.2	97	155					
		4-11-61	1130			L-1/8	2	10.5	54	10.8	99	125					
			1130			L-1/8	8	54	10.9	100	124						
			1025			L-1/4	2	12	--	10.8	--	125					
			1025			L-1/4	10	54	10.7	98	127						
			1010			1/2	2	10	54	10.7	98	126					
			1020			1/2	8	54	10.7	98	127						
			1100			R-1/4	2	9	54	10.8	99	132					
			1100			R-1/4	7	54	10.7	98	127						
1125	R-1/8	2	4	54	10.9	99	128										
244.1	At Red Bluff Bridge	4-11-61	1350			L-1/8	2	5.7	57	10.8	103	132					
			1355			L-1/4	2	14.4	57	10.8	103	132					
			1355			L-1/4	12	57.5	10.9	104	134						
			1500			1/2	2	9.2	57	10.7	102	132					
			1430			R-1/4	2	11.1	57	10.9	104	134					
			1425			R-1/4	9	57	10.9	104	134						
			1420			R-1/8	2	6.6	57	10.9	104	135					
229.8	Above Elder Creek	2-18-60	1100	9,060		L-1/4	1-2	9-10	49	11.1	98	153					
			1055			L-1/4	7-8	9-10	--	151							
			1050			1/2	1-2	7-8	49	11.1	98	151					
			1100			R-1/4	1-2	9-10	49	11.1	98	155					
			1105			R-1/4	7-8	9-10	49	11.0	97	155					
217.6	At Vina Bridge	1-22-60				L-1/4						154					
						1/2					156						
						R-1/4					154						
			3-18-60			1400	L-1/4	2-3	4-5	50	11.1	99	174				
						1410	1/2	2-3	50	10.9	97	173					
1425	R-1/4	2-3	50	10.9	97	175											

TABLE T-17 (Continued)

## SACRAMENTO RIVER WATER POLLUTION SURVEY

## QUALITY CROSS-SECTIONS — SACRAMENTO RIVER

1960-1961

River Mile	Location	Date	Time (PST)	Discharge, Mean Daily (cfs)	Location of Sampling Point		Depth of Water (feet)	Temp. (°F)	Dissolved Oxygen		ECx10 <sup>6</sup> at 25°C	pH
					Laterally	Depth (feet)			(ppm)	(% Sat.)		
199.6	At Hamilton City Bridge	2-19-60	0820 0820 0825	8,690	L-1/4 1/2 R-1/4	2-3 2-3 2-3	6-7 7-8 7-8	49	10.9 10.6 10.8	95	156 155 156	
184.5	At Ord Ferry	1-25-60			L-1/4 1/2 R-1/4						147 148 148	
		2-18-60	1555 1550	10,700	L-1/4 1/2	2-3 20	7-8 24	51	10.7 10.6	96	172 172	
			1555 1615 1605		1/2 R-1/4 R-1/4	1-2 22 2-3	24 27 27	51	10.6 10.5 10.7	94	168 168 164	
168.2	At Butte City Bridge	1-25-60			L-1/4 1/2		20 15				147 147	
		2-19-60	1120 1115	12,540	R-1/4 L-1/4 L-1/4	10 2-3	14 14		10.6 10.6		149 177 177	
			1100 1110		1/2 1/2	10 2-3	14 14		10.6 10.6		179 177	
			1050		R-1/4	10	14		10.6		179	
		4-12-61	1055 1000		R-1/4 L-1/8	2-3 2	14 8.4	58	10.7 9.8	94	177 152	
			1005 1010 1010 1035 1035		L-1/4 1/2 1/2 R-1/4 R-1/4	2 2 6 2 9	8 9.3 58 12.5 58	58 58 58 58	9.9 9.9 9.8 9.8 9.8	95 95 94 94 94	153 155 153 153 154	
			1040 1040		R-1/8 R-1/8	2 10	13.7 58	58	9.9 9.8	95 94	155 153	
144.1	At Colusa Bridge	1-25-60			L-1/4 1/2		10 16				143 144	
		2-23-60	1115 1125	9,080	R-1/4 L-1/4 1/2	1-2 10	4-5 14	51 51	10.5 10.6	94 95	145 181 180	
			1120 1140		1/2 R-1/4	2-3 10	14 14		10.6 10.7		180 180	
		4-12-61	1135 1305 1307		R-1/4 L-1/8 L-1/4	2-3 2 2	14 4.7 5.6	62 62	10.5 9.7 9.6	98 98	180 148 147	
			1310 1315 1330 1330 1340 1340		1/2 1/2 R-1/4 R-1/4 R-1/8 R-1/8	2 17 2 17 2 14	19.2 61 19 62 16 62	62 61 62 62 62 62	9.6 9.6 9.6 9.6 9.7 9.6	98 97 98 98 98 98	158 147 146 146 147 147	
138.9	Above Butte Slough	7- 6-60	1030		Left Bank L-1/8 L-1/4 L-1/4 1/2 1/2	1 2.8 3.5 4 8	2 5.5 7 10	68 68 68 68	9.0 9.1 9.1 9.1 9.2		120 120 120 120	
			1057		R-1/4 R-1/4 R-1/8 R-1/8 Right Bank	4 9 4 10 1	11 12 12 2	67 67 67 67.5	9.1 9.2 9.1 9.2 9.1		120 120 120 122	
138.7	Below Butte Slough	7- 6-60	1158		Left Bank L-1/8 L-1/8 L-1/4 L-1/4	4.5 4 10 4 10	9 12 12	68 68 68	9.1 9.1 9.1 9.0 9.0		125 125 125	
					1/2 1/2	4 11	13	68	9.1 9.1		123	
					R-1/4 R-1/4 R-1/8	4 10 4	12 11	68 68	9.1 9.0 9.1		123 122	
			1217		R-1/8 Right Bank	9 1	2	68 68	9.0 9.3		121	
118.1	Below Wilkins Slough	7- 5-60	1325		Left Bank L-1/8 L-1/8 L-1/4 L-1/4	1.3 4 9 4 12	2.5 11 14	68 68 68	8.8 8.9 8.9 9.0 8.9		130 130 130	
					1/2 1/2	4 14	16	68	8.9 9.0		130	
					R-1/4 R-1/4 R-1/8	4 14 4	16 10	68 68	8.9 9.0 8.9		130 130	
			1350		R-1/8 Right Bank	8 2.5	5	68	9.0 9.1		132	

TABLE T-17 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY

QUALITY CROSS-SECTIONS - SACRAMENTO RIVER

1960-1961

River Mile	Location	Date	Time (PST)	Discharge, Mean Daily (cfs)	Location of Sampling Point		Depth of Water (feet)	Temp. (°F)	Dissolved Oxygen		ECx10 <sup>6</sup> at 25°C	pH	
					Laterally	Depth (feet)			(ppm)	(% Sat.)			
111.6	At Boyer's Bend	7- 5-60	1050		Left Bank	0.3	0.5	70.5	8.7		130		
						L-1/8	4	10.5	69	9.0	130		
						L-1/8	8.5			9.0			
						L-1/4	4	11	69	9.0	130		
						L-1/4	9			9.0			
						1/2	4	26	69	9.0	130		
						1/2	24			8.9			
						R-1/4	4	29	69	9.0	130		
						R-1/4	27			9.0			
						R-1/8	4	25	69	8.7	130		
			1122		R-1/8	23			8.8				
					Right Bank	1.5	3	69	8.8	130			
111.4	At Boyer's Bend	4-13-61	1330		L-1/8	2	6	61	9.4	95	157		
			1335		L-1/4	2	9	61	9.5	96	157		
			1335		L-1/4	7		61	9.5	96	157		
			1405		1/2	2	26	61	9.4	95	159		
			1405		1/2	22		61	9.5	96	161		
			1415		R-1/4	2	34	61	9.5	96	161		
			1415		R-1/4	30		61	9.4	95	159		
			1435		R-1/8	2	17	61	9.4	95	158		
			1435		R-1/8	15		61	9.4	95	158		
			90.74	Above Colusa Basin Drain	5-12-60	1225		Left Bank			68		
		68									188		
		68									185		
		68									182		
		68									180		
		68									178		
90.6	Above Colusa Basin Drain	5-12-60	1230		Left Bank			67			190		
								67			190		
								67			188		
								67			189		
		1235		Right Bank			67			190			
90.5	Above Colusa Basin Drain	2-24-60	1015	10,700	Left Bank	L-1/4	14	18	50	10.4	92	177	
			1020			L-1/4	2-3	18	10.5	176			
			1020			1/2	20	24	10.4	176			
			1025			1/2	2-3	24	10.5	176			
			1025			R-1/4	18	22	10.5	175			
			7- 1-60			1030	R-1/4	2-3	22	10.4	92	176	
						0930	Left Bank	1.3	2.5	68	8.8	147	
							L-1/8	4	10	68	8.8	147	
							L-1/8	8		68	8.8		
							L-1/4	4	16	67.5	8.9	147	
				L-1/4	14			8.9					
				1/2	4	19	67.5	8.8	150				
				1/2	17			8.7					
				R-1/4	4	21	67.5	8.8	150				
				R-1/4	19			8.8					
		9- 1-60	1540	R-1/8	4	15	67.5	8.8	150				
			1545	R-1/8	13		68	8.6					
			1555	L-1/4			68	8.8	7.6				
				1/2			68	8.8	7.6				
				R-1/4			68	8.6	7.4				
4-13-61	1535	L-1/8	2	7.5	61	9.5	96	158					
	1537	L-1/4	2	17.5	61	9.5	96	161					
	1537	L-1/4	15		61	9.5	96	157					
	1625	1/2	2	22.5	61	9.5	95	161					
	1625	1/2	20		61	9.4	95	149					
	1625	R-1/4	2	22.5	61	9.5	96	164					
	1625	R-1/4	20		61	9.4	95	157					
	1607	R-1/8	2	22.5	61	9.5	96	161					
	1605	R-1/8	20		61	9.5	96	160					
90.2R	Colusa Basin Drain at Boat Ramp	9- 1-60	1215					71	7.1		7.6		
90.2	Below Colusa Basin Drain	7- 1-60	1100		Left Bank	3.5	7	68	8.6		172		
						L-1/8	4	16	68	8.6	172		
						L-1/4	14		68	8.7			
						L-1/4	4	17	68	8.7	174		
						L-1/4	15		68	8.9			
						1/2	4	16	68	8.9	175		
						1/2	14		68	8.9			
						R-1/4	4	17	68	8.8	182		
						R-1/4	15		68	8.8			
						R-1/8	4	12	68	8.9	185		
						R-1/8	10			8.8			
						Right Bank	1.8	3.5	68	8.9	187		
						20' fr R.Bank			72	7.4	7.4		
						60' fr R.Bank			68	7.7	7.5		
75' fr R.Bank			67	8.0									
1315	1/2		67	8.5	7.5								
1325	L-1/4		67	8.6	7.6								
1330	15' fr L.Bank		67	8.7	7.4								
89.8	Below Knights Landing	9- 1-60	1345		30' fr L.Bank			68	8.4		7.4		
			1350		L-1/4			68	8.3		7.4		
			1355		1/2		68	8.5		7.5			
			1400		30' fr R.Bank		68	8.4		7.4			

TABLE T-17 (Continued)

## SACRAMENTO RIVER WATER POLLUTION SURVEY

## QUALITY CROSS-SECTIONS—SACRAMENTO RIVER

1960-1961

River Mile	Location	Date	Time (PST)	Discharge, Mean Daily (cfs)	Location of Sampling Point		Depth of Water (feet)	Temp. (°F)	Dissolved Oxygen		ECx10 <sup>6</sup> et 25°C	pH																		
					Laterally	Depth (feet)			(ppm)	(% Sat.)																				
88.3	At Portuguese Bend	9-1-60	1450		20' fr L.Bank				68	8.4		7.5																		
			1455										L-1/4	68	8.2	7.5														
			1505										1/2	68	8.4	7.4														
			1510										R-1/4	68	8.1	7.4														
			1515										20' fr R.Bank	68	8.4	7.4														
81.5	Above Sacramento Slough	2-24-60	1340	10,700								226																		
			1340										L-1/4	15	19	10.3	224													
			1345										1/2	15	19	10.0	228													
			1350										1/2	2-3	19	10.2	226													
			1350										R-1/4	14	18	10.3	226													
			1355										R-1/4	2-3	18	10.2	228													
			1355														91	226												
80.9	Above Sacramento Slough	6-30-60	0930									175																		
80.9													Left Bank	1.5	3	69.5	8.7	175												
													L-1/8	4	15	69.5	8.9	175												
													L-1/8	13			8.6													
													L-1/4	4	17	69.5	8.4	175												
													L-1/4	15			8.5													
1/2													4	28	69.5	8.6	175													
1/2													26			8.5														
R-1/4													4	32	69.5	8.6	175													
R-1/4													30			8.4														
R-1/8													4	15	69	8.6	175													
R-1/8													13			8.6														
1055													Right Bank	3.5	7	69.5	8.7	173												
80.7	Below Sacramento Slough	6-30-60	1155									165																		
													Left Bank	1.5	3	74	8.2	180												
													L-1/8	3.5	7	73	8.2	187												
													L-1/4	3.5	7	72	8.2	187												
													1/2	4	8	71.5	8.2	190												
													1/2	4	10	71	8.3	190												
													R-1/4	4																
													R-1/4	8			8.5													
													R-1/8	4	10	70	8.5	190												
													R-1/8	8			8.5													
													1330	Right Bank	1	2	70	8.5	190											
71.0	At Elkhorn Ferry	2-25-60	0920	16,000								174																		
			0910										L-100'	8	10	11.0	174													
			0925										2-3	10	10	10.9	202													
			0930										1/2	12	12	10.7	202													
			0940										1/2	12	12	10.8	202													
			0915										R-100'	12	14	10.6	242													
			0915										R-100'	2-3	14	10.6	92	242												
			63.6										At Sacramento Weir	6-29-60	1150									195						
																									Left Bank	2.5	5	71	8.3	195
																									L-1/8	4	10	71	8.5	195
L-1/8	8				8.5																									
L-1/4	4	10.5		71	8.7	195																								
L-1/4	8.5				8.6																									
1/2	4	10		70.5	8.5	195																								
1/2	8				8.5																									
R-1/4	4	11.5		71	8.6	195																								
R-1/4	9.5				8.6																									
R-1/8	4	13		71	8.6	195																								
R-1/8	9				8.6																									
Right Bank	4	11		71	8.6	195																								
Right Bank	9				8.6																									
1230	L-1/8	2		10.7	62	9.1	153																							
1125	L-1/8	8			62	9.0	92	154																						
1130	L-1/4	2		10.5	62	9.1	93	149																						
1130	L-1/4	8		62	9.1	93	148																							
1155	1/2	2	11	62	9.2	94	152																							
1155	1/2	9		62	9.1	93	157																							
1205	R-1/4	3	12.3	62	9.2	94	153																							
1157	R-1/4	10		62	9.0	92	157																							
1153	R-1/8	2	13	62	9.1	93	157																							
1150	R-1/8	11		--	9.3		157																							
62.6	At Bryte Laboratory	2-26-60	0915	18,300								201																		
			0920										L-50'	5	9	50	10.7	94	200											
			0920										L-1/4	7	9		10.7		201											
			0925										2-3	10	13	10.8		200												
			0930										1/2	10	13	10.8		200												
			0930										1/2	2-3	13	10.7		200												
62.6	At Bryte Laboratory (continued)	2-26-60	0935									200																		
			0935										R-1/4	16	19	50	10.8	95	200											
			0940										R-1/4	2-3	19		10.7		200											
		6-14-60	1250										R-50'	5			7.8		200											
													R-1/4				7.8													
													1/2																	
		6-29-60	1400																				197							
																								Left Bank	0.8	1.5	72	8.7	195	
																								L-1/8	4.5	9	71	8.7	193	
																								L-1/4	4	12	71	8.6		
																								L-1/4	10			8.8		
																								1/2	4	13	71	8.8	192	
1/2	11					8.7																								
R-1/4	4			14	71	8.8	192																							
R-1/4	12					8.8																								
R-1/8	4	16	71	8.7	192																									
1443	R-1/8	14			8.8																									
	Right Bank	3.5	7	71.5	8.7	192																								
60.5	0.1 Mile Above American River	6-14-60	1310									8.1																		
													R-1/4			77	8.0													
													1/2				8.0													
	L-1/4				8.0																									

TABLE T-17 (Continued)

## SACRAMENTO RIVER WATER POLLUTION SURVEY

## QUALITY CROSS-SECTIONS - SACRAMENTO RIVER

1960-1961

River Mile	Location	Date	Time (PST)	Discharge, Mean Daily (cfs)	Location of Sampling Point		Depth of Water (feet)	Temp. (°F)	Dissolved Oxygen		ECx10 <sup>6</sup> at 25°C	M	
					Laterally (feet)	Depth (feet)			(ppm)	(% Sat.)			
58.2	Above West Sacramento Sewage Treatment Plant Outfall	6-14-60	1320		R-1/4 1/2 L-1/4			75	9.6 8.3 8.1				
56.8	Beacons 53 and 54	6-14-60	1350		R-1/4 1/2 L-1/4			75	8.0 8.0 8.2				
54.1	Wheeler No. 2	6-14-60	1410		R-1/4 1/2 L-1/4			75.5	8.0 8.2 8.2				
53.2	Brickyard	6-14-60	1420		R-1/4 1/2 L-1/4			76.5	8.1 8.0 8.0				
52.3	Beacons 42 and 43	6-14-60	1435		R-1/4 1/2 L-1/4			75	8.0 8.0 8.0				
46.4	At Freeport Bridge	1-27-60			L-1/4 1/2 R-1/4		20 15 25					190 188 186	
		2-25-60	1320 1315	19,000	L-1/4 L-1/4 L-1/4	13 2-3	16 16	51	10.8 10.6	97		179 179	
			1325 1330 1340 1345		1/2 1/2 R-1/4 R-1/4	14 2-3 20 2-3	19 19 24 24		10.7 10.9 10.5 10.5			179 178 179 178	
43.4	Above Clarksburg	2-29-60	1215 1215 1220 1220 1230 1230	16,400	L-1/4 L-1/4 2/2 2/2 R-1/4 R-1/4	16 2-3 30 2-3 33 2-3	19 19 35 35 37 37	50	10.6 10.6 10.7 10.6 10.6 10.6	93		193 193 194 194 194 196	
			1455 1455 1500 1500 1505 1505	16,400	L-1/4 L-1/4 2/2 2/2 R-1/4 R-1/4	14 2-3 14 2-3 14 2-3	18 18 18 18 18 18	50	10.5 10.5 10.5 10.6 10.5 10.5	92		208 208 205 205 206 206	
			1215 1215 1210 1210 1205 1205	14,900	L-1/4 L-1/4 1/2 1/2 R-1/4 R-1/4	25 2-3 20 2-3 15 2-3	29 29 23 23 19 19	49 49	10.4 10.4 10.5 10.4 10.4 10.4	91 91		172 171 171 172 173 174	
			0915 0915 0920 0920 0930 0930 0843 0844	14,900	L-1/4 1/2 R-1/4 L-1/2 1/2 1/2 R-1/4 R-1/4	13 2-3 11 2-3 11 2-3 18 2	16 13 13 13 13 20 20	49 71 70.5	10.5 10.6 10.5 10.6 10.5 7.7 7.8	92 87 87		195 195 195 175 174 175 174	
			0854 0855				12 2	14 14	71 71	8.5 8.5	95 95		
16.6	At Power Lines	10-11-60	0904 0905			20 2	22 22	71 71	8.9 8.9	99 100			
15.2	At Beacon 10	10-11-60	0914 0915			13 2	15 15	71 71	9.1 9.2	102 103			
14.2	Above Cache Slough	3- 3-60	1210 1210		1/2 1/2	12 2-3	16 16	50	10.2 10.1	89	204 204		
12.8	At Rio Vista Bridge	1-27-60			L-1/4 1/2 R-1/4	7 7 10	21 22 36					236 233 233	
		3- 3-60	1030 1040	14,000	L-60' L-1/7	10 13	25 16		10.4 10.4			199 201	
			1045 1050 1050 1055 1055		L-1/7 L-2/7 L-2/7 L-3/7 L-3/7	2-3 15 2-3 16 2-3	16 18 18 19 19	50	10.3 10.2 10.3 10.3 10.2	91		201 204 204 204 204	
12.8	At Rio Vista Bridge (continued)	3- 3-60	1100 1100 1105 1105 1110		L-4/7 L-4/7 L-5/7 L-5/7 L-6/7	16 2-3 19 2-3 19	19 19 22 22 22		10.0 10.1 10.1 10.2 10.2			211 208 211 211 208	
			1110 1115 1115 1116 1120		L-6/7 R-60' L-1/4 L-1/4 1/2	2-3 10 15 2 24	22 18 17 17 26	50 70.5 71 70.5	10.1 10.1 8.5 8.6 8.3	89		211 211	
			1121 1125 1126 1236 1239		1/2 R-1/4 R-1/4 1/2 L-1/4	2 19 2 2 2	26 21 21 26 17	70.5 70.5 71 72.5 71	8.5 8.1 8.4 8.4 8.8	94 90 94 94 98			

TABLE T-17 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 QUALITY CROSS-SECTIONS - SACRAMENTO RIVER

1960-1961

River Mile	Location	Date	Time (PST)	Discharge, Mean Daily (cfs)	Location of Sampling Point		Temp. of Water (°F)	Dissolved Oxygen (ppm)	ECx10 <sup>6</sup> at 25°C	pH	
					Depth: Laterally (feet)	Depth: Water (feet)					
11.8	Opposite Tide Oage at Rio Vista	10-11-60	1246			25	27	71	8.3	93	
			1247			2	27	71.5	8.0	90	
10.8	Below Military Reservation at Rio Vista	10-11-60	1252	22	24	2	24	71	7.8	88	
			1253					2	24	72	8.7
9.6	Opposite Beacon above Threemile Slough	10-11-60	1303			18	20	70.5	8.1	90	
			1304			2	20	71	8.2	92	
8.6	Beacon Above Horseshoe Bend	10-11-60	1309			25	27	70	8.1	90	
			1310			2	27	70	8.3	92	
7.5	At Chinumans Cut	10-11-60	1316			26	28	70	8.3	92	
			1317			2	28	72	8.8	100	
6.5	At Power Line Crossing Above Toland Landing	10-11-60	1330			35	37	69.5	7.9	87	
			1331			2	37	71.5	9.0	101	
			1338			36	38	69	7.8	86	
			1340			1/2	38	70	8.6	96	
			1343			1/2	34	69	7.9	86	
			1344			R-1/4	34	70	8.4	93	
5.3	Opposite Windmill on Right Bank	10-11-60	1355			33	35	68	7.7	84	
			1356			2	35	70	8.7	96	
4.0	Above Mayberry Slough	3-2-60	1205	14,400		10	20	50	10.3	91	264
			1200			L-1/8	22	25	10.3	258	
			1200			L-1/8	2-3	25	10.3	258	
			1150			L-1/4	21	25	10.4	249	
			1150			L-1/4	2-3	25	10.4	245	
			1140			L-3/8	22	26	10.4	236	
			1140			L-3/8	2-3	26	10.3	236	
			1045			1/2	25	29	10.3	236	
			1045			1/2	2-3	29	10.3	249	
			1055			L-5/8	22	26	10.4	241	
			1055			L-5/8	2-3	26	10.4	236	
			1110			L-3/4	22	26	10.3	236	
			1110			L-3/4	2-3	26	10.4	236	
			1120			L-7/8	26	27	10.3	236	
			1120			L-7/8	2-3	27	10.4	236	
			1125			R-60'	10	20	10.3	234	
			1412				28	30	7.7	85	
			1413				2	30	8.0	88	
			1418				35	37	88.5	85	
			1419				2	37	8.1	89	
1424		28	30	8.3	91						
1425		2	30	8.8	98						

TABLE T-18  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
TRIBUTARIES OF SACRAMENTO RIVER

1960-1961

Stream Mile	277.7R	288.1R	288.1R	289.1R	283.5L	283.5L	279.8L	278.4L	278.9L	276.4L	276.4L	
Stream Location	Middle Creek near Bedding	Olney Creek nr Bedding 1000' upstream	Clear Creek at Hwy. 99 Bridge	Clear Creek	Churn Creek 500' downstream from bridge	Churn Creek	Stillwater Cr. Most downstream bridge - Shingletown Rd	Cow Creek at bridge	Cow Creek near Balls Ferry	Rear Creek near Balls Ferry	Rear Creek near Balls Ferry	
Date Collected	5-5-60	5-5-60	10-6-60	11-29-60	5-5-60	11-29-60	5-5-60	10-6-60	11-30-60	5-7-60	11-30-60	
Time (P.M.S.L.)	1:30	1:40	1:15	0:45	1:00	1:14	0:30	1:30	0:40	0:30	0:30	
Discharge, cfs-Mean Daily	2	2	31	140	7	7	22	22	200	75	60	
Instantaneous	2 (est.)	6 (est.)	31 (est.)	140 (est.)	7 (est.)	7 (est.)	22 (est.)	22 (est.)	200 (est.)	75 (est.)	60 (est.)	
Temp. °F	66	62	--	45	61	61	60	60	66	55	46	
Dissolved Oxygen, ppm	9.1	12.4	--	11.3	9.9	11.5	9.5	--	11.5	13.0	11.4	
% Saturation	97	126	--	91	100	109	95	--	96	104	95	
pH	7.3	7.5	7.3	7.4	7.6	7.1	7.2	7.2	7.3	7.4	7.6	
EC x 10 <sup>6</sup> at 25°C	307	149	209	157	172	180	137	137	177	157	118	
Constituents in	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)
Total Dissolved Solids	175	92	117	116	116	116	82	141	111	91	91	
Sum	175	92	117	116	116	116	82	141	111	91	91	
Silica	(100) 25	22	14	32	32	32	18	38	31	31	31	
Cations												
Calcium (Ca)	22	1.10	13	0.65	18	0.90	11	0.55	17	0.85	11	0.55
Magnesium (Mg)	3.9	0.32	4.7	0.39	4.4	0.36	7.8	0.64	7.9	0.65	6.0	0.49
Sodium (Na)	49	1.26	7.5	0.33	16	0.70	10	0.44	7.2	0.31	8.8	0.38
Potassium (K)	0.4	0.01	1.0	0.02	1.3	0.03	0.6	0.01	2.1	0.05	0.9	0.04
Total Cations	84	2.69	32	1.39	39	1.92	24	1.20	27	1.30	27	1.10
Anions												
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	56	0.92	66	1.08	62	1.02	85	1.39	102	1.73	72	1.18
Sulfate (SO <sub>4</sub> )	17	0.35	4.9	0.10	10	0.22	5.1	0.11	5.9	0.12	1.3	0.01
Chloride (Cl)	4.9	1.38	6.7	0.19	23	0.65	14	0.39	8.2	0.23	8.4	0.24
Fluoride (F)	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.3	0.02	0.2	0.01
Nitrate (NO <sub>3</sub> )	0.3	0.00	0.6	0.01	0.2	0.00	2.6	0.04	0.8	0.01	0.5	0.01
Total Anions	84	2.65	32	1.38	39	1.89	24	1.19	27	1.25	27	1.12
Boron (B)	0.02	0.07	0.06	0.06	0.01	0.07	0.05	0.10	0.13	0.10	0.02	0.0
Total Hardness (as CaCO <sub>3</sub> )	72	52	63	67	67	67	40	75	75	50	50	
MC Hardness	25	0	12	0	0	0	0	0	0	0	0	
Percent Sodium	47	26	35	15	15	15	12	24	24	14	14	

Stream Mile	276.4L	275.1L	272.6R	272.6R	272.4R	270.1L	270.1L	263.3L	263.7R	261.9R	261.9R/0.7	
Stream Location	Rear Creek near Balls Ferry	Ash Creek At Hwy. Bridge	Anderson Creek At Balls Ferry Road Bridge	Anderson Creek Co. Rd 17	Cottonwood Creek Hwy. 99 Bridge	Battle Creek At bridge	Battle Creek At bridge	Inks Creek 1 mile above washed out Br. Hwy. 99	Berds Creek Bridge on NE Hwy. 99	Bedbank Creek	Bedbank Creek At Hwy. 99 Bridge	
Date Collected	10-6-60	5-6-60	10-6-60	11-30-60	11-30-60	10-6-60	11-30-60	5-6-60	5-6-60	10-6-60	5-15-61	
Time (P.M.S.L.)	1:45	07:00	10:10	10:00	10:00	1:30	1:15	1:40	1:05	1:10	1:00	
Discharge, cfs-Mean Daily	1:45	07:00	10:10	10:00	10:00	1:30	1:15	1:40	1:05	1:10	1:00	
Instantaneous	7 (est.)	8 (est.)	60 (est.)	400 (est.)	400 (est.)	400 (est.)	22 (est.)	7 (est.)	7 (est.)	8 (est.)	8 (est.)	
Temp. °F	--	58	64	52	51	--	59	62	62	54	54	
Dissolved Oxygen, ppm	--	7.1	10.3	7.8	10.7	--	10.7	8.7	10.1	13	13	
% Saturation	--	89	107	71	104	--	93	106	106	106	106	
pH	8.3	7.3	7.3	7.7	7.1	7.5	8.0	7.5	7.2	7.2	7.0	
EC x 10 <sup>6</sup> at 25°C	289	123	132	173	281	180	140	112	475	281	314	
Constituents in	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)	mg/l (ppm)	me/l (cpm)
Total Dissolved Solids	151	110	88	162	125	115	37	25	25	170	170	
Sum	151	110	88	162	125	115	37	25	25	170	170	
Silica	(100) 27	23	17	47	47	47	40	17	17	17	17	
Cations												
Calcium (Ca)	20	1.00	12	0.60	9.7	0.48	7.2	0.36	11	1.05	11	1.05
Magnesium (Mg)	13	1.04	5.8	0.48	5.8	0.48	6.7	0.52	12	1.23	9.8	0.81
Sodium (Na)	9.8	0.53	8.0	0.33	7.0	0.30	9.4	0.41	7.1	0.31	7.0	0.30
Potassium (K)	2.8	0.05	1.3	0.03	1.7	0.04	1.2	0.07	2	0.04	6.7	0.15
Total Cations	45	2.62	23	1.30	24	1.10	24	1.10	24	1.10	24	1.10
Anions												
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	14	0.32	79	1.29	65	1.06	77	1.27	102	1.73	126	2.06
Sulfate (SO <sub>4</sub> )	4.1	0.08	0.3	0.01	4.0	0.10	13	0.37	0.6	0.13	137	2.85
Chloride (Cl)	2.1	0.17	3.7	0.16	3.3	0.09	2.9	0.08	3.3	0.15	13	0.42
Fluoride (F)	0.1	0.00	0.1	0.00	0.1	0.00	0.1	0.00	0.2	0.01	0.2	0.01
Nitrate (NO <sub>3</sub> )	0.4	0.01	0.4	0.01	1.1	0.02	1.0	0.02	0.8	0.01	1.1	0.02
Total Anions	24	1.4	23	1.27	24	1.10	24	1.10	24	1.10	24	1.10
Boron (B)	0.08	0.03	0.02	0.10	0.09	0.1	0.09	0.1	0.05	0.05	0.05	
Total Hardness (as CaCO <sub>3</sub> )	102	44	42	117	56	50	34	34	14	14	115	
MC Hardness	0	0	0	0	0	0	0	0	0	0	0	
Percent Sodium	1	2	23	1	1	23	0	25	1	34	53	

\* Value obtained from instantaneous sample

TABLE T-1B (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY  
RESULTS OF ANALYSES  
TRIBUTARIES OF SACRAMENTO RIVER

1960-1961

Stream Mile	241.9R/0.9	241.9R/0.9	241.9R/0.1	241.9R/0.1	241.9R/0.1	241.9R/0.1	239.0L	235.1L	233.5L	229.0L	221.0L	
Stream	Redbank Creek	Redbank Creek	Redbank Creek	Redbank Creek	Redbank Creek	Redbank Creek	Salt Creek	Butler Slough	Antelope Creek	Mill Creek	Toomes Creek	
Location	At Rwy 99 Bridge	At Rwy 99 Bridge	near Moutb	near Mouth	near Mouth	near Mouth	End Patterson Rwy 99	Bridge on Rwy 99	At Rwy 99E	At gate west of Rwy 99	At Rwy 99 Br. at Los Molinos	
Date Collected	5-21-61	4-18-61	2-15-61	3-21-61	4-18-61	5-4-60	5-4-60	10-7-60	10-3-60	10-7-60	5-4-60	
Time (P.S.T.)	1210	1120	1120	1145	1030	1340	1100	1420	1145	1230		
Discharge, cfs-Mean Daily	122	3 (est)	15 (est)	18 (est)	19 (est)	33 (est)	20 (est)	18 (est)	32 (est)	33 (est)		
Instantaneous	59*	63.5*	53*	59*	65*	62*	--	--	--	59		
Temp. °F	10.0*	10.0*	9.4*	8.1*	7.6*	9.6	--	--	--	9.7		
Dissolved Oxygen, ppm	99*	104*	86*	80*	80*	98	--	--	--	96		
% Saturation	7.6*	8.2	7.6*	7.4*	7.7	7.5*	7.8	7.4	7.6	8.0	7.8	
pH	7.6*	7.6*	7.4*	7.4*	7.3*	7.4	7.3	7.4	7.6	7.8	7.9	
Field Lab.	4.8	3.81	1.34	4.41	3.21	1.14	2.01	2.32	2.05	1.26		
EC x 10 <sup>6</sup> at 25°C												
Constituents in	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)
Total Dissolved Solids	238				260		86		144		165	
Sum												
Silica (SiO <sub>2</sub> )	15				17		31		40		41	
Cations												
Calcium (Ca)	4.5	2.24			4.1	2.04	8.7	0.43	14	0.70	13	0.65
Magnesium (Mg)	1.9	1.58			1.7	1.38	5.0	0.41	8.3	0.68	13	0.67
Sodium (Na)	1.3	0.56			2.4	1.04	5.9	0.26	13	0.56	20	0.87
Potassium (K)	1.0	0.02			1.5	0.04	1.0	0.02	2.5	0.06	4.6	0.12
Total Cations	4.40				4.40		1.12		2.00		2.31	
Anions												
Carbonate (CO <sub>3</sub> )	0	0.00			0	0.00	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	200	3.28			168	2.75	60	0.98	99	1.62	83	1.36
Sulfate (SO <sub>4</sub> )	4.0	0.83			6.9	1.44	0	0.00	3.4	0.07	13	0.27
Chloride (Cl)	6.2	0.17			7.3	0.20	4.0	0.11	13	0.37	22	0.62
Fluoride (F)	0.2	0.01			0.2	0.01	1.1	0.00	0.1	0.00	0.2	0.01
Nitrate (NO <sub>3</sub> )	1.0	0.02			0.2	0.00	0.2	0.00	0.5	0.01	1.1	0.02
Total Anions	4.31				4.40		1.09		2.07		2.28	
Boron (B)	0.1				0.1		0.06		0.32		0.69	
Total Hardness (As CaCO <sub>3</sub> )	191				171		42		69		66	
NC Hardness	27				33		0		0		0	
Percent Sodium	13				23		23		28		38	

\* Value obtained from instantaneous sample.

Stream Mile	219.1L	219.1L	197.1L	60.4L/0.2	60.4L/0.2	American River	60.4L/0.2					
Stream	Deer Creek	Deer Creek	Pine Creek	American River								
Location	At Rwy 99E Bridge	At Rwy 99E Bridge	near Moutb	near Mouth								
Date Collected	5-4-60	10-7-60	5-4-60	8-30-60	8-30-60	8-30-60	8-30-60	8-30-60	9-1-60	9-1-60	9-1-60	
Time (P.S.T.)	1145	1215	0915	0415	1015	1615	2220	1015	1615	2215		
Discharge, cfs-Mean Daily	180 (est)	40 (est)	---	---	---	---	---	---	---	---	---	
Instantaneous	61	---	68	---	63	67	69.5	67	68	70.5	65	
Temp. °F	10.3	---	6.8	---	8.8	8.5	8.4	8.4	8.3	8.4	8.5	
Dissolved Oxygen, ppm	10.4	---	7.0	---	9.1	9.2	9.4	9.1	9.1	9.4	9.0	
% Saturation	7.5	7.6	8.1	7.2	7.9	6.7	7.4	7.2	7.3	7.5	7.2	
pH	7.5	7.6	7.2	7.9	6.7	7.4	7.2	7.3	7.3	7.5	7.2	
Field Lab.	1.13	1.77	2.97	6.0	5.6	5.8	8.2	5.4	6.0	5.8		
EC x 10 <sup>6</sup> at 25°C												
Constituents in	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)	mg/l (ppm)	me/l (epm)
Total Dissolved Solids	84	138	204	45	37	39	52	36	38	38		
Sum												
Silica (SiO <sub>2</sub> )	31	42	54	15	11	10	12	12	11	12		
Cations												
Calcium (Ca)	2.3	0.46	1.3	0.65	2.4	1.20	5.4	0.27	5.4	0.27	5.7	0.28
Magnesium (Mg)	4.1	0.34	7.4	0.61	1.7	1.38	2.1	0.17	1.8	0.15	2.3	0.19
Sodium (Na)	6.2	0.27	3.3	0.56	1.2	0.52	3.0	0.13	2.2	0.10	2.8	0.12
Potassium (K)	1.0	0.02	2.2	0.06	1.2	0.03	1.0	0.02	0.9	0.02	0.8	0.02
Total Cations	1.09	1.88	3.13	0.59	0.54	0.60	0.76	0.51	0.54	0.54	0.56	
Anions												
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	61	1.00	103	1.69	167	2.74	24	0.39	26	0.43	26	0.43
Sulfate (SO <sub>4</sub> )	0.3	0.01	2.5	0.05	5.6	0.12	2.8	0.06	0.3	0.01	0.8	0.02
Chloride (Cl)	1.7	0.05	6.0	0.17	3.4	0.10	2.3	0.06	1.7	0.05	2.8	0.08
Fluoride (F)	0.1	0.00	0.1	0.00	0.2	0.01	0.1	0.00	0.2	0.01	0.0	0.00
Nitrate (NO <sub>3</sub> )	0.4	0.01	0.9	0.01	4.7	0.08	0.9	0.01	0.5	0.01	0.8	0.01
Total Anions	1.07	1.92	3.05	0.52	0.51	0.54	0.66	0.47	0.54	0.54	0.50	
Boron (B)	0.08	0.23	0.05	0.03	0.00	0.00	0.17	0.02	0.02	0.02	0.02	
Total Hardness (As CaCO <sub>3</sub> )	40	63	129	22	21	23	23	20	22	21	21	
NC Hardness	0	0	0	2	2	2	6	0	2	2	1	
Percent Sodium	25	30	17	22	18	21	34	18	18	18	18	

TABLE T-19  
SACRAMENTO RIVER WATER POLLUTION SURVEY  
RESULTS OF ANALYSES  
WASTES DISCHARGED TO SACRAMENTO RIVER

1960-1961

WEST SACRAMENTO SEWAGE TREATMENT PLANT, MILE 58.0R

Date Collected	8-30-60		8-30-60		8-30-60		9-1-60		9-1-60		9-1-60		9-1-60	
Time (P.S.T.)	1120		1720		2325		0520		1120		1710		2320	
Discharge, $10^6$ gal	1.75		2.65		2.00		0.92		2.77		2.40		2.18	
Instantaneous Temp. $^{\circ}$ F	78		80		78		74		78		77		77	
Dissolved Oxygen, ppm														
% Saturation														
pH	Field	Lab.	7.6		7.8		7.5		8.2		8.0		8.2	
EC x $10^6$ at 25 $^{\circ}$ C	1280		1340		1160		1190		1350		1480		1260	
Constituents in	mg/l (ppm)	me/l (epm)												
<b>Total Dissolved Solids</b>														
Sum	644		691		592		622		680		780		663	
Silica (SiO <sub>2</sub> )	51		54		48		50		50		50		49	
<b>Cations</b>														
Calcium (Ca)	28	1.40	12	0.60	22	1.10	30	1.50	33	1.65	22	1.10	28	1.40
Magnesium (Mg)	29	2.40	37	3.04	32	2.62	26	2.14	32	2.63	32	2.64	30	2.44
Sodium (Na)	134	5.83	160	6.96	122	5.31	130	5.66	138	6.00	186	8.09	141	6.13
Potassium (K)	13	0.33	14	0.36	13	0.33	12	0.31	13	0.33	13	0.33	13	0.33
Ammonium (NH <sub>4</sub> )	36	2.00	35	1.94	30	1.61	31	1.72	36	2.00	39	2.16	30	1.66
<b>Total Cations</b>	11.96		12.90		10.97		11.33		12.61		14.32		11.96	
<b>Anions</b>														
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	355	5.82	361	5.92	353	5.78	347	5.69	382	6.26	385	6.31	364	5.96
Sulfate (SO <sub>4</sub> )	4.1	0.08	0.0	0.00	0.0	0.00	15	0.31	7.4	0.15	25	0.52	23	0.48
Chloride (Cl)	210	5.92	235	6.63	180	5.08	186	5.24	217	6.12	261	7.36	198	5.58
Fluoride (F)	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Nitrate (NO <sub>3</sub> )	0.5	0.01	0.5	0.01	0.6	0.01	0.3	0.00	0.6	0.01	1.0	0.02	0.6	0.01
<b>Total Anions</b>	11.83		12.56		10.87		11.24		12.54		14.21		12.03	
Boron (B)	0.6		0.9		0.7		1.8		0.8		1.0		1.0	
Total Hardness (As CaCO <sub>3</sub> )	190		182		186		182		214		187		192	
NC Hardness	0		0		0		0		0		0		0	
Percent Sodium	49		54		48		50		45		41		37	
Phosphate - Ortho (PO <sub>4</sub> )	26		40				34		28		41		37	

SACRAMENTO SEWAGE TREATMENT PLANT, MILE 54.1L

Date Collected	8-30-60		8-30-60		8-30-60		8-30-60		9-1-60		9-1-60		9-1-60		9-1-60	
Time (P.S.T.)	0330		0930		1535		2130		0330		0930		1530		2130	
Discharge, $10^6$ gal	62.0		63.0		79.0		80.0		57.7		60.5		75.0		76.0	
Instantaneous Temp. $^{\circ}$ F	78		79		81		81		78		79		80.5		79.5	
Dissolved Oxygen, ppm																
% Saturation																
pH	Field	Lab.	7.0		7.2		7.0		6.7		7.6		7.2		7.3	
EC x $10^6$ at 25 $^{\circ}$ C	646		571		680		668		684		632		662		674	
Constituents in	mg/l (ppm)	me/l (epm)														
<b>Total Dissolved Solids</b>																
Sum	352		300		354		358		378		344		360		350	
Silica (SiO <sub>2</sub> )	53		46		48		51		46		43		46		46	
<b>Cations</b>																
Calcium (Ca)	25	1.25	23	1.15	22	1.10	25	1.25	26	1.30	25	1.25	28	1.40	24	1.20
Magnesium (Mg)	19	1.55	17	1.39	25	2.06	20	1.61	17	1.38	19	1.55	16	1.34	21	1.70
Sodium (Na)	53	2.30	48	2.09	65	2.83	60	2.61	71	3.09	51	2.22	55	2.39	59	2.57
Potassium (K)	14	0.78	10	0.26	14	0.36	14	0.36	12	0.31	12	0.31	12	0.31	14	0.36
Ammonium (NH <sub>4</sub> )	14	0.36	12	0.66	17	0.94	12	0.66	13	0.72	14	0.78	20	1.11	15	0.83
<b>Total Cations</b>	6.24		5.55		7.29		6.49		6.80		6.11		6.55		6.66	
<b>Anions</b>																
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	224	3.67	189	3.10	210	3.44	206	3.38	257	4.21	213	3.49	232	3.80	213	3.49
Sulfate (SO <sub>4</sub> )	0.2	0.00	0.2	0.00	0.0	0.00	2.0	0.04	10	0.21	14	0.29	14	0.29	2.0	0.04
Chloride (Cl)	77	2.17	62	1.75	76	2.14	84	2.37	68	1.92	74	2.09	72	2.03	78	2.20
Fluoride (F)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Nitrate (NO <sub>3</sub> )	0.6	0.01	0.7	0.01	0.9	0.01	1.0	0.02	0.5	0.01	0.5	0.01	0.5	0.01	1.0	0.02
<b>Total Anions</b>	5.85		4.86		5.59		5.81		6.35		5.88		6.13		5.75	
Boron (B)	0.2		0.0		0.2		0.5		1.0		0.2		2.0		0.3	
Total Hardness (As CaCO <sub>3</sub> )	140		127		158		143		134		140		137		145	
NC Hardness	0		0		0		0		0		0		0		0	
Percent Sodium	37		38		39		40		45		36		36		38	
Phosphate - Ortho (PO <sub>4</sub> )	12		8.0		14		16		15		12		17		14	

TABLE T-19 (Continued)

SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES

WASTES DISCHARGED TO SACRAMENTO RIVER

1960-1961

MEADOWVIEW SEWAGE TREATMENT PLANT, MILE 47.7L

Date Collected	8-30-60		8-30-60		8-30-60		8-30-60		9-1-60		9-1-60		9-1-60		9-1-60	
Time (P.S.T.)	0305		0905		1505		2105		0305		0905		1505		2105	
Discharge, MGD	0.2-0.3*		0.2-0.3*		0.2-0.3*		0.2-0.3*		0.2-0.3*		0.2-0.3*		0.2-0.3*		0.2-0.3*	
Instantaneous																
Temp. °F	69		74		81		71		79		74				72	
Dissolved Oxygen, ppm																
% Saturation																
pH	Field	Lab.	7.3		7.6		7.6		7.3		7.9		7.8		7.8	
EC x 10 <sup>6</sup> at 25°C	878		906		949		840		830		872		847		816	
Constituents in	mg/l (ppm)	me/l (epm)														
Total Dissolved Solids	471		460		466		433		415		449		436		435	
Silica (SiO <sub>2</sub> )	71		57		56		57		54		55		54		57	
Cations																
Calcium (Ca)	23	1.15	20	1.00	10	0.50	24	1.20	15	0.75	17	0.85	21	1.05	14	0.70
Magnesium (Mg)	20	1.65	24	1.96	28	2.34	18	1.48	22	1.81	22	1.81	16	1.33	21	1.76
Sodium (Na)	82	3.57	77	3.35	84	3.65	66	2.87	68	2.92	77	3.35	64	2.78	72	3.13
Potassium (K)	16	0.41	13	0.33	14	0.36	14	0.36	13	0.35	14	0.36	14	0.36	14	0.36
Ammonium (NH <sub>4</sub> )	41	2.27	42	2.33	51	2.83	39	2.16	40	2.22	43	2.38	49	2.72	44	2.44
Total Cations	9.05		8.97		9.68		8.07		8.05		8.79		8.24		8.39	
Anions																
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	329	5.39	350	5.74	387	6.34	334	5.47	341	5.59	340	5.57	362	5.93	353	5.78
Sulfate (SO <sub>4</sub> )	3.4	0.07	0.0	0.00	0.5	0.01	15*	0.31	0.0	0.00	20*	0.42	22	0.46	18*	0.37
Chloride (Cl)	92	2.59	96	2.71	83	2.34	74	2.09	73	2.06	76	2.14	63	1.78	64	1.80
Fluoride (F)	--	----	--	----	--	----	--	----	--	----	--	----	--	----	--	----
Nitrate (NO <sub>3</sub> )	1.1	0.02	0.8	0.01	0.8	0.01	0.6	0.01	0.6	0.01	0.5	0.01	0.7	0.01	0.5	0.01
Total Anions	8.07		8.46		8.70		7.88		7.66		8.14		8.18		7.96	
Boron (B)	0.3		0.0		0.2		0.6		1.2		0.1		2.8		0.4	
Total Hardness (As CaCO <sub>3</sub> )	140		148		142		134		127		135		119		123	
NC Hardness	0		0		0		0		0		0		0		0	
Percent Sodium	39		37		38		36		37		38		34		37	
Phosphate - Ortho (PO <sub>4</sub> )	50		46		54		50		48		48		59		58	

\* Estimated

CLARKSBURG CRYSTAL SUGAR, MILE 43.3R

Date Collected	8-30-60		8-30-60		8-30-60		8-30-60		9-1-60		9-1-60		9-1-60		9-1-60	
Time (P.S.T.)	0225		0800		1400		1945		0205		0800		1400		2000	
Discharge, MGD	3.51		3.51		3.51		3.51		3.09		3.09		3.09		3.09	
Instantaneous																
Temp. °F	94		94		94		96		92		92		93		92	
Dissolved Oxygen, ppm																
% Saturation																
pH	Field	Lab.	7.2		7.6		7.5		7.3		7.7		8.2		7.9	
EC x 10 <sup>6</sup> at 25°C	1540		1460		1520		1560		1480		1490		1380		1210	
Constituents in	mg/l (ppm)	me/l (epm)														
Total Dissolved Solids	892		873		929		904		805		875		802		760	
Silica (SiO <sub>2</sub> )	35		26		54		35		32		33		32		34	
Cations																
Calcium (Ca)	222	11.08	229	11.43	230	11.48	228	11.38	188	9.38	220	10.98	195	9.73	186	9.28
Magnesium (Mg)	13	1.07	26	2.18	29	2.37	7.7	0.63	26	2.17	0.4	0.03	12	1.00	20	1.69
Sodium (Na)	53	2.30	54	2.35	60	2.61	55	2.39	53	2.30	57	2.48	52	2.26	56	2.44
Potassium (K)	30	0.77	28	0.72	29	0.74	30	0.77	30	0.77	29	0.74	30	0.77	28	0.72
Ammonium (NH <sub>4</sub> )	26	1.44	25	1.38	18	1.00	23	1.27	24	1.33	24	1.33	25	1.38	0	0.00
Total Cations	16.66		18.06		18.20		16.44		15.95		15.56		15.14		14.13	
Anions																
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	976	16.00	915	15.00	954	15.64	997	16.34	945	15.49	956	15.67	846	13.86	714	11.70
Sulfate (SO <sub>4</sub> )	0.0	0.00	0.0	0.00	0.0	0.00	1.5	0.03	0.0	0.00	2.0	0.04	3.6*	0.07	5.3*	0.11
Chloride (Cl)	58	1.64	59	1.66	57	1.61	55	1.55	9.7	0.27	62	1.75	61	1.72	61	1.72
Fluoride (F)	--	----	--	----	--	----	--	----	--	----	--	----	--	----	--	----
Nitrate (NO <sub>3</sub> )	1.3	0.02	1.4	0.02	0.9	0.01	1.5	0.02	0.9	0.01	0.9	0.01	0.7	0.01	1.9	0.31
Total Anions	17.66		16.68		17.26		17.94		15.77		17.47		15.66		13.84	
Boron (B)	0.2		0.0		0.1		0.3		0.0		1.0		0.2		0.2	
Total Hardness (As CaCO <sub>3</sub> )	608		681		693		601		578		551		537		549	
NC Hardness	0		0		0		0		0		0		0		0	
Percent Sodium	14		13		14		14		14		16		15		17	
Phosphate - Ortho (PO <sub>4</sub> )	6.5		7.0		4.7		7.2		4.9		5.5		4.9		3.3	

\* Estimated.

TABLE T-19 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
WASTES DISCHARGED TO SACRAMENTO RIVER

1960-1961

ISLETON SEWAGE TREATMENT PLANT, MILE 18.1L

Date Collected	8-30-60		8-30-60		8-30-60		8-30-60		9-1-60		9-1-60		9-1-60		9-1-60			
Time (P.S.T.)	0030		0645		1230		1815		0025		0635		1210		1805			
Discharge, MOD	0.13**		0.13**		0.13**		0.13**		0.13**		0.13**		0.13**		0.13**			
Instantaneous																		
Temp. °F	72		74		74		74		72		72		73		72			
Dissolved Oxygen, ppm																		
% Saturation																		
pH	Field	Lab.	7.5		7.4		7.9		8.0		7.5		7.9		7.8		8.2	
EC x 10 <sup>6</sup> at 25°C	1960		1840		1790		3090		2620		2320		1860		2660			
Constituents in	mg/l (ppm)	me/l (epm)																
Total Dissolved Solids																		
Sum	1070		983		959		1630		1380		1200		1110		1630			
Silica (SiO <sub>2</sub> )	40		46		40		43		42		41		40		40			
Cations																		
Calcium (Ca)	26	1.30	18	0.90	26	1.30	28	1.40	35	1.75	33	1.65	28	1.40	43	2.14		
Magnesium (Mg)	21	1.74	26	2.14	21	1.70	27	2.26	22	1.83	20	1.65	22	1.80	17	1.40		
Sodium (Na)	324	14.09	284	12.35	284	12.35	532	23.14	425	18.49	355	15.44	345	15.01	460	20.01		
Potassium (K)	8.8	0.22	14	0.36	8.0	0.20	14	0.36	12	0.31	11	0.28	10	0.26	15	0.38		
Ammonium (NH <sub>4</sub> )	24	1.33	24	1.33	25	1.38	26	1.44	22	1.22	20	1.11	23	1.27	27	1.50		
Total Cations	18.68		17.08		16.93		28.60		23.60		20.13		19.74		25.43			
Anions																		
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00		
Bicarbonate (HCO <sub>3</sub> )	282	4.62	277	4.54	304	4.98	337	5.52	325	5.33	289	4.74	293	4.80	327	5.36		
Sulfate (SO <sub>4</sub> )	6.9	0.14	0.0	0.00	12	0.25	12	0.25	0.0	0.00	0.0	0.00	16	0.33	186	3.87		
Chloride (Cl)	453	12.77	458	12.92	418	11.79	802	22.62	680	19.18	595	16.78	500	14.10	701	19.77		
Fluoride (F)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Nitrate (NO <sub>3</sub> )	0.6	0.01	0.5	0.01	0.5	0.01	1.9	0.03	0.4	0.01	0.6	0.01	0.5	0.01	0.4	0.01		
Total Anions	17.54		17.47		17.03		28.42		24.92		21.53		19.24		29.01			
Boron (B)	0.9		0.6		0.4		0.6		0.0		1.4		0.5		2.9			
Total Hardness (As CaCO <sub>3</sub> )	152		152		150		183		179		165		160		177			
NC Hardness	0		0		0		0		0		0		0		0			
Percent Sodium	75		72		73		81		78		77		76		79			
Phosphate - Ortho (PO <sub>4</sub> )	23		21		20		24		18		19		17		22			

\*\* Monthly Average

RIO VISTA SEWAGE TREATMENT PLANT, MILE 11.6R

Date Collected	8-29-60		8-30-60		9-30-60		8-30-60		9-1-60		9-1-60		9-1-60		9-1-60			
Time (P.S.T.)	2330		0545		1200		1740		0000		0600		1100		1710			
Discharge, MOD	0.32**		0.32**		0.32**		0.32**		0.27**		0.27**		0.27**		0.27**			
Instantaneous																		
Temp. °F	76		76		68		76		74		73		74		75			
Dissolved Oxygen, ppm																		
% Saturation																		
pH	Field	Lab.	7.8		7.7		8.1		8.1		7.5		8.3		7.8		8.0	
EC x 10 <sup>6</sup> at 25°C	1060		1080		1150		987		1080		1100		1120		943			
Constituents in	mg/l (ppm)	me/l (epm)																
Total Dissolved Solids																		
Sum	614		580		623		553		561		634		636		566			
Silica (SiO <sub>2</sub> )	36		41		35		36		36		37		38		34			
Cations																		
Calcium (Ca)	16	0.80	4.0	0.20	11	0.55	12	0.60	13	0.65	17	0.85	18	0.90	16	0.80		
Magnesium (Mg)	20	1.64	28	2.34	22	1.83	21	1.70	22	1.79	21	1.71	22	1.80	19	1.56		
Sodium (Na)	172	7.48	154	6.70	160	6.96	148	6.44	148	6.44	172	7.48	172	7.48	144	6.26		
Potassium (K)	10	0.26	12	0.31	8.0	0.20	7.0	0.18	10	0.26	7.5	0.19	10	0.26	6.0	0.15		
Ammonium (NH <sub>4</sub> )	22	1.22	26	1.44	31	1.72	14	0.78	26	1.44	25	1.35	22	1.22	5.8	0.32		
Total Cations	11.40		10.99		11.26		9.70		10.58		11.61		11.66		9.09			
Anions																		
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00		
Bicarbonate (HCO <sub>3</sub> )	522	8.56	525	8.62	506	8.29	427	7.00	505	8.28	509	8.34	482	7.90	373	6.11		
Sulfate (SO <sub>4</sub> )	18	0.37	0.0	0.00	48	1.00	40	0.83	0.5	0.01	41	0.85	49	1.02	42	0.87		
Chloride (Cl)	83	2.34	80	2.26	88	2.48	77	2.17	83	2.34	86	2.42	88	2.48	80	2.26		
Fluoride (F)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
Nitrate (NO <sub>3</sub> )	0.6	0.01	0.6	0.01	0.8	0.01	0.4	0.01	0.4	0.01	0.4	0.01	0.4	0.01	0.4	0.01		
Total Anions	11.28		10.89		11.78		10.01		10.64		11.62		11.41		9.79			
Boron (B)	1.1		1.3		0.95		1.3		0.2		2.0		1.3		8.2			
Total Hardness (As CaCO <sub>3</sub> )	122		127		119		115		122		128		135		118			
NC Hardness	0		0		0		0		0		0		0		0			
Percent Sodium	66		61		62		66		61		64		64		69			
Phosphate - Ortho (PO <sub>4</sub> )	23		20		29		18		22		22		28		19			

\*\* Monthly Average.

TABLE T-20  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
AGRICULTURAL DRAINS

1960-1961

BUTTE SLOUGH, MILE 138.9L/O.1

Date Collected	5-6-60		8-5-60		9-3-60		11-1-60		11-29-60		4-7-61		5-11-61	
Time (P.S.T.)	1030													
Discharge, cfs-Mean Daily	415													
Instantaneous														
Temp. °F	68													
Dissolved Oxygen, ppm	7.8													
% Saturation	85													
pH	Field		Lab.		7.3		7.7		8.2		8.0			
EC x 10 <sup>6</sup> at 25°C	250		396		389		309		215		219		243	
Constituents in	mg/l (ppm)	me/l (epm)												
Total Dissolved Solids														
Sum	147													
Silica (SiO <sub>2</sub> )	23													
Cations														
Calcium (Ca)	19		0.95				22		1.10		17		0.85	
Magnesium (Mg)	11		0.93				14		1.14		9.6		0.79	
Sodium (Na)	14		0.61		22		0.96		32		1.39		20	
Potassium (K)	1.3		0.03						2.8		0.07		2.5	
Total Cations	2.52						3.18		2.31		2.27		2.62	
Anions														
Carbonate (CO <sub>3</sub> )	0		0.00				0		0.00		0		0.00	
Bicarbonate (HCO <sub>3</sub> )	122		2.00				154		2.52		113		1.85	
Sulfate (SO <sub>4</sub> )	9.9		0.21											
Chloride (Cl)	7.2		0.20		9.0		0.25		9.2		0.26		16	
Fluoride (F)	0.1		0.00						0.2		0.01		0.2	
Nitrate (NO <sub>3</sub> )	1.9		0.03						2.1		0.03		2.1	
Total Anions	2.44						3.01		2.08					
Boron (B)	0.07		0.11		0.11		0.09		0.05		0.26		0.06	
Total Hardness (As CaCO <sub>3</sub> )	94		164		161		112		82		88		94	
NC Hardness	0						0		0					
Percent Sodium	24						27		26		21		27	

SPECIFIC CONDUCTANCE - BUTTE SLOUGH

Date	ECx10 <sup>6</sup> at 25°C	Date	ECx10 <sup>6</sup> at 25°C
6- 4-60	292	11- 1-60	297
8- 5-60	389	11-29-60	211
9- 3-60	385	1- 5-61	293
9-30-60	364		

RECLAMATION DISTRICT NO. 70, MILE 124.2L

Date Collected	5-18-60		7-18-60		8-5-60		8-19-60		10-14-60		2-17-61		5-11-61	
Time (P.S.T.)	1220													
Discharge, cfs-Mean Daily														
Instantaneous														
Temp. °F	66													
Dissolved Oxygen, ppm	9.9													
% Saturation	105													
pH	Field		Lab.		7.4		7.7		8.5		6.18		6.89	
EC x 10 <sup>6</sup> at 25°C	216		672		618		689		1020		1030		625	
Constituents in	mg/l (ppm)	me/l (epm)												
Total Dissolved Solids	131													
Sum	129													
Silica (SiO <sub>2</sub> )	24													
Cations														
Calcium (Ca)	15		0.75						42		2.10			
Magnesium (Mg)	8.4		0.69						53		4.33		6.43	
Sodium (Na)	13		0.56		46		2.00		47		2.04		47	
Potassium (K)	1.3		0.03						1.4		0.04		1.1	
Total Cations	2.03						10.43		10.55		6.51			
Anions														
Carbonate (CO <sub>3</sub> )	0		0.00						12		0.40			
Bicarbonate (HCO <sub>3</sub> )	90		1.48						299		4.90			
Sulfate (SO <sub>4</sub> )	4.4		0.20											
Chloride (Cl)	13		0.37		85		2.40		68		1.92		90	
Fluoride (F)	0.1		0.00						0.4		0.02		153	
Nitrate (NO <sub>3</sub> )	9.6		0.01						1.5		0.02		4.31	
Total Anions	2.06						9.65		9.65		166		4.68	
Boron (B)	0.06		0.22		0.22		0.20		0.21		0.26		0.17	
Total Hardness (As CaCO <sub>3</sub> )	72		217		197		220		322		322		217	
NC Hardness	0								77					
Percent Sodium	28								38		39		33	
Color (Units)														
Turbidity (Silica Solids)	3													
Odor (Threshold)	5													

SPECIFIC CONDUCTANCE - RECLAMATION DISTRICT NO. 70

Date	ECx10 <sup>6</sup> at 25°C	Date	ECx10 <sup>6</sup> at 25°C
5- 2-60	552	8-19-60	671
6- 4-60	736	9- 3-60	592
6-17-60	820	10-14-60	1,060
7- 1-60	774	12-14-60	1,010
7-18-60	652	2- 3-61	1,040
8- 5-60	594	2-17-61	1,130

Nitrogen Series	
Organic Nitrogen (N)	0.2
Nitrite (NO <sub>2</sub> )	0.00
Nitrate (NO <sub>3</sub> )	0.7
Ammonium (NH <sub>4</sub> )	0.0
Phosphate - Ortho (PO <sub>4</sub> )	0.1
Total (PO <sub>4</sub> )	0.1
Ether Solubles	4.4
Biochemical Oxygen Demand (5-day at 20°C)	1.03
Chemical Oxygen Demand	5.7
Suspended Solids	11.5
Detergents (ABS)	0.0
Phenolic Material	0.000
Settleable Solids (ml/l)	

TABLE T-20 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
AGRICULTURAL DRAINS

1960-1961

RECLAMATION DISTRICT NO. 2047, MILE 99.0R

RECLAMATION DISTRICT NO. 787, MILE 93.6R

Date Collected	8- 5-60		8-19-60		9-3-60	
Time (P.S.T.)						
Discharge, cfs-Mean Daily						
Instantaneous						
Temp. °F						
Dissolved Oxygen, ppm						
% Saturation						
pH	Field	Lab.				
EC x 10 <sup>6</sup> at 25°C	159		155		163	
Constituents in	mg/l (ppm)	mc/l (cpm)	mg/l (ppm)	mc/l (cpm)	mg/l (ppm)	mc/l (cpm)
Total Dissolved Solids						
Sum						
Silica (SiO <sub>2</sub> )						
Cations						
Calcium (Ca)						
Magnesium (Mg)						
Sodium (Na)	7	0.30	8	0.35	8	0.35
Potassium (K)						
Total Cations						
Anions						
Carbonate (CO <sub>3</sub> )						
Bicarbonate (HCO <sub>3</sub> )						
Sulfate (SO <sub>4</sub> )						
Chloride (Cl)	4.4	0.12	4.4	0.12	4.8	0.14
Fluoride (F)						
Nitrate (NO <sub>3</sub> )						
Total Anions						
Boron (B)	0.11		0.10		0.07	
Total Hardness (As CaCO <sub>3</sub> )	40		36		35	

SPECIFIC CONDUCTANCE - RECLAMATION DISTRICT NO. 2047

Date	ECx10 <sup>6</sup> at 25°C	Date	ECx10 <sup>6</sup> at 25°C
5- 2-60	160	7- 1-60	161
5-24-60	178	8- 5-60	127
6- 4-60	183	8-19-60	152
6-17-60	172	9- 3-60	157

Date Collected	5-18-60		7-18-60		8-19-60		5-11-61	
Time (P.S.T.)	1540							
Discharge, cfs-Mean Daily	1440							
Instantaneous								
Temp. °F	70							
Dissolved Oxygen, ppm	7.2							
% Saturation	80							
pH	Field	Lab.	7.3		7.7			
EC x 10 <sup>6</sup> at 25°C	462		492		437		502	
Constituents in	mg/l (ppm)	mc/l (cpm)						
Total Dissolved Solids	273							
Sum	272							
Silica (SiO <sub>2</sub> )	20							
Cations								
Calcium (Ca)	21							
Magnesium (Mg)	21							
Sodium (Na)	42		36	1.57	32	1.39	50	3.02
Potassium (K)	1.5	0.04						
Total Cations	4.67							
Anions								
Carbonate (CO <sub>3</sub> )	0							
Bicarbonate (HCO <sub>3</sub> )	159							
Sulfate (SO <sub>4</sub> )	58							
Chloride (Cl)	28	0.78	30	0.85	29	0.82	26	0.73
Fluoride (F)	0.3							
Nitrate (NO <sub>3</sub> )	1.7							
Total Anions	4.66							
Boron (B)	0.63		0.65		0.62		0.78	
Total Hardness (As CaCO <sub>3</sub> )	140		161		140		151	
NC Hardness	10							
Percent Sodium	39							
Color (Units)	20							
Turbidity (Silica Scale)	26							
Odor (Threshold) (°C)	5.6							

SPECIFIC CONDUCTANCE - RECLAMATION DISTRICT NO. 787

Date ECx10<sup>6</sup> at 25°C

Nitrogen Series			
Organic Nitrogen (N)	0.3		
Nitrite (NO <sub>2</sub> )	0.01		
Nitrate (NO <sub>3</sub> )	1.0		
Ammonium (NH <sub>4</sub> )	0.0		
Phosphate - Ortho (PO <sub>4</sub> )	0.4		
Total (PO <sub>4</sub> )	0.4		
Ether Solubles	11		
Biochemical Oxygen Demand (5-Day at 20°C)	3.94	6-17-60	459
Chemical Oxygen Demand	31.0	7- 1-60	398
Suspended Solids	118	7-18-60	479
Detergents (ABS)	0.0	8-19-60	431
Phenolic Material	0.005		
Settleable Solids (ml/l)	0.005		

SYCAMORE SLOUGH, MILE 90.2R/O.1L

RECLAMATION DISTRICT NO. 1000, PUMPING PLANT NO. 3, MILE 66.3L

Date Collected	7-18-60		8-5-60		2-3-61	
Time (P.S.T.)						
Discharge, cfs-Mean Daily						
Instantaneous						
Temp. °F						
Dissolved Oxygen, ppm						
% Saturation						
pH	Field	Lab.				
EC x 10 <sup>6</sup> at 25°C	653		574		944	
Constituents in	mg/l (ppm)	mc/l (cpm)	mg/l (ppm)	mc/l (cpm)	mg/l (ppm)	mc/l (cpm)
Total Dissolved Solids						
Sum						
Silica (SiO <sub>2</sub> )						
Cations						
Calcium (Ca)						
Magnesium (Mg)						
Sodium (Na)	47	2.04	45	1.96	97	4.22
Potassium (K)						
Total Cations	9.97					
Anions						
Carbonate (CO <sub>3</sub> )						
Bicarbonate (HCO <sub>3</sub> )						
Sulfate (SO <sub>4</sub> )						
Chloride (Cl)	52	1.47	44	1.24	97	2.74
Fluoride (F)						
Nitrate (NO <sub>3</sub> )						
Total Anions						
Boron (B)	0.98		0.92		1.2	
Total Hardness (As CaCO <sub>3</sub> )	208		181		285	
NC Hardness						
Percent Sodium	42					

SPECIFIC CONDUCTANCE - SYCAMORE SLOUGH

Date	ECx10 <sup>6</sup> at 25°C
7-18-60	644
8- 5-60	564
2- 3-61	934

Date Collected	9-30-60		10-14-60		11-14-60		5-12-61	
Time (P.S.T.)	0728							
Discharge, cfs-Mean Daily								
Instantaneous								
Temp. °F	62							
Dissolved Oxygen, ppm	7.9							
% Saturation	81							
pH	Field	Lab.	8.5		8.5			
EC x 10 <sup>6</sup> at 25°C	574		682		773		282	
Constituents in	mg/l (ppm)	mc/l (cpm)						
Total Dissolved Solids	35							
Sum	26							
Silica (SiO <sub>2</sub> )								
Cations								
Calcium (Ca)	36							
Magnesium (Mg)	26							
Sodium (Na)	46	2.00	52	2.26	37	2.65	30	1.30
Potassium (K)	2.5	0.06						
Total Cations	6.02							
Anions								
Carbonate (CO <sub>3</sub> )	7							
Bicarbonate (HCO <sub>3</sub> )	221							
Sulfate (SO <sub>4</sub> )	12							
Chloride (Cl)	58	1.64	69	1.94	94	2.65	19	0.54
Fluoride (F)	0.4							
Nitrate (NO <sub>3</sub> )	2.3							
Total Anions	5.55							
Boron (B)	0.16		0.15		0.15		0.18	
Total Hardness (As CaCO <sub>3</sub> )	198		267		267		80	
NC Hardness	17							
Percent Sodium	33							

SPECIFIC CONDUCTANCE - RECLAMATION DISTRICT NO. 1000, PUMPING PLANT NO. 3

Date	ECx10 <sup>6</sup> at 25°C
9-30-60	567
10-14-60	673
11- 1-60	769
11-14-60	768

TABLE T-20 (Continued)  
SACRAMENTO RIVER WATER POLLUTION SURVEY

RESULTS OF ANALYSES  
AGRICULTURAL DRAINS

1960-1961

RECLAMATION DISTRICT NO. 1000, SECOND BANNON SLOUGH, NATOMAS MAIN CANAL, MILE 61.5L

Date Collected	5-26-60		9-14-60		11-14-60		11-29-60		2-3-61		2-17-61		3-3-61		3-24-61		4-7-61	
Time (P.S.T.)			2140															
Discharge, cfs-Mean Daily	131		44															
Instantaneous																		
Temp. °F			71															
Dissolved Oxygen, ppm			4.3															
% Saturation			48															
pH Field Lab.	7.4		8.0				8.5		4.41		8.35		8.69		8.24		2.77	
EC x 10 <sup>6</sup> at 25°C	410		548		559		629		441		835		869		824		277	
Constituents in	mg/l (ppm)	me/l (epm)																
Total Dissolved Solids	240																	
Sum	232		326															
Silica (SiO <sub>2</sub> )	20		31				25											
Cations																		
Calcium (Ca)	25	1.25	33	1.65			36	1.80										
Magnesium (Mg)	16	1.29	27	2.19			29	2.36			2.54							
Sodium (Na)	34	1.48	46	2.00	45	1.96	50	2.18	40	1.74	73	3.18	66	2.87	62	2.70	22	0.96
Potassium (K)	1.5	0.04	1.9	0.05			3.0	0.08	4.3	0.11	2.1	0.05	1.9	0.05	2.0	0.05	3.0	0.08
Total Cations		4.06		5.89				6.42		4.39		8.90		8.89		8.44		2.74
Anions																		
Carbonate (CO <sub>3</sub> )	0	0.00	0	0.00			10	0.33										
Bicarbonate (HCO <sub>3</sub> )	153	2.51	254	4.16			193	3.16										
Sulfate (SO <sub>4</sub> )	24	0.50	16	0.33														
Chloride (Cl)	35	0.99	45	1.27	66	1.86	72	2.03	40	1.13	92	2.59	86	2.42	86	2.42	20	0.56
Fluoride (F)	0.3	0.02	0.3	0.02			0.4	0.02										
Nitrate (NO <sub>3</sub> )	1.5	0.02	1.0	0.02			5.9	0.10										
Total Anions		4.04		5.80				5.64										
Boron (B)	0.16		0.18		0.14		0.13		0.18		0.21		0.35		0.37		0.16	
Total Hardness (As CaCO <sub>3</sub> )	127		192				208		127		284		299		285		85	
NC Hardness	2		0				50											
Percent Sodium		36		34			34		40		36		32		32		35	

SPECIFIC CONDUCTANCE - RECLAMATION DISTRICT NO. 1000,  
SECOND BANNON SLOUGH, NATOMAS MAIN CANAL

Date	ECx10 <sup>6</sup> at 25°C
9-3-60	531
11-14-60	614
11-29-60	558
2-3-61	425
2-17-61	823

NATOMAS EAST MAIN DRAIN (BACK BORROW FIRST BANNON SLOUGH), MILE 60.6L/1.4

Date Collected	5-26-60		7-18-60		8-5-60		8-19-60		8-30-60		8-30-60		8-30-60		9-1-60		9-1-60	
Time (P.S.T.)									1140		1745		2345		0540		1140	
Discharge, cfs-Mean Daily																		
Instantaneous																		
Temp. °F									72		74		72		68		72	
Dissolved Oxygen, ppm									4.0		6.8		3.5		1.6		3.7	
% Saturation									45		79		40		17		42	
pH Field Lab.	7.0				8.3		4.84		7.8		7.3		8.1		8.1		7.9	
EC x 10 <sup>6</sup> at 25°C	174		498		483		484		390		386		384		382		359	
Constituents in	mg/l (ppm)	me/l (epm)																
Total Dissolved Solids	105								253		258		253		250		238	
Sum	118								53		53		56		54		54	
Silica (SiO <sub>2</sub> )	21																	
Cations																		
Calcium (Ca)	11	0.55							20	1.00	23	1.15	20	1.00	19	0.95	19	0.95
Magnesium (Mg)	4.5	0.37							12	1.00	10	0.83	11	0.90	12	0.95	10	0.87
Sodium (Na)	13	0.56	40	1.74	50	2.18	40	1.74	38	1.65	41	1.78	38	1.65	38	1.65	35	1.52
Potassium (K)	2.1	0.05							4.6	0.12	4.6	0.12	4.9	0.12	4.6	0.12	4.8	0.12
Total Cations		1.53								3.77		3.88		3.67		3.67		3.46
Anions																		
Carbonate (CO <sub>3</sub> )	0	0.00							0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Bicarbonate (HCO <sub>3</sub> )	52	0.85							131	2.15	130	2.13	128	2.10	124	2.03	120	1.97
Sulfate (SO <sub>4</sub> )	8.7	0.18							14	0.29	16	0.33	14	0.29	13	0.27	12	0.25
Chloride (Cl)	14	0.39	58	1.64	58	1.64	56	1.58	43	1.21	44	1.24	42	1.18	42	1.18	40	1.13
Fluoride (F)	0.2	0.01							0.3	0.02	0.3	0.02	0.3	0.02	0.4	0.02	0.3	0.02
Nitrate (NO <sub>3</sub> )	4.7	0.08							3.6	0.06	2.0	0.03	3.5	0.06	5.9	0.10	3.9	0.06
Total Anions		1.51								3.73		3.75		3.65		3.60		3.43
Boron (B)	0.17		0.46		0.43		0.41		0.34		0.27		0.35		0.31		0.26	
Total Hardness (As CaCO <sub>3</sub> )	46		117		118		119		100		99		95		95		91	
NC Hardness	3								0		0		0		0		0	
Percent Sodium		37								44		46		45		45		44

SPECIFIC CONDUCTANCE - NATOMAS EAST MAIN DRAIN  
(BACK BORROW FIRST BANNON SLOUGH)

Date	ECx10 <sup>6</sup> at 25°C	Date	ECx10 <sup>6</sup> at 25°C
6-4-60	360	11-1-60	278
6-17-60	378	11-14-60	167
7-1-60	389	11-29-60	224
7-18-60	485	12-14-60	242
8-5-60	459	1-5-61	226
8-19-60	470	1-23-61	215
9-3-60	367	2-3-61	143
9-30-60	454	2-17-61	201
10-14-60	281		

TABLE T-20 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 RESULTS OF ANALYSES  
 AGRICULTURAL DRAINS

1960 - 1961

	9-1-60	9-1-60	9-12-60	9-14-60	10-14-60	11-24-60	1-5-61	2-3-61	3-3-61	3-24-61
Date Collected	1745	2345	1235	0620						
Time (P.S.T.)										
Discharge, cfs-Mean Daily										
Instantaneous										
Temp. °F	73	70	73	72						
Dissolved Oxygen, ppm	5.2	2.6	2.5	2.2						
% Saturation	60	30	29	25						
pH	7.6	7.9	7.9	7.5	7.6					
Field Lab.										
EC x 10 <sup>6</sup> at 25°C	380	384	424	387	170	228	145	226	226	248
Constituents in	mg/l (ppm)	me/l (epm)								
Total Dissolved Solids	248	251	276	252	17					
Sum	55	54	58	54						
Silica (SiO <sub>2</sub> )										
Cations										
Calcium (Ca)	18	19	22	20	11	0.55				
Magnesium (Mg)	12	11	11	12	4.5	0.37	1.28	0.90	1.40	1.58
Sodium (Na)	37	38	46	38	13	0.56	19	9.4	17	18
Potassium (K)	5.4	4.9	4.6	4.6	5.3	0.14	2.8	4.2	2.4	2.8
Total Cations	3.67	3.65	4.16	3.73	1.62	2.18	1.42	2.20	2.20	2.43
Anions										
Carbonate (CO <sub>3</sub> )	0	0	0	0	0	0.00				
Bicarbonate (HCO <sub>3</sub> )	129	120	135	130	21	0.34				
Sulfate (SO <sub>4</sub> )	13	22	10	8.7	0.18					
Chloride (Cl)	42	40	51	44	16	0.45	17	7.7	14	16
Fluoride (F)	0.2	0.3	0.4	0.3	0.3	0.02	0.3	0.22	0.39	0.45
Nitrate (NO <sub>3</sub> )	2.0	2.6	6.8	6.2	6.4	0.10	6.4	0.10		
Total Anions	3.60	3.62	3.99	3.67	0.91					
Boron (B)	0.28	0.29	0.29	0.29	0.12	0.18	0.14	0.13	0.15	
Total Hardness (As CaCO <sub>3</sub> )	96	94	102	98	46	64	45	70	79	
MC Hardness	0	0	0	0	29	38	29	34	34	32
Percent Sodium	44	45	48	44	34	38	29	34	34	32

FIGURE T-1  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

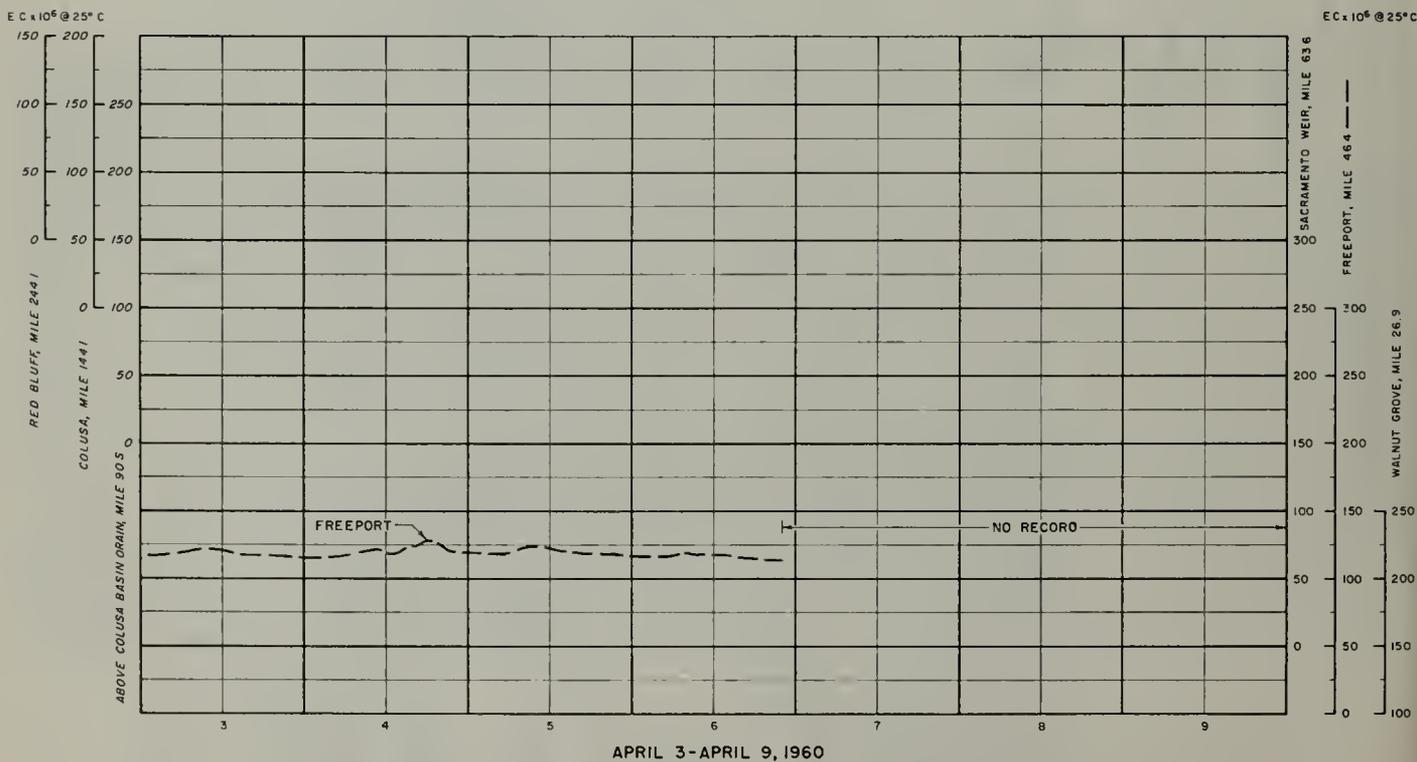
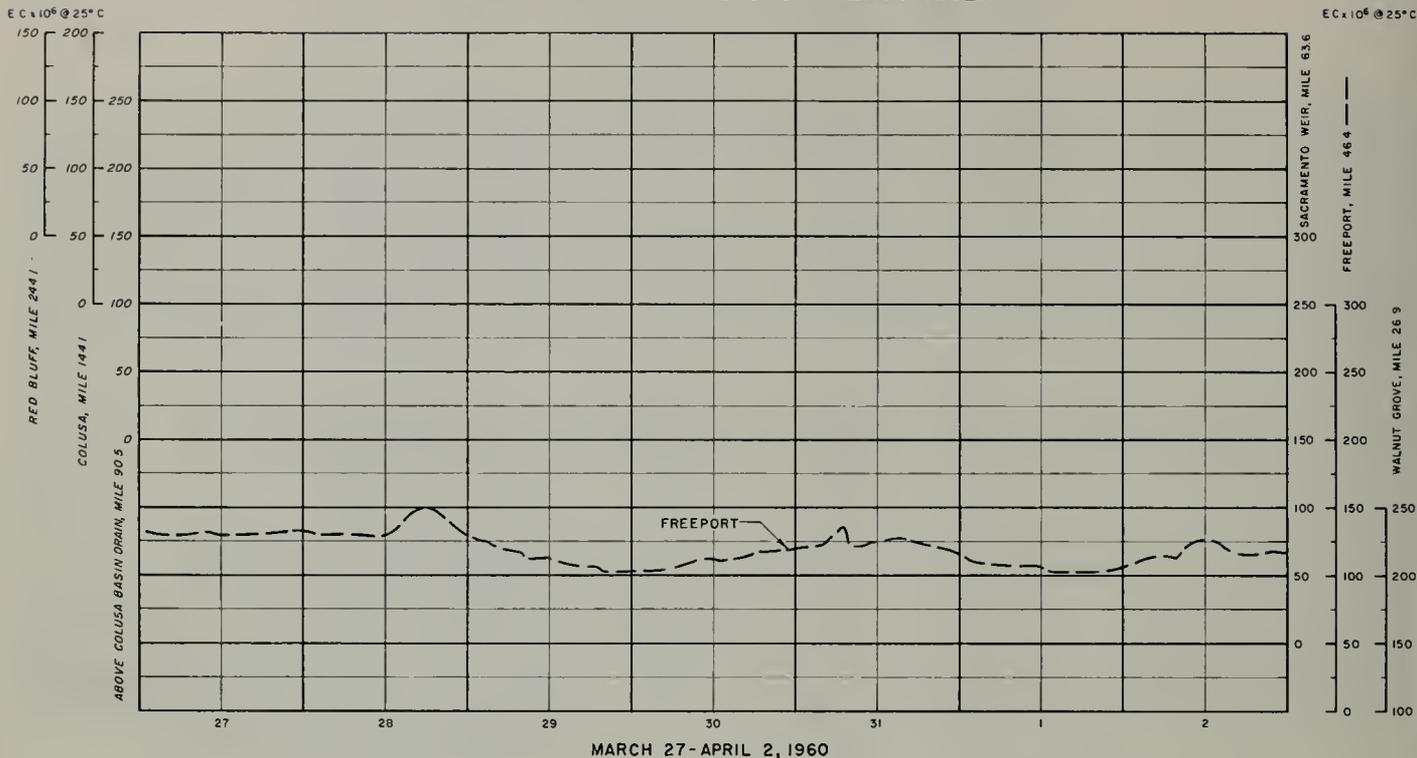


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

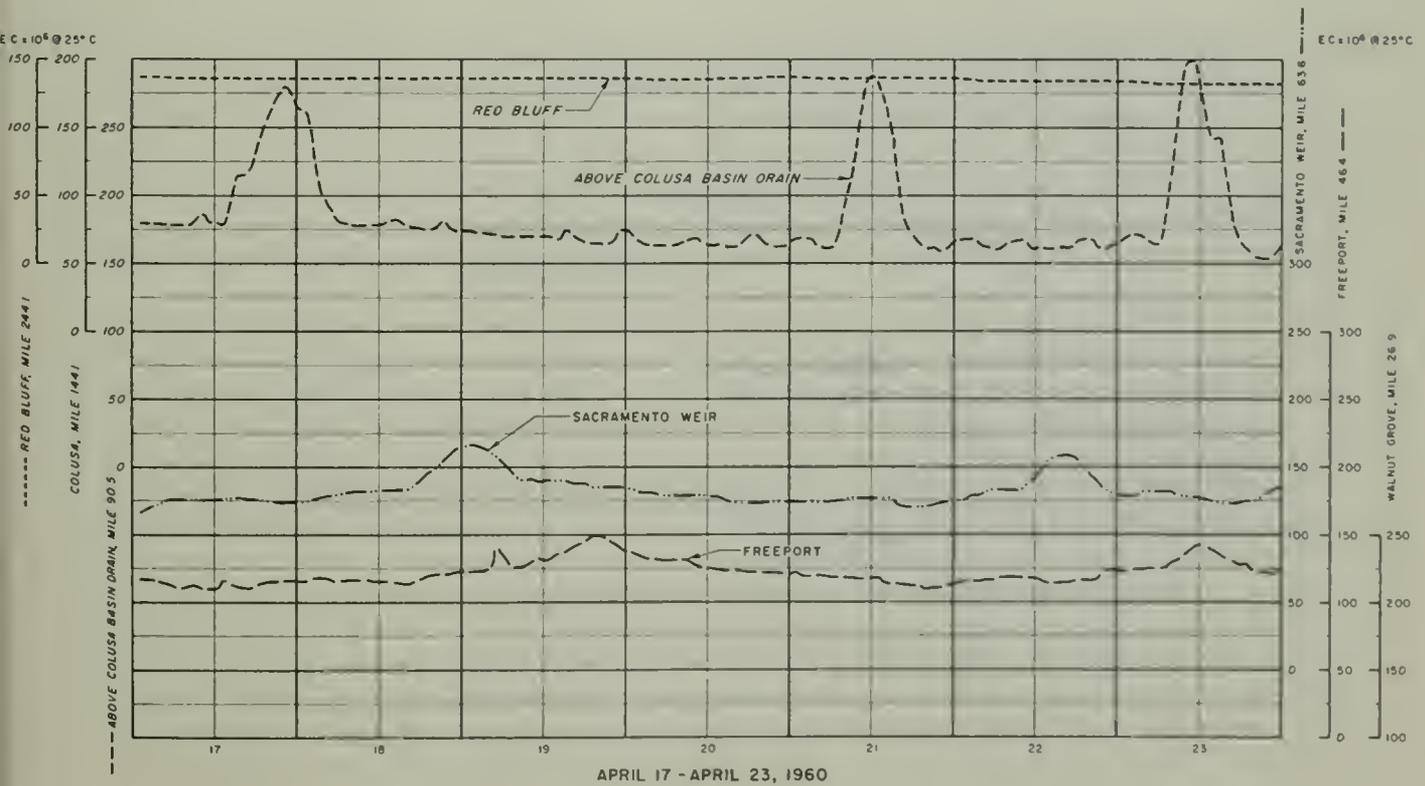
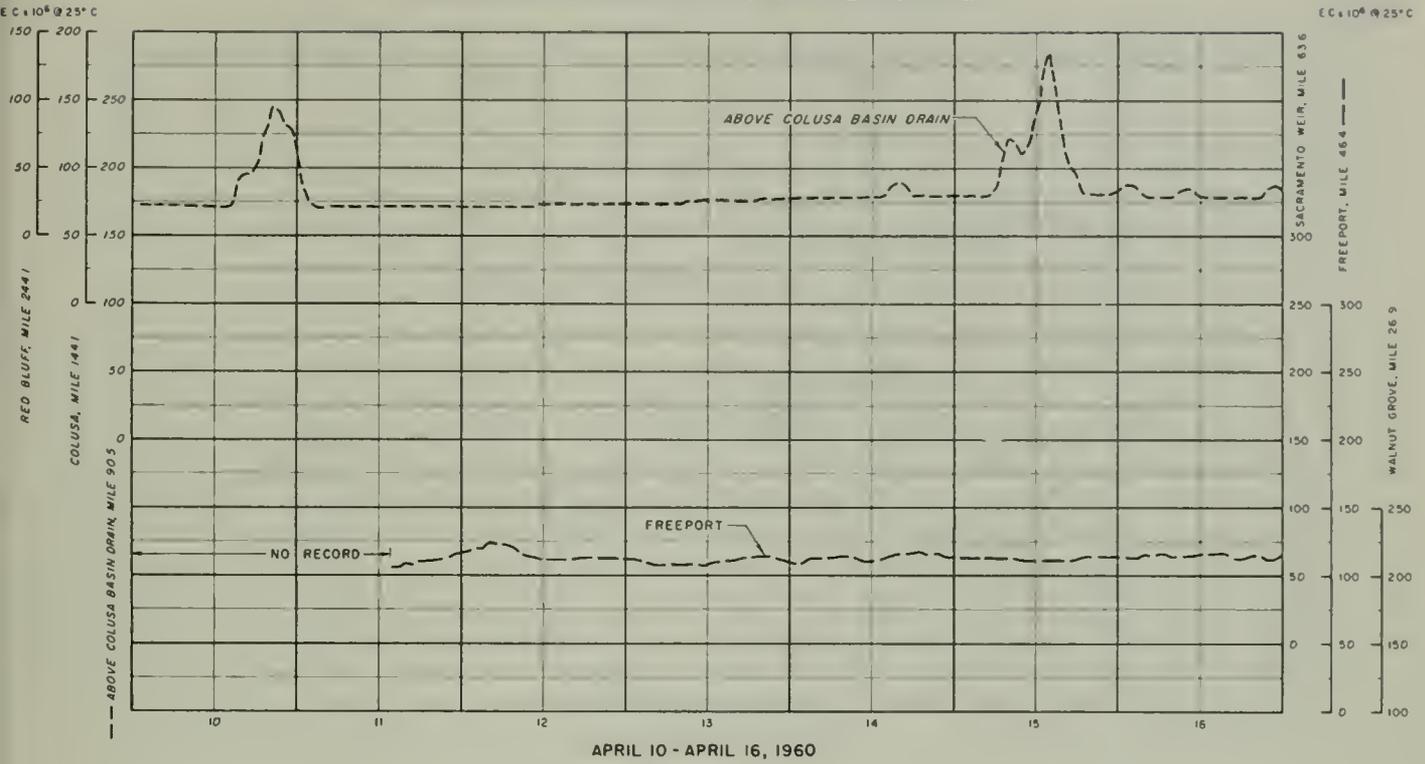


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

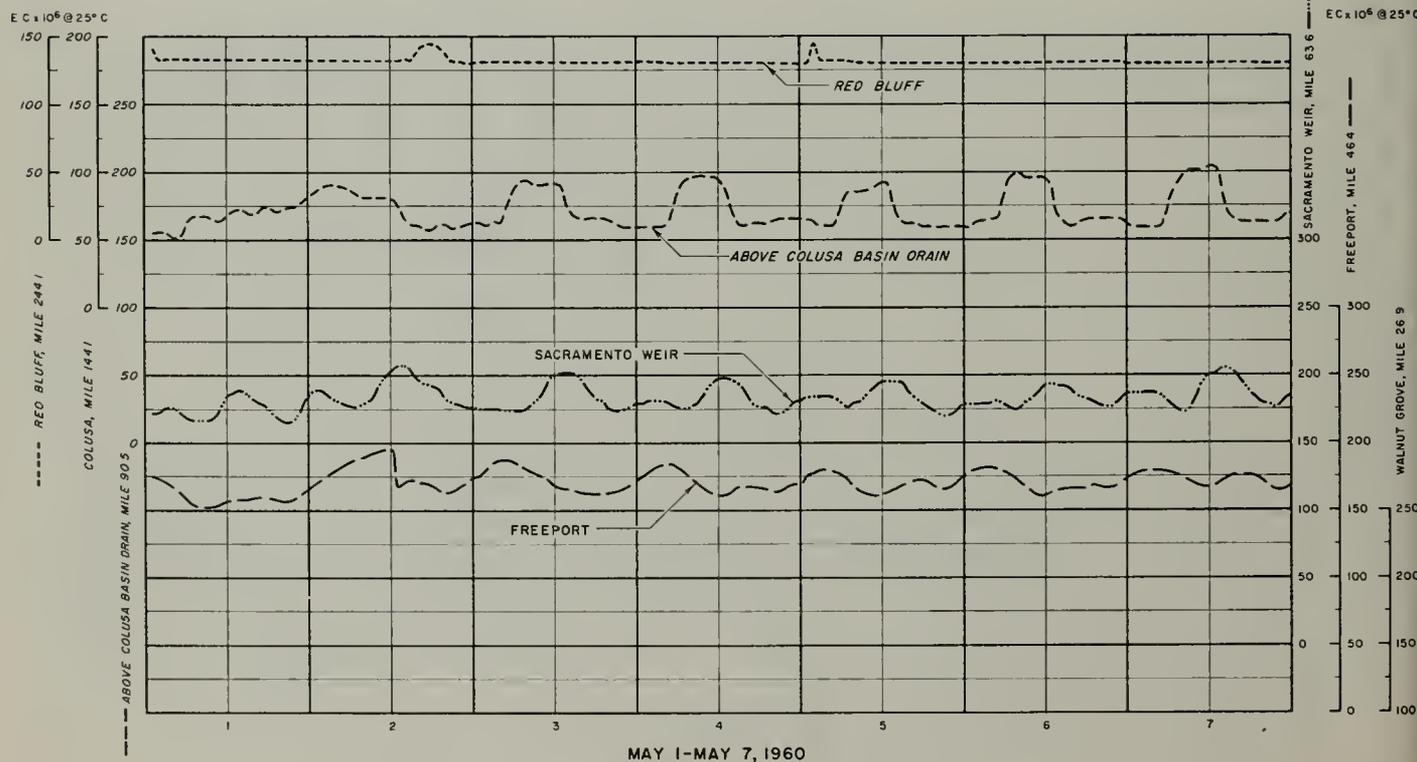
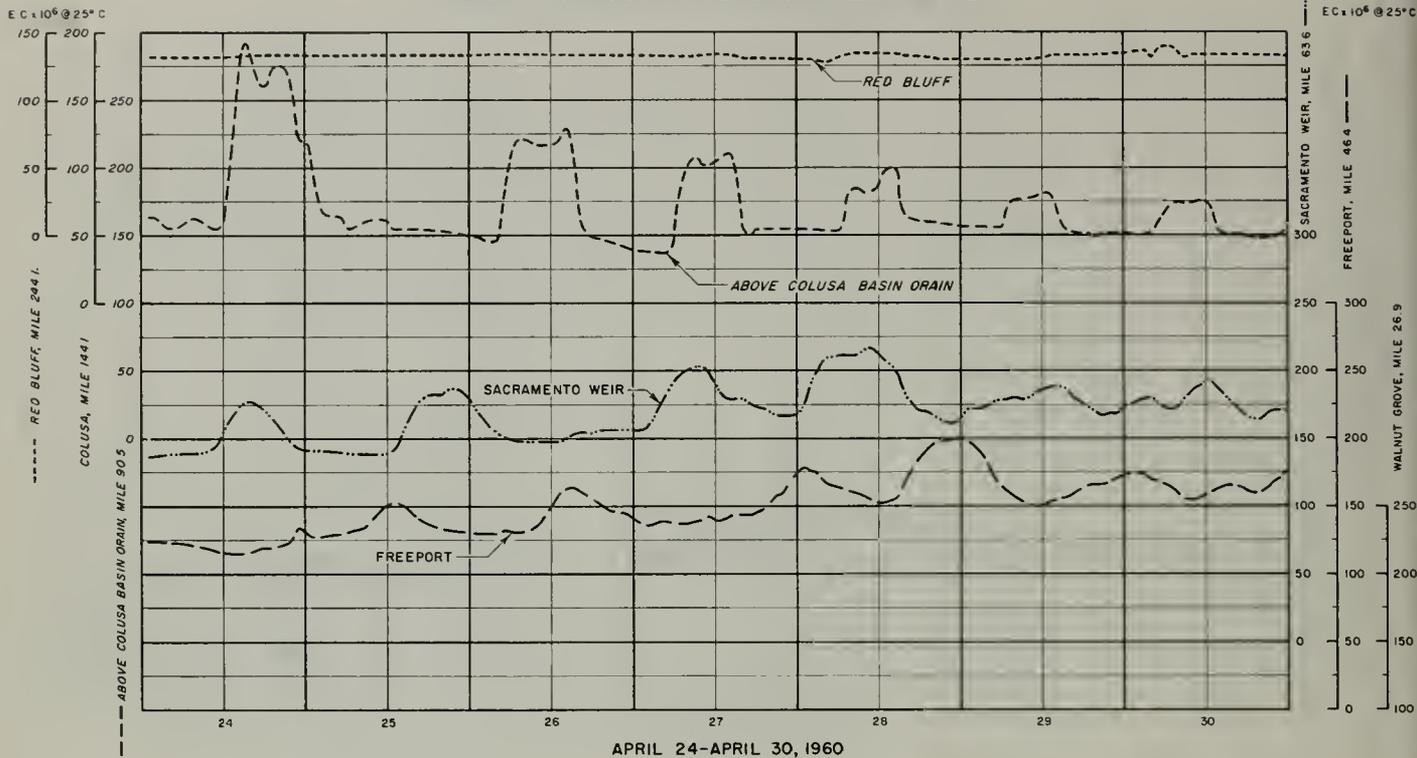


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

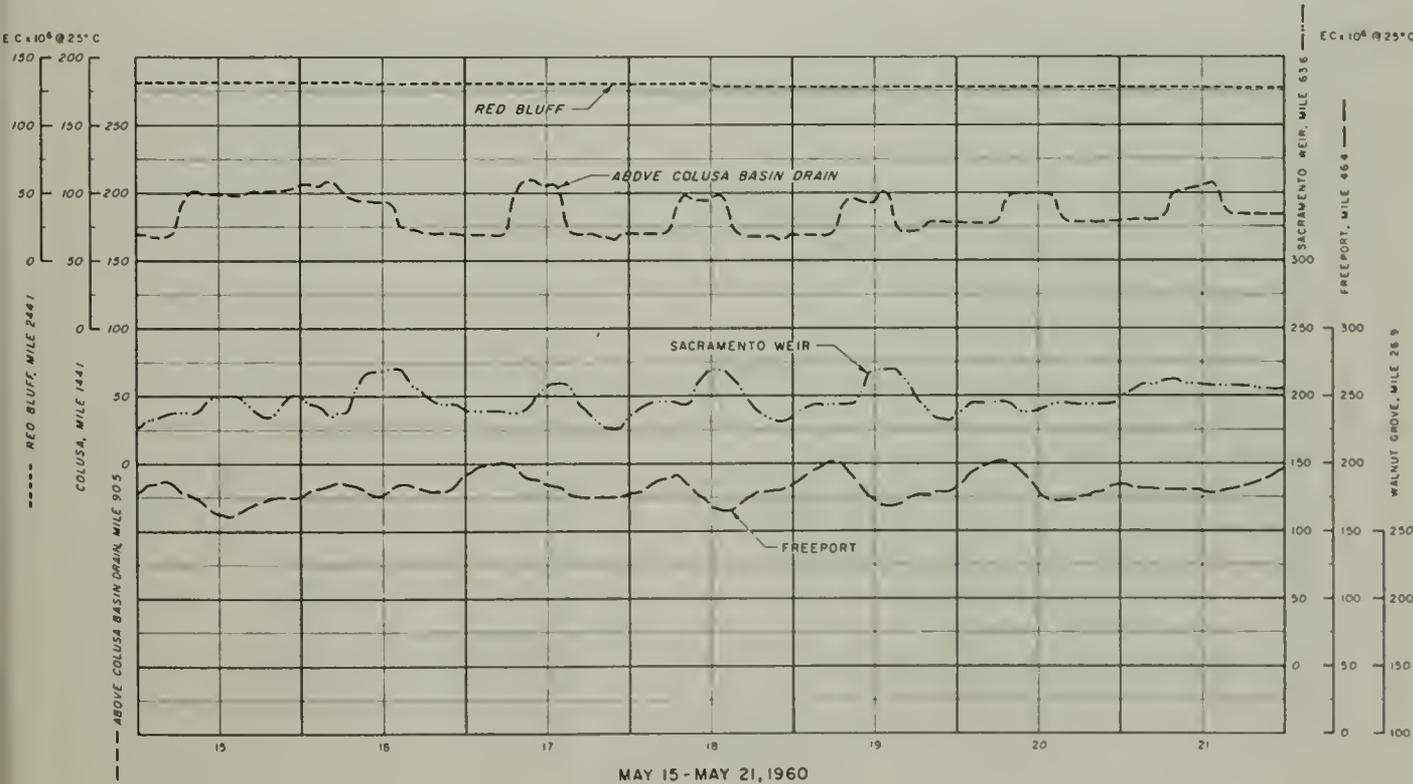
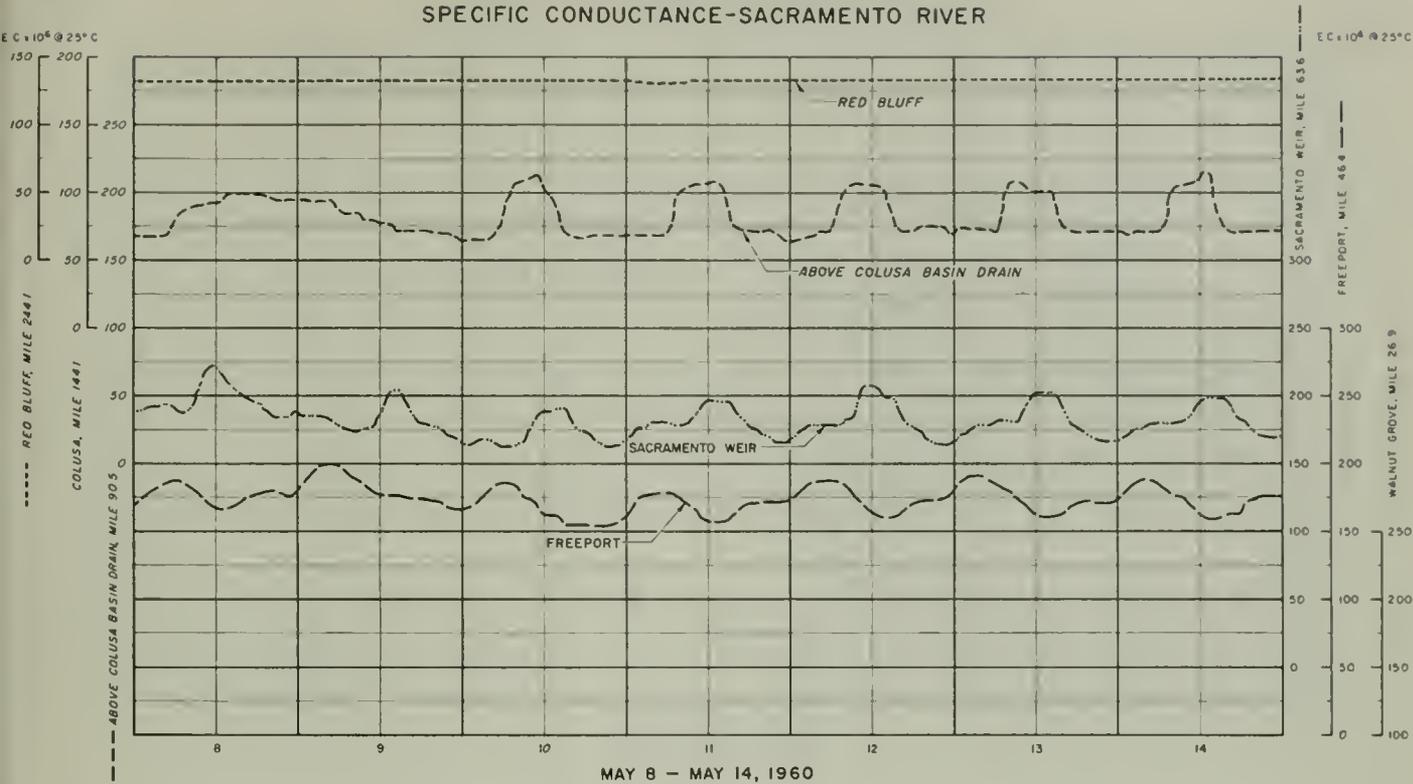


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

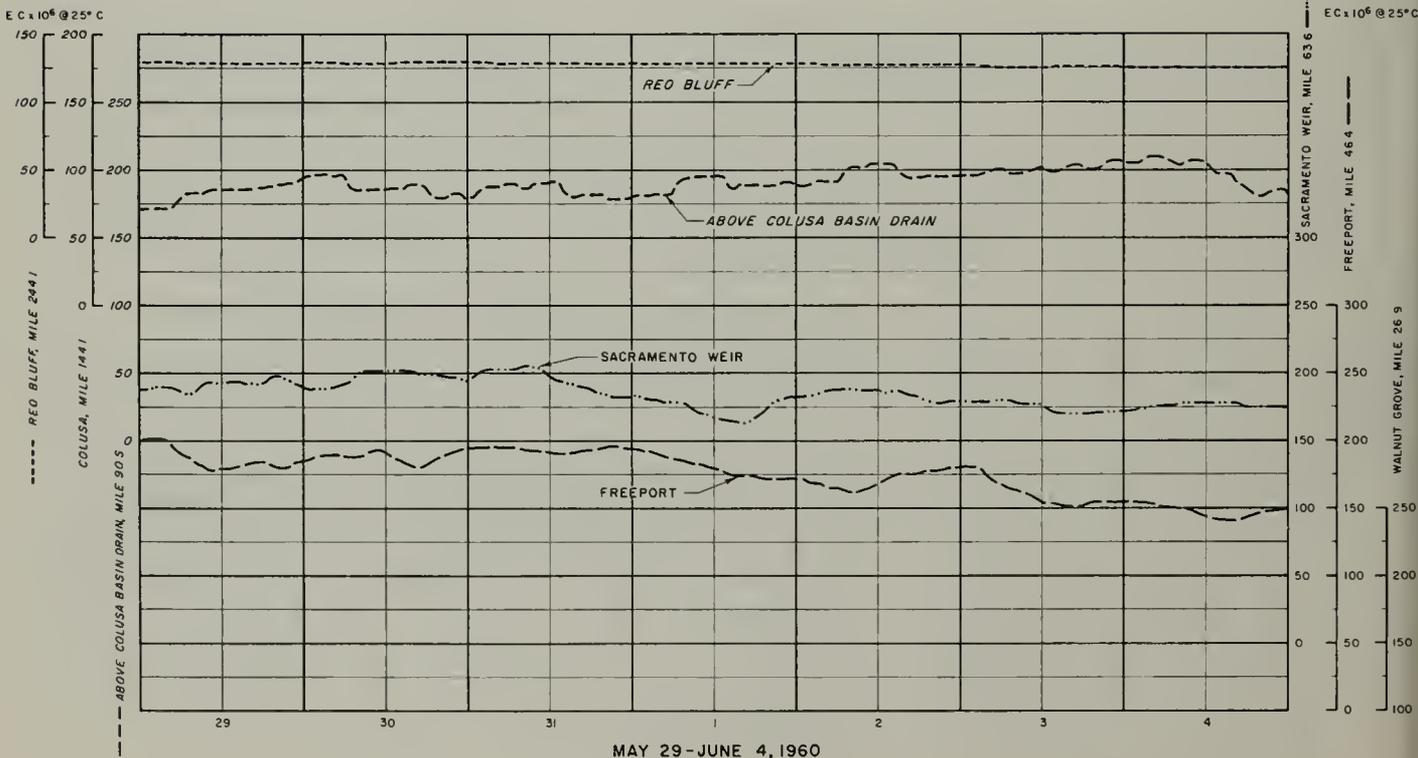
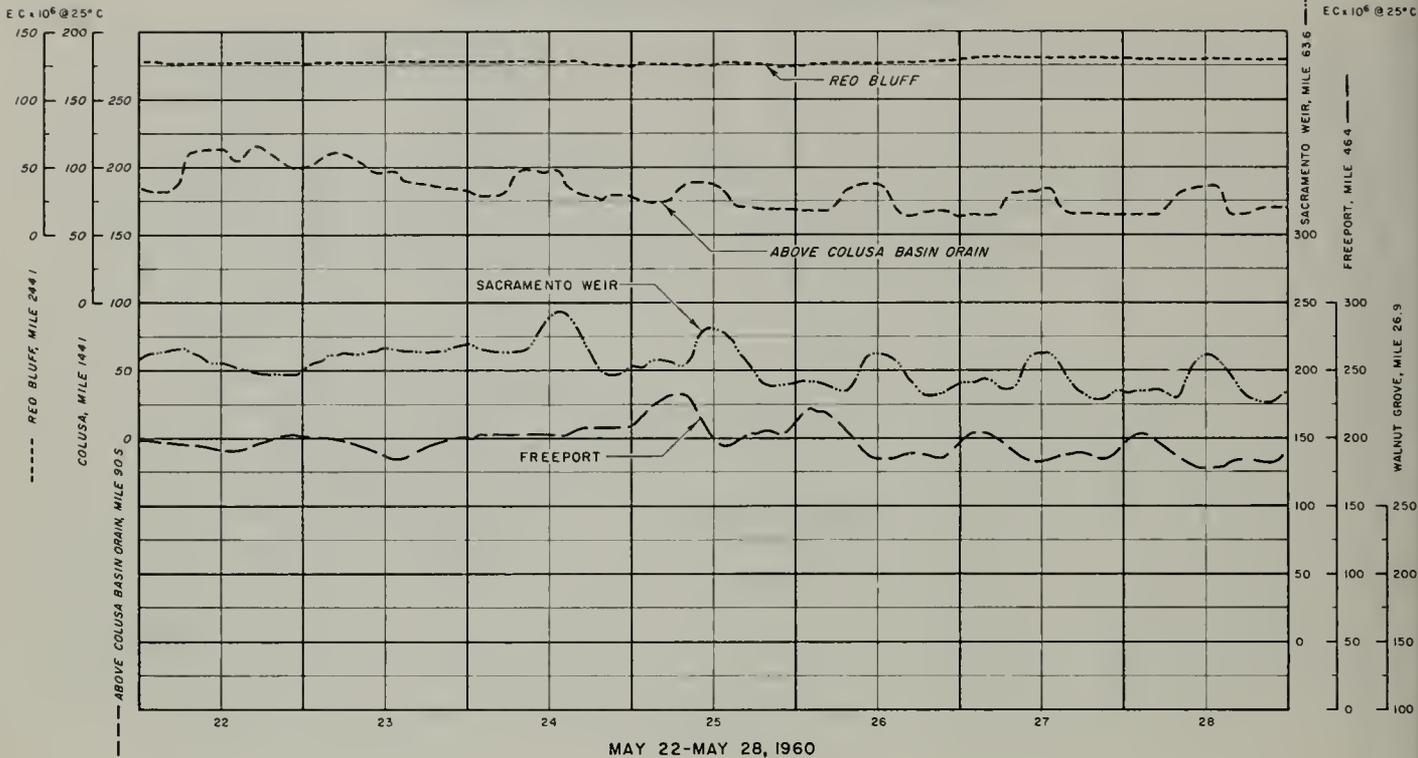


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

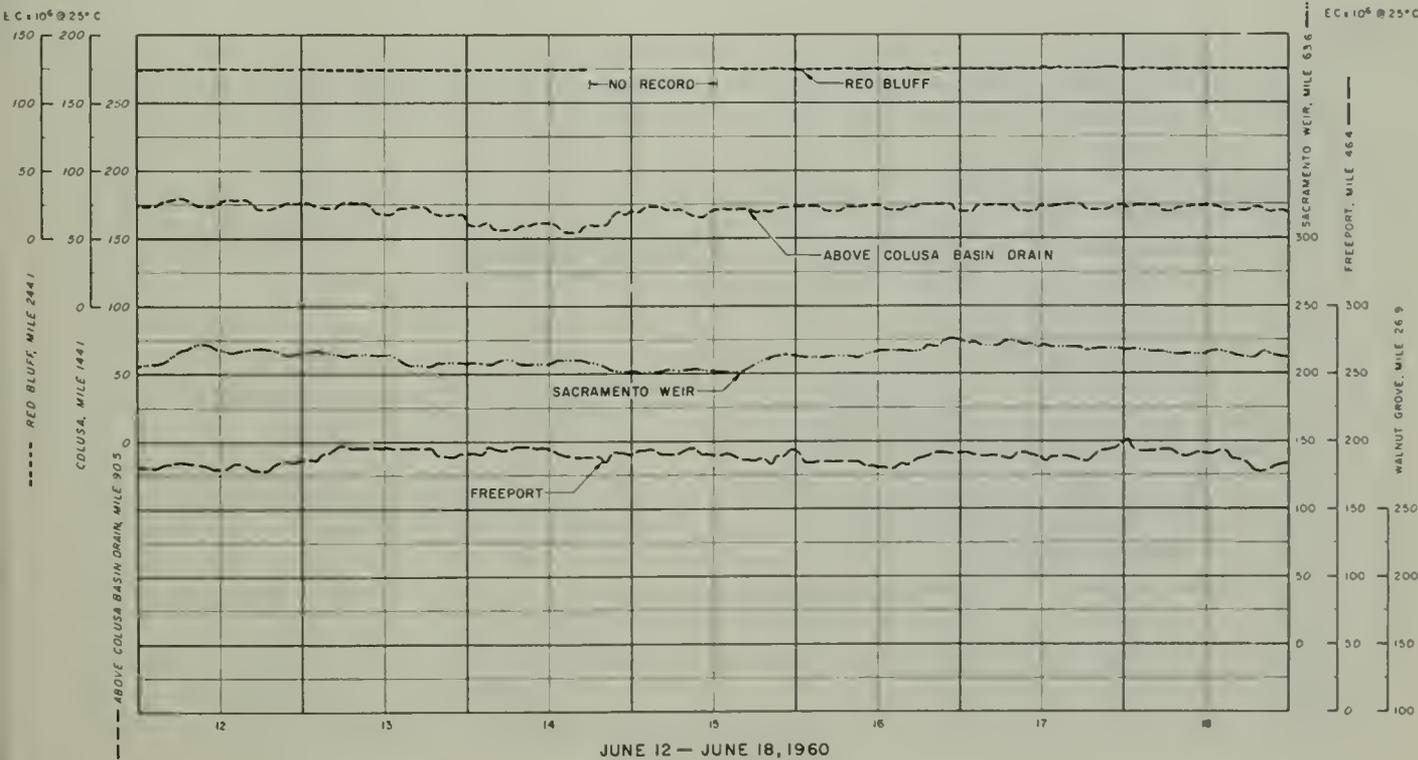
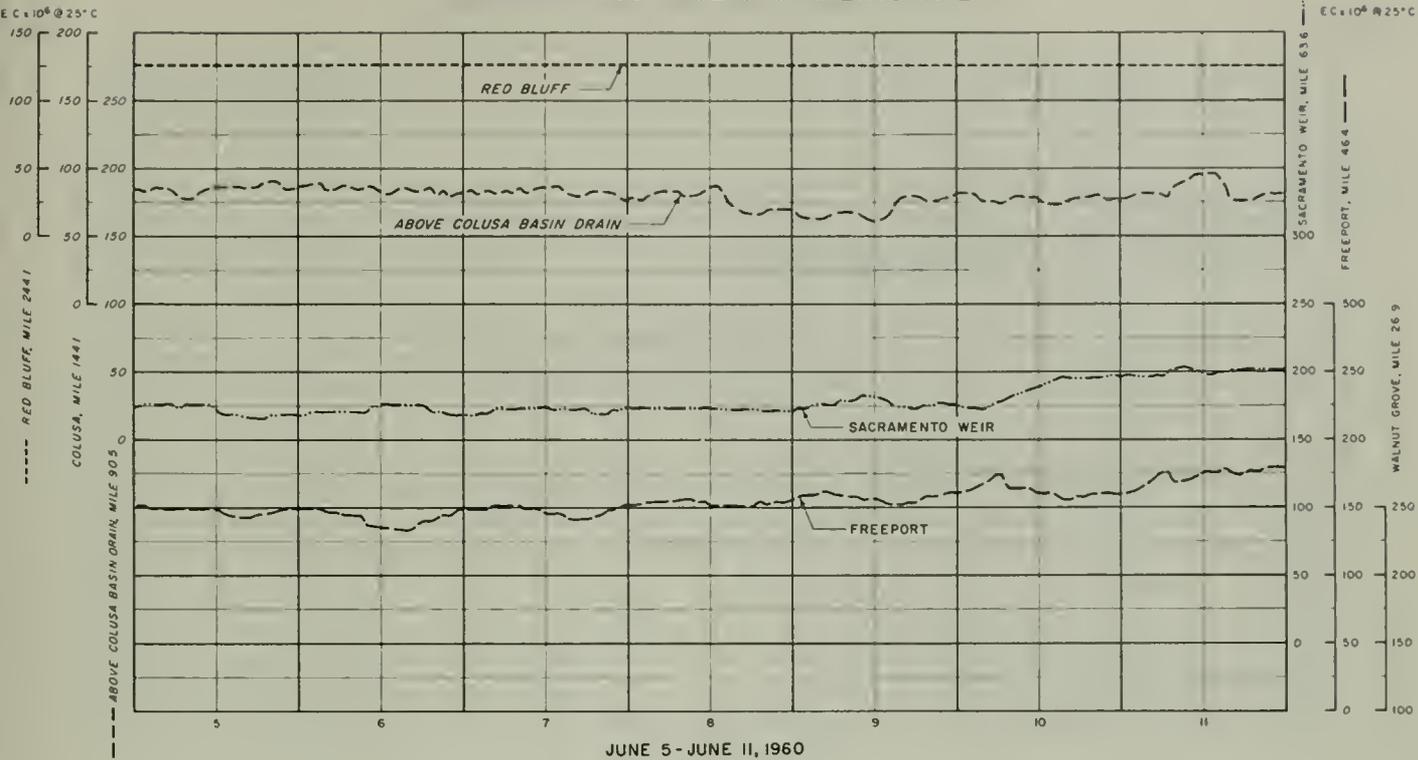


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

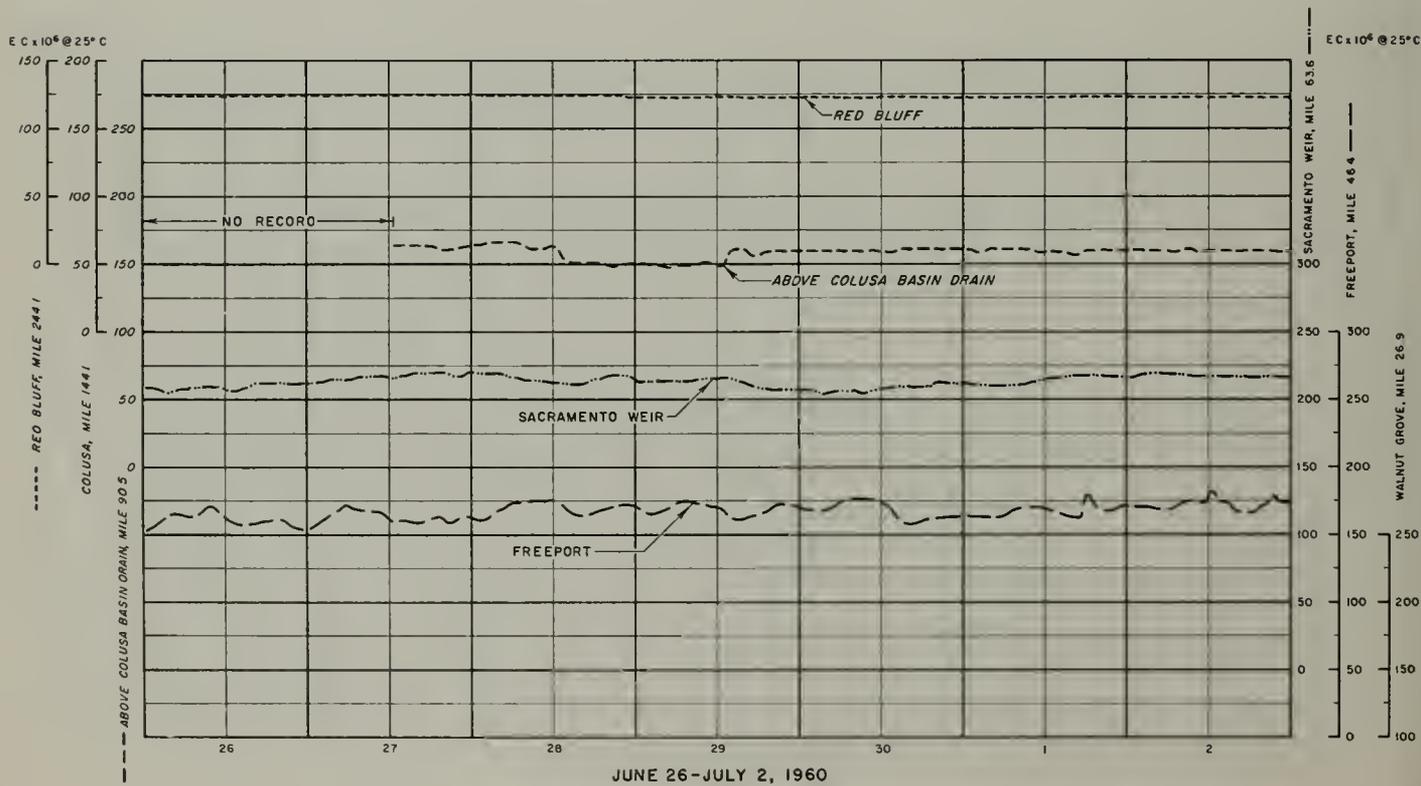
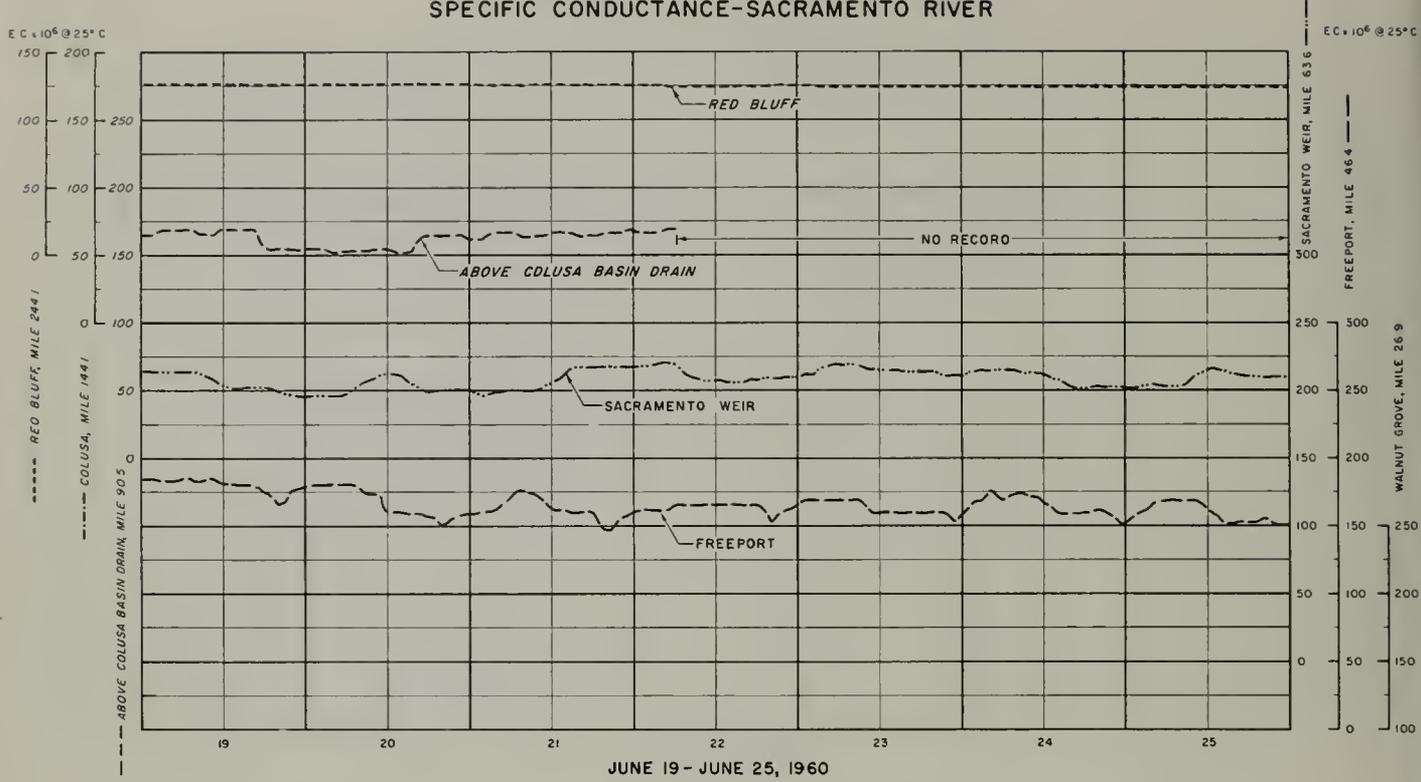


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

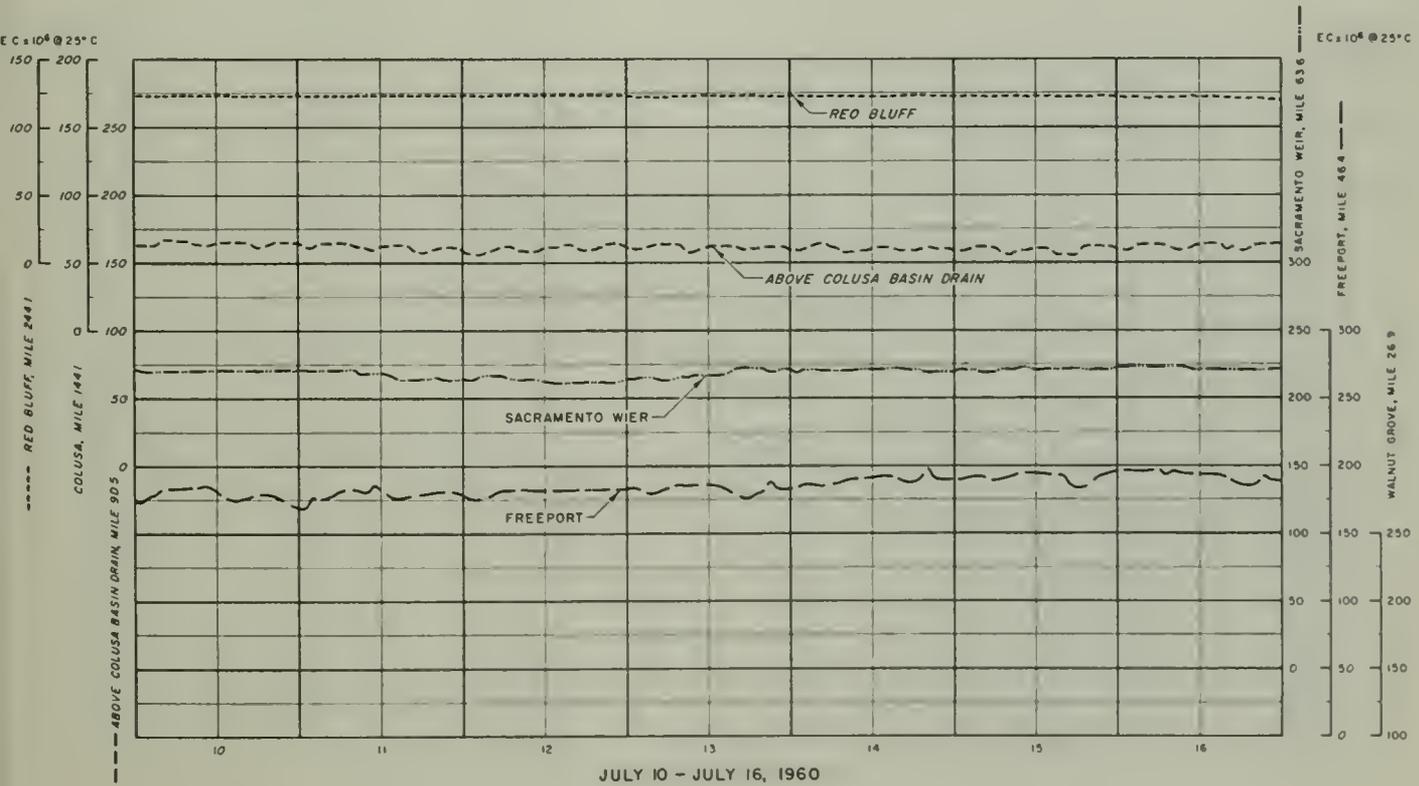
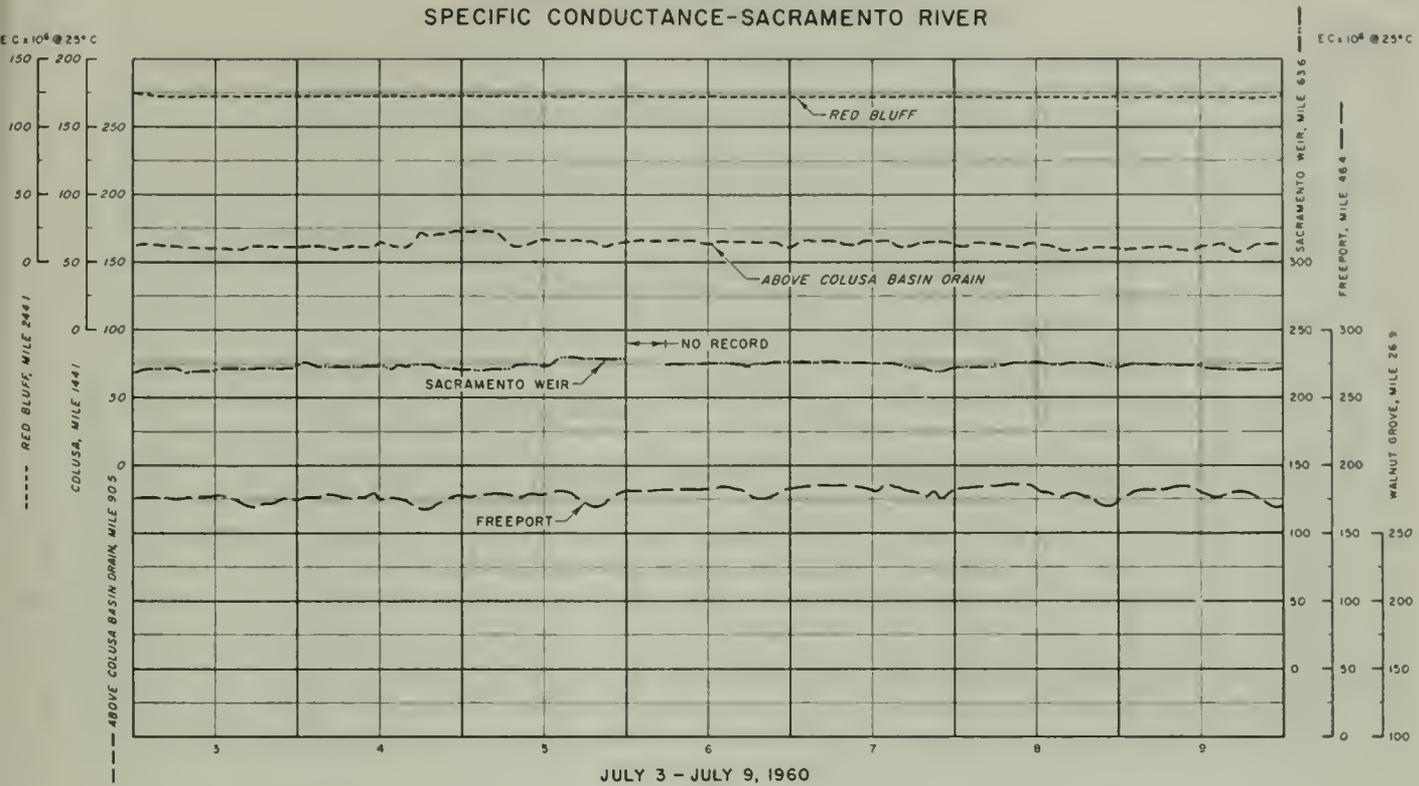


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

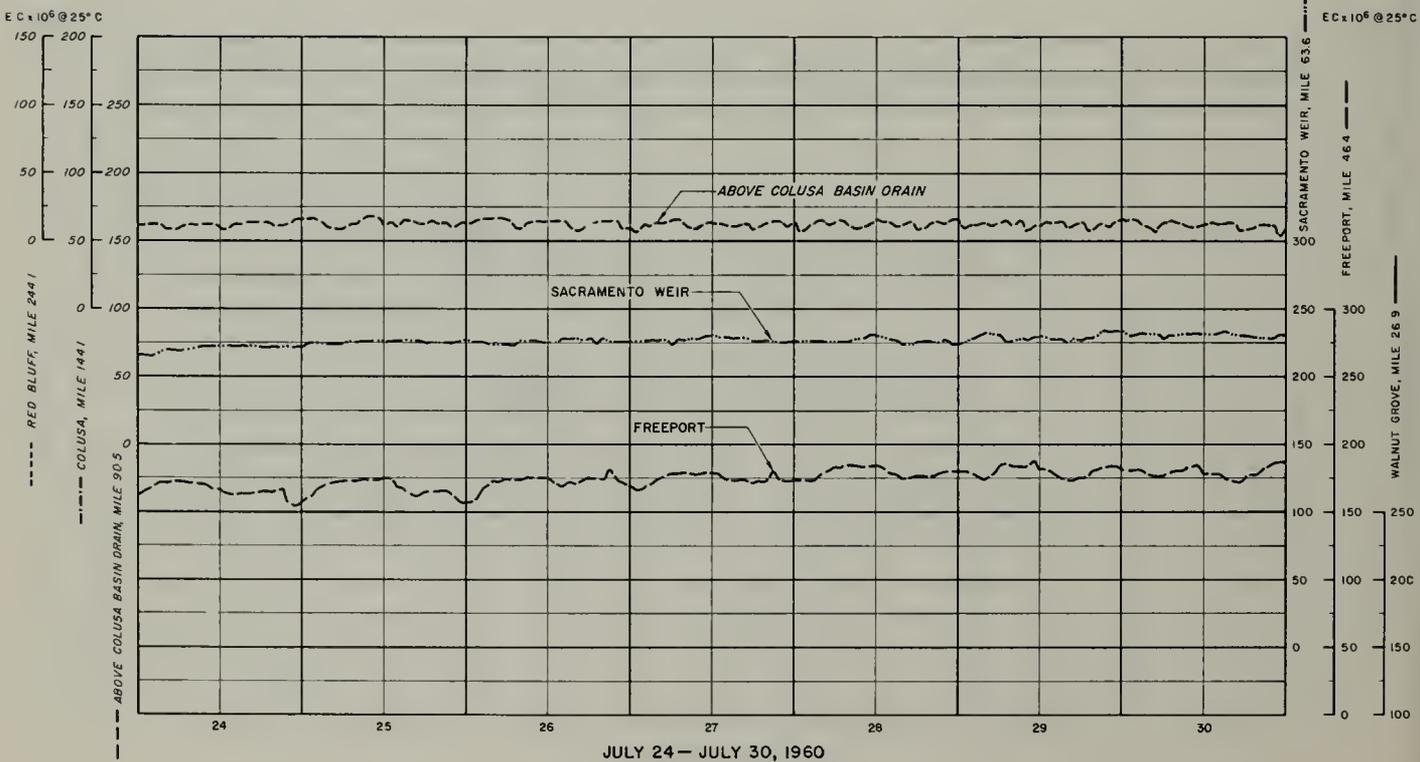
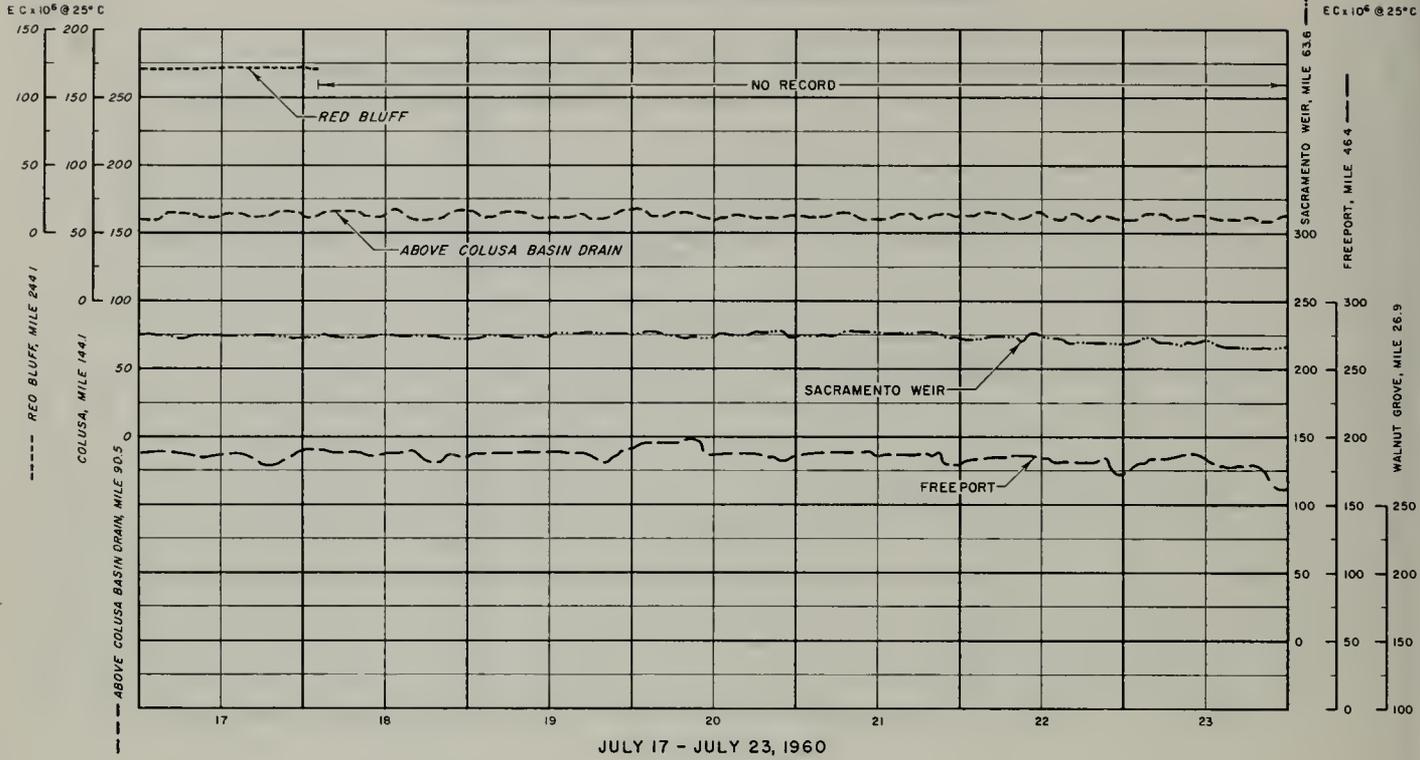


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

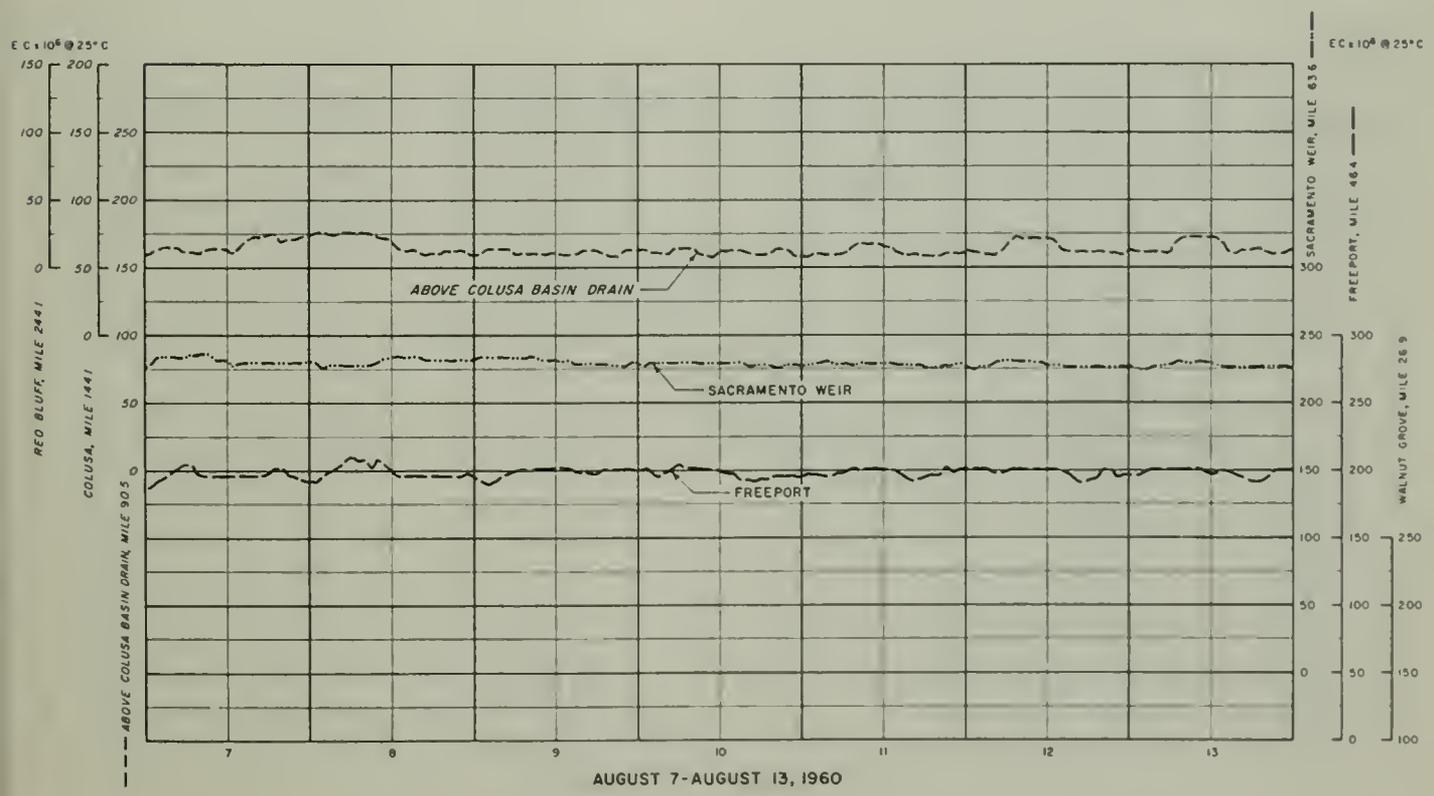
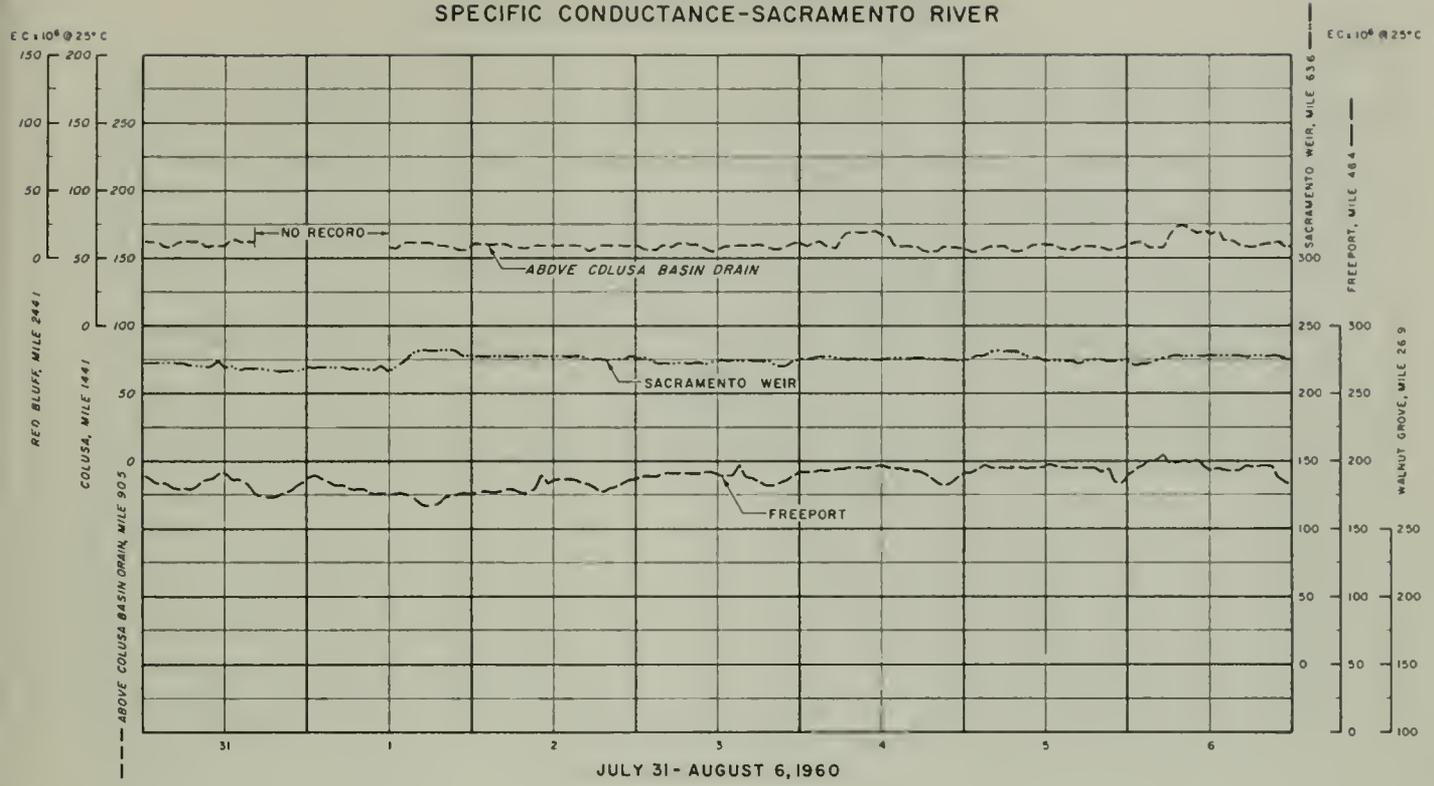


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

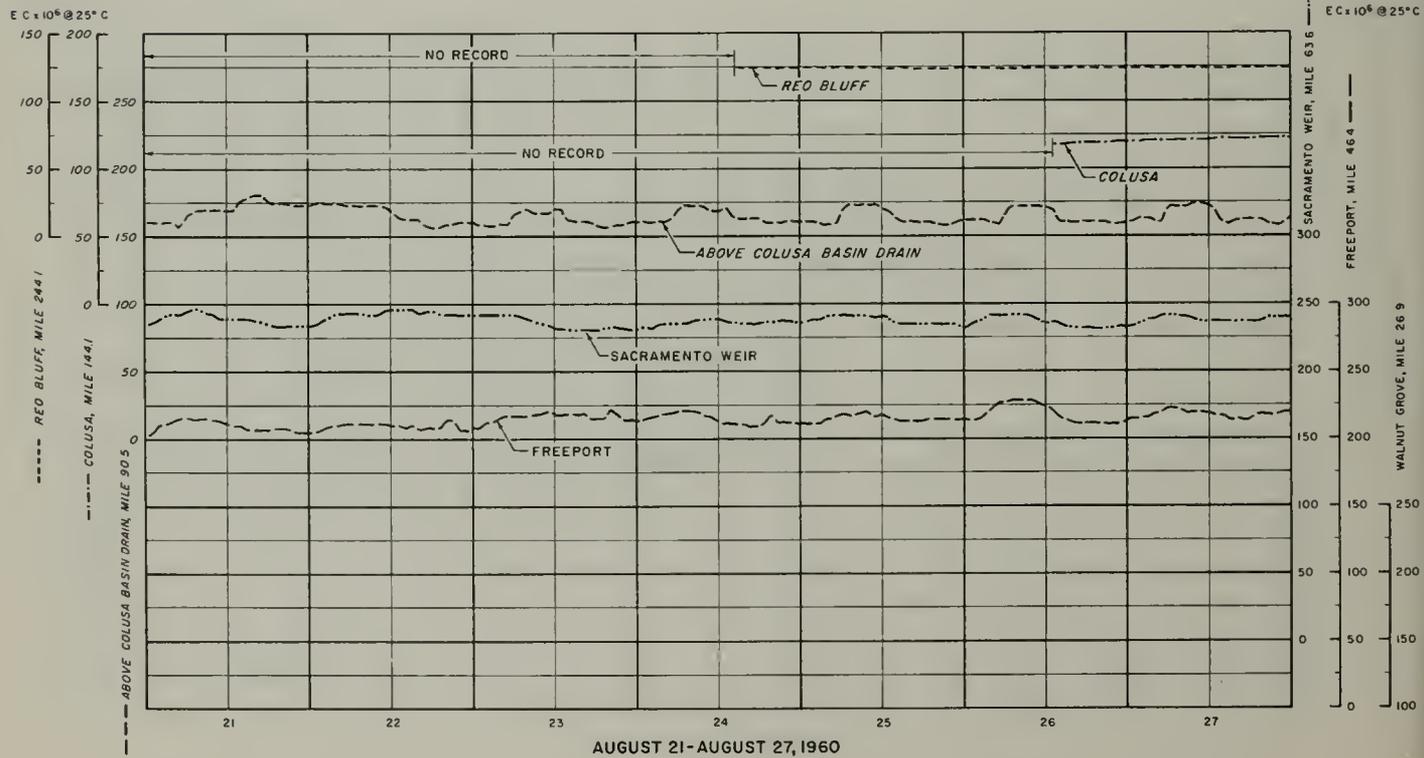
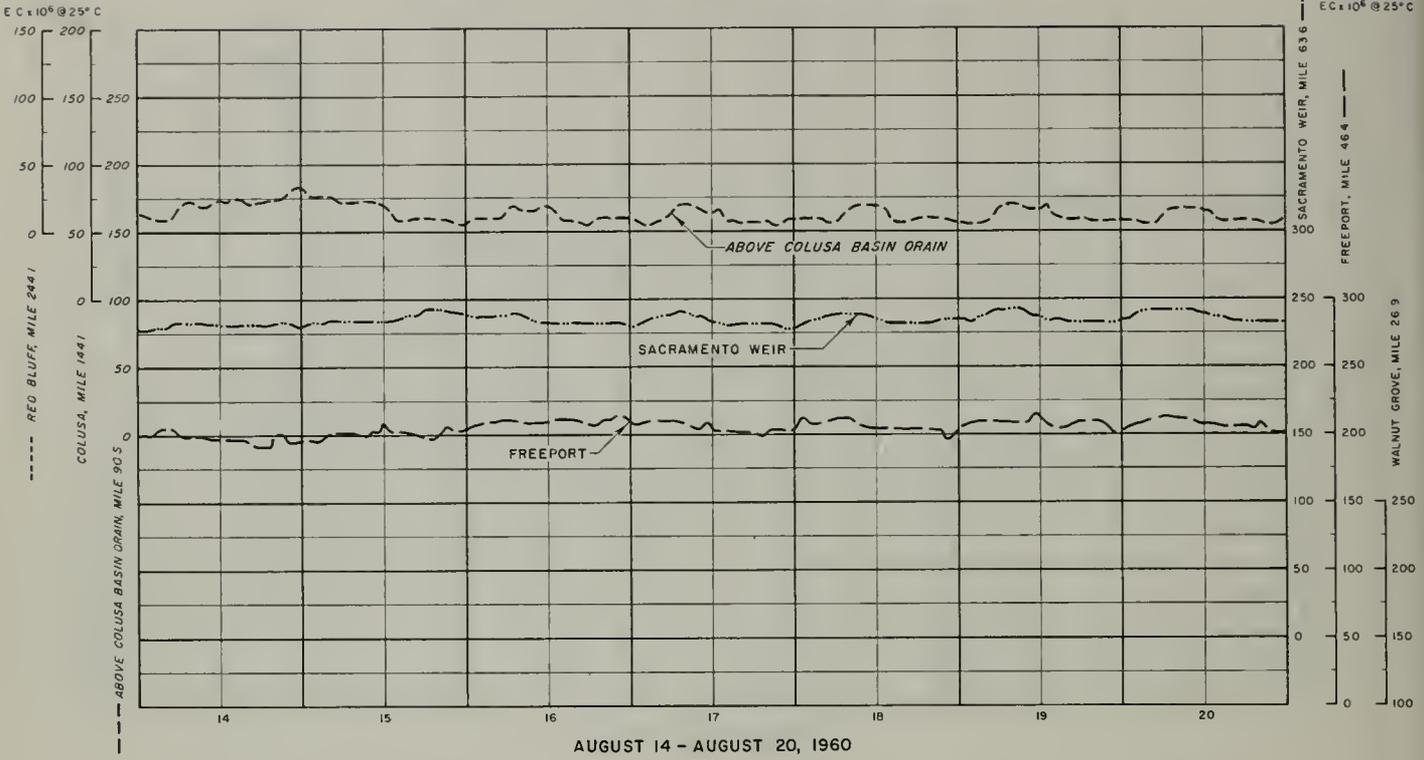


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

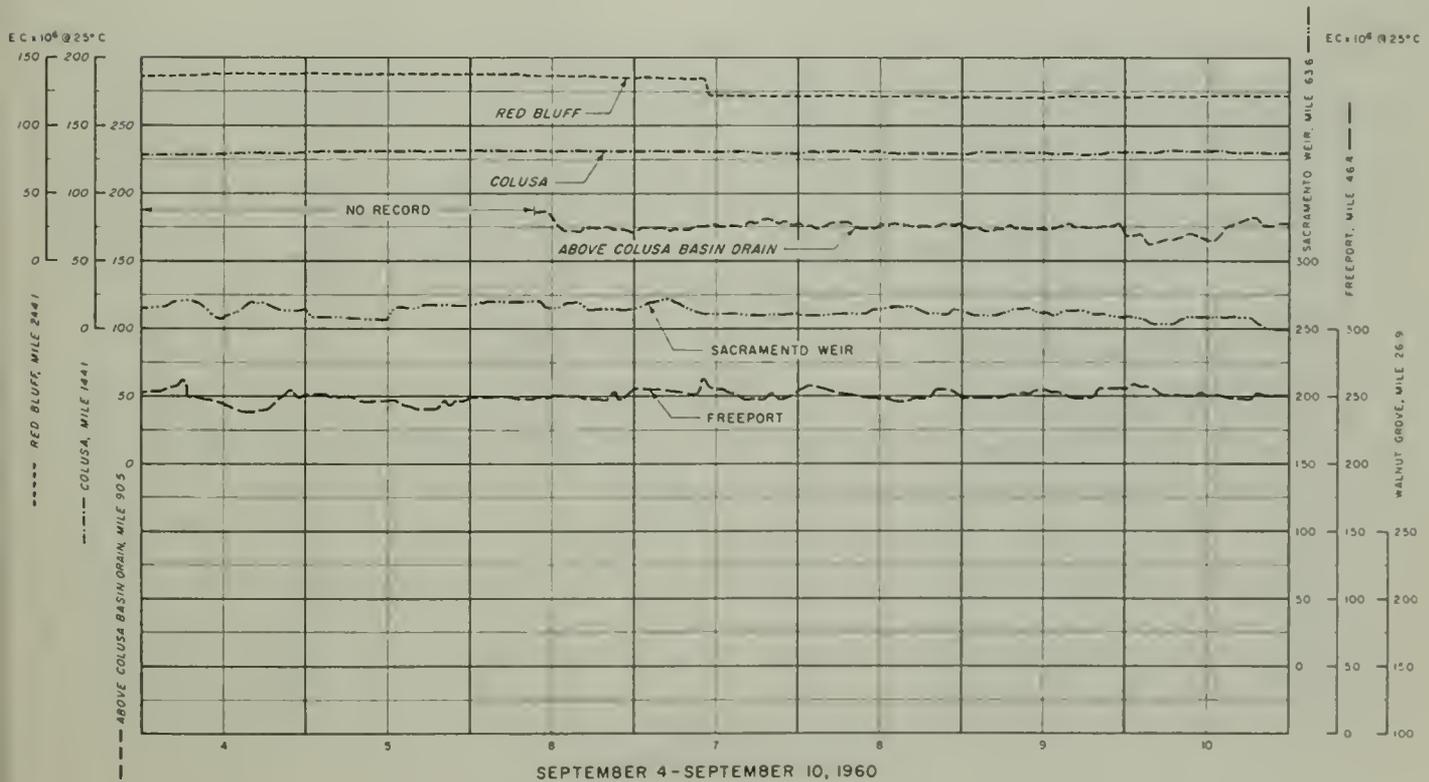
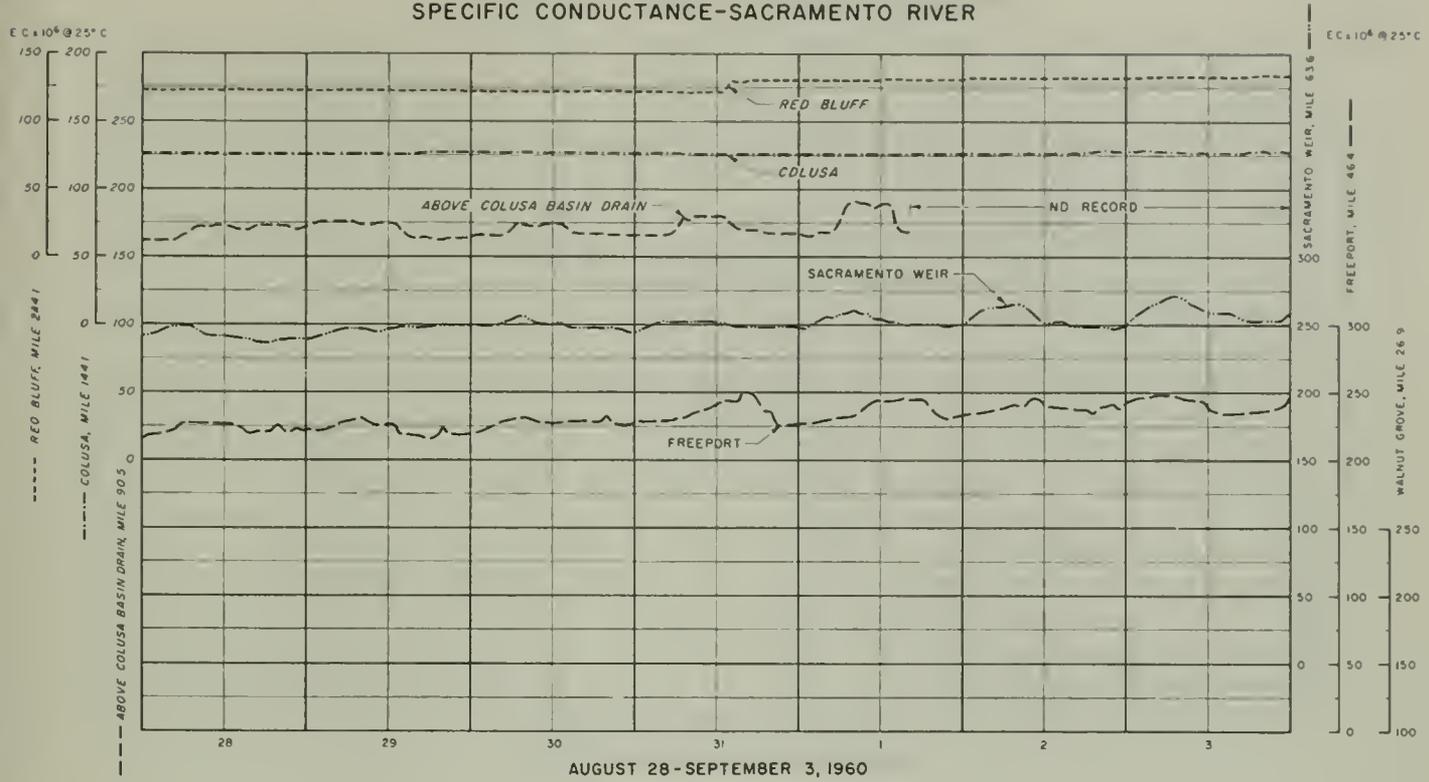


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

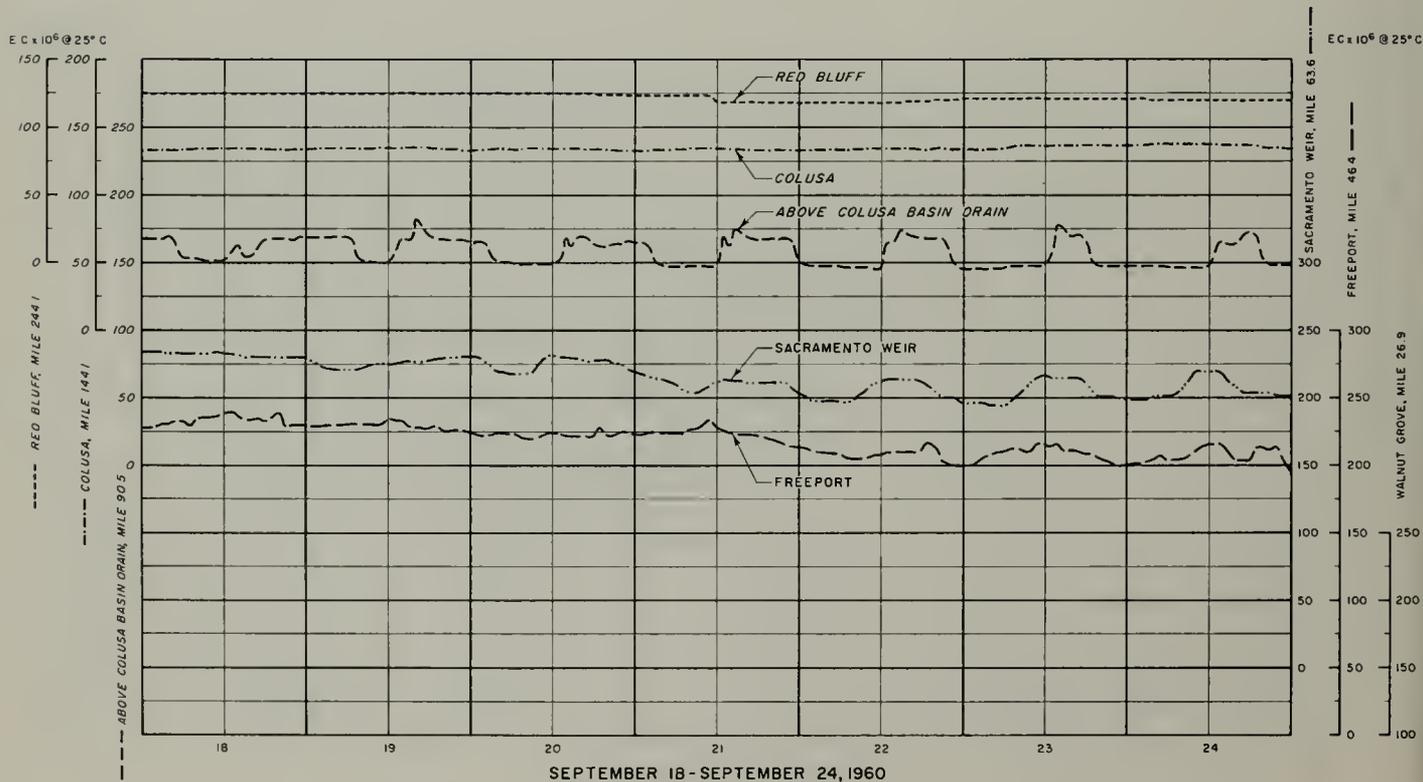
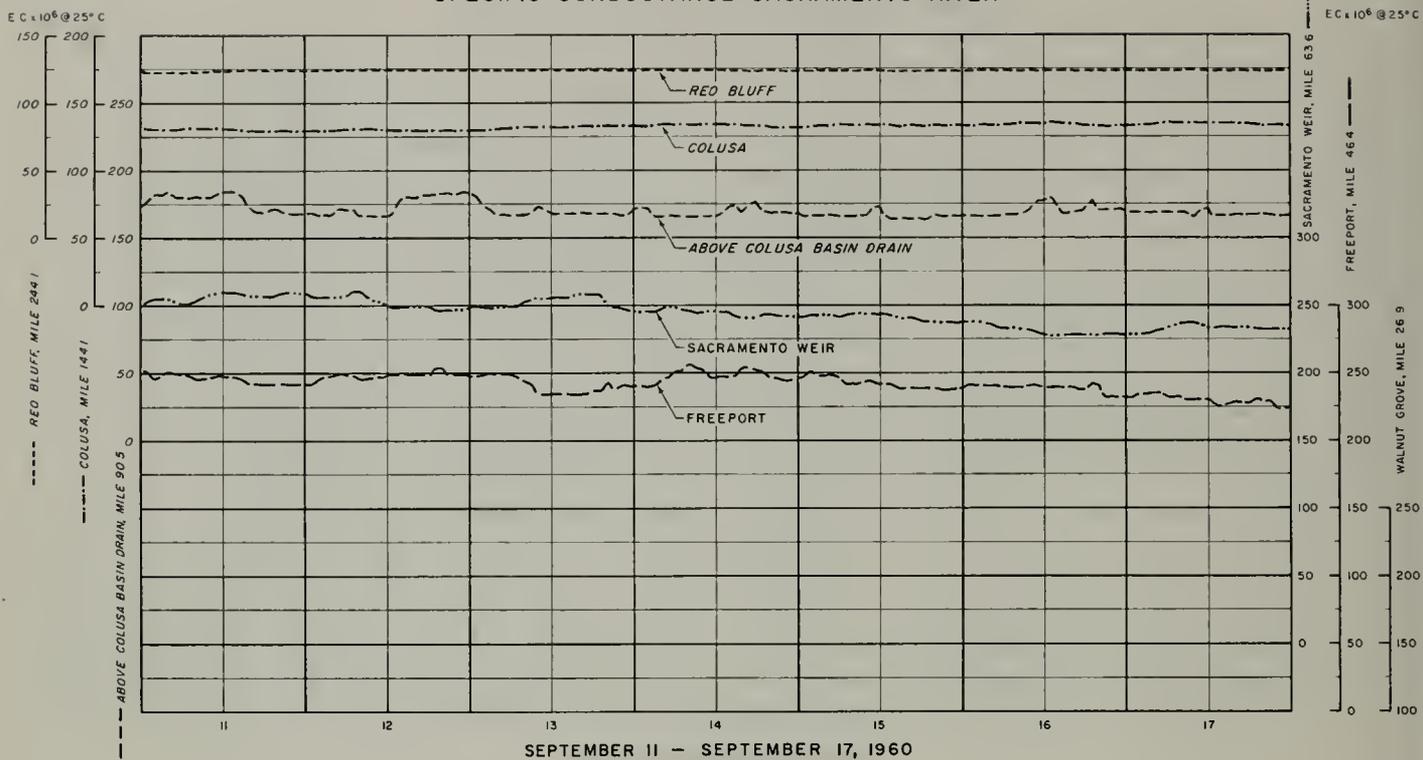


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

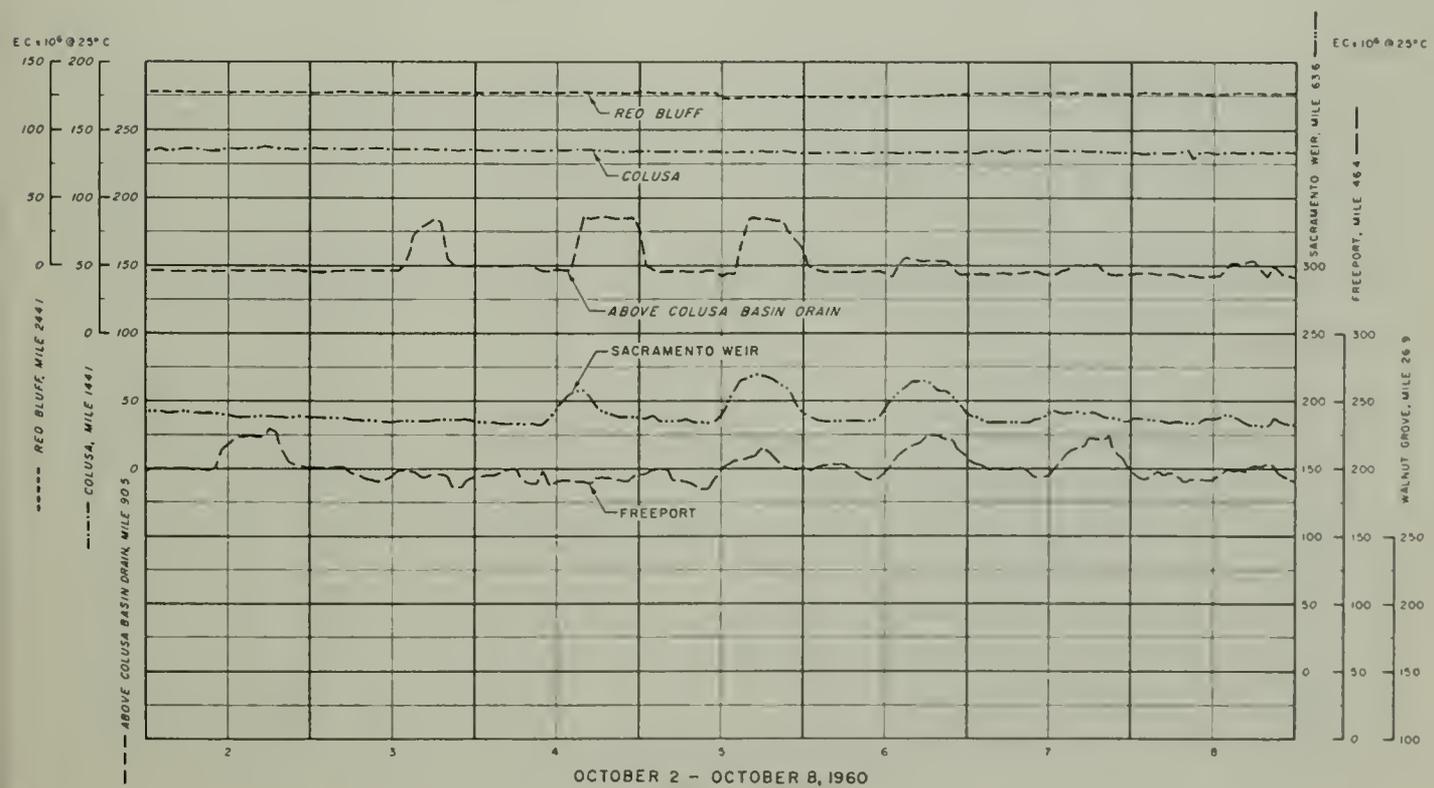
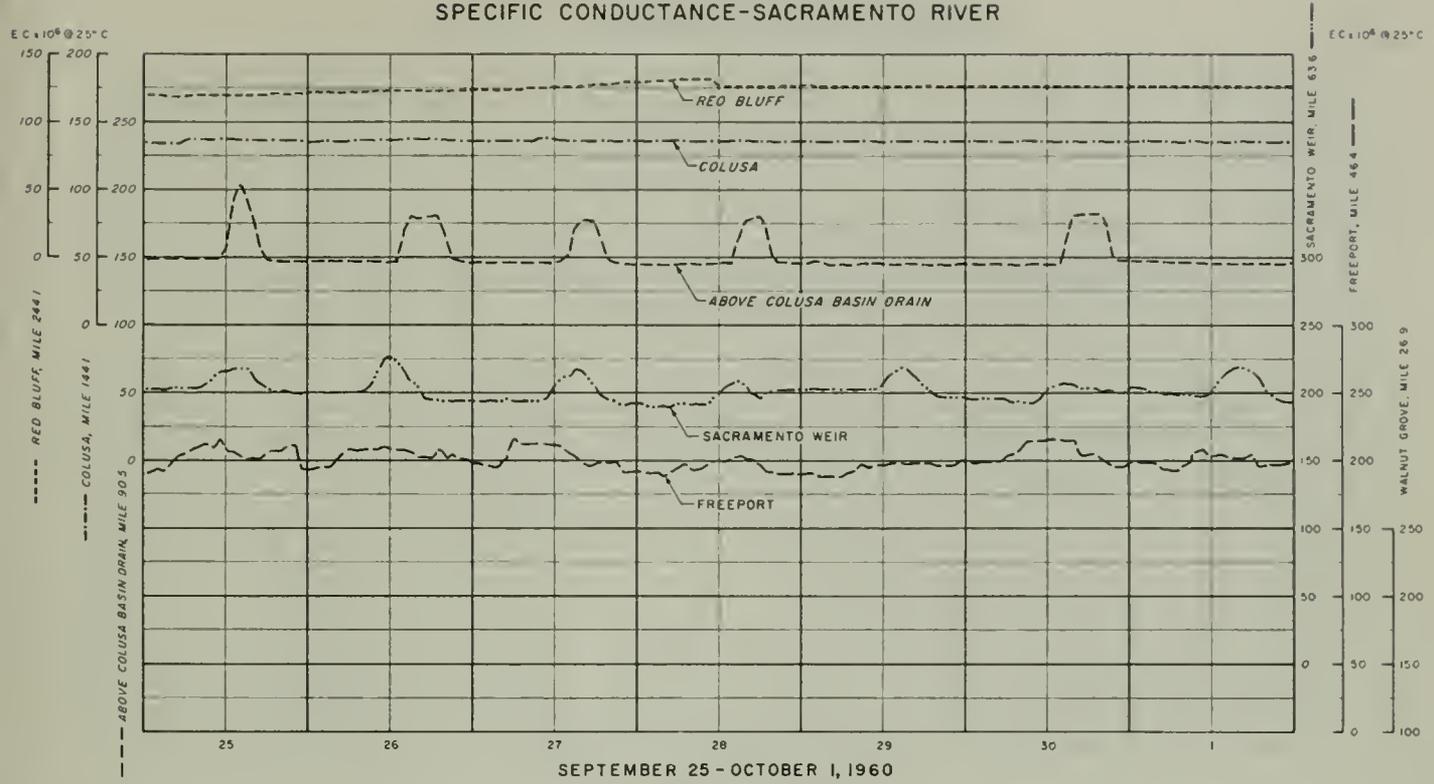


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

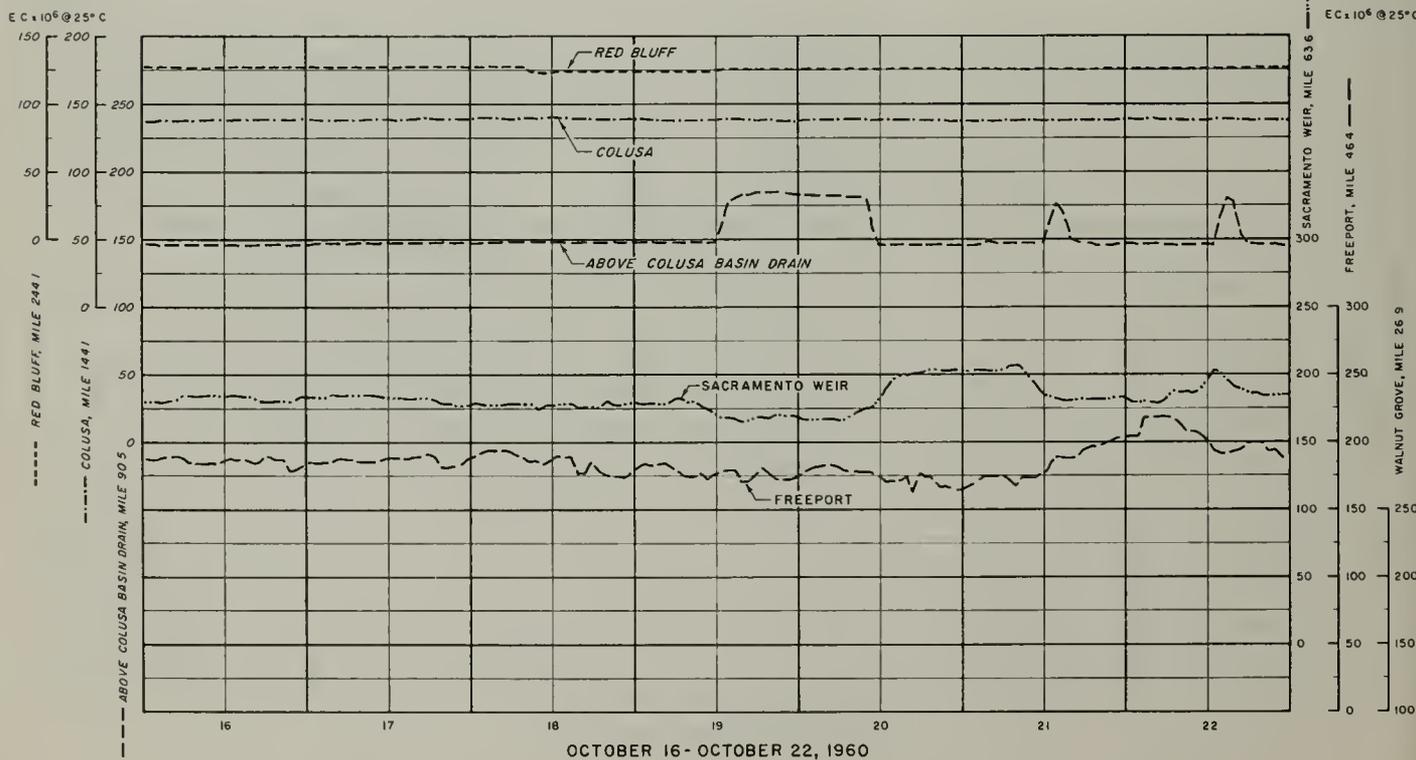
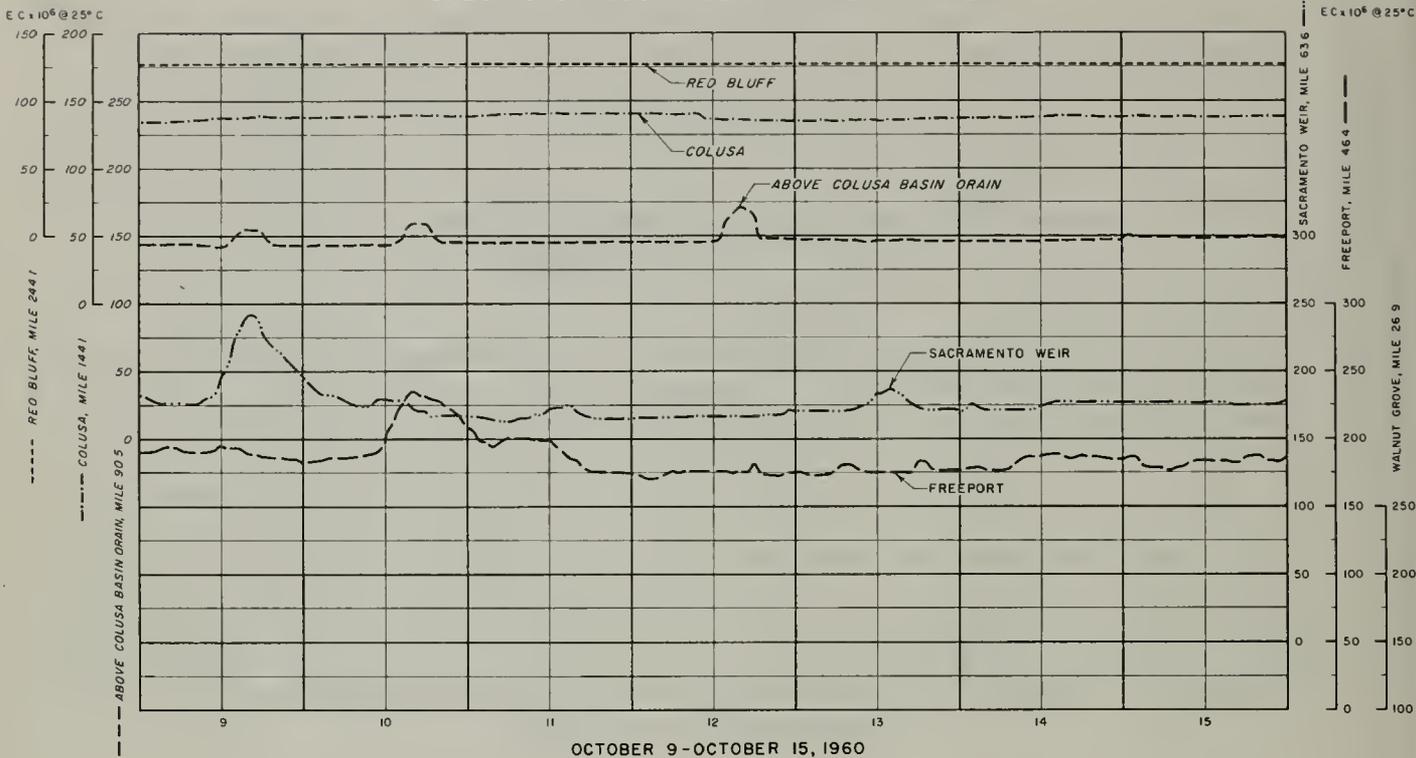


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

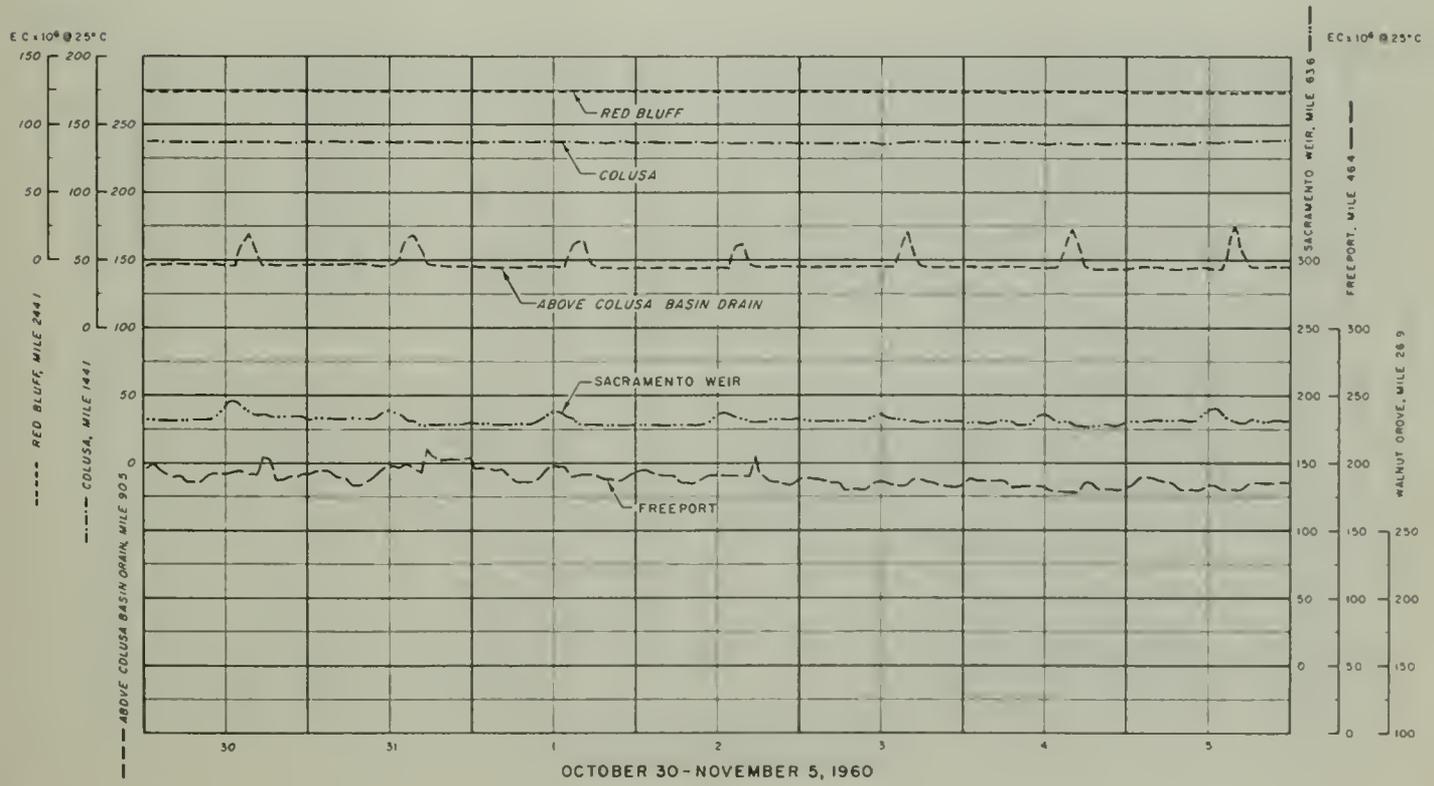
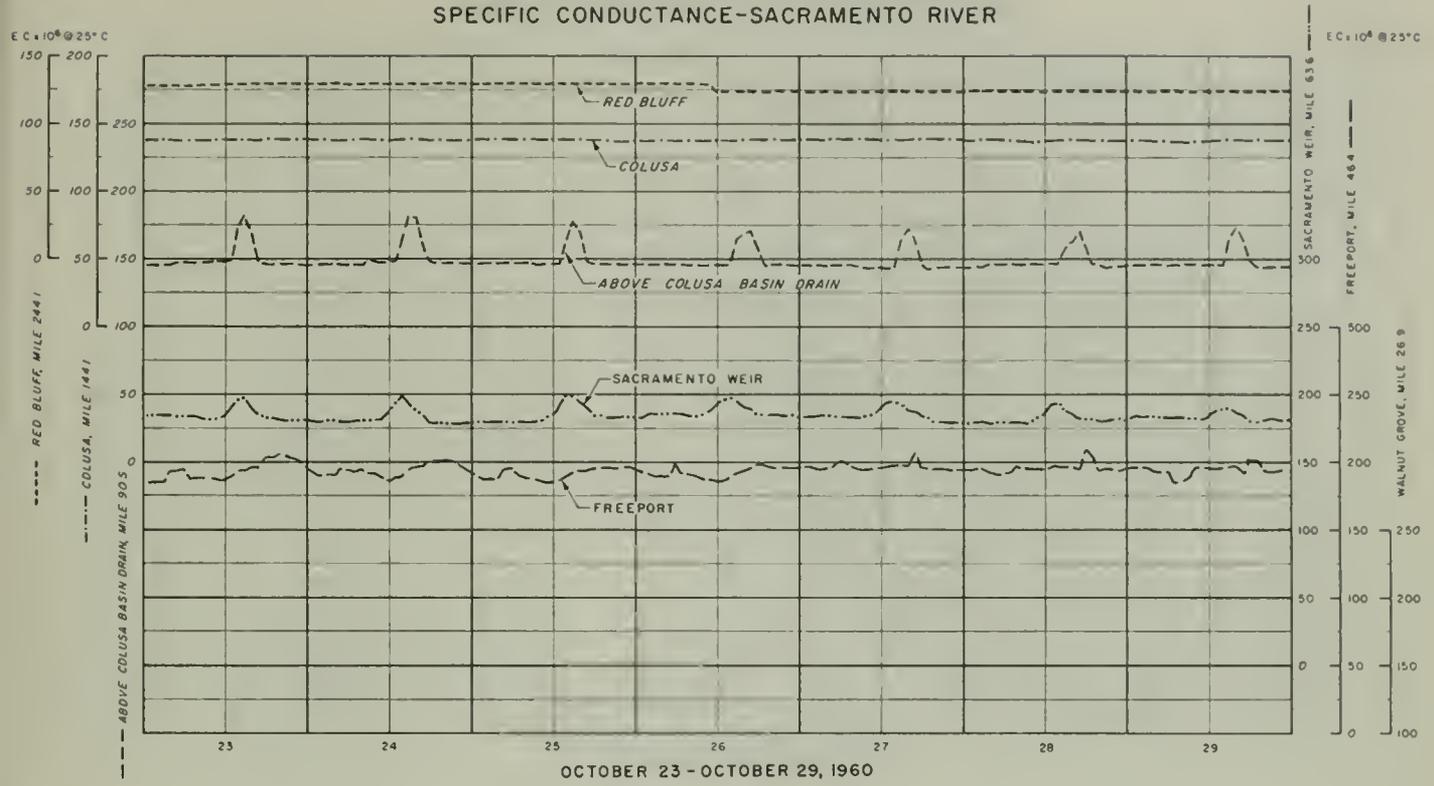


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

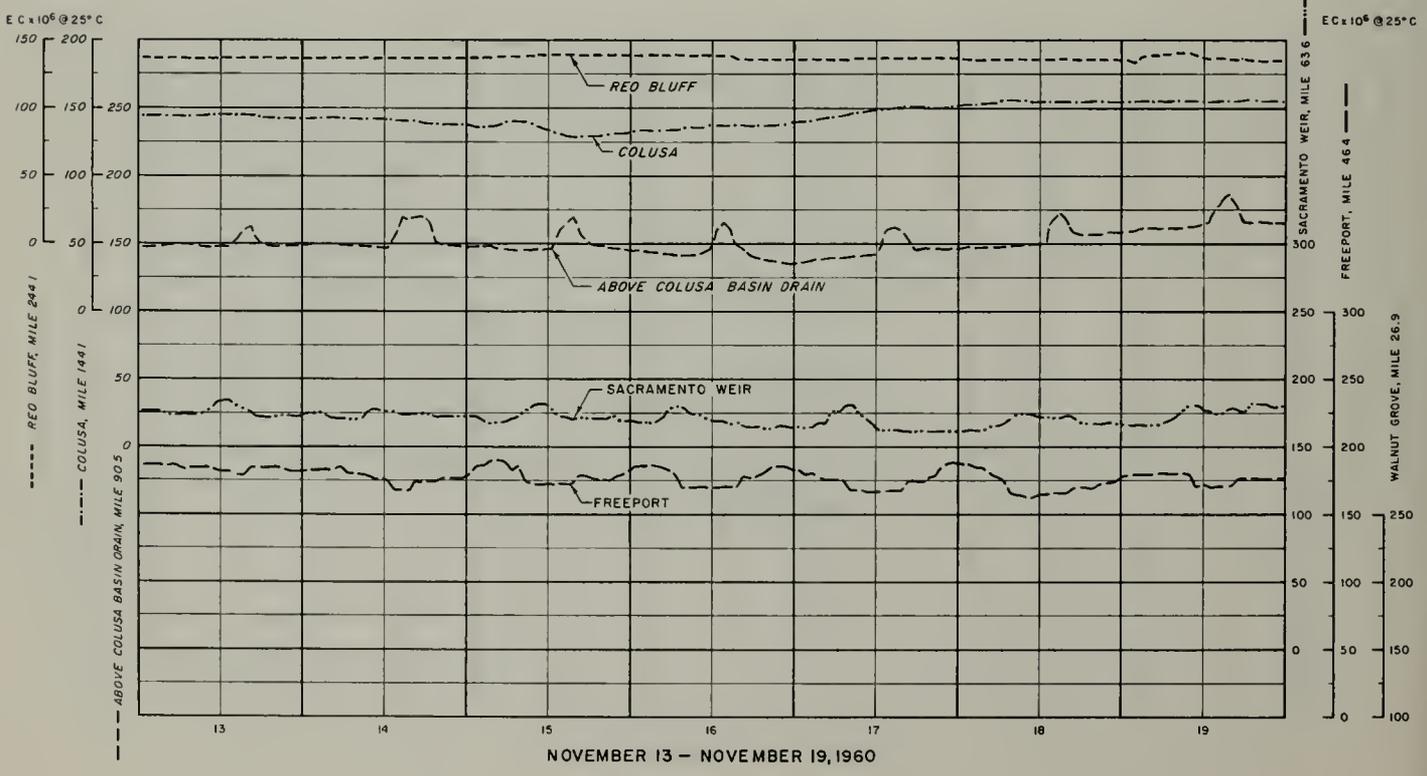
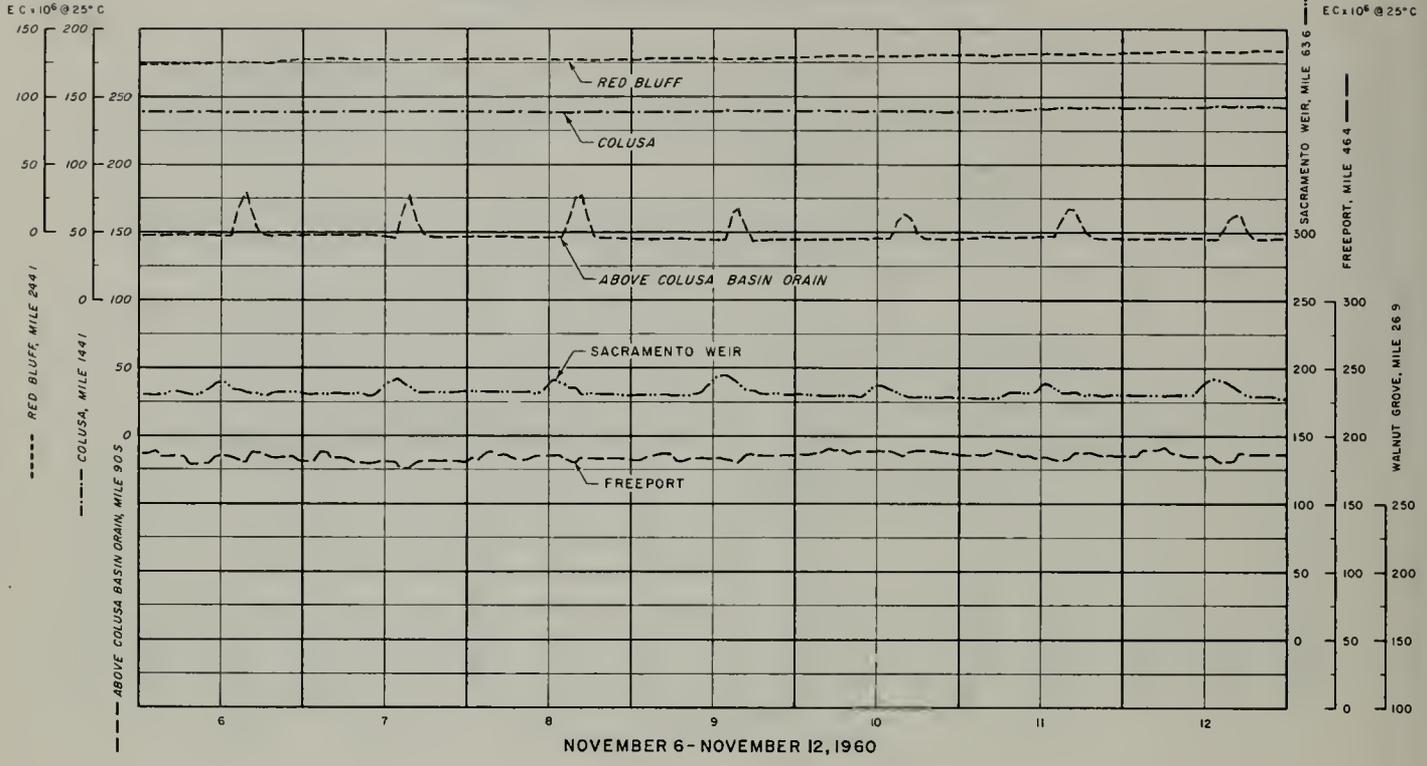


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

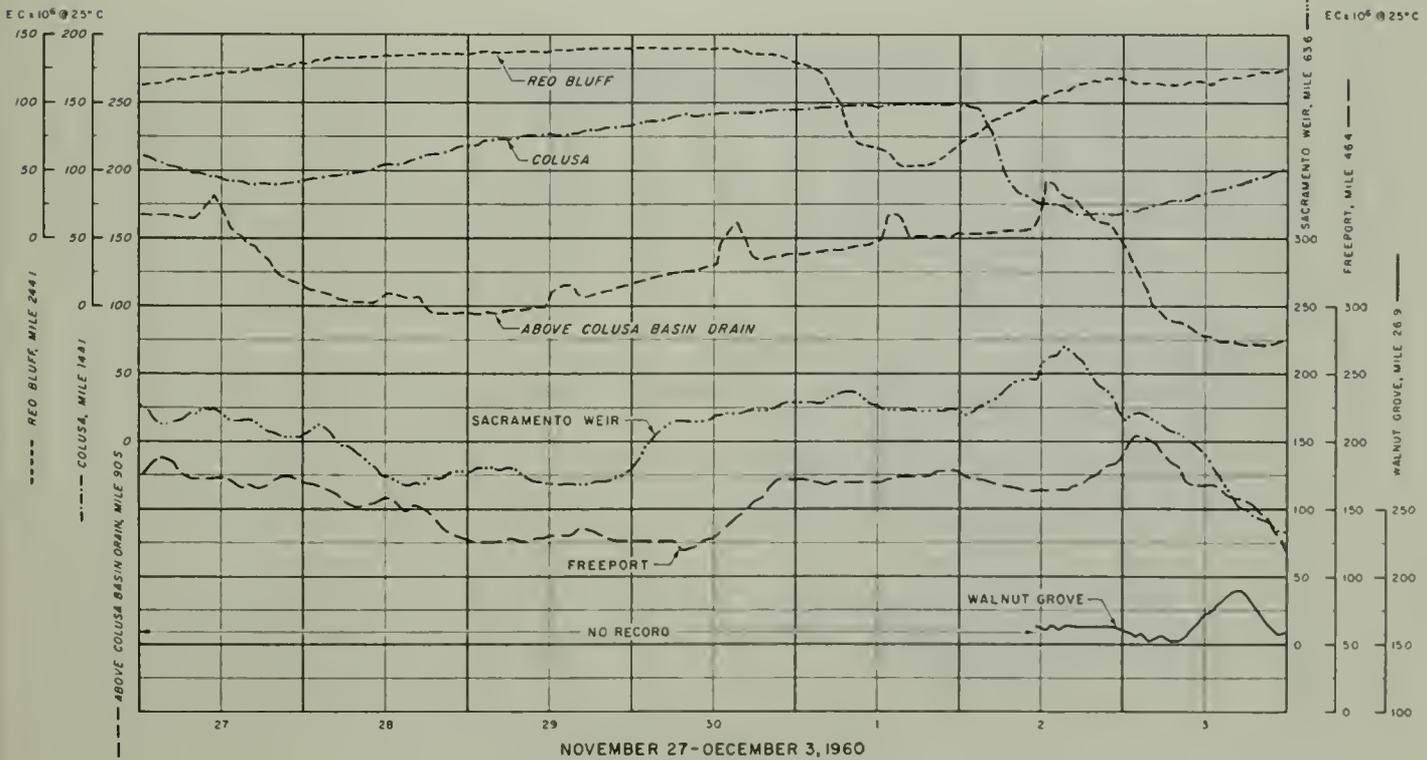
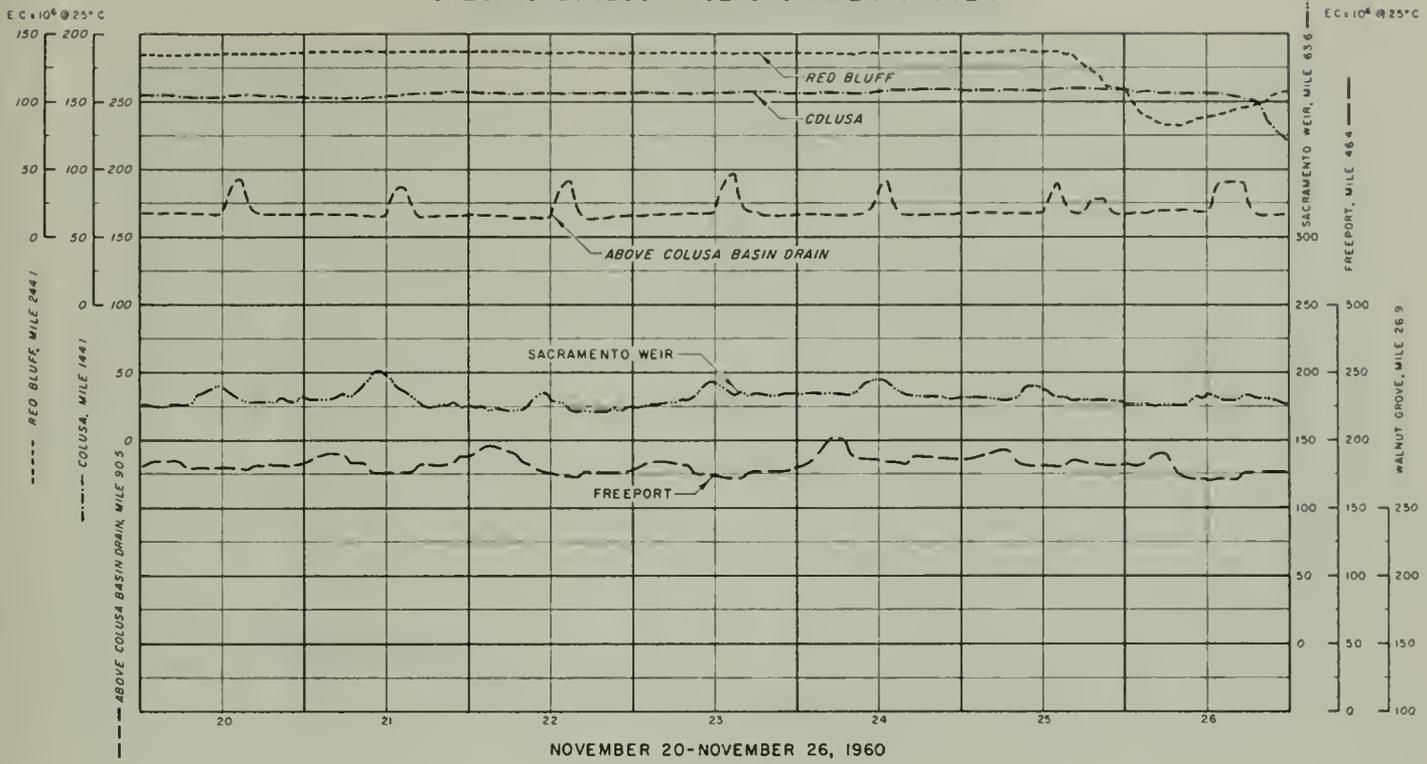


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

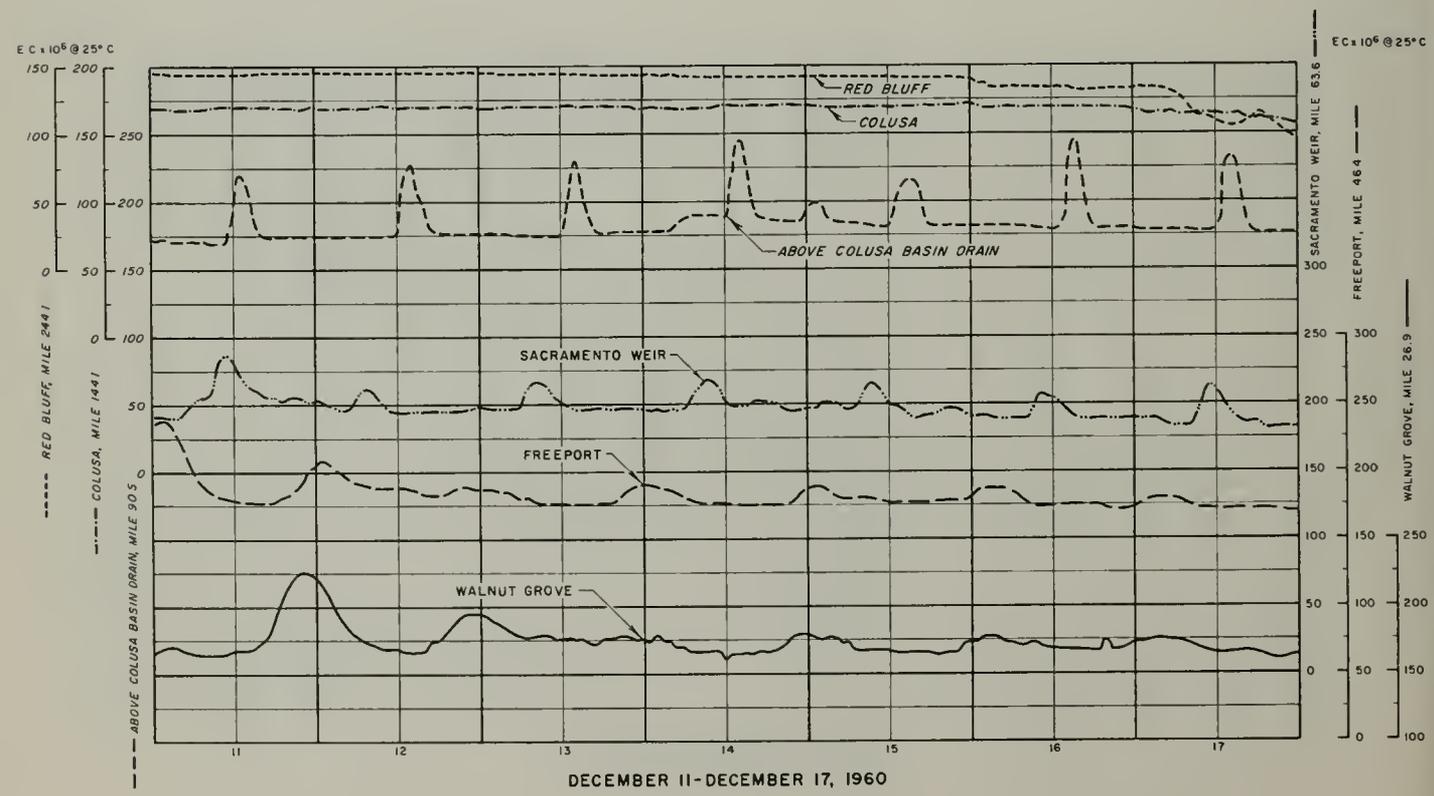
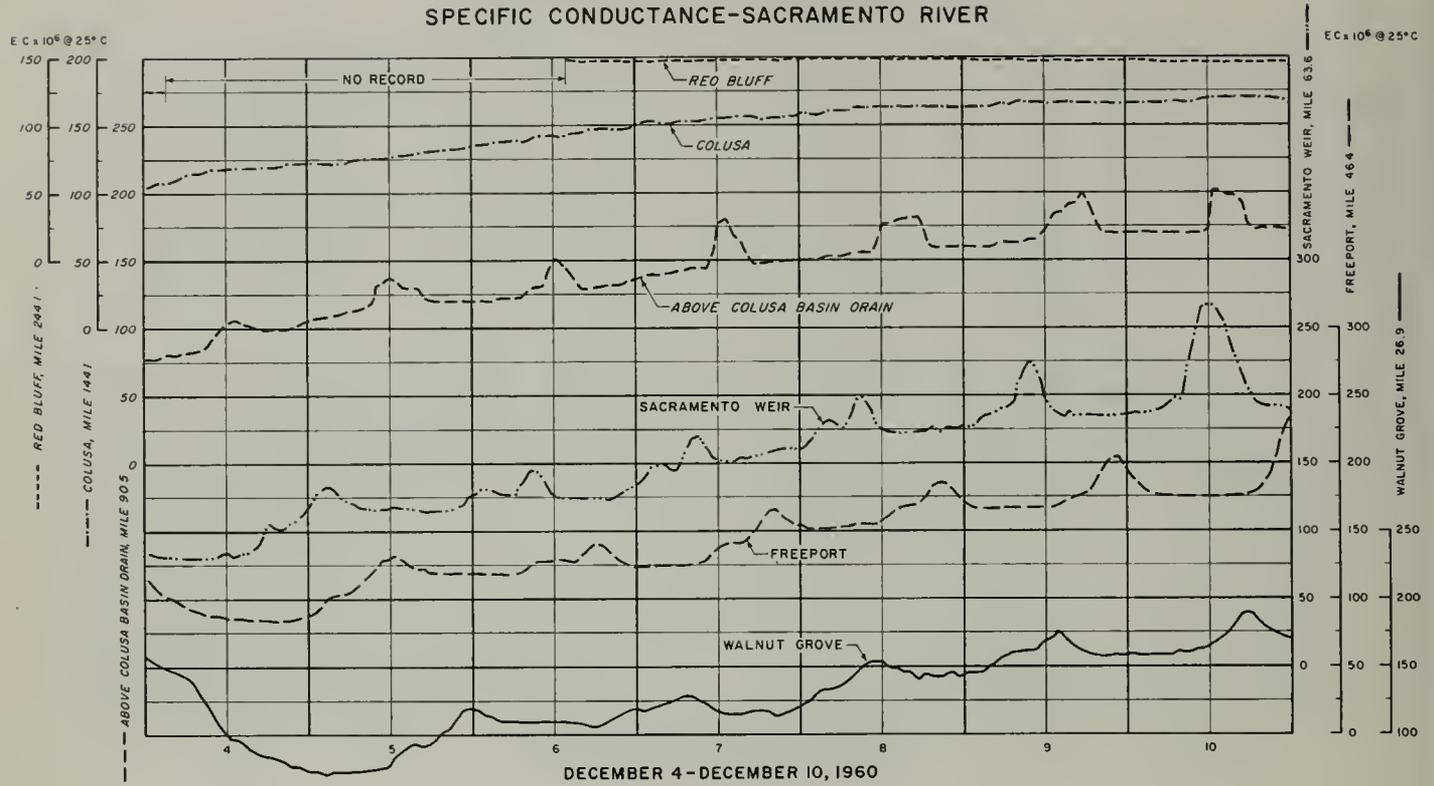


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

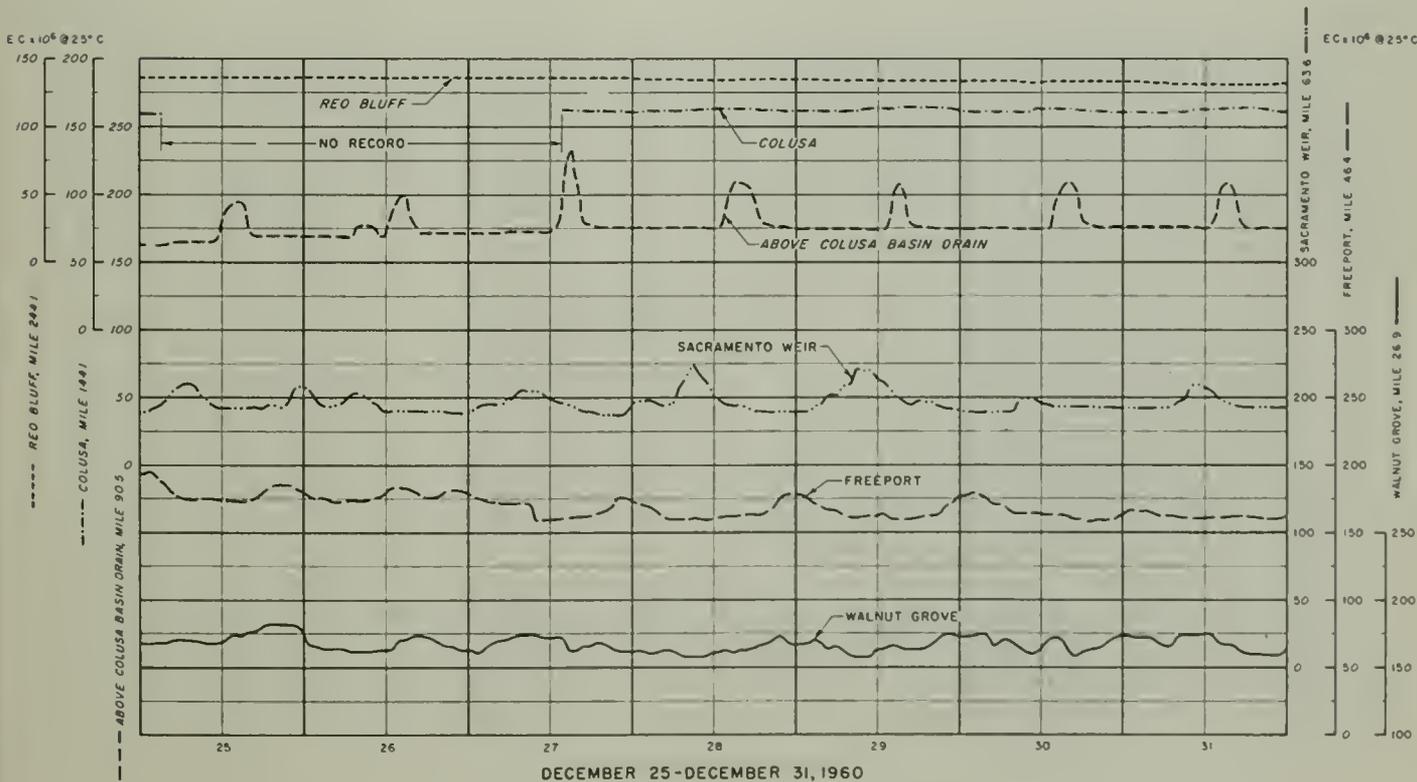
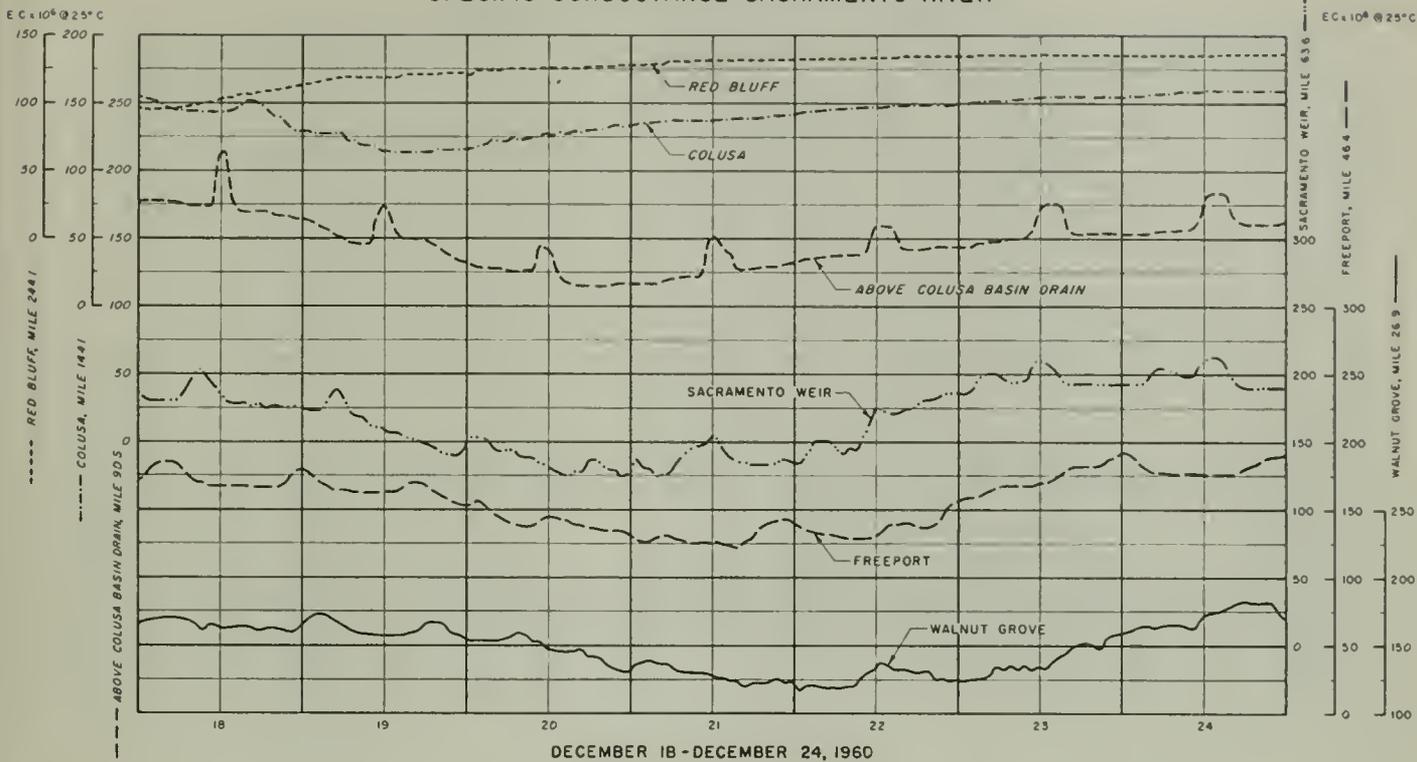


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

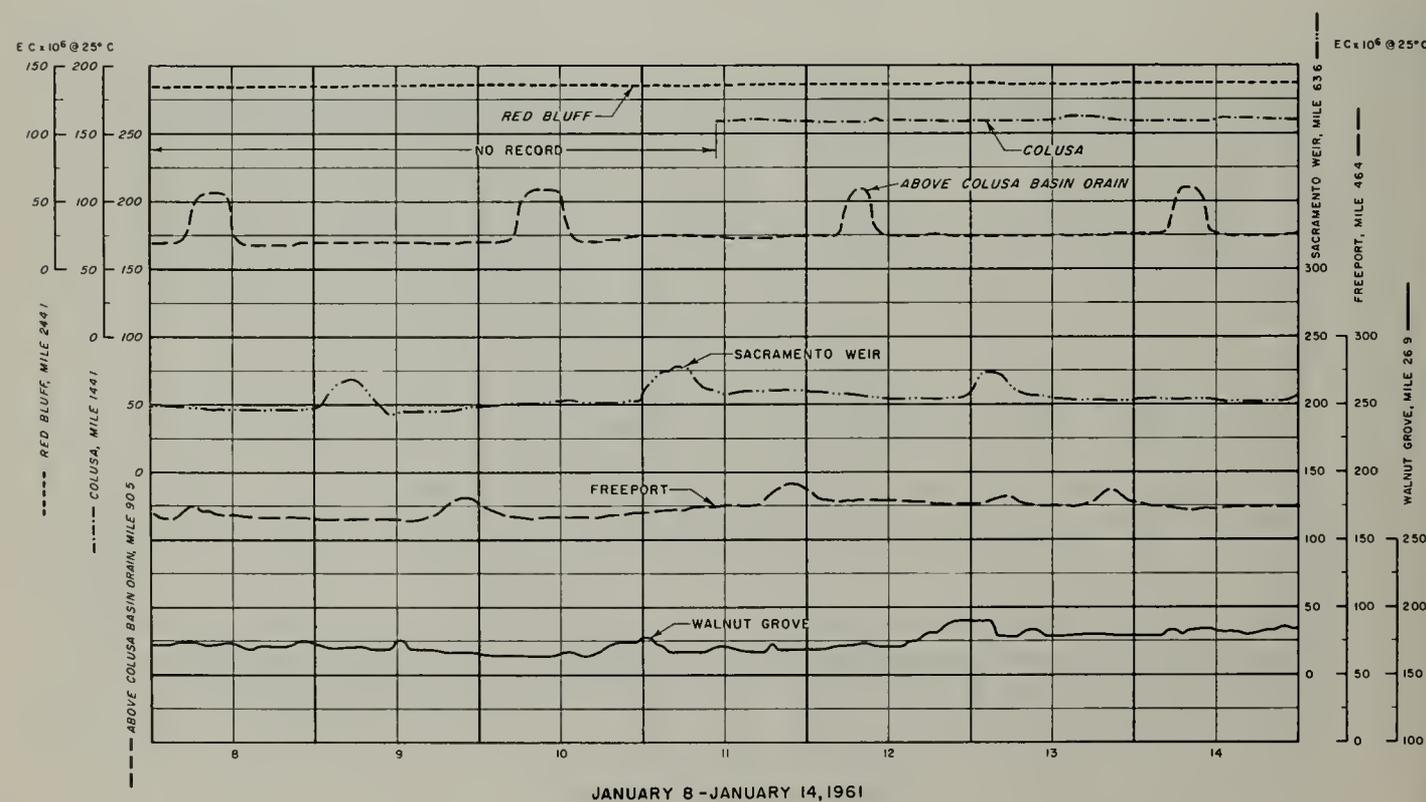
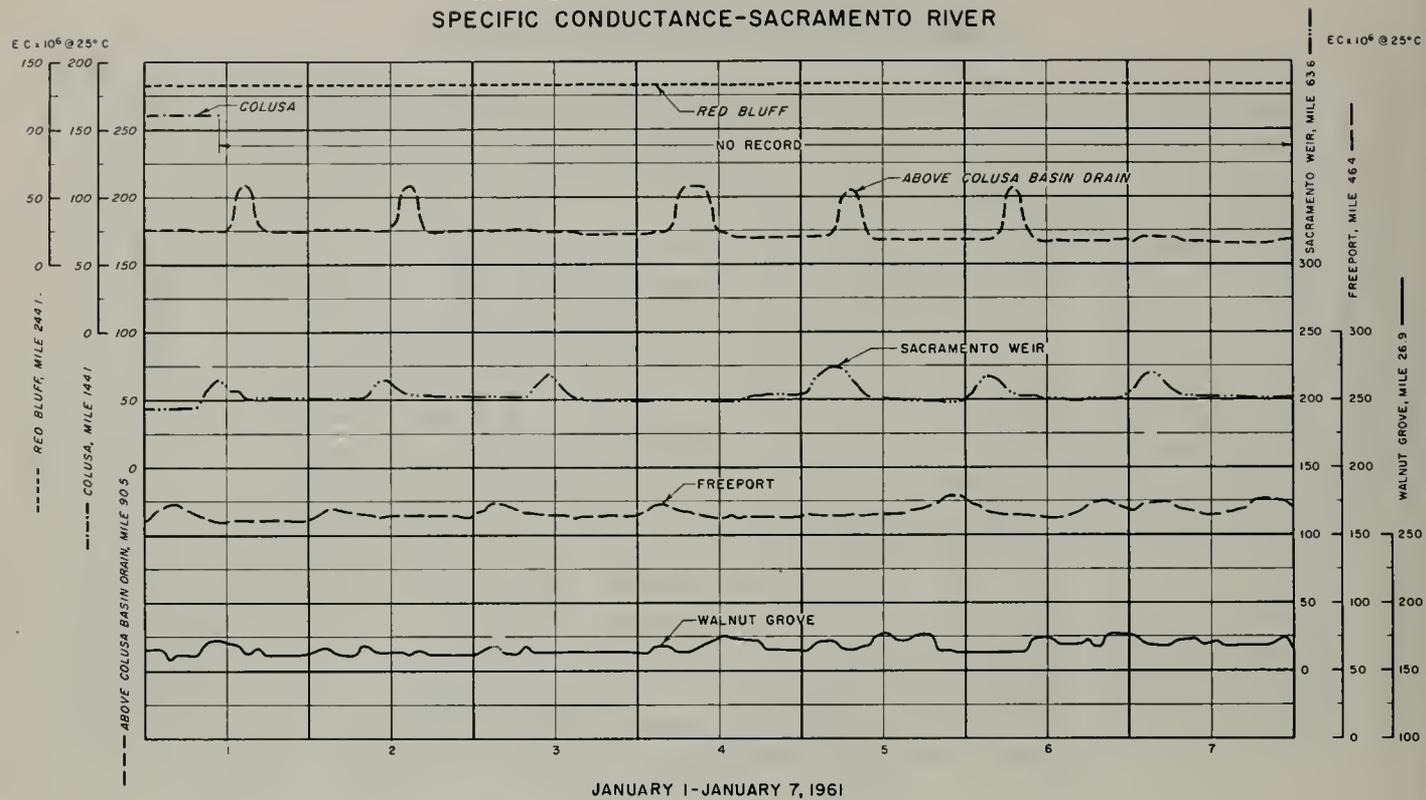


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

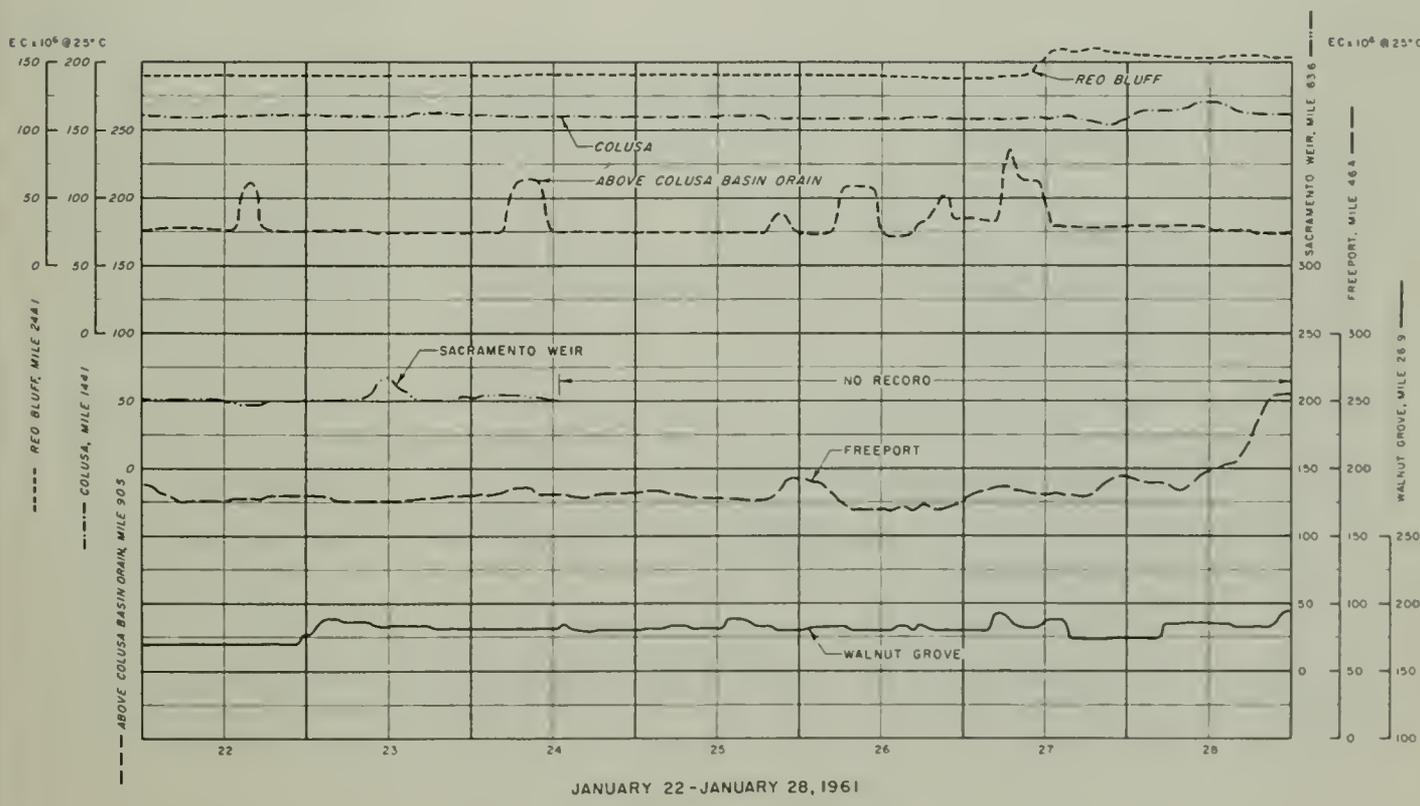
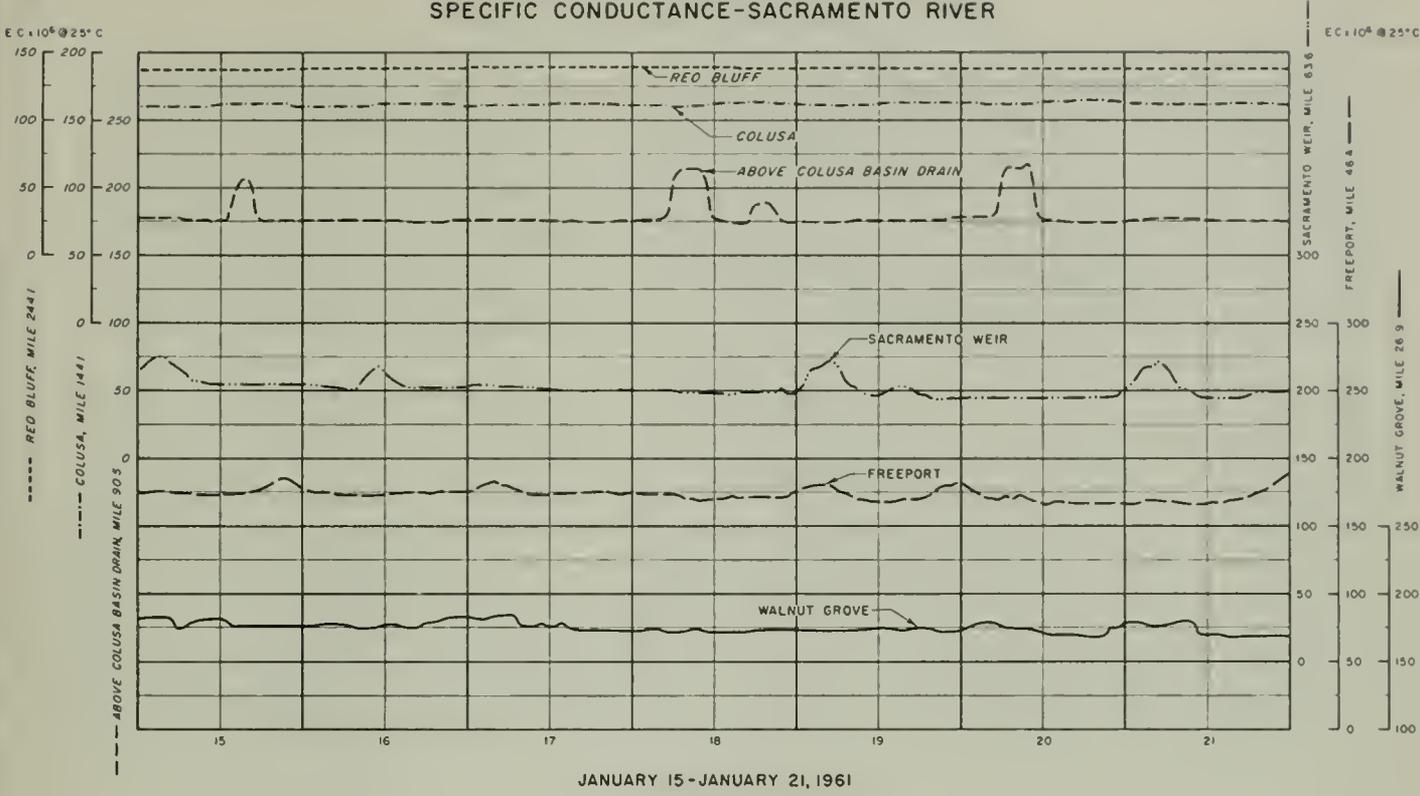




FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

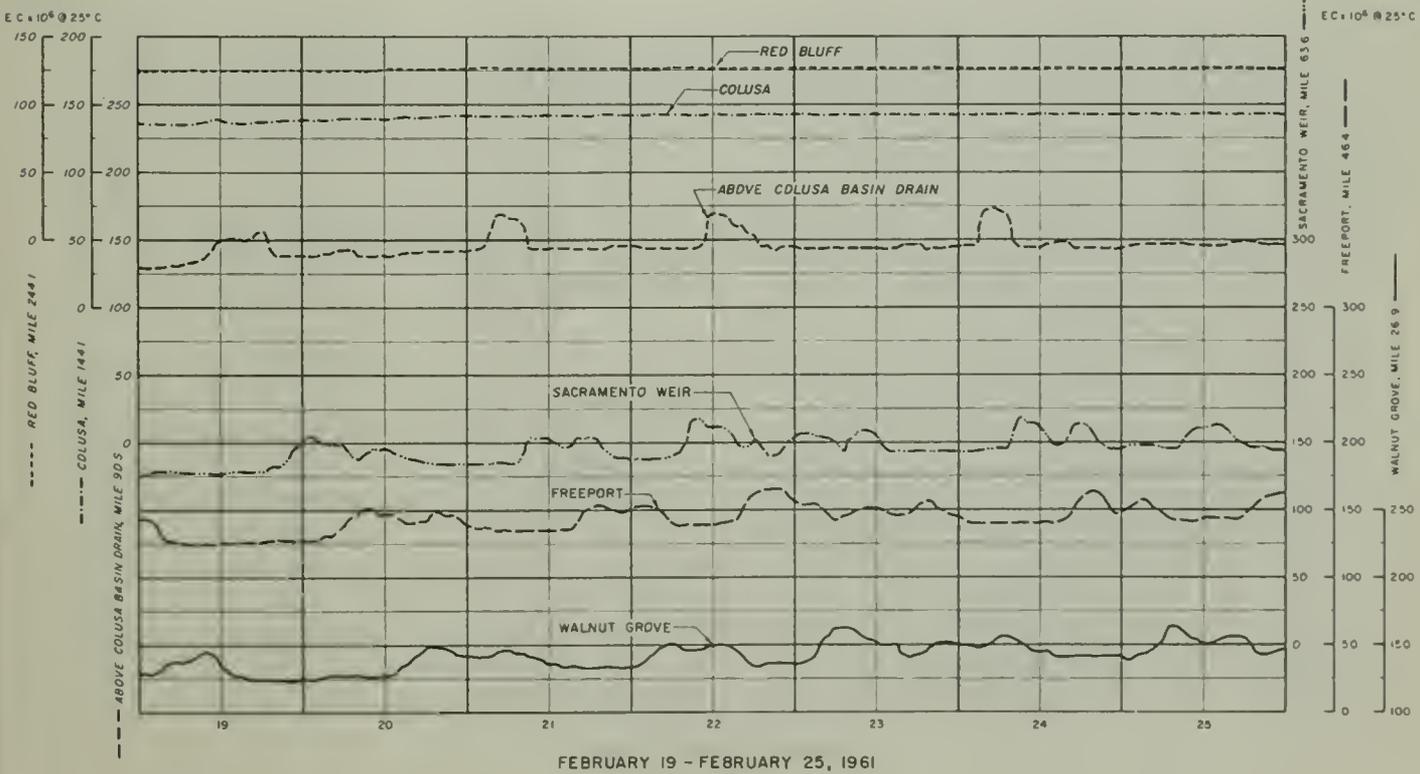
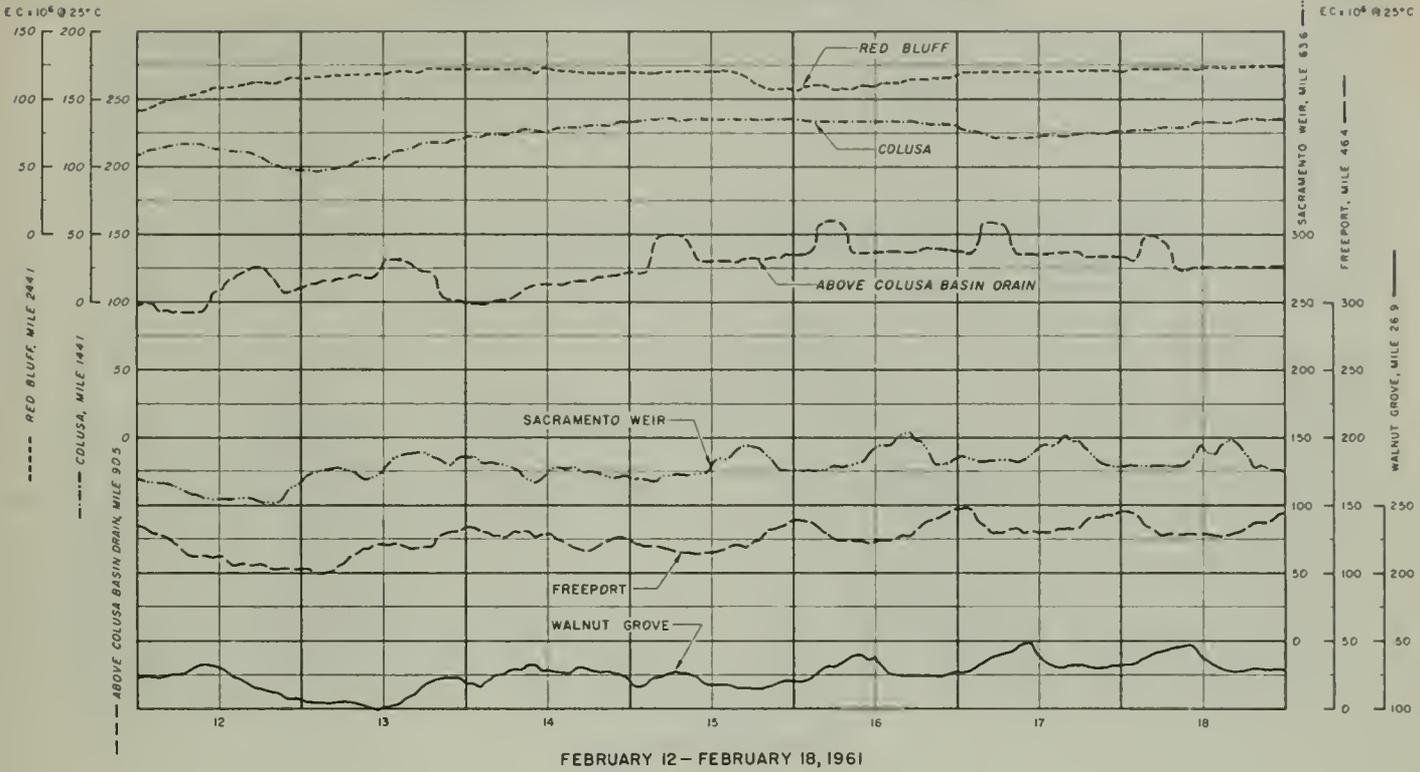


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

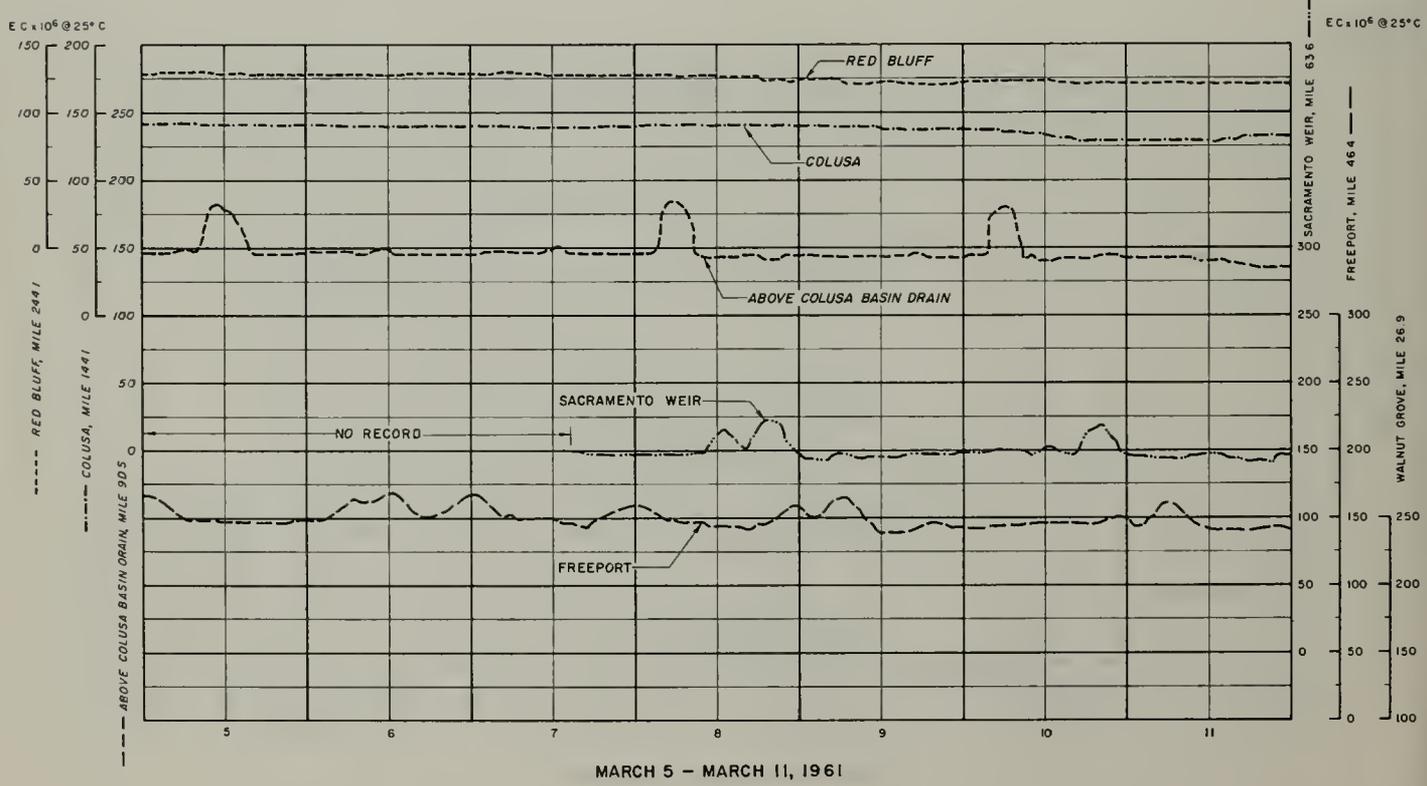
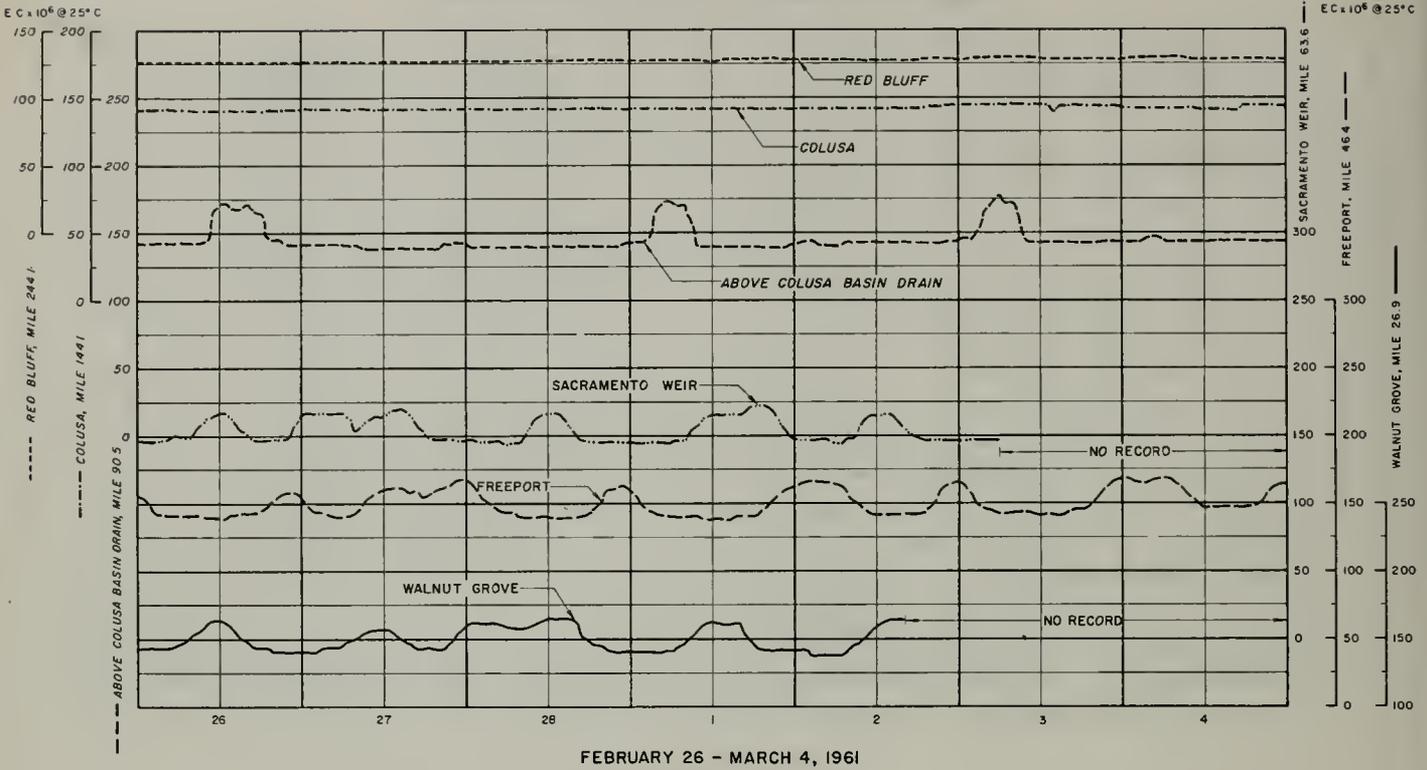


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

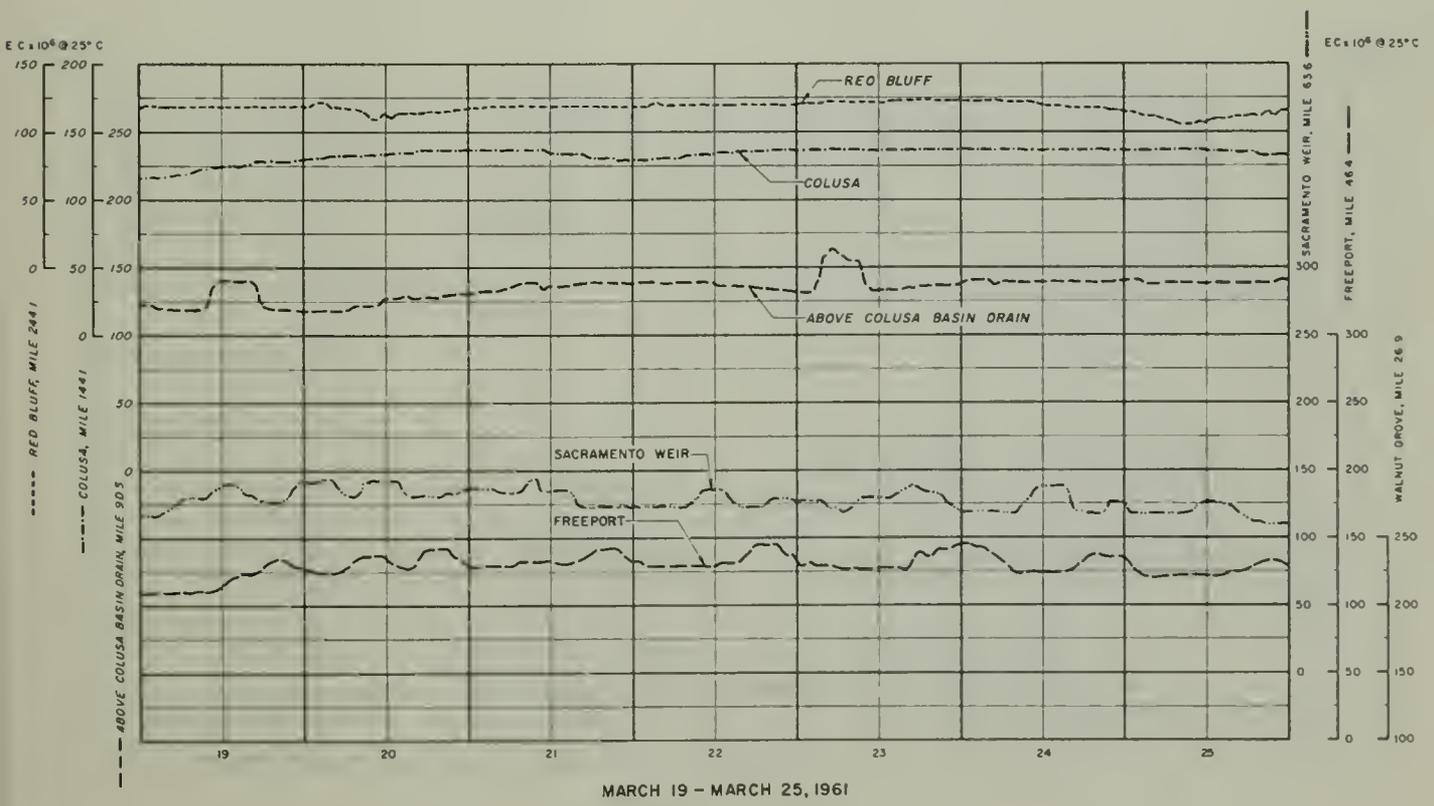
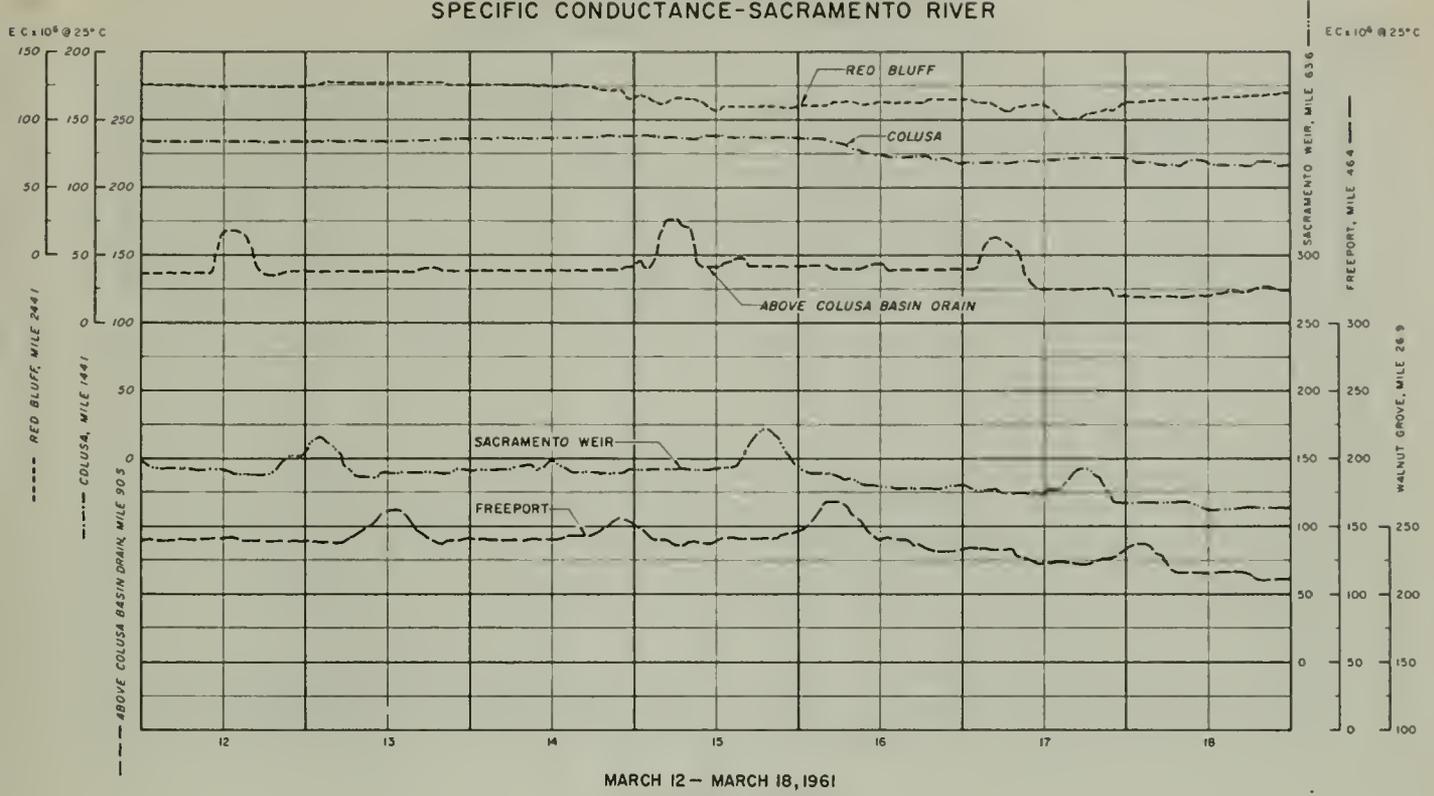


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

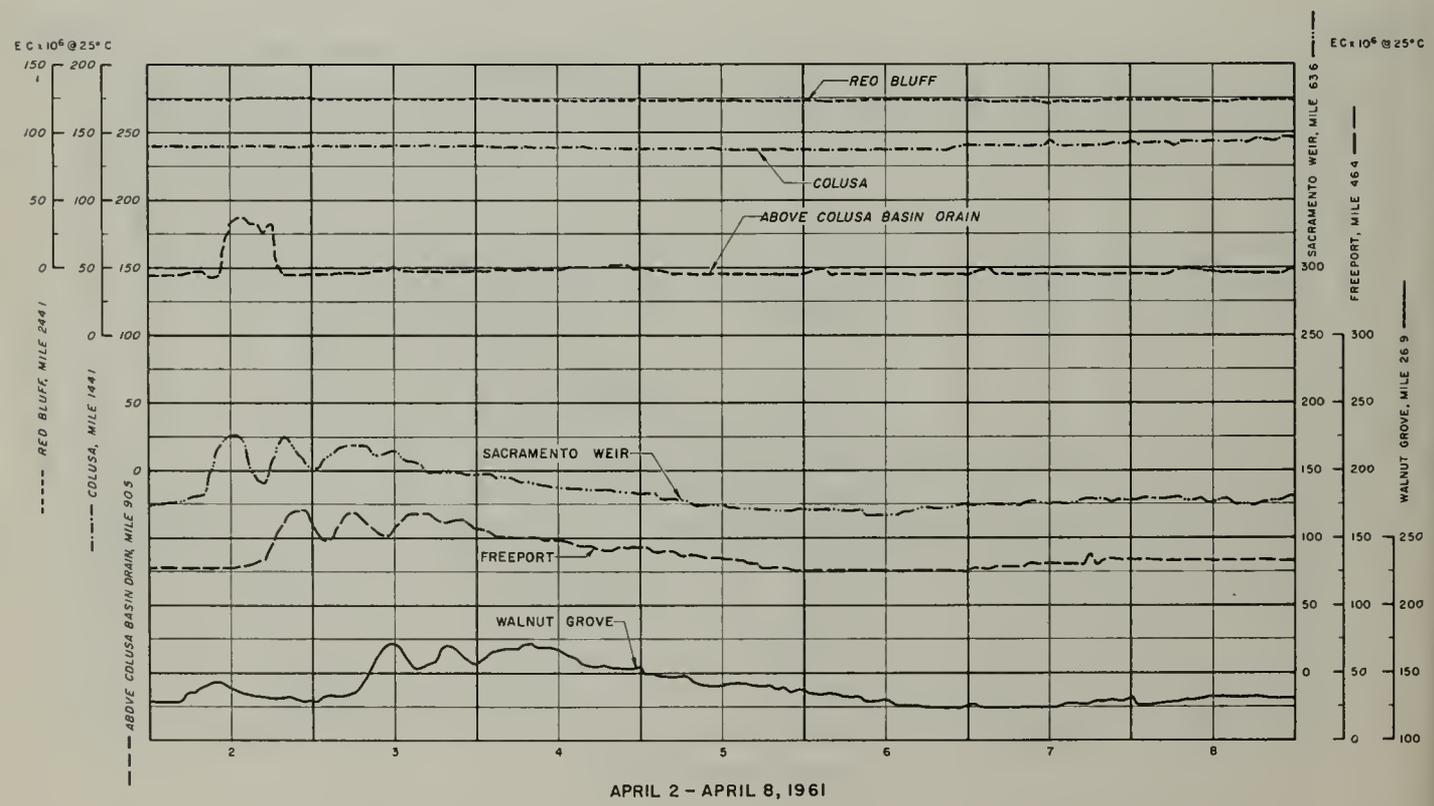
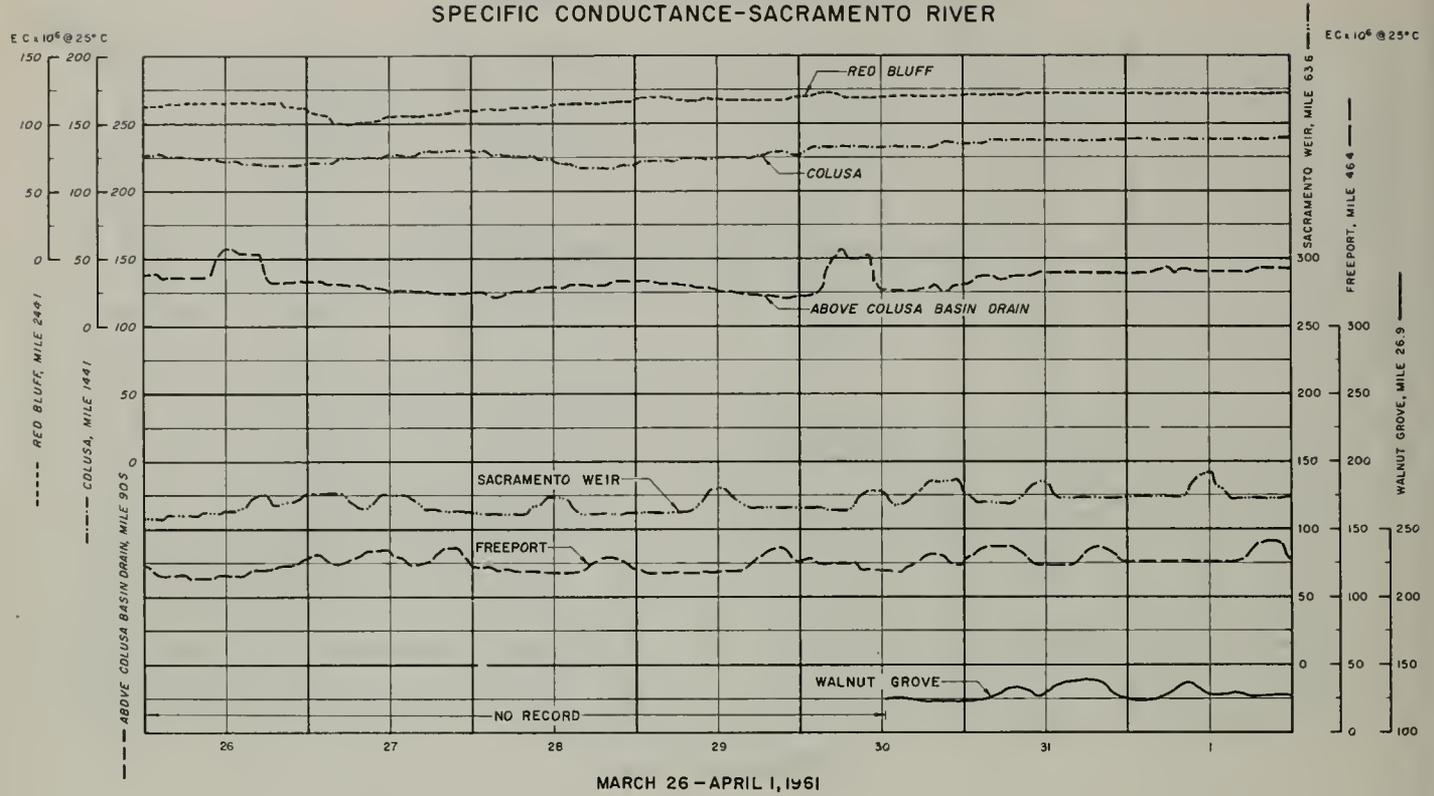


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

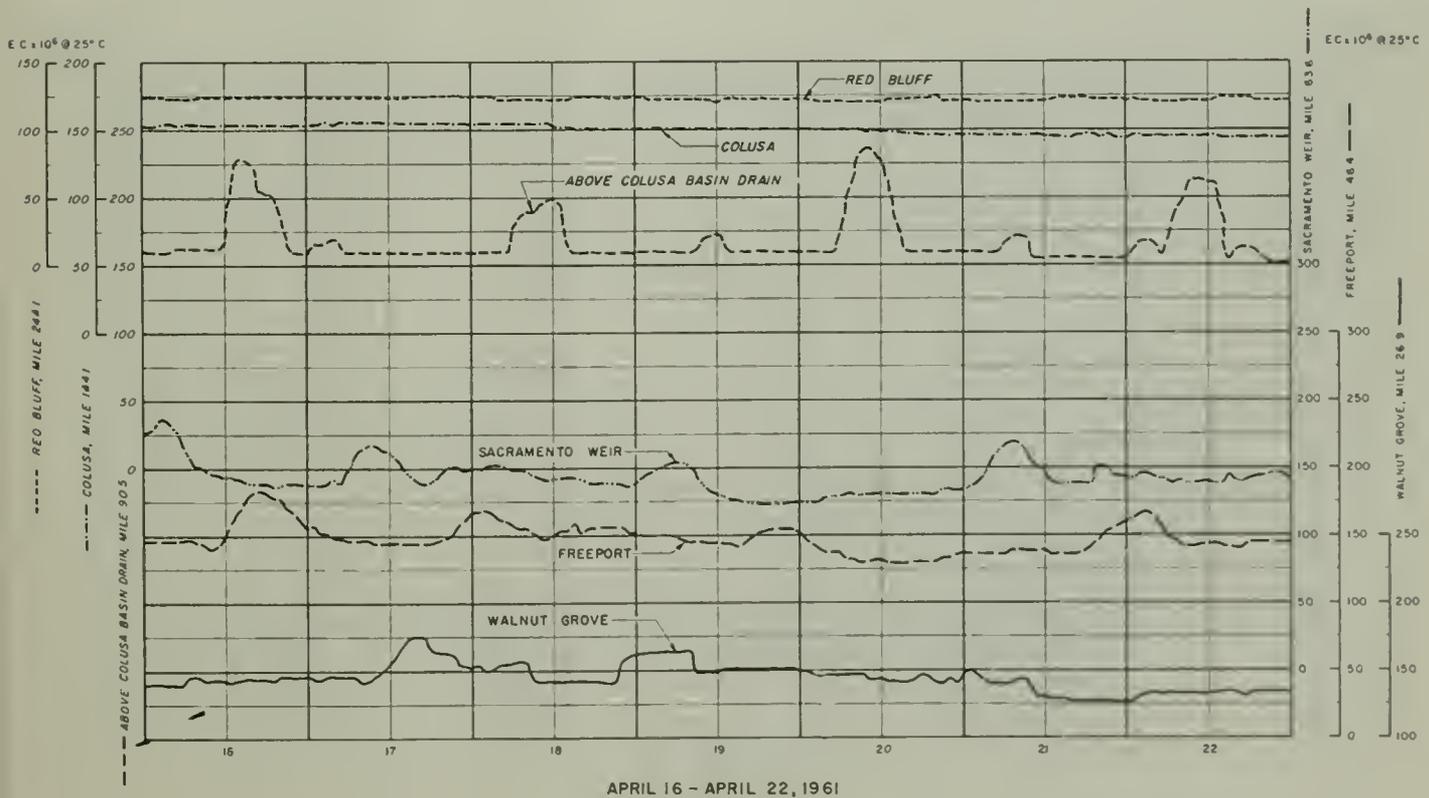
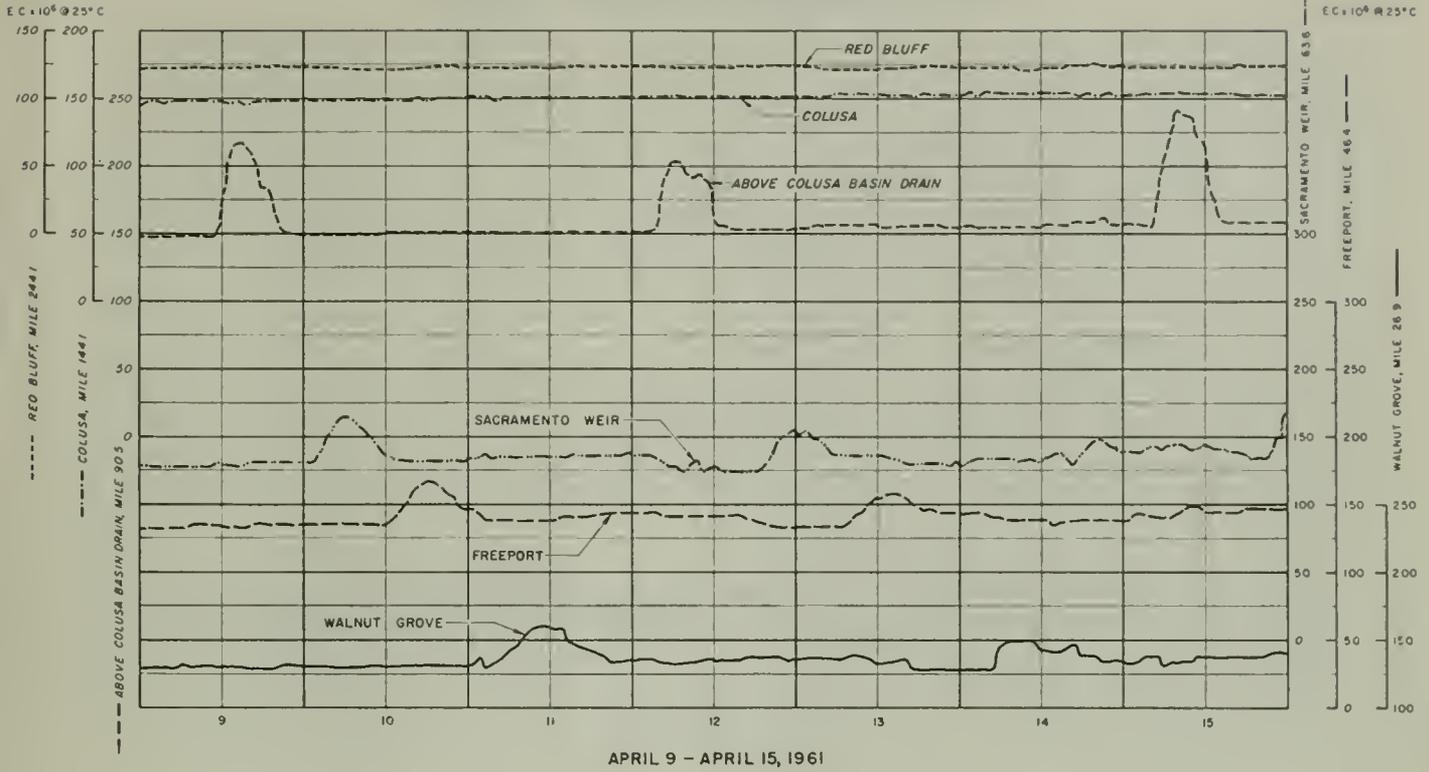


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

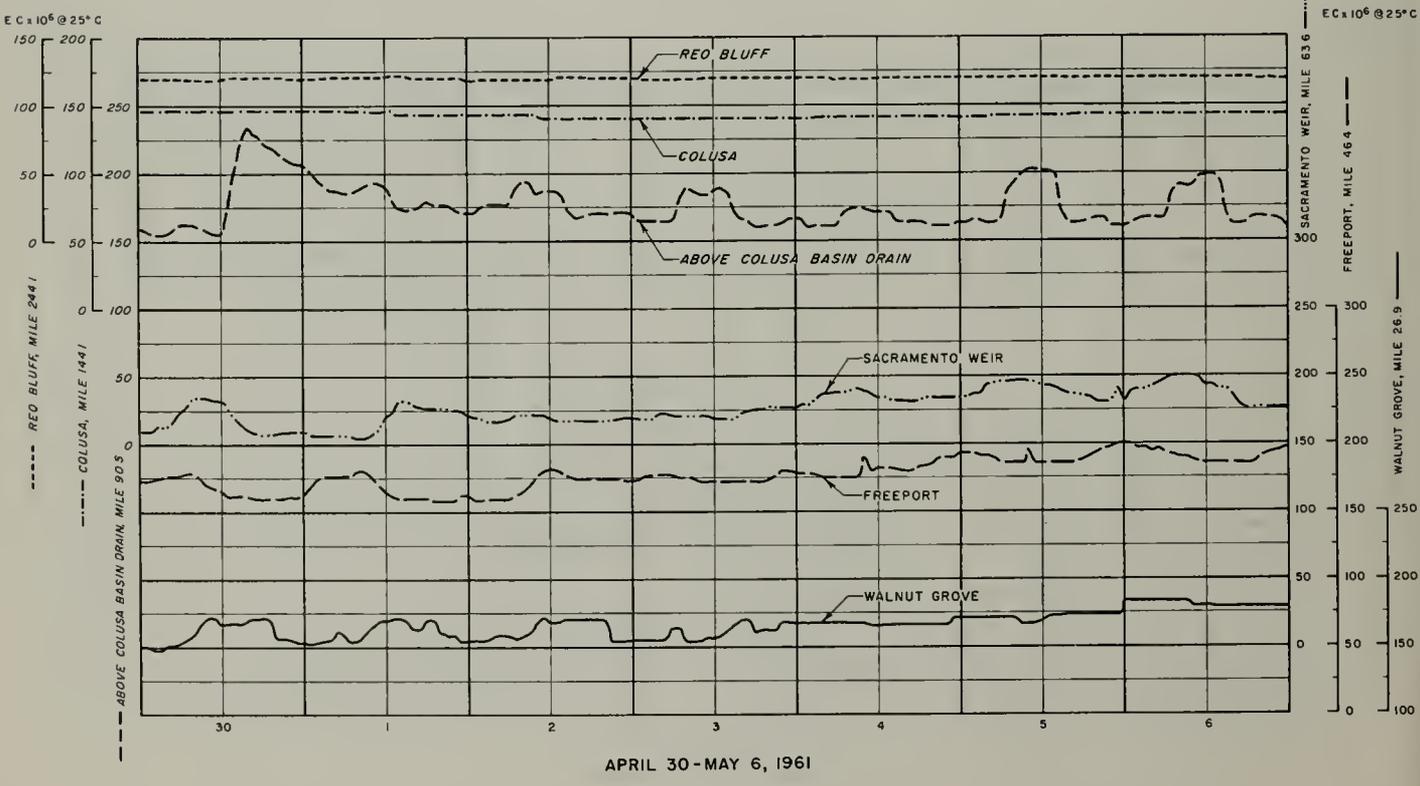
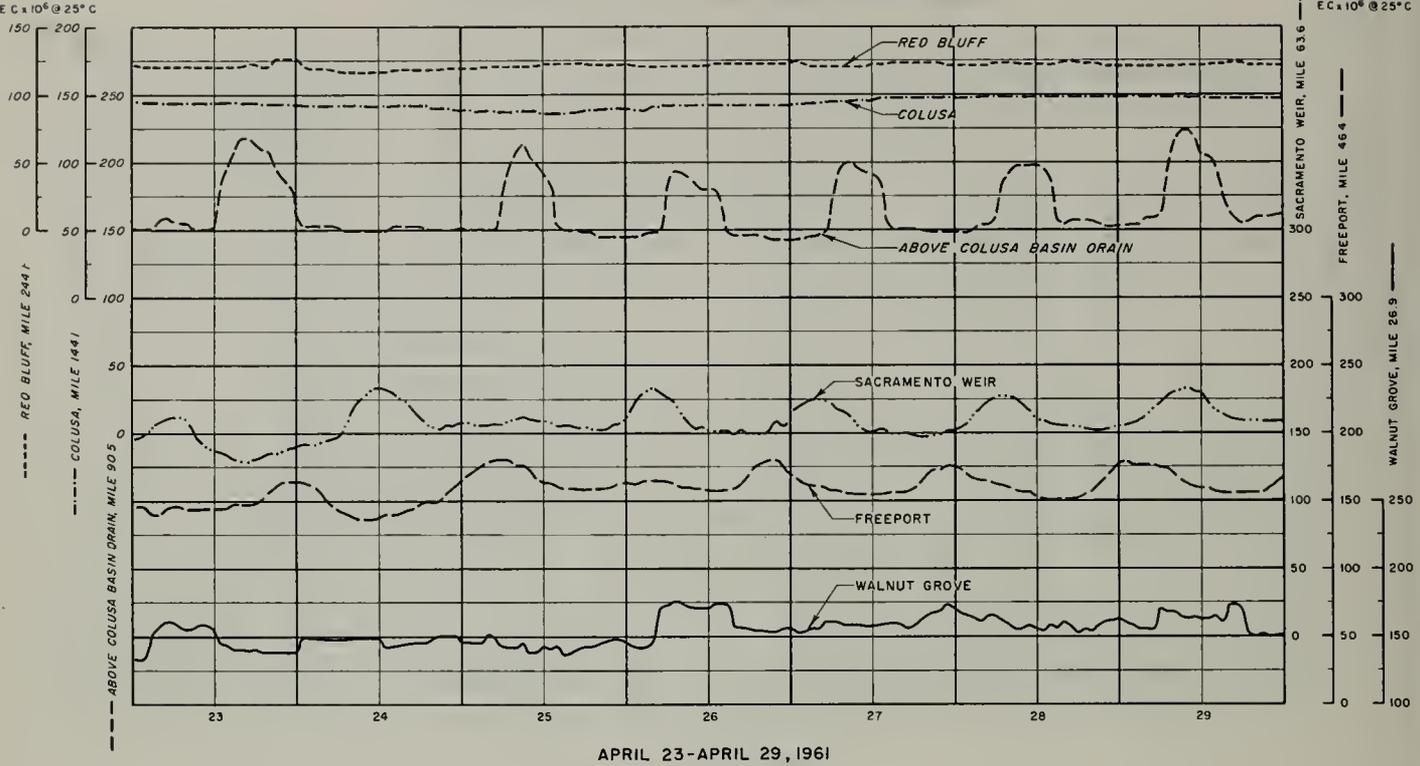


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

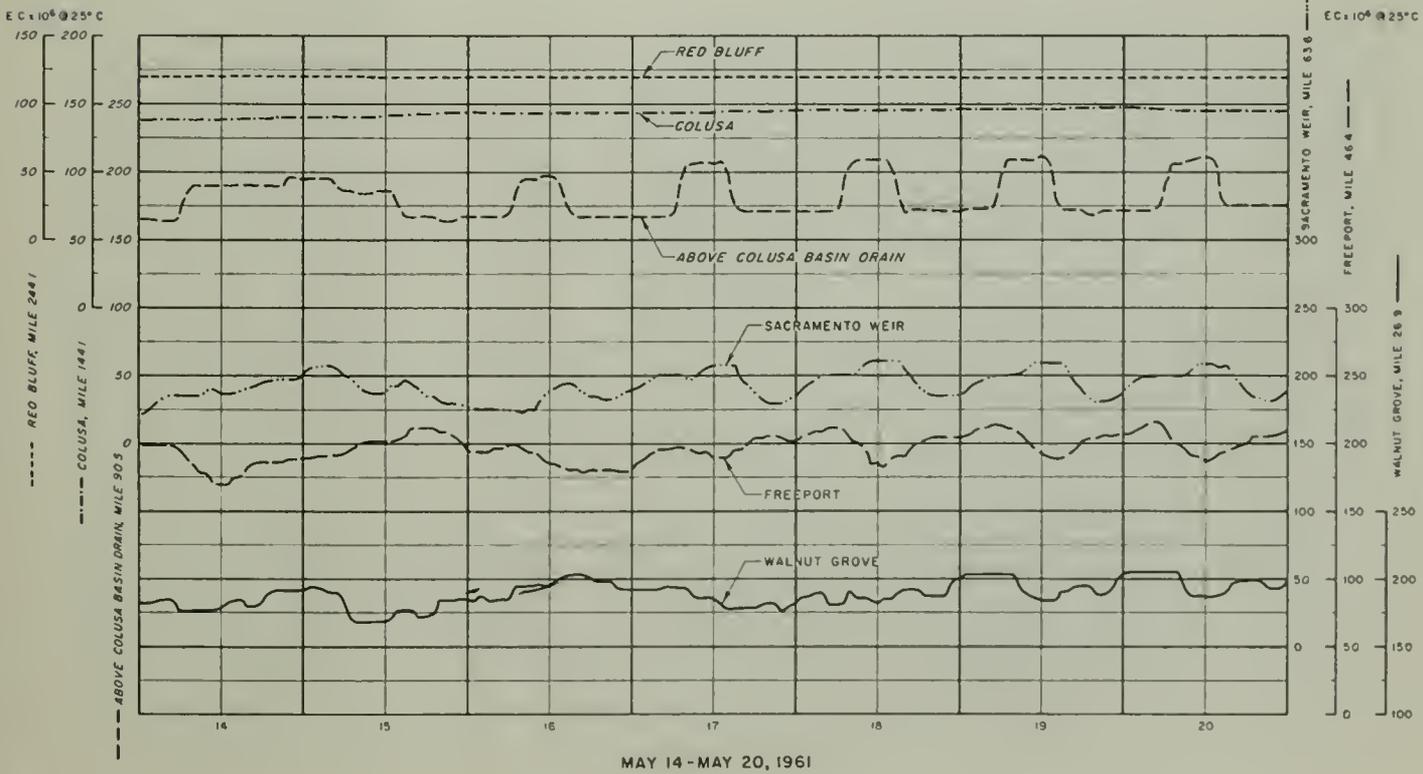
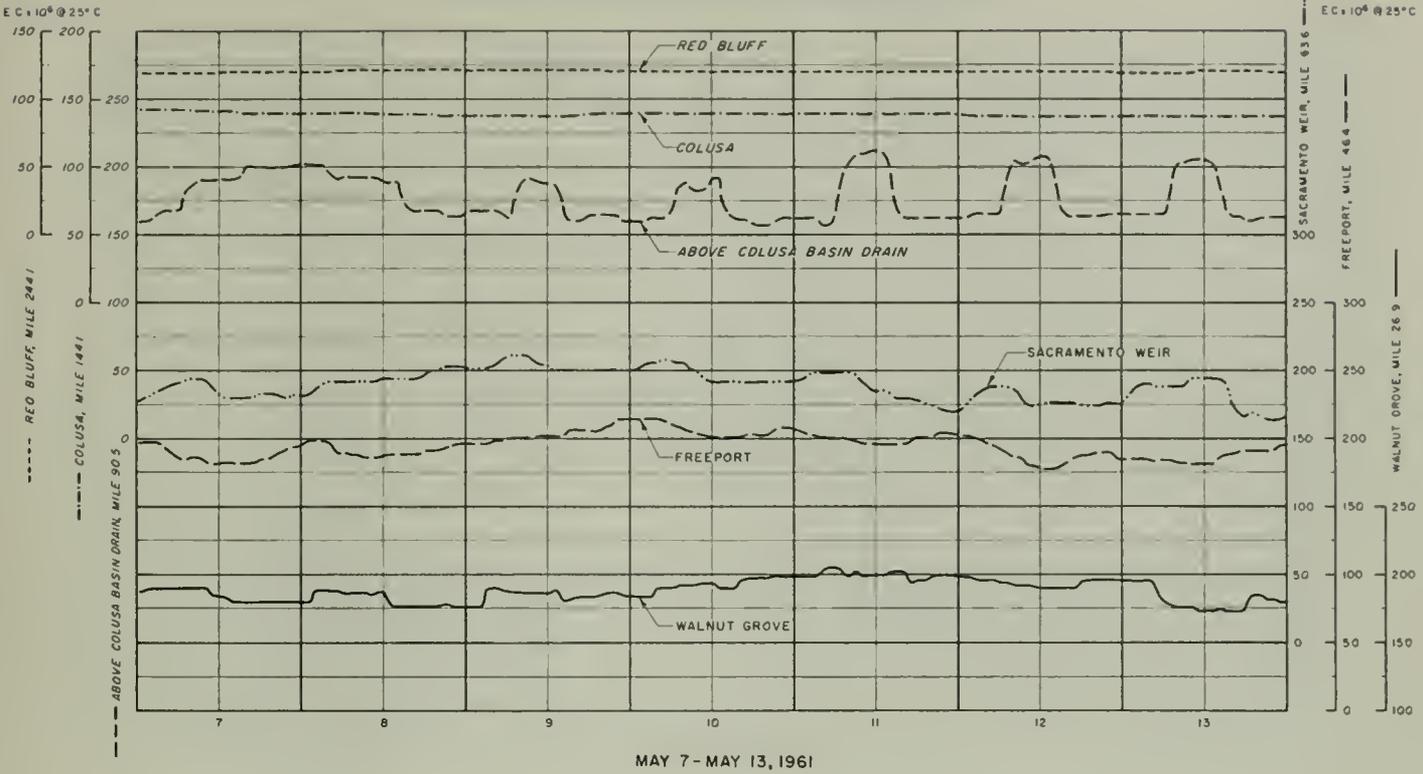


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

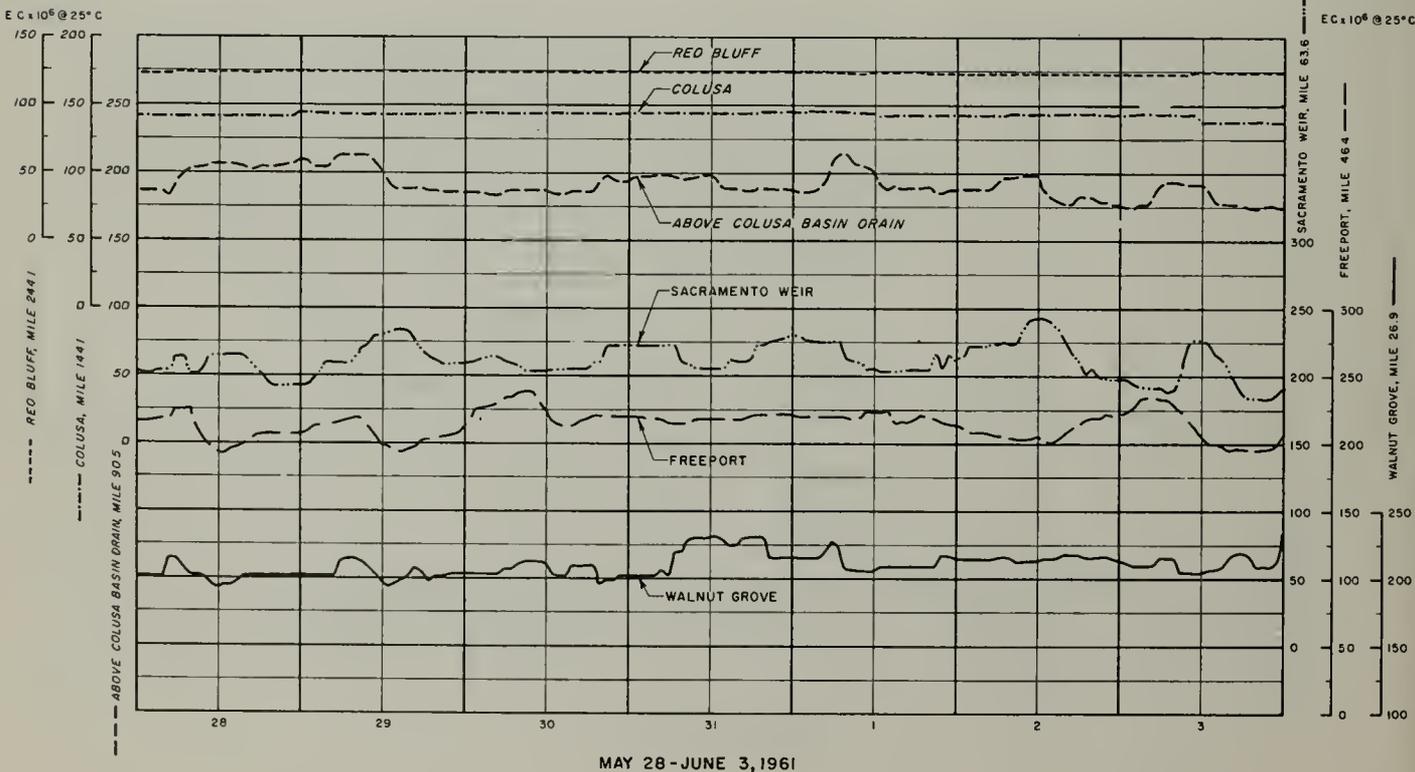
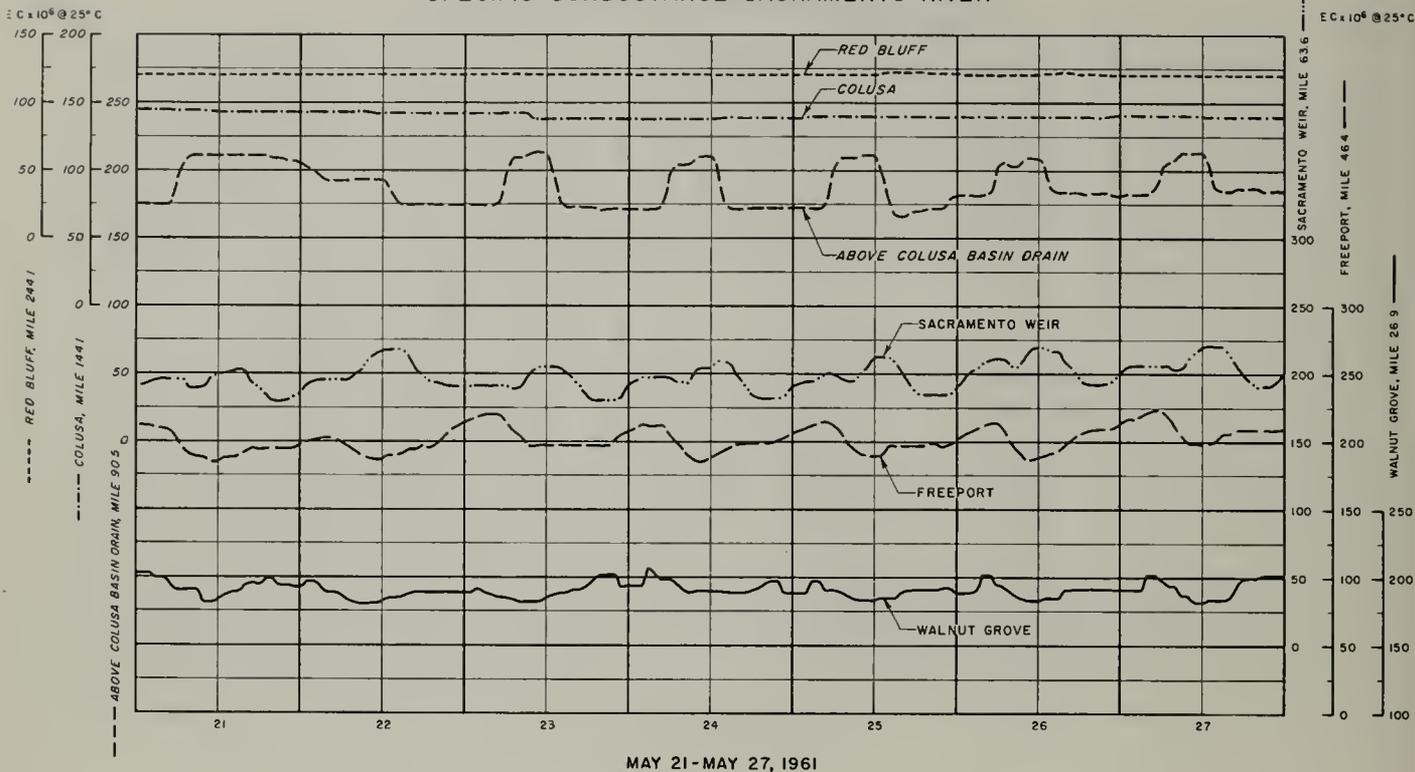


FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER

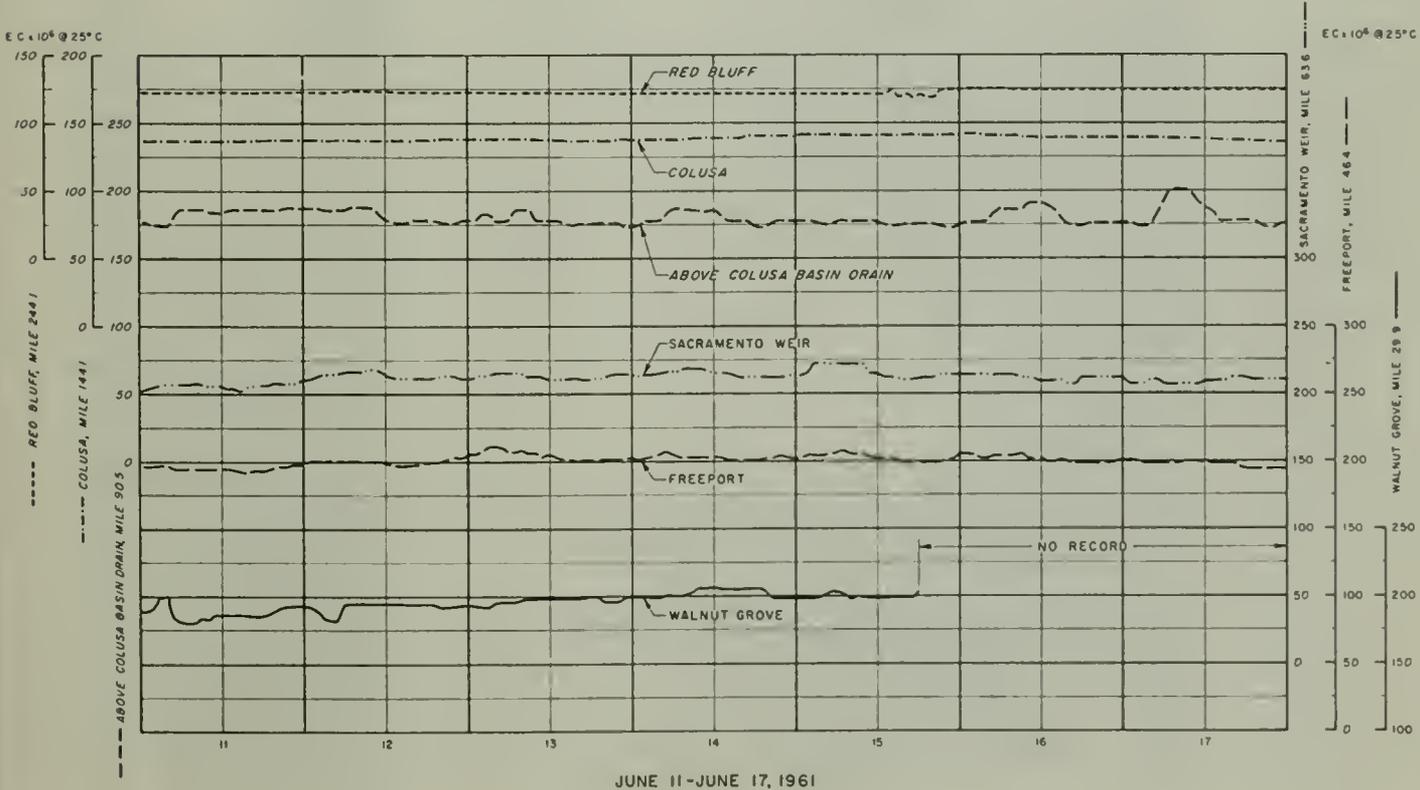
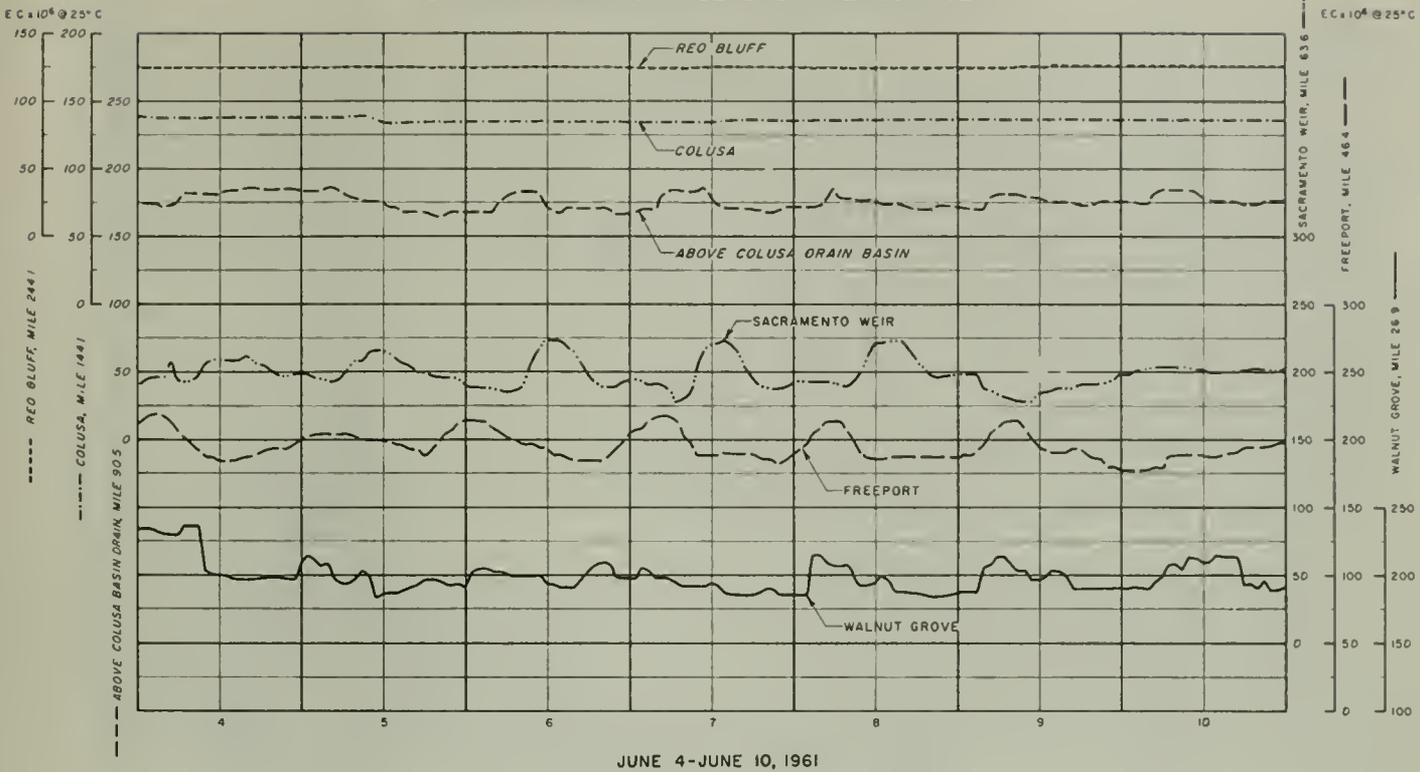
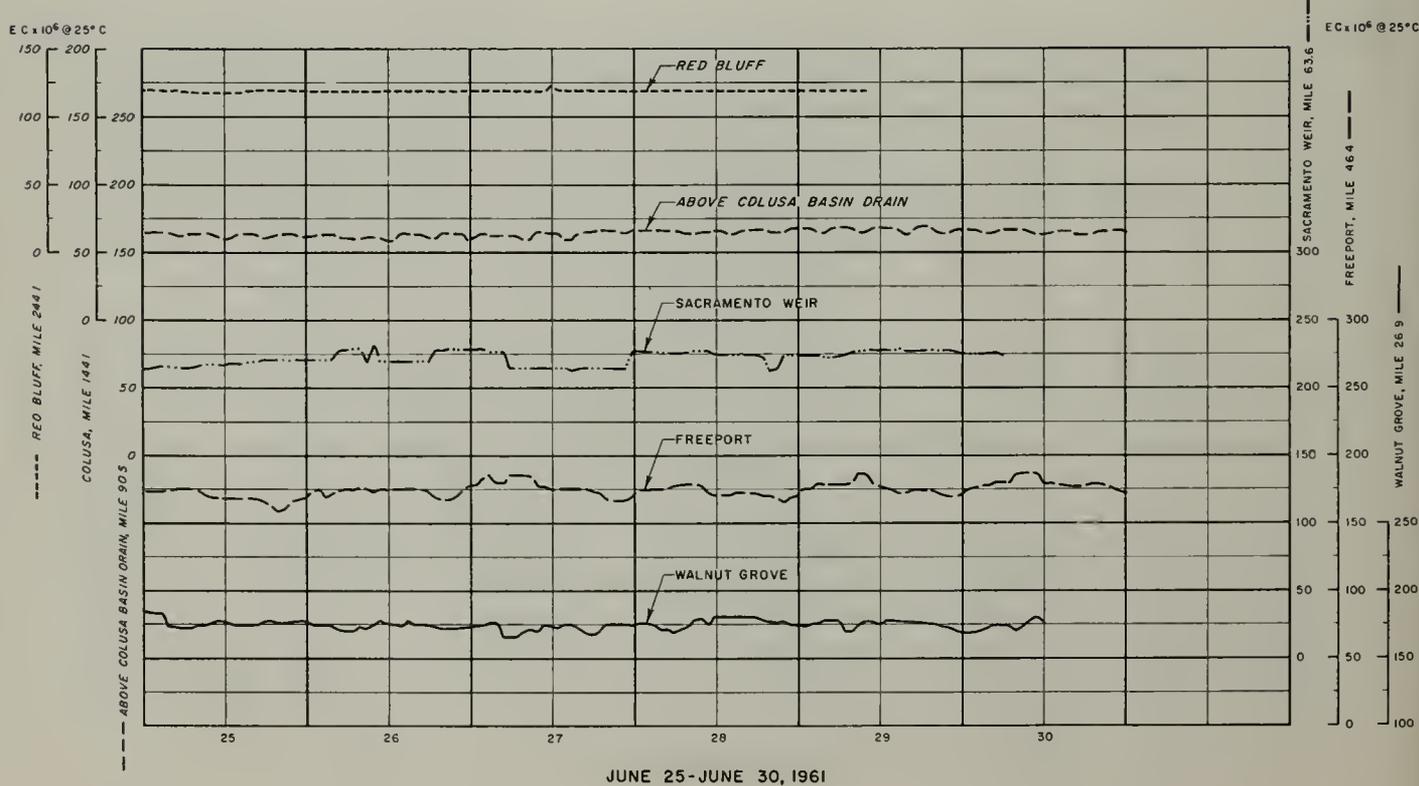
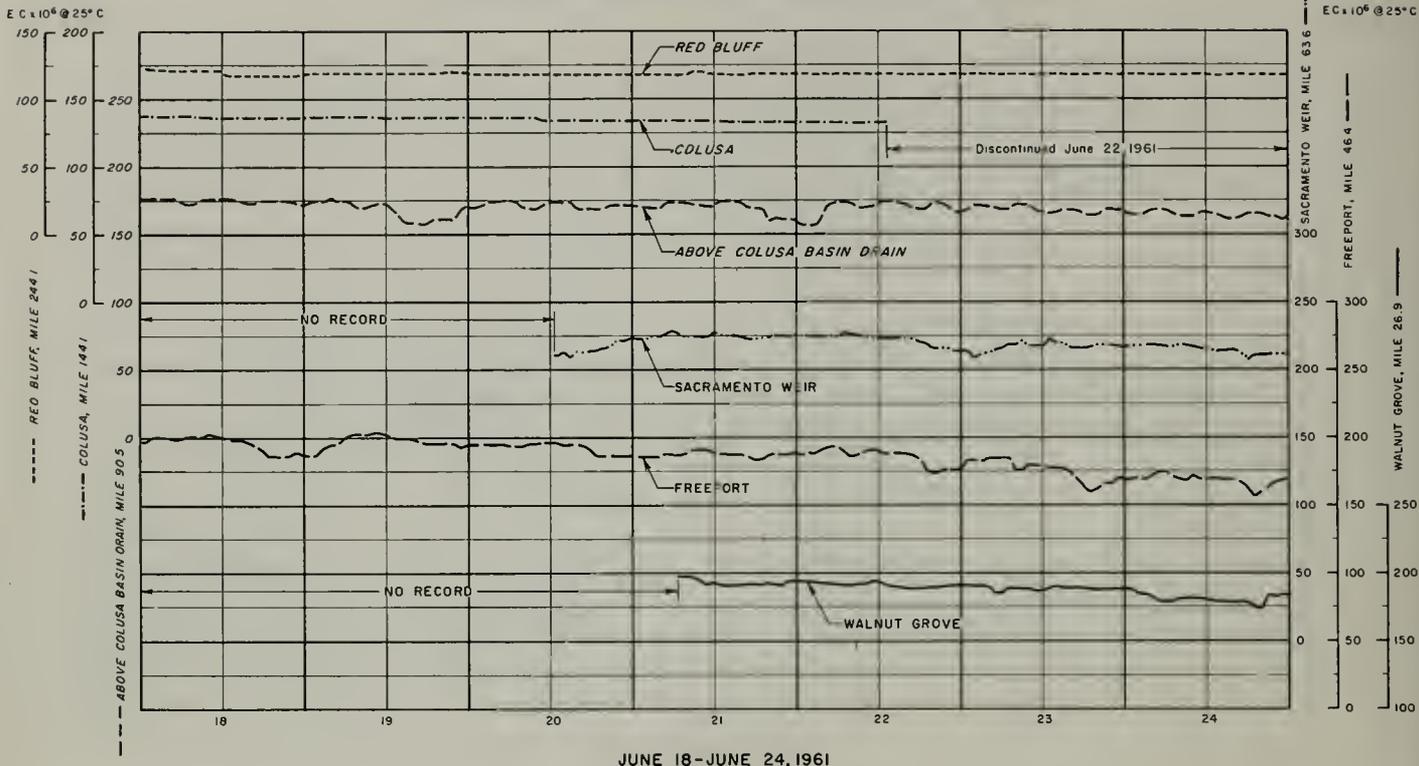
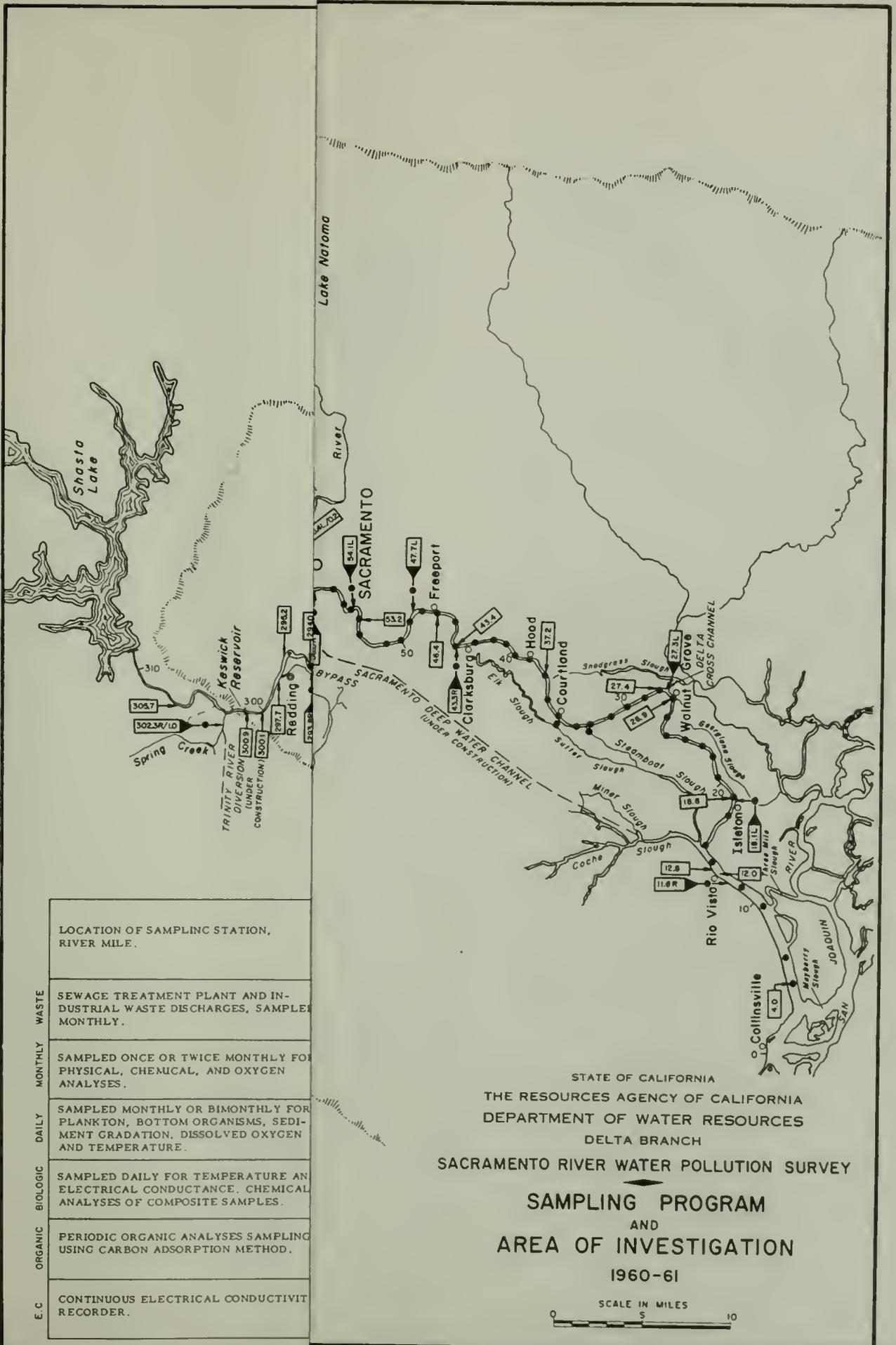


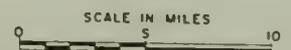
FIGURE T-1 (Continued)  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
 SPECIFIC CONDUCTANCE-SACRAMENTO RIVER





	LOCATION OF SAMPLING STATION, RIVER MILE.
WASTE	SEWAGE TREATMENT PLANT AND INDUSTRIAL WASTE DISCHARGES, SAMPLED MONTHLY.
MONTHLY	SAMPLED ONCE OR TWICE MONTHLY FOR PHYSICAL, CHEMICAL, AND OXYGEN ANALYSES.
DAILY	SAMPLED MONTHLY OR BIMONTHLY FOR PLANKTON, BOTTOM ORGANISMS, SEDIMENT GRADATION, DISSOLVED OXYGEN AND TEMPERATURE.
BIOLOGIC	SAMPLED DAILY FOR TEMPERATURE AND ELECTRICAL CONDUCTANCE. CHEMICAL ANALYSES OF COMPOSITE SAMPLES.
ORGANIC	PERIODIC ORGANIC ANALYSES SAMPLING USING CARBON ADSORPTION METHOD.
E.C.	CONTINUOUS ELECTRICAL CONDUCTIVITY RECORDER.

STATE OF CALIFORNIA  
 THE RESOURCES AGENCY OF CALIFORNIA  
 DEPARTMENT OF WATER RESOURCES  
 DELTA BRANCH  
 SACRAMENTO RIVER WATER POLLUTION SURVEY  
**SAMPLING PROGRAM**  
 AND  
**AREA OF INVESTIGATION**  
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