State of California

THE RESOURCES AGENCY

Department of Water Resources

Northern Branch

QUALITY OF GROUND AND SURFACE WATERS IN THE NORTH COASTAL AREA

Office Report

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INTRODUCTION

In the development of a water supply, the quality of the water is equally as important as the quantity. An abundant supply of water is of no value unless it is either of satisfactory quality or can be economically treated to make it suitable for one or more beneficial uses. Knowledge of the water quality in areas of excess supply together with an evaluation of parameters which determine or affect its quality are therefore important considerations in planning for future water resources development.

Purpose and Scope of Study

The purpose of this study was to determine the present mineral quality of surface and ground waters in the Trinity, Mad-Redwood, and Eel Hydrographic Units and to identify any significant water quality problems which may affect future development of these units. The study was made as a part of the department's Coordinated Statewide Planning Program.

Future developments in these hydrographic units will result in a change in some of the factors which determine present water quality. For this reason, it is not considered feasible to make water quality projections until project planning has reached a stage where operations studies can be undertaken and their effects on water quality evaluated. Data for future salt routing will be obtained after the operation studies have been completed. No attempt has, therefore, been made in this study to forecast mineral quality or to determine incremental degradation due to domestic and industrial uses related to future projects. Based on the findings contained herein, recommendations will be made to the Surface Water Quality Monitoring Program for any modifications in the program which could increase its effectiveness.

Area of Investigation

The Trinity, Mad-Redwood, and Eel Hydrographic Units are located on the western slopes of the coast ranges. The units include portions of Humboldt, Trinity, Mendocino, Lake, and Glenn Counties. Plates 1, 2, 3, and 4 show these hydrographic units and the locations of sampling points used in this study.

The area is mountainous with moderate to rugged topography. Population is sparse except along the ocean in the vicinity of river deltas. Economically, the area is primarily dependent on timber resources. The water-associated redwood environment makes the North Coastal Area highly attractive for recreational purposes, resulting in stimulation of the area's economy.

Heavy rainfall, averaging about 62 inches annually in the Eel Hydrographic Unit, gives the area the asset of abundant water. Periodic damaging floods constitute the most serious water problem. Precipitation is not uniformly distributed in time or in area. Most precipitation occurs in the form of low intensity winter and spring rains. Rainfall during the period from late spring to early fall is only occasional and of small consequence.

The abundance of water, far in excess of local needs, gives the North Coastal Area high priority as a potential source of water to meet the State's increasing water demand.

Chemical Characteristics of Natural Waters

All natural waters in or on the ground contain dissolved minerals. Even raindrops, while falling, absorb minor amounts of chemicals, chiefly carbon dioxide, from the atmosphere. Minerals in soil and rock formations are dissolved by water containing carbon dioxide derived from the atmosphere

and organic acids from the soil, in conjunction with biologic activity. Consequently, the chemical characteristics of surface and ground waters in any particular area are related to the composition of soils and rock formations in that area.

Most of the mineral constituents in water are ionized to form positive ions (cations) and negative ions (anions). In natural waters, the most prevalent cations are calcium, magnesium, and sodium; and the most prevalent anions are bicarbonate, sulfate, and chloride. Waters are classified, with respect to mineral composition, in terms of the predominant ions. Specifically, the name of an ion is used where it constitutes at least half of its ionic group, expressed in equivalents per million. Where no one ion fulfills the requirement, a hyphenated combination of the two most abundant constituents is used. Thus, a calcium bicarbonate type water denotes that calcium constitutes at least half of the cations and bicarbonate represents at least half of the anions. Where calcium, though predominant, is less than half, and sodium is next in abundance, the name is modified to calcium-sodium bicarbonate.

As the mineral pickup by a water is usually governed by the rock formation through which it flows, so also is the quantity of mineral pickup. However, in addition to the kind of formation through which a water flows, the length of time that the water is in contact with the soil or rock formation has a great effect on the quantity of minerals that go into solution. Thus, barring man-made pollution, the mineral quality of a stream is related to the distance of the water from its source, the area of contact with the rock formation, as well as the kind of formation, and the flow characteristics (velocity, turbulence, etc.). Streams in California improve in mineral quality with high flows in the winter and spring and deteriorate in mineral quality with sluggish flows in the summer and fall. (This typical relationship

between flow and quality was found to exist in the North Coastal streams discussed in this study.) One common exception to this pattern is the first freshet of the rainy season. Such a high or flood flow may wash down a large amount of salts that have accumulated during the summer and fall, resulting in temporary impairment of water quality.

Water Quality Criteria

In all activities dealing with observation and measurement of physical data, there must be a yardstick or standard by which the observer, planner, or user can judge or classify the information gathered. With regard to water quality, the problem becomes one of determining whether or not water is suitable for the anticipated use or uses.

Criteria presented in the following sections can be utilized in evaluating mineral quality of water relative to the broad categories of beneficial uses indicated. It should be noted that these criteria are merely guides to the appraisal of water quality. Except for those constituents which are considered toxic to human beings, these criteria are suggested, rather than mandatory, limiting values. Water which exceeds one or more of these limiting values need not be eliminated from consideration as a source of supply, but other sources of better quality water should be investigated.

Criteria for Drinking Water

Criteria for appraising the suitability of drinking water and water supply systems used by carriers and others subject to Federal quarantine regulations have been promulgated by the U. S. Public Health Service. The limiting concentrations of chemical substances in drinking water have been abstracted from these criteria and are shown in the following tabulation. Other organic or mineral substances may be limited if their presence renders the water hazardous for use.

UNITED STATES PUBLIC HEALTH SERVICE
DRINKING WATER STANDARDS
1962

Chemical Substance	Mandatory limit in ppm
Arsenic (As)	0.05
Barium (Ba)	1.0
Cadmium (Cd)	0.01
Chromium (Hexavelent) (Cr^{+6})	0.05
Cyanide	0.2
Lead (Pb)	0.05
Selenium (Se)	0.01
Silver (Ag)	0.05

	Nonmandatory, but recommended limit in ppm
Alkyl Benzene Sulphonate (detergent)	0.5
Arsenic (As)	0.01
Carbon Chloroform Extract	0.2
Chloride (Cl)	250
Copper (Cu)	1.0
Cyanide	0.01
Fluoride (F)	(See page 6)
Iron (Fe)	0.3
Manganese (Mn)	0.05
Nitrate (NO_3)	45
Phenols	0.001
Sulfate (SO_4)	250
Total Dissolved Solids	500
Zinc (Zn)	5

In addition, the United States Public Health Service recently announced limits on concentrations of radioactivity in drinking water, as follows:

Constituents	Recommended maximum limits, micromicrocuries per liter
$Radium^{226}$	3
$Strontium^{90}$	10
Gross beta activity	1,000*

* In the known absence of $strontium^{90}$ and alpha emitters.

Interim standards for certain mineral constituents have 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 the following table are not exceeded.

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

	Permit	Temporary Permit
Total solids	500 (1000)*	1500 ppm
Sulfates (SO_4)	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 water is available in sufficient quantity for use in the system.

The California State Board of Public Health also has defined the maximum safe amounts of fluoride ion in drinking water in relation to mean annual temperature. These relationships are tabulated below.

RELATIONSHIP OF TEMPERATURE TO FLUORIDE CONCENTRATION IN DRINKING WATER

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

Criteria for Irrigation Water

Criteria for mineral quality of irrigation water have been developed by the United States Regional Salinity Laboratory in cooperation with the University of California. Because of

diverse climatological conditions and the variation in crops and soils in California, only general limits of quality for irrigation waters can be suggested. The department uses three broad classifications of irrigation waters as listed below.

Class 1 - Regarded as safe and suitable for most plants under most conditions of soil and climate.

Class 2 - Regarded as possibly harmful for certain crops under certain conditions of soil or climate, particularly in the higher ranges of this class.

Class 3 - Regarded as probably harmful to most crops and unsatisfactory for all but the most tolerant.

Limiting concentrations of chemical constituents in irrigation water as classified above are shown in the following tabulation.

QUALITATIVE CLASSIFICATION OF IRRIGATION WATER

Chemical properties	Class 1 Excellent to good	Class 2 Good to injurious	Class 3 Injurious to unsatisfactory
Total dissolved solids, in ppm	Less than 700	700 - 2000	More than 2000
Conductance, in Micromhos at 25°C	Less than 1000	1000 - 3000	More than 3000
Chlorides, 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

These criteria have limitations in actual practice. In many instances, water of a given quality may be wholly unsuitable for irrigation under certain conditions of use, and yet be completely satisfactory under

other circumstances. Soil permeability, drainage, temperature, humidity, rainfall, and other conditions can alter the response of a crop to a particular quality of water.

Criteria for Industrial Uses

Water quality criteria for industrial water 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 the use of poor quality water. In general, where a water supply meets drinking water standards, it is satisfactory for many industrial uses; either directly or following a limited amount of polishing treatment by the industry.

Hardness

Even though hardness in water is not included in the foregoing criteria, it is important in domestic and industrial uses. Excessive hardness in water used for domestic purposes causes increased consumption of soap and formation of scale in pipe and fixtures. Values for degrees of hardness which are used in this report are shown in the following tabulation:

HARDNESS CLASSIFICATION

Range of hardness, expressed as $CaCO_3$ in ppm	Relative classification
0 - 100	Soft
101 - 200	Moderately hard
Greater than 200	Hard

PRESENT WATER QUALITY CONDITIONS

Following is a discussion of the mineral quality of surface and ground waters in each of the aforementioned hydrographic units. Mineral analyses of surface and ground waters are listed in Appendix A and B to this report, respectively. A summary by hydrographic subunit of significant water quality characteristics is tabulated in Appendix C.

Surface Water Quality in Trinity River Hydrographic Unit

Headwaters of the Trinity River rise in the rugged terrain of the Scott Mountains, 20 miles west of Mt. Shasta. From this source, the river flows southerly between the Trinity Alps and the Trinity Mountains to the recently completed Trinity and Lewiston Reservoirs and passes the town of Lewiston where a monthly stream sampling monitoring station is maintained. Length of this reach of the Trinity River from its source to Lewiston is approximately 50 miles. In this reach of the Trinity River, water in the main stem and its tributaries flows mostly across an ultrabasic rock formation partially altered to serpentine and rich in magnesium. There are also several other significant rock types within this drainage area including granitics, shales, sandstones, conglomerate, tuffs, and agglomerate. Analyses of water collected at the Lewiston station over the past 12 years have shown it to be consistently magnesium bicarbonate in mineral character.

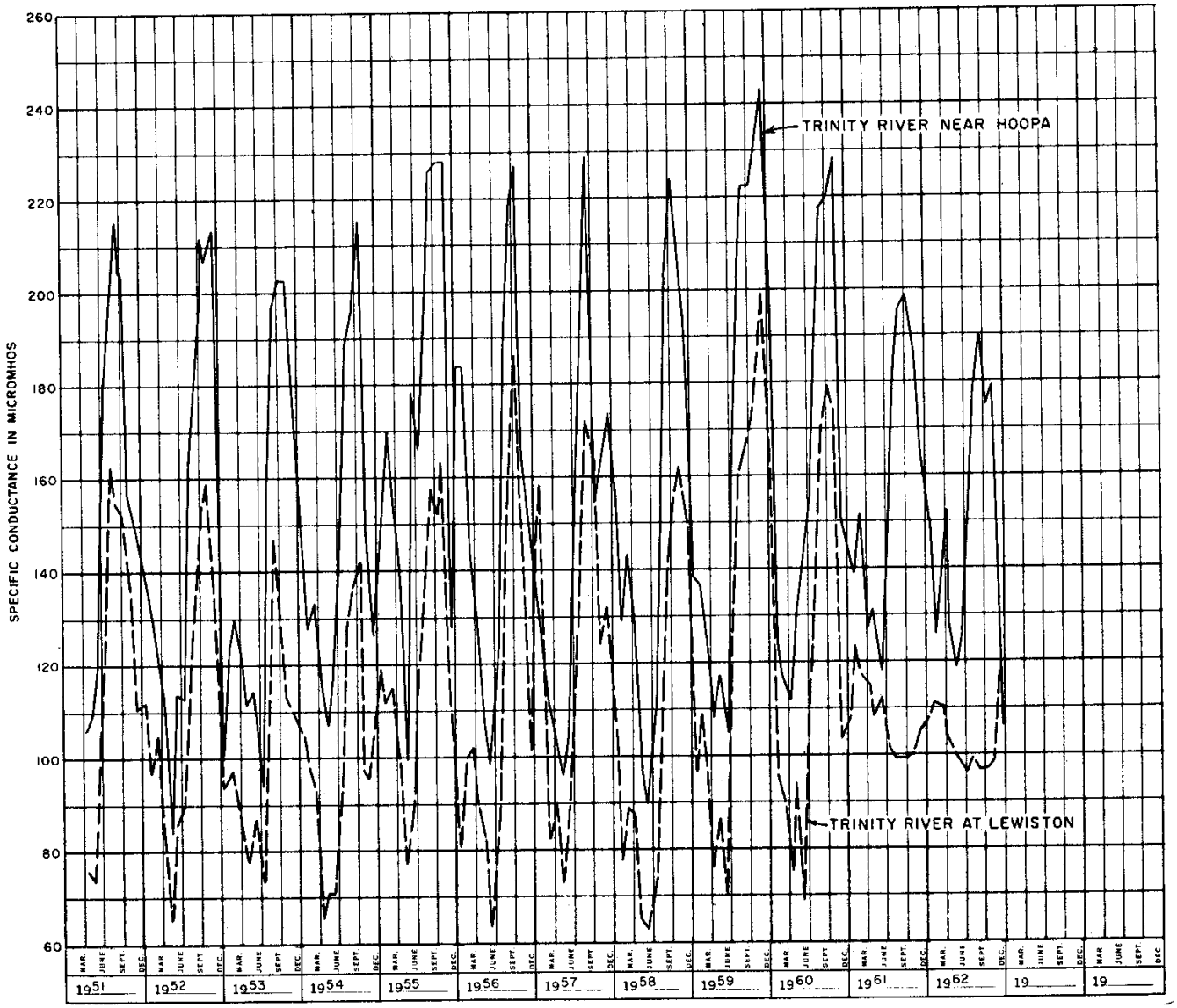
From Lewiston, the Trinity River flows westerly approximately 40 miles to Burnt Ranch where the second monthly monitoring station has been maintained since 1958. Tributaries to this reach of the river flow across metamorphic rocks (schist and meta-volcanics) with some granite and small

patches of softer sedimentary rocks. These formations put into solution calcium primarily with much lesser amounts of sodium and magnesium. Thus, by the time the magnesium bicarbonate water at Lewiston reaches the vicinity of Burnt Ranch, it has been altered in character to a calcium-magnesium bicarbonate type water.

Near Salyer a short distance downstream from Burnt Ranch, the main stem is joined by the South Fork Trinity River. It then flows northerly through the Hoopa Valley to Weitchpec where it discharges into the Klamath River. The most downstream permanent monitoring station on the Trinity River is located near Hoopa where a monthly sampling has been made since 1951. Drainage from Burnt Ranch to Hoopa, including the large tributary areas of Hayfork Creek and the South Fork, flows over rock formations similar to those between Lewiston and Burnt Ranch, resulting in a proportionately greater pickup of calcium than magnesium by the water. An average of analyses of water from the Hoopa station shows it to be calcium bicarbonate in type, since calcium constitutes more than 50 percent of the total cations. Thus, dilution by a water whose predominant cation is calcium causes the magnesium bicarbonate type water at Lewiston to be altered to a calcium-magnesium bicarbonate type by the time it reaches Burnt Ranch, and to a calcium bicarbonate type water when it arrives at Hoopa.

Trinity River water shows a typical seasonal fluctuation in quality. Figure 1 depicts the range in mineral quality (as evidenced by specific conductance) of grab samples collected monthly over a 12-year period from the Trinity River at Lewiston and Hoopa stations. This shows at Lewiston a low of 63 and a high of 198 micromhos, and at Hoopa a low

FIGURE I



SEASONAL FLUCTUATIONS IN WATER QUALITY OF
TRINITY RIVER AT HOOPA AND NEAR LEWISTON

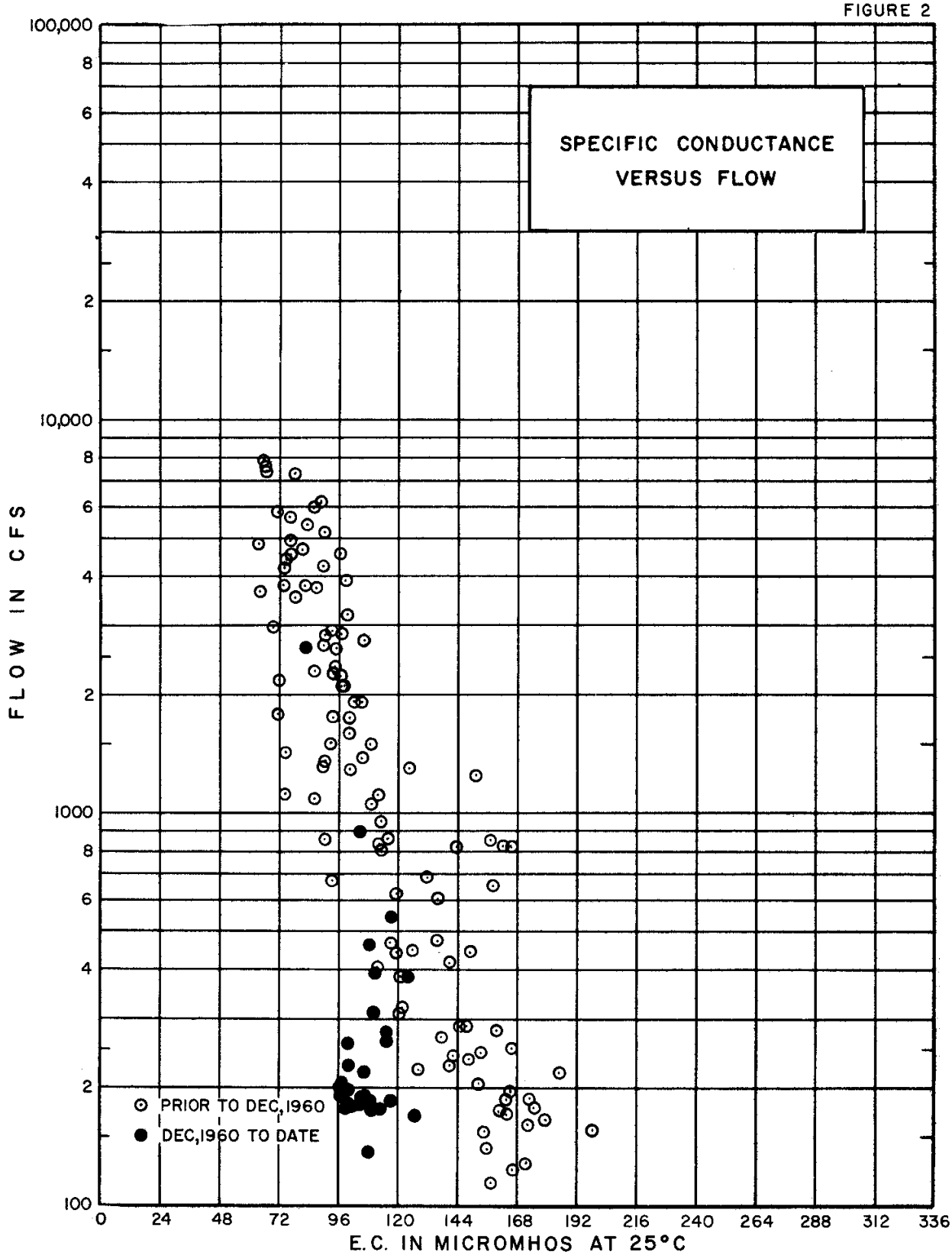
of 90 and a high of 243 micromhos. It also shows that construction of the Trinity Dam and Reservoir had a striking effect in reducing the amplitude of the fluctuations, especially at Lewiston, after the reservoir began operating in November 1960.

Figures 2, 3, and 4 show the relationship between specific conductance and flow at stream water monitoring stations located at Lewiston, Burnt Ranch, and Hoopa, respectively. In a natural stream, specific conductance is typically inversely proportional to flow. This typical relationship is well defined at each of these stations.

The change in water quality due to the construction of Trinity Dam and Reservoir is further illustrated in Figure 2 by plots of data obtained from samples collected at Lewiston from November 1960 through 1962. Much of the data obtained subsequent to November 1960 reflects a period when the reservoir was filling so that the results shown in Figure 2 may be expected to be further modified following stabilization of the reservoir and the establishment of a normal operating pattern for the dam. The water quality effect of Trinity Dam and Reservoir will be to increase the mineral concentration of the Trinity River over what it formerly was during high flow periods and to improve the mineral quality during what was formerly low flow periods. This effect is reflected in Figure 2 by an increase in the slope of the specific conductivity verses flow curve, with the conductivity values being grouped into a rather narrow band showing a more constant quality over the year. As was previously indicated, this same effect is shown by the reductions in the amplitude of fluctuations in Figure 1.

The net future change in the average annual quality of the Trinity River due to the Trinity Dam and Reservoir is not clear at this time. Samples

FIGURE 2



TRINITY RIVER AT LEWISTON (4a)
APRIL, 1951 – JUNE, 1963

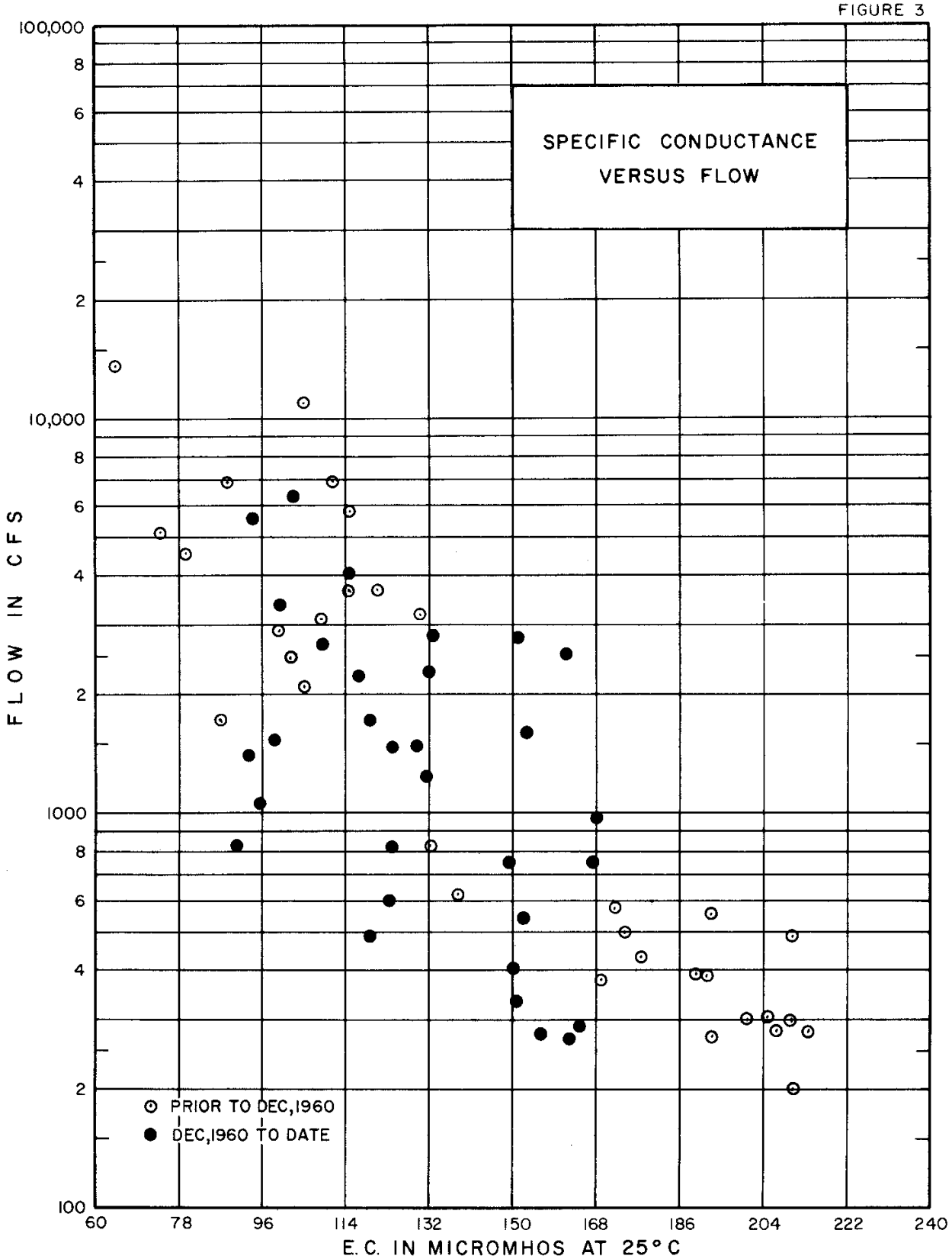
collected at Lewiston have shown a deterioration in mineral quality over that obtained during what was formerly high flow periods prior to the dams construction. This is to be expected as was indicated above; however, the level of deterioration may be lowered with time. Certainly one cause of the deterioration is the increased area and time of contact of the stored water in the reservoir with soil and rock formations. This effect may become less pronounced since virgin land probably is leached of much of its readily soluble mineral content during the first few years of inundation.

Data collected within the next few years, following stabilization of the reservoir and the establishment of a normal operating pattern for the dam, may be expected to more clearly define the reservoir's effect on the average annual quality of the Trinity River.

The specific conductivity versus flow curves, as indicated on Figures 3 and 4 at Burnt Ranch and Hoopa, do not show as pronounced a shift following November 1960 as is shown at the Lewiston station. Surface runoff and ground water seepage tend to reduce the reservoirs water quality effect on these lower reaches of the Trinity River. An improvement in water quality is indicated, however, in samples collected during the period following reservoir construction over that which had been found in samples collected at these stations prior to the dam construction in what would normally be low flow periods. This improvement is shown on Figures 3 and 4 by the plots of data collected subsequent to November 1960.

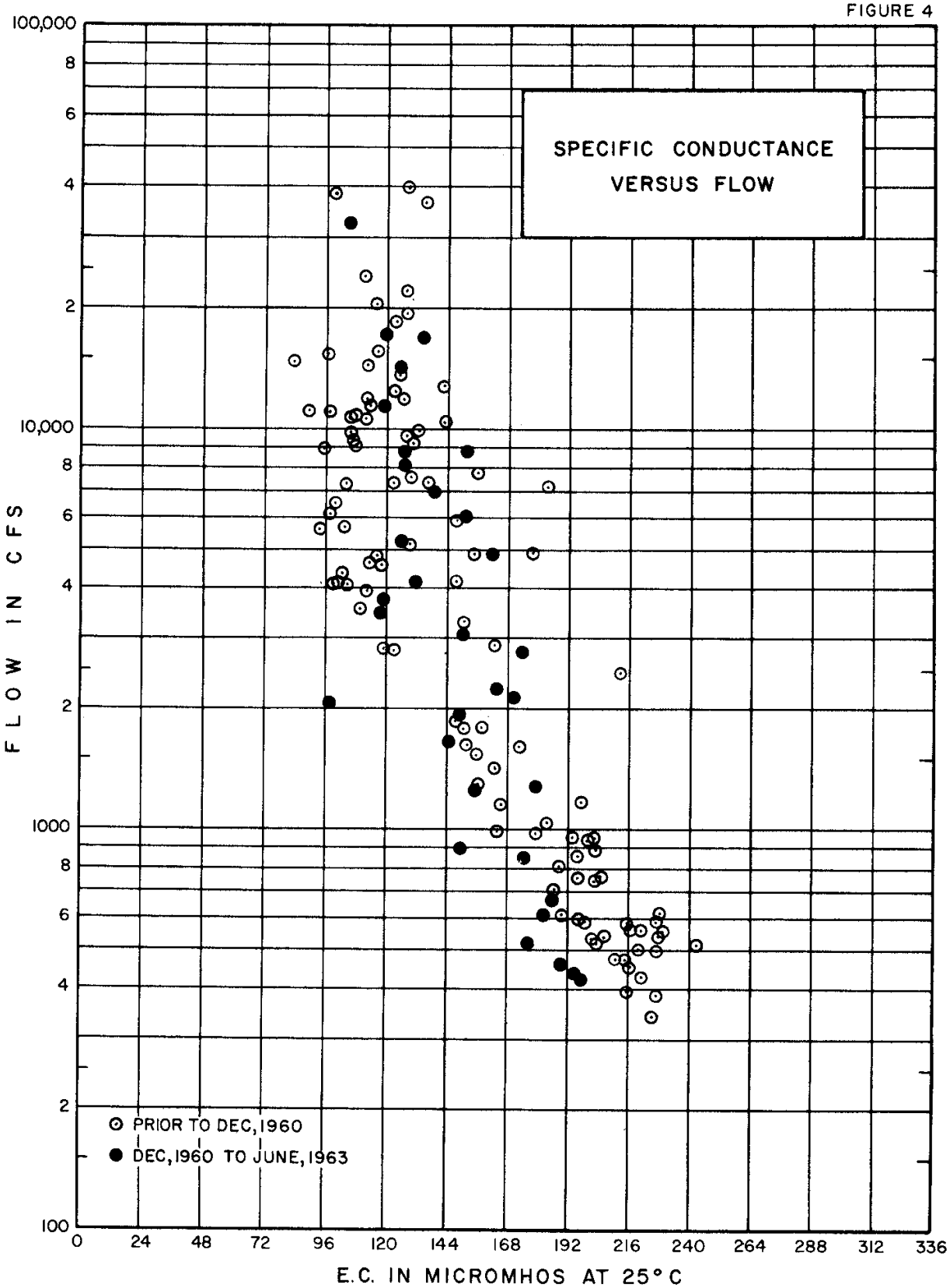
The net effect of the reservoir on the average annual quality of Trinity River water will not be of a magnitude to be a prime concern under present conditions of development. Analyses of more than 100 samples collected at the Lewiston station from 1951 through 1962 show the following ranges of

FIGURE 3



TRINITY RIVER NEAR BURNT RANCH (4b)
APRIL, 1958 – JUNE, 1963

FIGURE 4



TRINITY RIVER NEAR HOOPA (4)
APRIL, 1951 – JUNE, 1963

significant mineral characteristics: specific conductance of 63 to 198 micromhos, hardness from 27 to 84 ppm, boron from 0.00 to 0.23 ppm, and sodium percentage from 5 to 24 percent. Water with the foregoing mineral characteristics is Class 1 for irrigation and would be considered a very desirable source of supply for nearly all beneficial uses.

Tributaries flowing into the Trinity River, between the Lewiston and Hoopa stations, are generally similar to the good quality water in the main stem. One minor exception is Hayfork Creek, tributary to the South Fork Trinity River. Analyses of 20 samples from Hayfork Creek collected during the period 1958 to 1960 show the following ranges in selected mineral characteristics: specific conductance 149 to 483 micromhos, hardness 69 to 162 ppm, boron 0.00 to 0.23 ppm, and sodium percentage from 5 to 29 percent. This water, although more mineralized than other streams in this hydrographic unit, is still a good to excellent quality water and is considered Class 1 for irrigation. It is possible that this more mineralized water results from influent ground water in the vicinity of Hayfork Valley. However, by the time Hayfork Creek is diluted by the less mineralized water of the South Fork and then the main stem of the Trinity, it has only a moderate effect on the average mineral quality of Trinity River water at Hoopa.

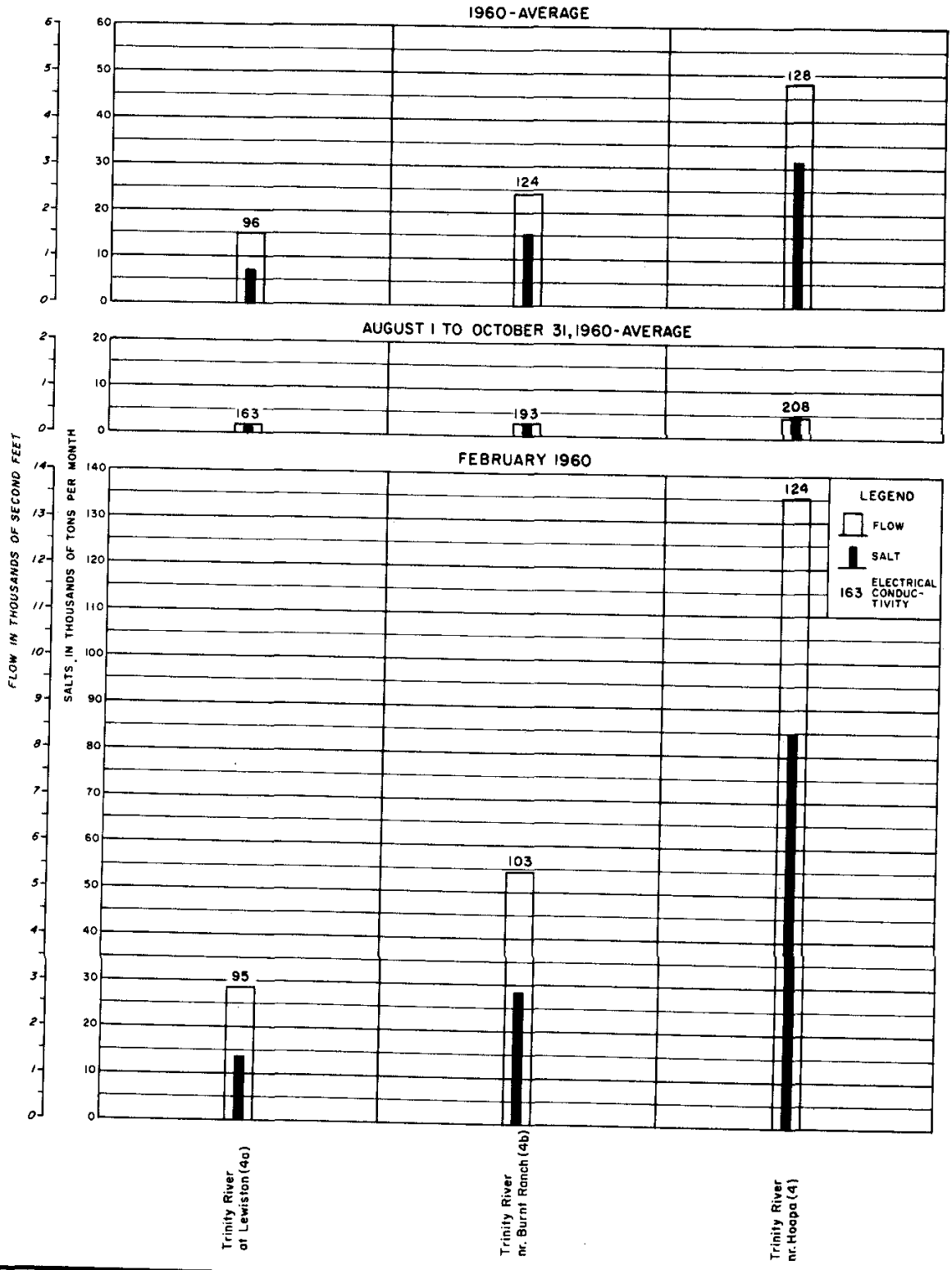
Analyses of more than 100 samples collected at the Hoopa station from 1951 through 1962 show the following ranges of significant mineral characteristics: specific conductance from 90 to 243 micromhos, hardness 44 to 120 ppm, boron 0.00 to 0.20 ppm, and sodium percentage from 3 to 13 percent. This water, only moderately more mineralized than the headwaters near Lewiston, is still of excellent quality and desirable for nearly all beneficial uses.

In order to more fully illustrate incremental changes in the quality of the Trinity River Figure 5 was prepared. This figure shows average flows during three time periods, and the quantity of salt being carried by the water at each flow. The top set of bars show average flow and tons of salt for 1960; the middle set of bars show average flow and tons of salt for the period from August 1, 1960 to October 31, 1960, and the lower set of bars show the average flow and tons of salt for February 1960. Thus, conditions representative of the entire year, and two typical seasons are shown. The electrical conductivities used in computing the quantity of salt were obtained from the specific conductivity versus flow curves using the average flow for the period represented. These conductivities are printed above each of the bars in the figure. The 1960 data was chosen for the preparation of Figure 5, since the stream flow during 1960 was within 10 percent of the average of record.

Figure 5 clearly indicates again the inverse relationship between flow and specific conductance. Incremental impairment of the Trinity River is indicated by comparing the relationship between flow and tons of salt at each station.

The 1960 mean annual data shows that there is an increase of only 32 micromhos between the Lewiston station and the Hoopa station. The Burnt Ranch station is approximately 40 miles downstream from the Lewiston station and about 20 miles upstream from the Hoopa station. More impairment occurs (28 micromhos) between Lewiston and Burnt Ranch than occurs between Burnt Ranch and Hoopa (4 micromhos). The largest tributary to the Trinity River is the South Fork Trinity River, which joins the main stem between the Burnt Ranch and Hoopa stations. It appears from Figure 5 that the South Fork and its major tributary, Hayfork Creek, have little overall effect on the main stems mineral quality. Figure 5 indicates that there is apparently no major source of mineral degradation tributary to the Trinity River.

FIGURE 5



AVERAGE FLOW AND TONS OF SALT-TRINITY RIVER BASIN

Ground Water Quality in Trinity River Hydrographic Unit

Of the six small ground water basins identified in the Trinity River Hydrographic Unit, namely, Hoopa Valley, Hayfork Valley, Hyampom, Weaverville, Lewiston, and Trinity Center, ground water analyses are available only from Hayfork Valley. Ground water in the other five basins is exploited to a very limited extent, mostly from springs or shallow dug wells. Although quality data on these ground waters are lacking, their general mineral quality characteristics can be predicted. Quality of surface water in these areas is well defined, and since streamflow in late summer and early fall consists mostly of influent ground water, mineral quality of this dry-season streamflow should approximate the mineral quality of shallow ground water.

The following discussion is limited to the only ground water basin in the Trinity River Hydrographic Unit from which quality data are available.

Hayfork Valley Subunit

Available quality data on ground water in Hayfork Valley consists of 33 mineral analyses from 19 wells. Of the 19, a total of 18 are shallow dug wells ranging down to 20 feet in depth with diameters of from 30 to 72 inches. The nineteenth well is a 12-inch diameter drilled hole with a depth reported to be in excess of 400 feet.

Water from 10 of the 18 dug wells is calcium-magnesium bicarbonate in chemical character; the remaining 8 dug wells produce a calcium bicarbonate type water. A single sample collected on July 7, 1959, from the 400-foot drilled well, 31N/12W-14F1, showed a sodium chloride type water. Since marine sediments are included in geologic maps of this area, it is probable

this well is drawing some water from a formation of marine origin containing connate water. However, since concentrations of total dissolved solids and boron are no greater than 457 ppm and 0.12 ppm, respectively, the water of marine origin must have been diluted considerably by good quality meteoric water. Although the resulting mixture of water from this well does not carry high concentrations of boron or dissolved solids, it is considered class 3, "injurious to unsatisfactory" for irrigation because of its high sodium percentage(88 percent). The analysis results for water obtained from well 31N/12W-14 F1 are shown on page B-2 of Appendix B.

Samples collected from the dug wells, which draw recent meteoric water from the shallow alluvium, show the following ranges of significant quality characteristics: specific conductance from 109 to 443 micromhos (76 to 248 ppm dissolved solids), hardness 46 to 184 ppm, boron 0.02 to 0.39 ppm, and percent sodium from 7 to 20 percent. Median values are: specific conductance 210 micromhos, hardness 94 ppm, boron 0.1 ppm, and percent sodium 14 percent. Heavy metal determinations from 5 ground water sources produced no significantly high values in excess of Drinking Water Standards. This water is of good mineral quality, class 1 for irrigation, and suitable for most beneficial uses. A few of the wells produce water that would be considered moderately hard for domestic use but a majority supply water classed as soft.

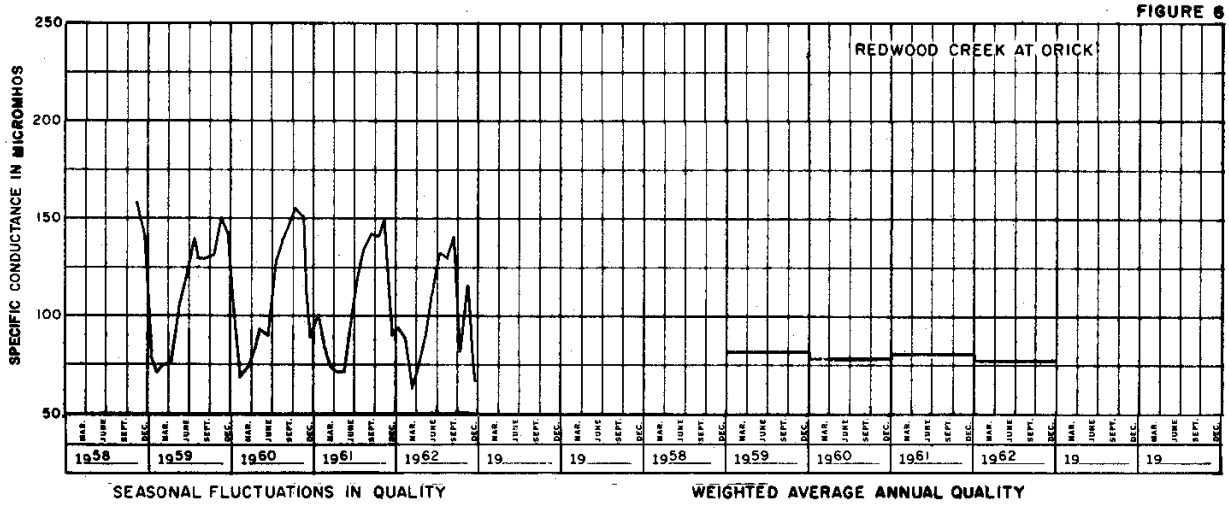
Four of the dug wells were sampled annually from 1959 through 1962. Although analyses over the four-year period show minor variations in mineral concentrations, no trend in changing quality is apparent.

Surface Water Quality in Mad-Redwood Hydrographic Unit

Compared to Trinity River on the north and Mad River on the south, Redwood Creek is a short stream. Before discharging to the ocean near Orick, it flows parallel to a northwest-trending fault over most of its length of approximately 55 miles. Over nearly its entire length, this creek bottoms on metasedimentary rocks consisting of sandstone and shale, metamorphosed to varying degrees. This results in a calcium bicarbonate type water with low percentages of other mineral constituents.

The relatively short length of Redwood Creek, as well as the type of rock through which it flows, results in a water carrying very low concentrations of dissolved solids. Figure 6 shows that from 1959 through 1962 monthly grab samples collected at Orick varied in specific conductance from 64 to 158 micromhos and annual quality averaged about 80 micromhos.

FIGURE 6



WEIGHTED AVERAGE ANNUAL AND SEASONAL FLUCTUATIONS IN WATER QUALITY OF REDWOOD CREEK AT ORICK

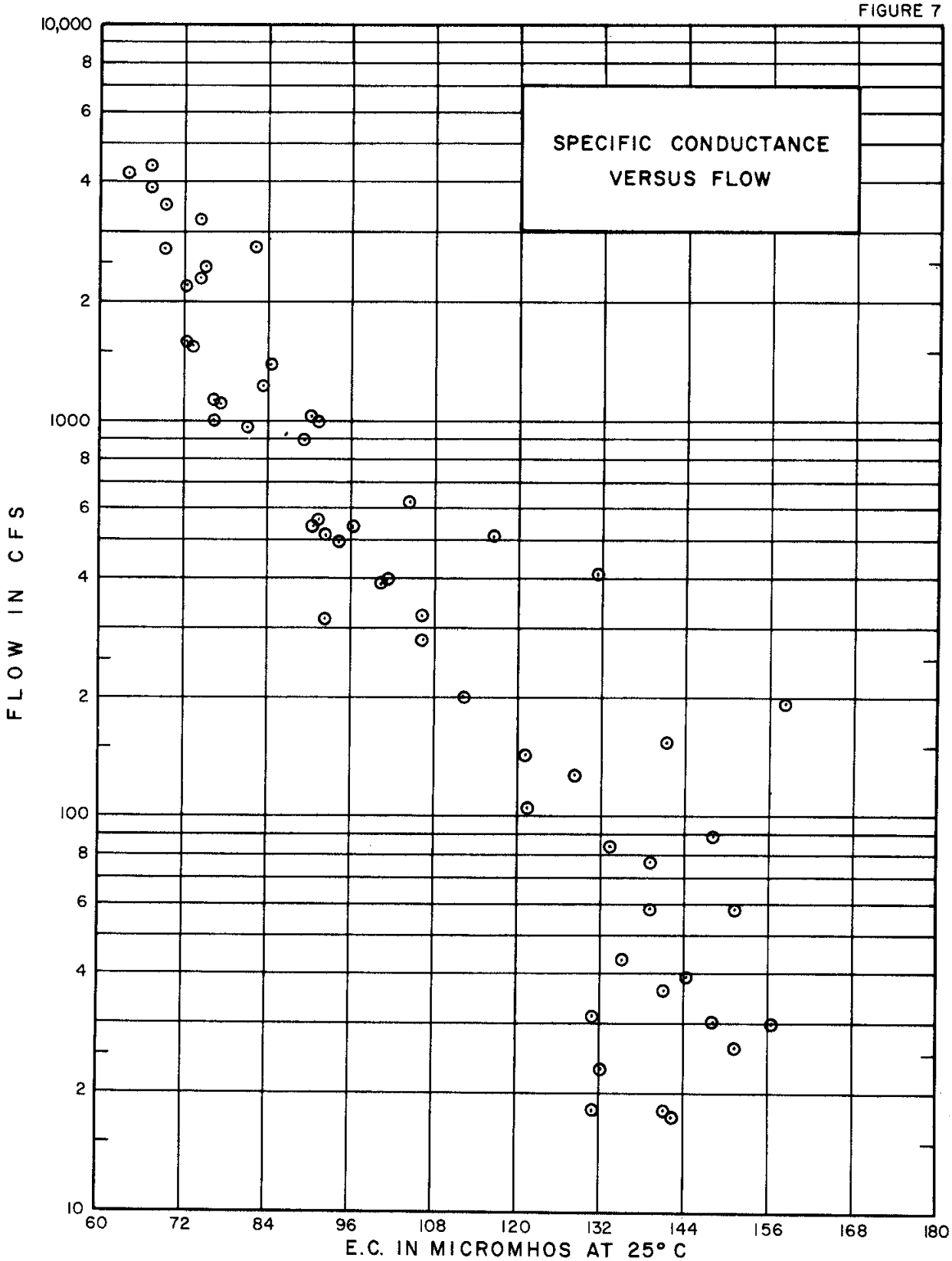
Figure 7 shows a typical inverse relationship between specific conductance and flow at Orick. The scattering of points at lower and intermediate flows appear to indicate the effect of ground water seepage and the first freshet of the rainy season.

Ranges of other significant constituents were hardness 26 to 68 ppm, boron 0.0 to 0.2 ppm, and percent sodium 7 to 23 percent,indicating a water of excellent mineral quality, desirable for nearly all beneficial uses. However, analyses for heavy metals from samples collected at Orick have shown concentrations of iron as high as 0.17 ppm. Water with this concentration of iron, especially if accompanied by some manganese, approaches the range where its use for domestic purposes may result in staining of porcelain fixtures. The United States Public Health Service drinking water standards has a recommended limit of 0.3 ppm iron and 0.05 ppm manganese.

Source of the iron in the Orick analyses of Redwood Creek water is thought to be Prairie Creek. This stream flows southerly, parallel to the coast until it joins Redwood Creek just above Orick. Geologic formations in the drainage area of Prairie Creek are Recent valley fill and stream gravels underlain by the poorly consolidated Hookton and Rohnerville formations consisting of gravel, sand, silt, and clay. All of these formations contain appreciable amounts of iron oxides, as evidenced by their reddish-yellow to yellowish-brown color.

Water in the upper reaches of Redwood Creek is believed to be very similar in quality to water near the mouth. Only four analyses are available from the upper reach near Green Point (approximately 30 miles upstream from Orick). Since none of these four was a high-flow sample, and none was collected on the same day as a sample from Orick, it is difficult to compare upstream and downstream quality. However, it is unlikely that the excellent mineral quality (excepting iron content) in the lower reach could be bettered appreciably in the upper reaches of Redwood Creek.

FIGURE 7



REDWOOD CREEK AT ORICK (3b)
NOVEMBER, 1958 - JUNE, 1963

Between the mouths of Redwood Creek on the north and Mad River on the south lie Big Lagoon and Little River Hydrographic Subunits. Each of these subunits encompasses several small coastal streams that discharge directly to the ocean.

Only one surface water analysis is available from the Big Lagoon Subunit. This single sample collected from McDonald Creek indicates a good quality sodium-calcium bicarbonate-chloride type water. With total dissolved solids of only 46 ppm, it is possible that at least part of the sodium chloride contained in this water was introduced by wind-driven spray or mist from the ocean.

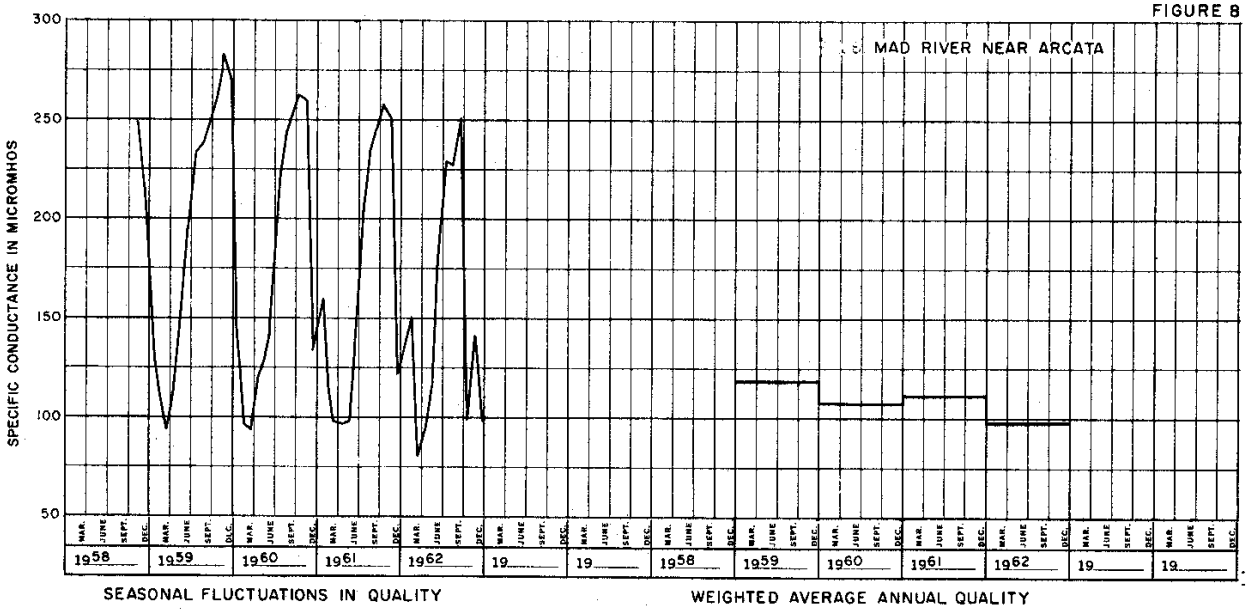
In Little River Subunit, three samples have been collected from Little River at Crannell. Analyses of these three samples indicate a calcium bicarbonate type water of excellent mineral quality. Significant quality characteristics show the following ranges: specific conductance 59 to 98 micromhos, hardness 16 to 30 ppm, boron 0.02 to 0.04 ppm, and percent sodium 18 to 31 percent. Heavy metal determinations were not made of surface water in this subunit.

The Mad River rises in the rugged Six Rivers National Forest in southern Trinity County. It flows northwesterly for about 100 miles until it discharges to the sea near Arcata, just north of Humboldt Bay. For most of this distance, it flows across the Franciscan formation which consists of sandstone, shale, conglomerate, greenstone, chert, and minor amounts of limestone and schist. Since this is a hard, relatively insoluble formation, mineral pickup by the flowing water is near a minimum. This results in a calcium bicarbonate type water with a low concentration of total dissolved solids. In the lower reaches, however, from above Boulder Creek to the vicinity of Blue Lake, the main stem as well as tributaries of the

Mad River flows across patches of softer sedimentary rocks of marine origin. Water in this reach is still calcium bicarbonate in character, although the percentage of magnesium has increased somewhat, but concentrations of total dissolved solids are markedly higher than in the upper reach near the Town of Mad River. From the vicinity of Blue Lake to the regular monitoring station near Arcata, the Mad River flows across terrace gravels and the Hookton and Rohnerville formations containing iron oxides. However, this reach is only about 3 miles in length, and the highest concentration of iron determined in samples of water was 0.10 ppm.

Figure 8 shows that from 1959 through 1962 monthly grab samples collected from Mad River near Arcata varied in specific conductance from 81 to 283 micromhos and annual quality weighted by flow averaged about 110 micromhos. Ranges of other significant constituents were hardness 35 to 136 ppm, boron 0.0 to 0.26 ppm, and percent sodium 5 to 15 percent, indicating a water of good mineral quality suitable for nearly all beneficial uses.

FIGURE 8



WEIGHTED AVERAGE ANNUAL AND SEASONAL FLUCTUATIONS IN WATER QUALITY OF MAD RIVER NEAR ARCATA

The specific conductance versus flow relationship of the Mad River at Arcata is shown in Figure 9. Some scattering of points in the low and intermediate flow range indicates the effect of ground water seepage and the first freshet of the rainy season. In the high flow range, the specific conductance varies very little indicating that the river is approaching rain water quality.

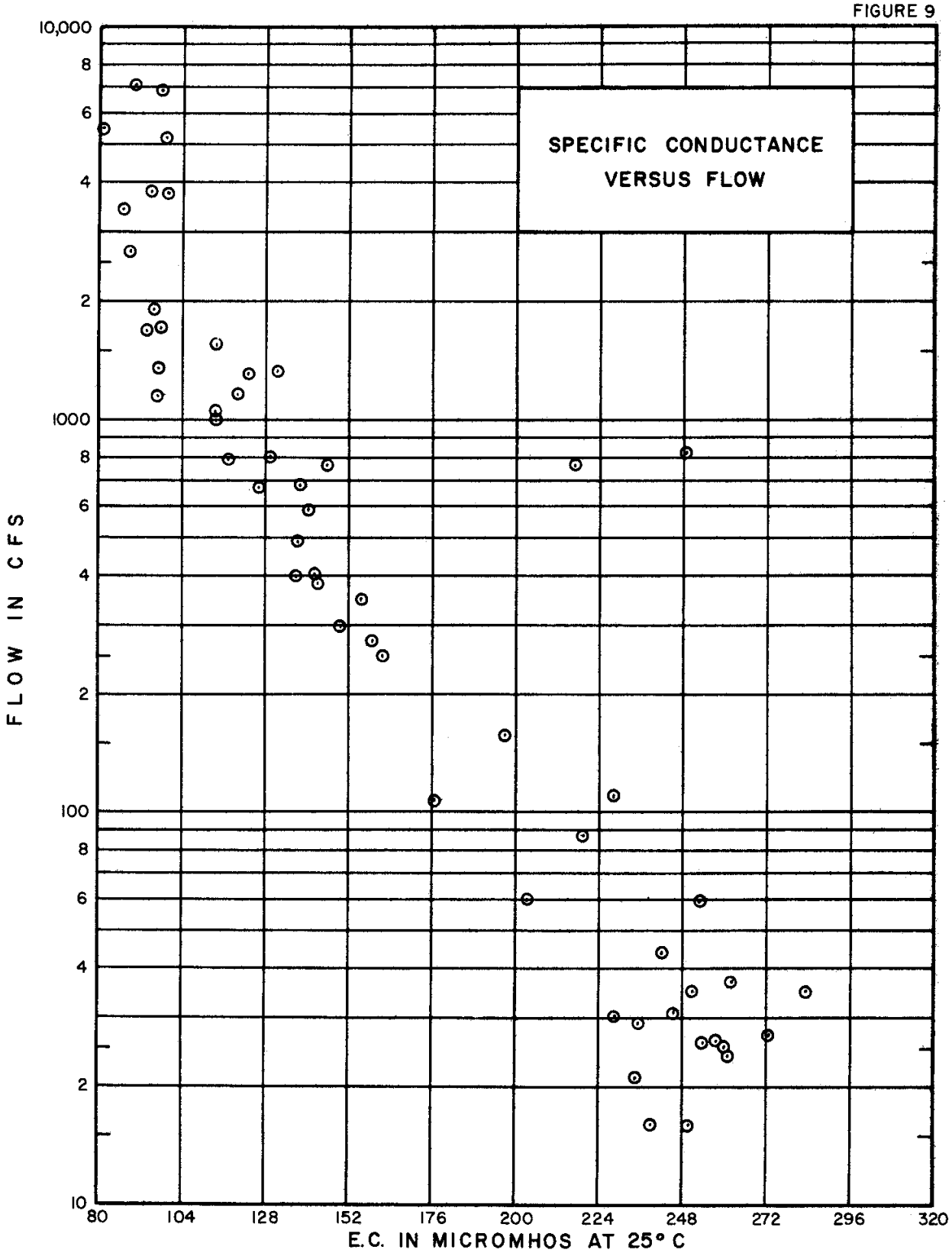
A limited number of low-flow samples were collected from Mad River near Maple Creek, approximately 20 miles upstream from the station near Arcata. Analyses of these samples suggest that quality of water in this reach is quite similar to the quality near Arcata.

Fifteen samples were collected near the Town of Mad River, approximately 50 miles upstream from the station near Arcata. Analyses of these samples, representing quality in the Ruth Subunit, indicates substantially less mineralization of Mad River water than in the downstream reaches. Ranges of significant constituents were specific conductance from 65 to 128 micromhos, hardness 28 to 55 ppm, boron 0.00 to 0.20 ppm, and percent sodium 10 to 16 percent. This water closely resembles the excellent mineral quality of water in Redwood Creek near its mouth.

The annual mean flows and mineral concentrations (as electrical conductance) are shown in Figure 10 for Redwood Creek and Mad River at Orick and Arcata, respectively. Figure 10 shows mean flows and mineral concentrations representative of typical seasons at these locations.

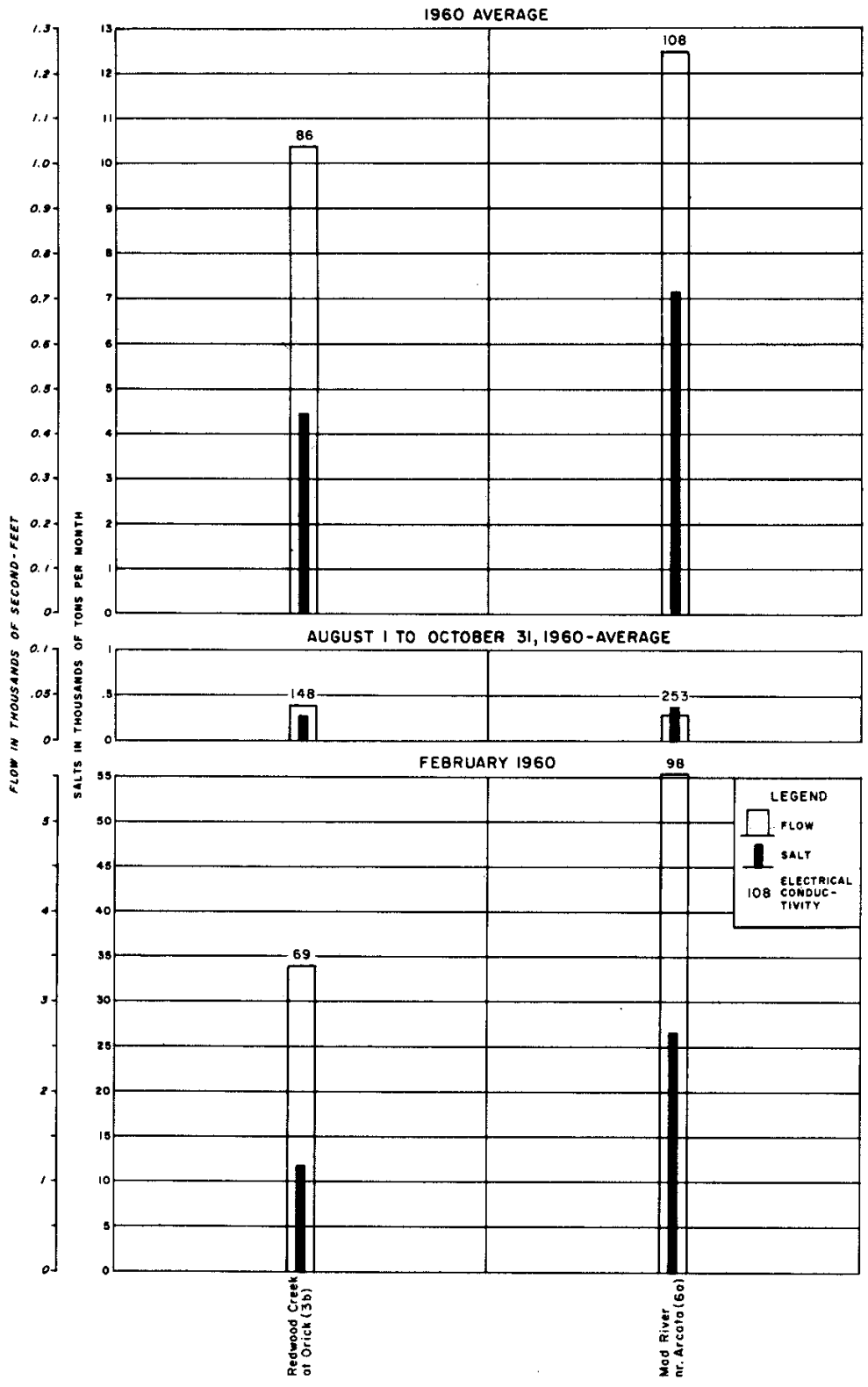
Differences in mineral quality and flow for each period, as well as quality differences in the two streams, can readily be seen in Figure 10. It is apparent that Redwood Creek provides a consistently higher quality water at Orick, with respect to total salts, than does Mad River at Arcata.

FIGURE 9



MAD RIVER NEAR ARCATA (6a)
NOVEMBER, 1958 - JUNE, 1963

FIGURE 10



AVERAGE FLOW AND TONS OF SALT-REDWOOD CREEK & MAD RIVER

Ground Water Quality in Mad-Redwood Hydrographic Unit

Ground water in the Mad River-Redwood Creek Hydrographic Unit is exploited in significant quantities in only three of the eight hydrographic subunits.

Orick Subunit

Analyses of ground water from only three wells are available from the Orick subunit near the mouth of Redwood Creek, but these are sufficient to give evidence of incipient salt-water encroachment into the alluvium from which the wells draw water derived primarily from Redwood Creek runoff. These shallow wells are located inland from the ocean approximately one-quarter mile, one-half mile, and 1½ miles, and depths to water in August 1954 were 13 feet, 16 feet, and 18 feet, respectively. An analysis of water from Well No. 10N/1E-4C, 1½ miles inland, showed a calcium bicarbonate type water very similar to the excellent mineral quality of Redwood Creek water. Specific conductance was 157 micromhos, and chlorides totaled 10 ppm. Well No. 11N/1E-32J, one-half mile inland, produced a sodium-calcium chloride type water with a specific conductance of 582 micromhos, and a chloride concentration of 99 ppm. Well No. 10N/1E-5C, approximately one-quarter mile inland from the ocean, produced a sodium chloride type water with a specific conductance of 562 micromhos, and a chloride concentration of 130 ppm.

Big Lagoon Subunit

Analyses also are available from three shallow wells near the mouth of McDonald Creek in the Big Lagoon Subunit. Water from these wells (all 30 feet in depth) is a sodium-calcium chloride-bicarbonate type. This does not indicate sea-water intrusion, however, since this ground water is similar in character to McDonald Creek Water, the source of recharge.

Water from these three wells showed a narrow range of significant quality characteristics, as follows: specific conductance 93 to 100 micromhos (dissolved solids 50 to 56 ppm), hardness 21 to 28 ppm, boron 0.03 to 0.15 ppm, percent sodium 35 to 44, and chloride 13 to 14 ppm.

Blue Lake Subunit

Ground water basins in the Blue Lake Subunit include Dows Prairie Terrace, the inland Mad River Valley near the town of Blue Lake, and the portion of the Arcata Plain that borders the lower reach of the Mad River. The southerly and larger portion of Arcata Plain has been placed in the Eureka Plain Subunit of the Eel River Hydrographic Unit.

Dows Prairie Terrace. Analyses of water from three wells are available in this elevated area north of the Mad River. The three sampled wells draw water from the Hookton formation, and none penetrates below sea level. They produce a magnesium-sodium bicarbonate type water with concentrations of iron ranging as high as 3.0 ppm. Other significant characteristics range as follows: specific conductance 113 to 332 micromhos (dissolved solids 75 to 217 ppm), hardness 31 to 118 ppm, boron 0.0 to 0.1 ppm, and percent sodium 21 to 40 percent. One domestic well, No. 7N/1E-29D1 with a depth of 170 feet, showed an extremely high nitrate concentration of 92 ppm, although total dissolved solids were only 217 ppm. Since chlorides at 24 ppm were only moderately higher than in the other two wells drawing water from the Hookton formation, and concentrations of other constituents were not unusual. The source of the nitrates is unknown.

Inland Mad River Valley. Mineral analyses are available from five wells in the inland valley near the town of Blue Lake. These wells, with depths ranging from 20 to 86 feet, bottom in Recent alluvium, and produce a calcium bicarbonate or calcium-magnesium bicarbonate type water similar in character and quality to Mad River surface water. Ranges of significant

quality characteristics are: specific conductance 85 to 244 micromhos (dissolved soldis 48 to 137 ppm), hardness 24 to 117 ppm, boron 0.02 to 0.06 ppm, and percent sodium 10 to 30 percent. Concentrations of iron are moderate for ground water in this region, ranging from 0.02 to 0.18 ppm.

Northern Portion of Arcata Plain. Fifty analyses from 22 wells are available to evaluate ground water in this area. Most of these wells are less than 50 feet deep, penetrate Recent alluvium, and produce a calcium-magnesium bicarbonate type water. One well, No. 6N/1E-8H1, is 110 feet deep, and produces a sodium bicarbonate-chloride type water, indicating that it probably bottoms in the Hookton formation. Significant quality characteristics of water from these wells vary considerably as illustrated by the following ranges: specific conductance 151 to 517 micromhos (dissolved solids 82 to 371 ppm), hardness 33 to 252 ppm, boron 0.00 to 1.1 ppm, and percent sodium 6 to 56 percent. Concentrations of iron range as high as 15 ppm, and manganese as high as 2.3 ppm.

Well No. 6N/1W-1P1, near the mouth of the Mad River, was drilled to a depth of approximately 20 feet. Since the land surface elevation in this area is about 10 feet, the well bottomed below sea level, and was subject to intense salt-water intrusion. Concentrations of chloride increased from 528 ppm in 1952 to 6,650 ppm in 1959 when the well was abandoned. At this time, a new well, No. 6N/1W-1P2, was drilled at the same location to a depth of 100 feet. This well was sealed from shallow waters to a depth of about 50 feet, where it penetrated a thick layer of clay that capped a deeper pressure aquifer. Since 1959, chloride concentrations in water from this deeper aquifer have not exceeded 50 ppm, although relatively high concentrations of iron and manganese have been encountered (Appendix A-2).

Median values from all sampled wells in the Blue Lake Subunit are as follows: specific conductance 270 micromhos, hardness 100 ppm, boron 0.04 ppm, and percent sodium 21 percent.

Considering the Mad River-Redwood Creek Hydrographic Unit as a whole, ground water is generally of good mineral quality, suitable for most beneficial uses. High concentrations of iron and/or manganese, however, make some ground waters objectionable as a source of domestic supply. Although most ground water in this unit is soft to moderately hard, a few wells produce water that would be considered excessively hard for domestic use unless treated.

One well in this hydrographic unit has been sampled intermittently over the past ten years, but no historical trend in quality is apparent.

Surface Water Quality in Eel River Hydrographic Unit

The Eel River watershed, with a drainage area of about 3,600 square miles, is located in the Coast Ranges between the drainage basins of the Mad River to the north, and the Mattole River to the south. The stream courses, beginning with the headwaters of the main stem of the Eel in the Lake Pillsbury area, roughly parallel the northwestward trending ridges of the Coast Ranges for more than 150 miles to the mouth of the Eel River, just south of Humboldt Bay. Most of the drainage area is mountainous, and the topography is moderately to extremely rugged.

On the upper main stem of the Eel River, storage in Lake Pillsbury provides sufficient water for an average annual diversion of 140,000 acre-feet into the Russian River basin for power development and irrigation. The first significant tributary, Outlet Creek, joins the main river from the south, 35 miles below Lake Pillsbury. Five miles farther downstream, the main stem is joined from the east by the Middle Fork. It then flows northwesterly through a steep canyon for about 80 miles before its confluence with a

major tributary, the South Fork. About 20 miles farther downstream where it is joined by its last sizeable tributary, the Van Duzen River, the Eel River reaches the coastal plain, through which it meanders for 15 miles before discharging to the ocean.

The Eel River, and most of its major tributaries, yield an excellent quality calcium bicarbonate type water, with relatively small variations in character and quality among the sampled tributaries. This is due primarily to the similarity in mineral composition of rock types within the drainage area. The major streams do not cross a wide variety of rock types, but flow parallel to the northwest-trending ridges. In addition, ground water basins and mineralized springs, which can have a significant effect on the chemical composition of surface water, are of limited occurrence in the Eel River watershed.

Surface water in the Lake Pillsbury Subunit is calcium bicarbonate in character, and of excellent mineral quality. Monthly analyses of samples collected since 1951 show the following ranges of significant quality characteristics: specific conductance from 95 to 285 micromhos, hardness 42 to 133 ppm, boron 0.0 to 1.5 ppm, and percent sodium 6 to 17 percent. Median values are specific conductance 140 micromhos, hardness 60 ppm, boron 0.3 ppm, and a percent sodium of 14. The narrow range in concentrations of total dissolved solids, as evidenced by specific conductance, is due to regulation by Lake Pillsbury which tends to mix the more mineralized water from low flows with the less mineralized water from high flows. Although a boron determination of 1.5 ppm was made, such high concentrations rarely occur, and the median value of 0.3 ppm is within the limits of a Class 1 irrigation water.

Analysis of a sample collected at Potter Valley Powerhouse on September 6, 1961, showed a manganese concentration of 0.26 ppm, which is

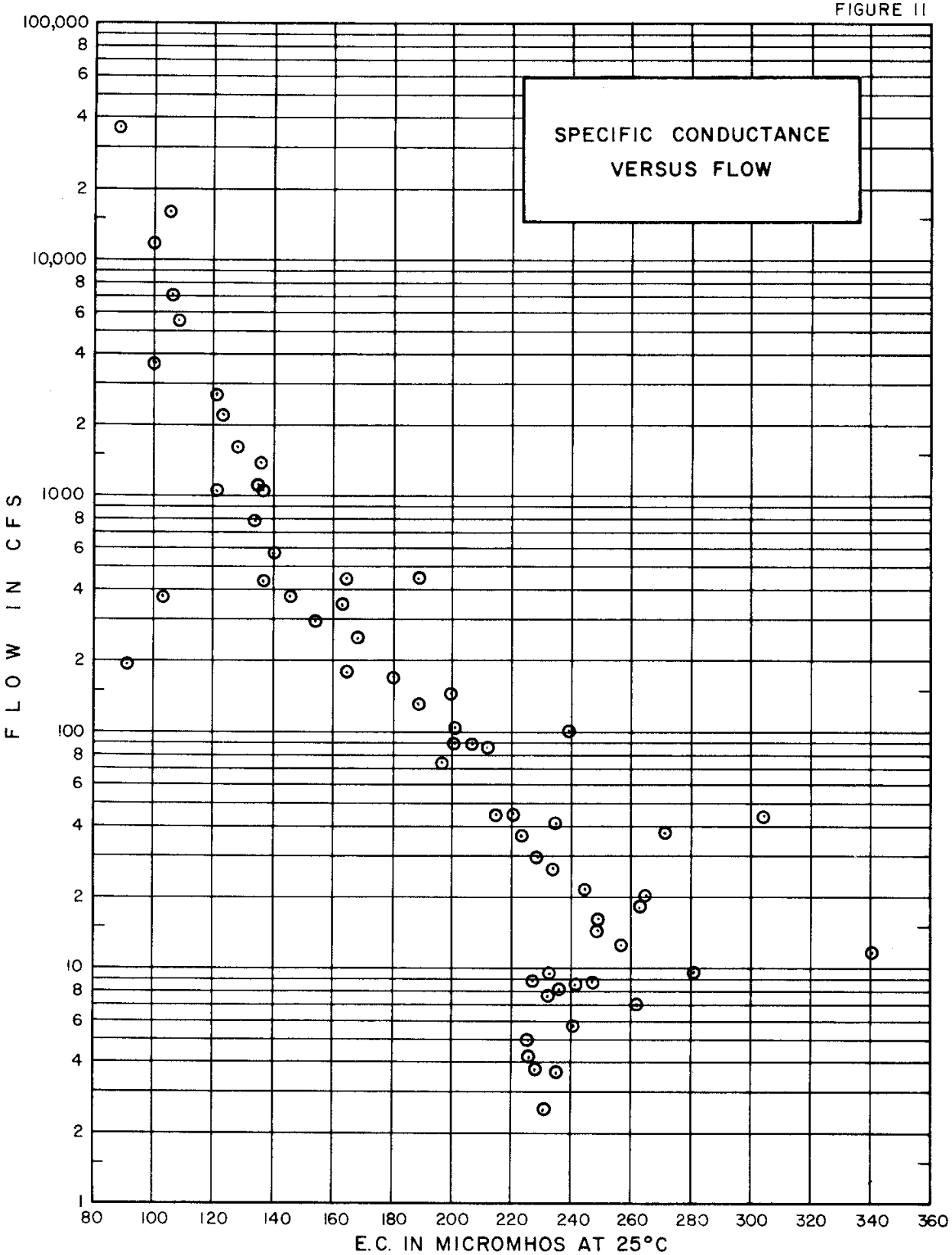
considerably above the U. S. Public Health Service recommended limit of 0.05 ppm for drinking water. Previous and subsequent analyses, however, have shown no significant concentrations of manganese in this water. Since there are no known industrial waste discharges in this area, the high concentration of manganese in September 1961, is believed to have resulted from the concentrating of manganese ions or compounds in Lake Pillsbury. This complex phenomenon is related to changes in concentrations of dissolved oxygen with depth, and is accelerated by biologic activity.

Approximately 35 miles downstream from Lake Pillsbury are located monthly monitoring stations 5B on Outlet Creek, and 5D on the main stem of the Eel, just above its confluence with Outlet Creek. Both of these stations were established in April 1958.

Station 5D representing the Willis Ridge Subunit shows the following ranges in significant quality characteristics: specific conductance from 88 to 340 micromhos, hardness 42 to 136 ppm, boron 0.0 to 1.1 ppm, and percent sodium 7 to 35 percent. Median values are: specific conductance 200 micromhos, hardness 90 ppm, boron 0.2 ppm, and 15 percent sodium. It can be seen by the wider range of specific conductance and percent sodium that, with increasing distance from Lake Pillsbury, upstream regulation has a smaller damping effect on fluctuations of mineral quality. Figure 11 shows the relationship between specific conductivity and flow at this station.

Analyses of samples collected from Outlet Creek and its tributaries, exhibit the following ranges of significant quality characteristics: specific conductance from 58 to 528 micromhos, hardness 24 to 164 ppm, boron 0.0 to 9.9 ppm, and percent sodium 8 to 33 percent. Median values are: specific conductance 215 micromhos, hardness 80 ppm, boron 0.4 ppm, and

FIGURE 11



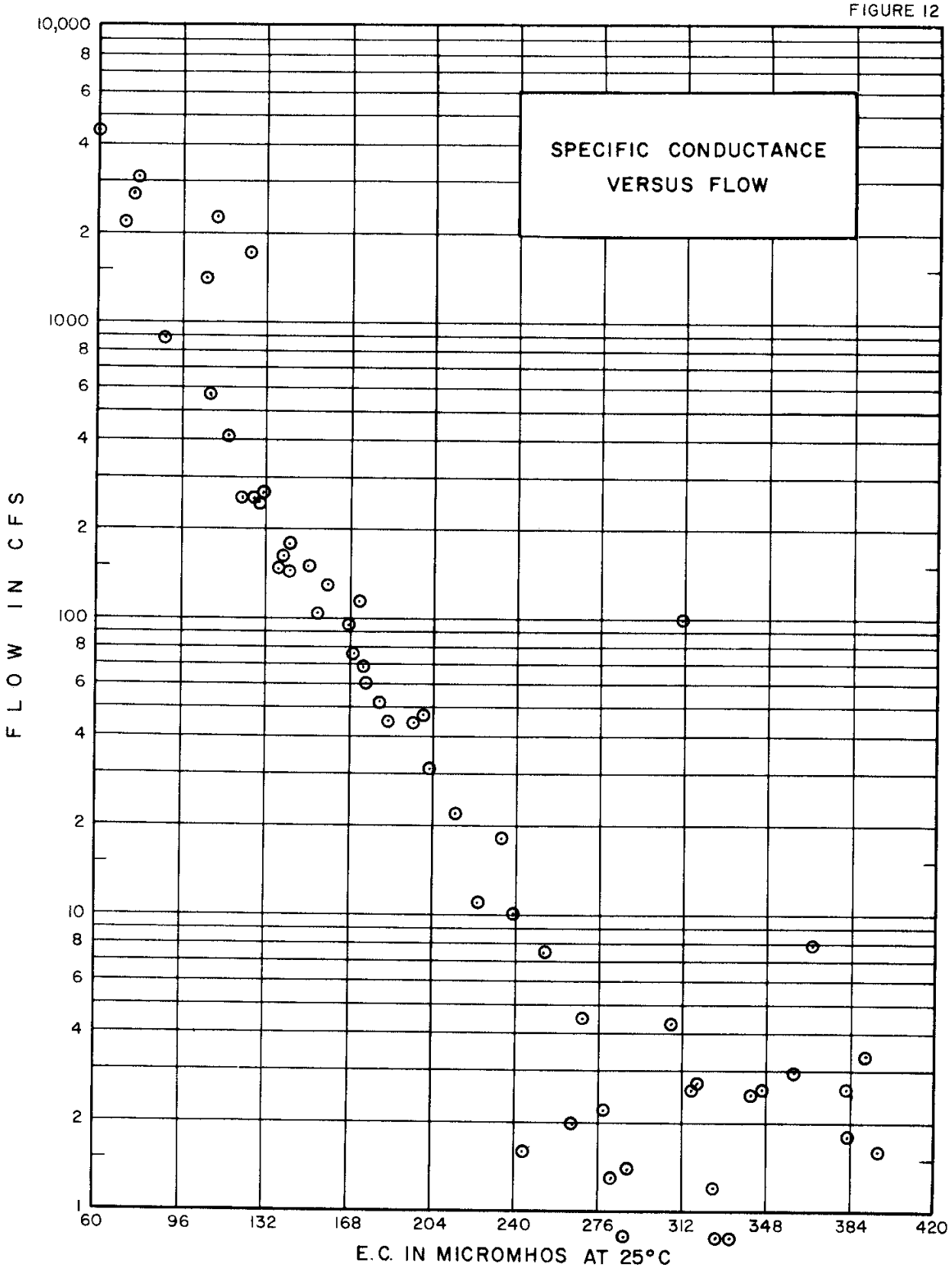
EEL RIVER NEAR DOS RIOS (5d)
APRIL, 1958 – JUNE, 1963

percent sodium 20 percent. The relationship between conductivity and flow for Outlet Creek at station 5B near Longvale is shown in Figure 12. Concentrations of iron in tributaries to Outlet Creek reached as high as 0.6 ppm, which is unusually high for surface water in this region. However, the most striking quality aspect manifested by streams in this subunit was the boron concentrations, which ranged as high as 9.9 ppm in Long Valley Creek, the largest tributary of Outlet Creek. But the median value of all boron determinations made of surface water in this subunit was only 0.4 ppm; and an average value, weighted by flow, would be even less.

About 5 miles farther downstream, the main stem of the Eel is joined by the Middle Fork near Dos Rios, which also has had a monthly sampling station since April 1958. Analyses from this station show a calcium bicarbonate type water, comparable in quality to water in the main stem in this reach of the river. Significant quality characteristics range as follows: specific conductance from 91 to 374 micromhos, hardness 40 to 152 ppm, boron 0.0 to 0.7 ppm, and percent sodium 4 to 24 percent. Median values are specific conductance 215 micromhos, hardness 90 ppm, boron 0.1 ppm, and a sodium percentage of 12. Figure 13 shows the relationship between specific conductivity and flow.

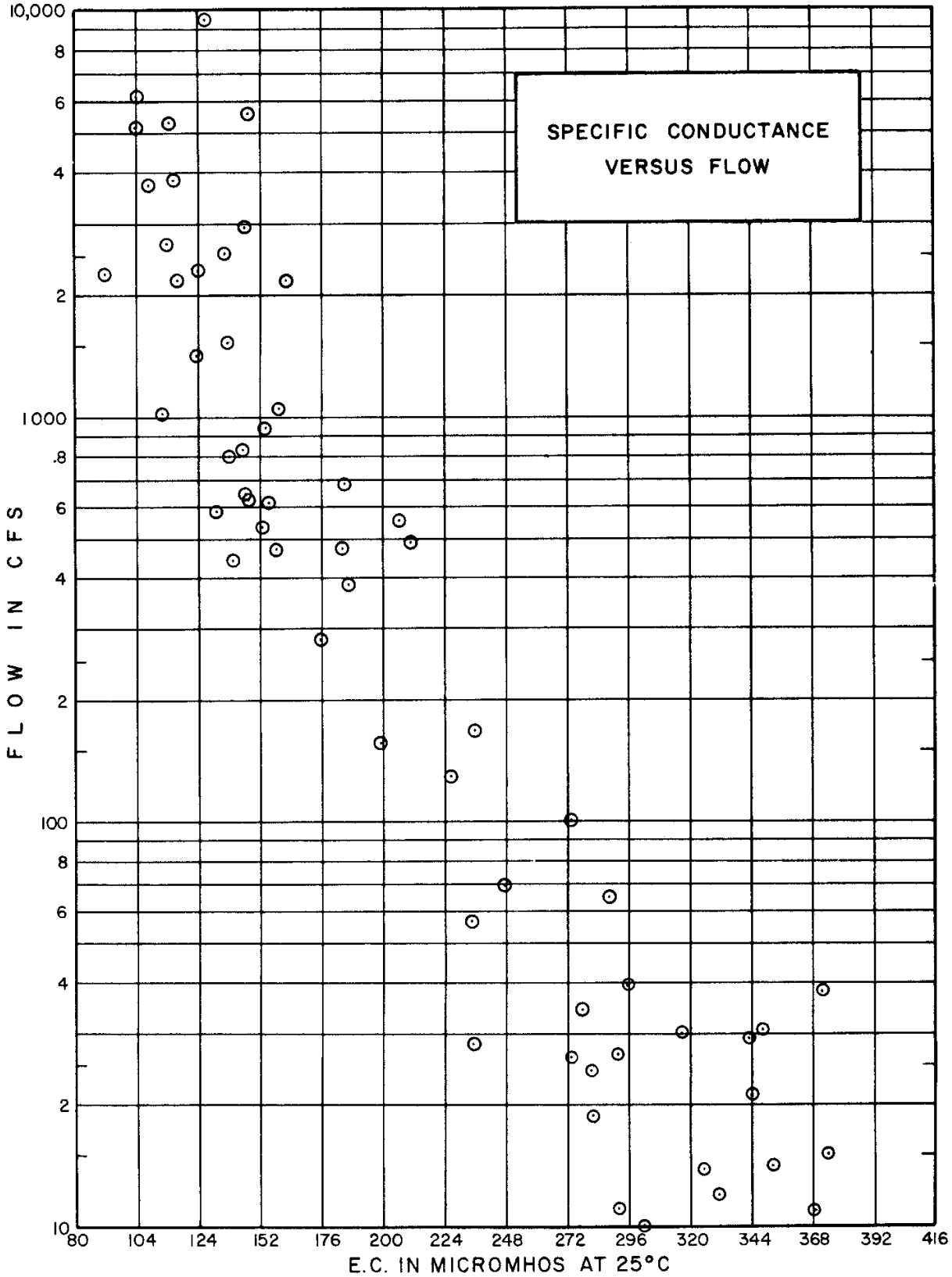
The next sampling station is on the main stem of the Eel River near McCann, approximately 75 miles downstream from Dos Rios. Although tributary inflow to this reach of the river is minor, the mineral quality of water flowing over this 75-mile length does not deteriorate substantially. This indicates that mineral pickup from the streambed is minimal, due to the hard, relatively insoluble rocks over which the water flows. Monthly samples since 1951 from the McCann station show the following ranges of significant quality characteristics: specific conductance from

FIGURE 12



OUTLET CREEK NEAR LONGVALE (5b)
MAY, 1958 - JUNE, 1963

FIGURE 13



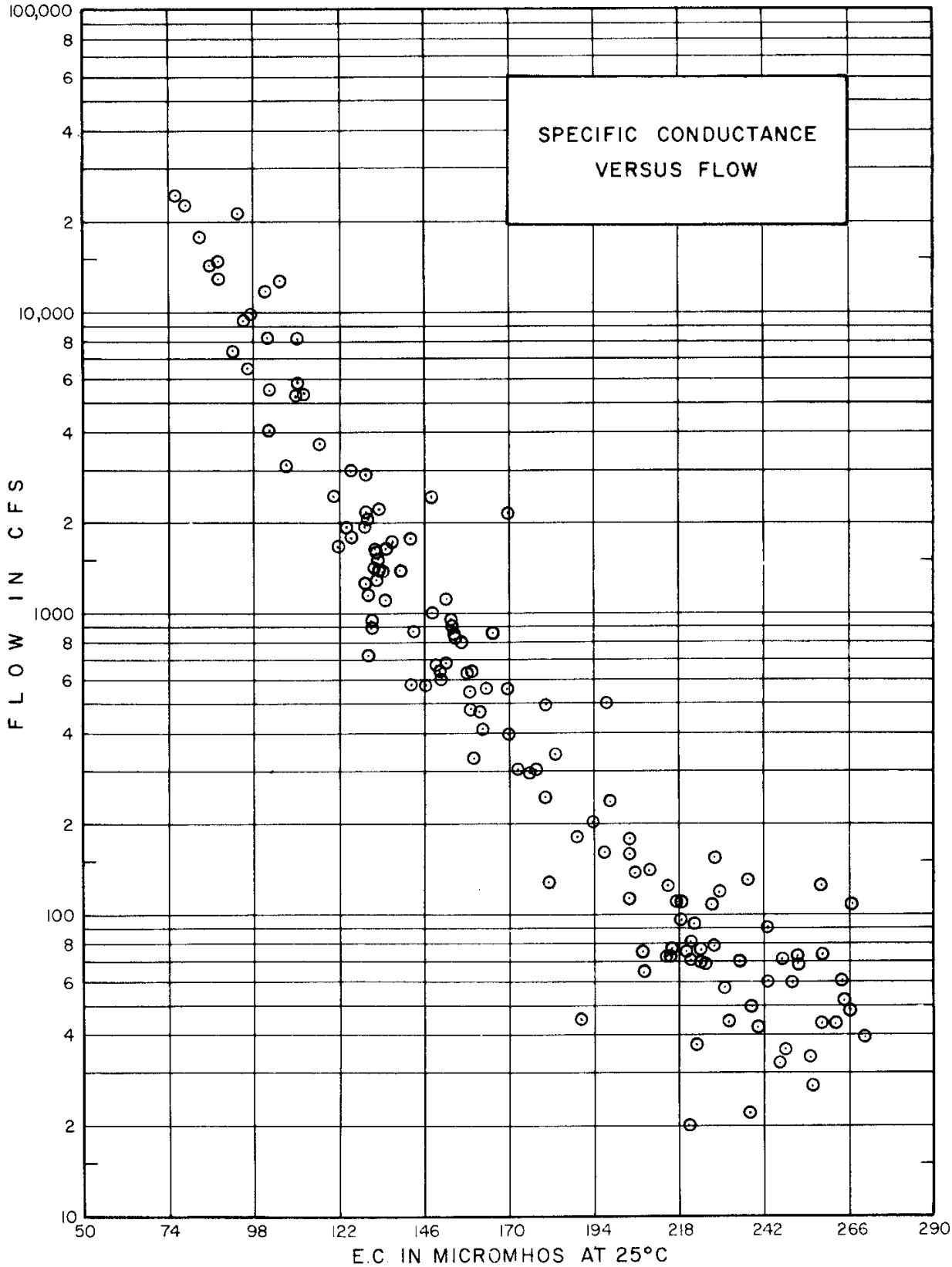
MID. FK. EEL RIVER AT DOS RIOS (5c)
APRIL, 1958 - JUNE, 1963

101 to 399 micromhos, hardness 41 to 204 ppm, boron 0.0 to 0.3 ppm, and percent sodium 8 to 26 percent. Median values are: specific conductance 205 micromhos, hardness 95 ppm, boron 0.1 ppm, and percent sodium 12 percent.

Approximately 5 miles downstream from the McCann station, the main stem receives substantial quantities of excellent quality water from the South Fork. Monthly samples since 1951 collected from the South Fork near Miranda show the following ranges of selected quality characteristics: specific conductance from 76 to 273 micromhos, hardness 28 to 124 ppm, boron 0.0 to 0.5 ppm, and percent sodium 9 to 29 percent. Median values are: specific conductance 180 micromhos, hardness 75 ppm, boron 0.1 ppm, and percent sodium 17 percent. Specific conductivity versus flow is shown in Figure 14. Although still generally a calcium bicarbonate type water, percentages of magnesium and sodium are usually somewhat higher in this tributary than in waters from the main stem.

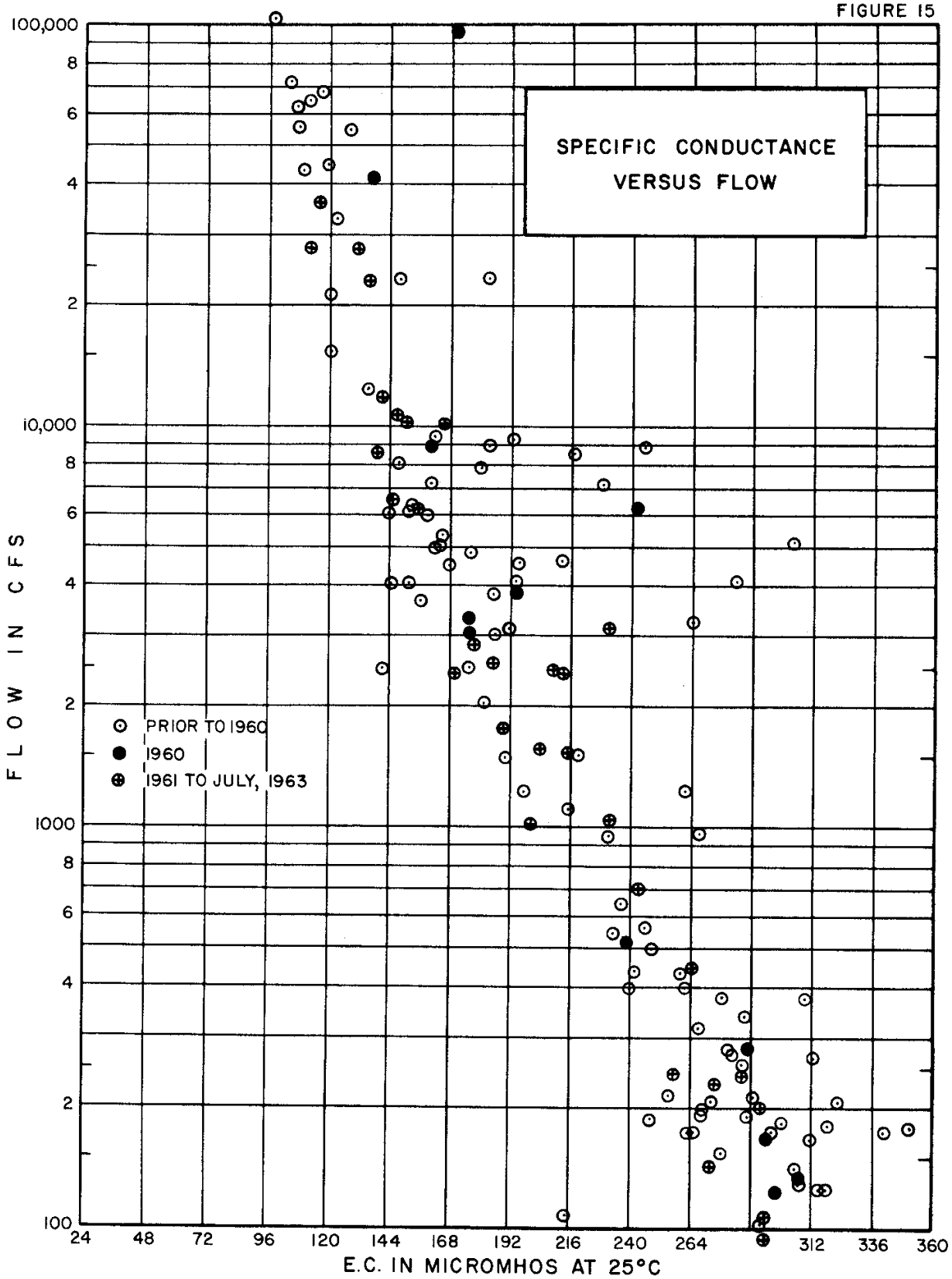
Despite the addition of excellent quality water from the South Fork, quality in the main stem appears to deteriorate somewhat between McCann and the Scotia station, a distance of approximately 20 miles. This suggests the presence of a source of soluble material in this reach of the river. Waste discharges in the vicinity of Scotia may also be a cause of this moderate deterioration in quality. Monthly samples collected since 1951 at the Scotia station show the following ranges of significant quality characteristics: specific conductance from 98 to 441 micromhos, hardness 43 to 212 ppm, boron 0.0 to 0.5 ppm, and percent sodium 8 to 26 percent. Median values are: specific conductance 220 micromhos, hardness 100 ppm, boron 0.1 ppm, and percent sodium 13 percent. The specific conductivity versus flow curve for this station is shown on Figure 15.

FIGURE 14



S. FK. EEL RIVER NEAR MIRANDA (7)
APRIL, 1951 - JUNE, 1963

FIGURE 15

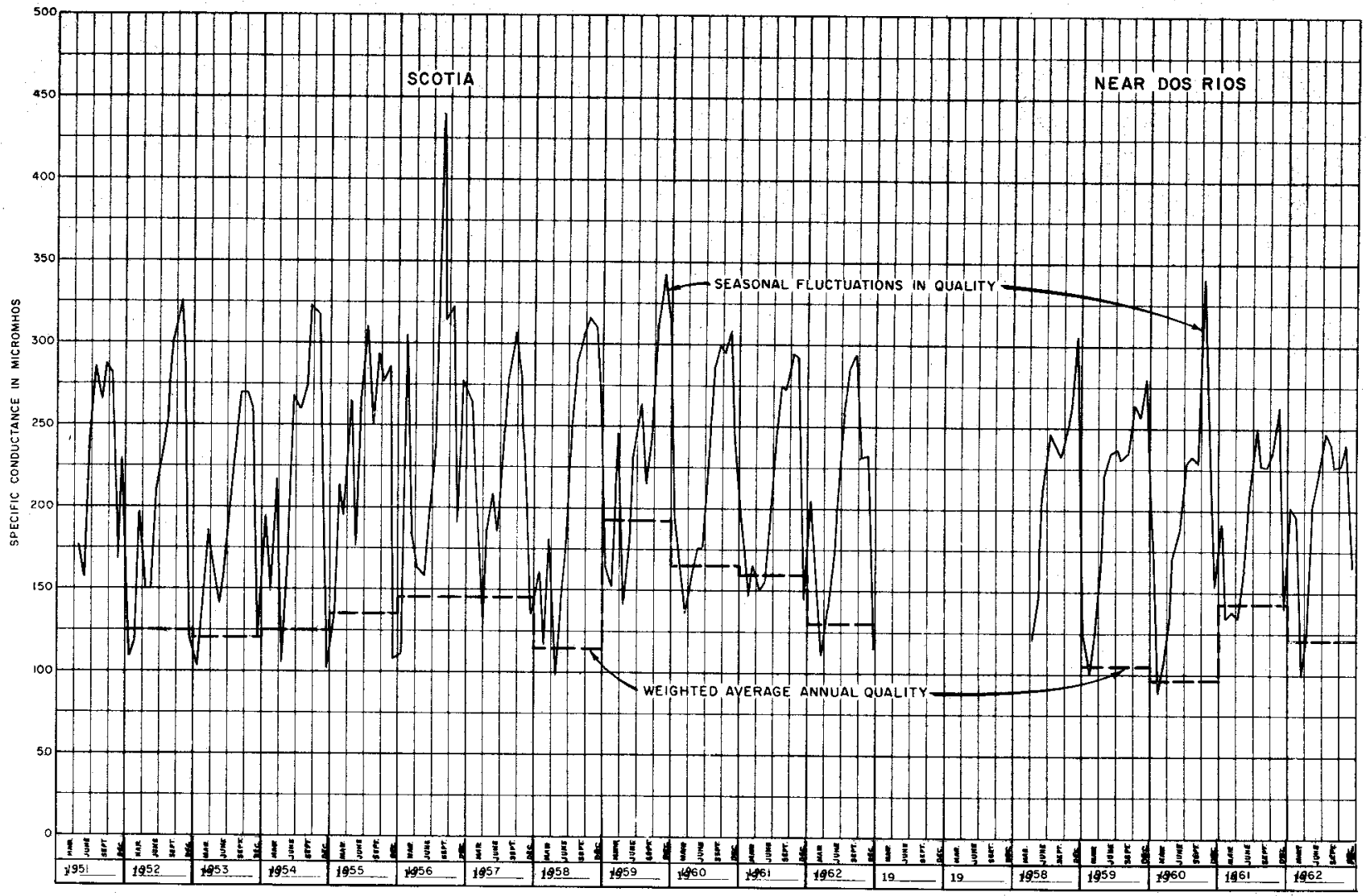


EEL RIVER AT SCOTIA (6)
APRIL, 1951 - JUNE, 1963

Figure 16 shows the seasonal fluctuations in quality, and the annual average quality weighted by flow, of water passing the Scotia station compared to water at the upstream station near Dos Rios. It can be seen that the curves for the seasonal fluctuations at the two stations appear quite similar. However, a mean of the weighted annual average for each station for the years 1959-62 shows a substantial difference in quality, as represented by specific conductance. These figures are 116 micromhos at the station near Dos Rios compared to 162 micromhos at the Scotia station. As previously stated, the median values for these two stations are approximately 200 micromhos for the upstream station, and 220 for the Scotia station. The question of which has the greater validity, the weighted annual average or the median, depends upon the manner in which the water will be used. If the water is impounded in a large reservoir, with a capacity approaching the annual discharge of the stream, the weighted annual average would be a truer measure of the quality. If, however, the water is not impounded, and the user takes a constant amount of water from the flowing stream every day of the year, a median value would have greater meaning in describing the quality.

One more sizeable tributary, the Van Duzen River, joins the Eel about 5 miles downstream from Scotia. Monthly samples collected since 1958 from the Van Duzen River near Bridgeville show a calcium bicarbonate type water of excellent mineral quality. Ranges of significant quality characteristics are as follows: specific conductance from 71 to 319 micromhos, hardness 28 to 152 ppm, boron 0.0 to 0.2 ppm, and percent sodium 4 to 21 percent. Median values are: specific conductance 160 micromhos, hardness 70 ppm, boron 0.1 ppm, and sodium 11 percent. Figure

FIGURE 16



WEIGHTED AVERAGE ANNUAL AND SEASONAL FLUCTUATIONS IN WATER QUALITY OF EEL RIVER AT SCOTIA AND NEAR DOS RIOS

FIGURE 16

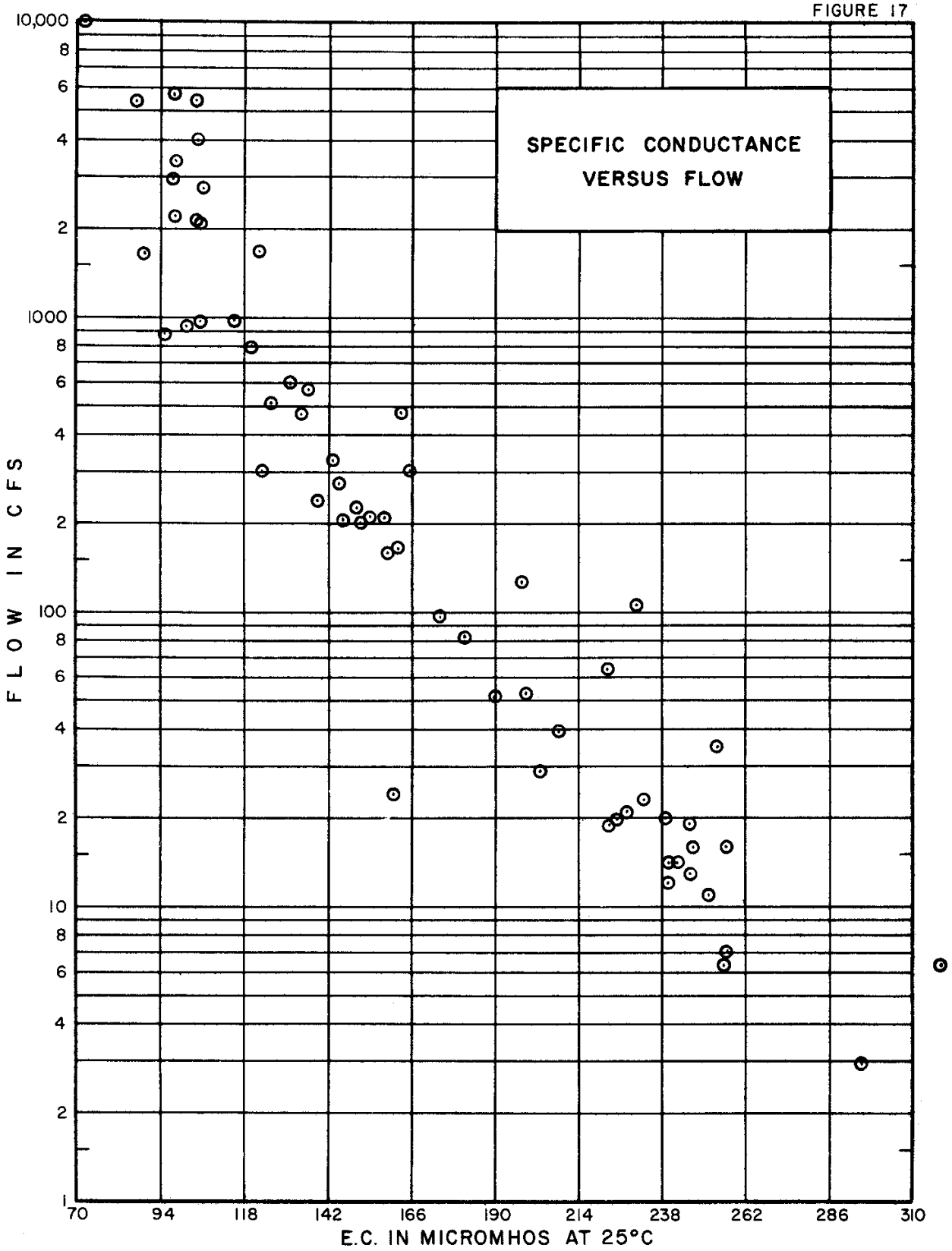
17 shows the specific conductivity versus flow relationship of the Van Duzen River at this station.

The Mattole River drains an area of about 300 square miles to the southwest of the Eel River watershed. The main stem of the Mattole River flows generally northwest in its 44-mile course to the ocean. It is joined by its principal tributary, the North Fork, near Petrolia about 5 miles from the ocean. Monthly samples collected since 1959 from the main stem just above Petrolia, show a calcium bicarbonate type water of excellent mineral quality. Ranges of significant quality characteristics are as follows: specific conductance 72 to 396 micromhos, hardness 22 to 162 ppm, boron 0.0 to 0.5 ppm, and percent sodium 10 to 36 percent. Median values are: specific conductance 180 micromhos, hardness 80 ppm, boron 0.1 ppm, and percent sodium 16 percent. The specific conductivity versus flow relationship at this station is shown in Figure 18.

Several smaller streams in the Eel River Hydrographic Unit discharge directly to the ocean or to Humboldt Bay. Most of these that were sampled discharged water of good mineral quality. One exhibiting poorer quality is Fleener Creek, a very small stream discharging directly to the ocean west of Ferndale. A sample collected on August 17, 1954, was a sodium chloride-bicarbonate type water with a specific conductance of 715 micromhos and total iron content of 1.8 ppm.

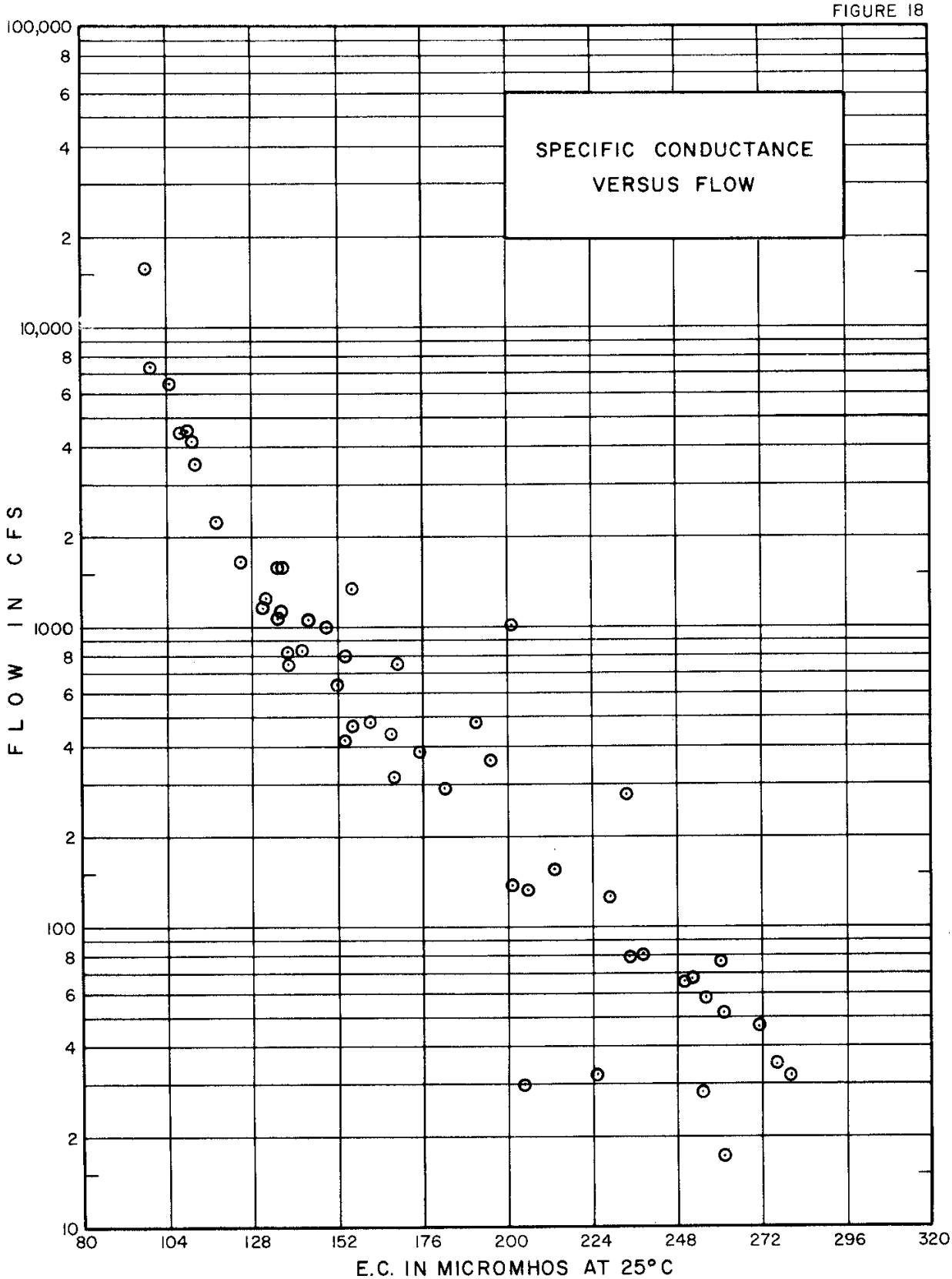
Figure 19 shows annual mean flows and mineral concentrations (as electrical conductance) at stations located in the Eel Hydrographic Unit. Figure 19 also shows mean flows and mineral concentrations at these same stations for two periods representative of typical seasons. Flow data obtained at Alderpoint was used in computations for the McCann Station. The flows shown in the figures may, therefore, be lower than the

FIGURE 17



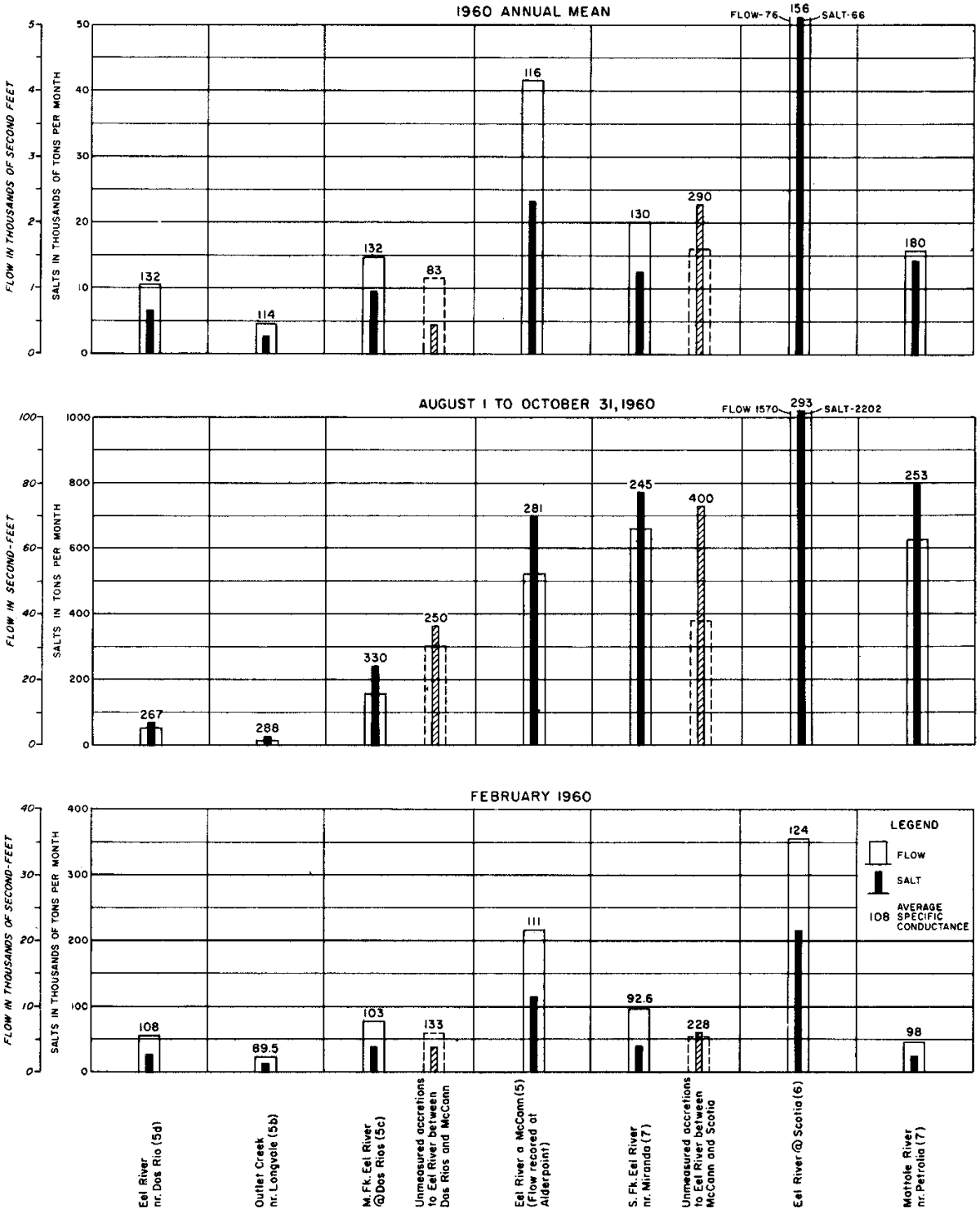
VAN DUZEN RIVER NEAR BRIDGEVILLE (5a)
APRIL, 1958 – JUNE, 1963

FIGURE 18



MATTOLE RIVER NEAR PETROLIA (7a)
JANUARY, 1959–JUNE, 1963

FIGURE 19



AVERAGE FLOWS AND TONS OF SALTS - EEL RIVER BASIN

true flows, which in turn would result in a lower computed quantity of salt at McCann.

The data, representing the 1960 annual mean in Figure 19, shows that the mineral quality of the Eel River between Dos Rios and McCann is slightly impaired due to inflows from Outlet Creek and unmeasured accretions. The Middle Fork Eel River is shown to be essentially of the same quality as the Eel River.

Between McCann and Scotia, an apparent impairment of Eel River water quality takes place, which is attributed in Figure 19 to unmeasured accretions. The effect of waste discharges upstream from the Scotia station may be an important source of quality impairment in this reach of the Eel River. Additional information obtained during the feasibility portion of the study may more adequately define the causes of the slight quality deterioration noted above.

Considered as a whole, the Eel Hydrographic Unit has surface water of excellent mineral quality. Although some analyses have shown high concentrations of boron or iron or manganese, median or average of test results at any of the stations sampled would indicate a water quality desirable for nearly all beneficial uses.

Ground Water Quality in Eel River Hydrographic Unit

As is typically the case, ground water in the Eel River Hydrographic Unit is more mineralized than the surface water. However, aside from scattered pockets with high concentrations of boron, and small areas near the coast yielding brackish water, ground water in this unit is a Class 1, "good to excellent" irrigation supply. As a source of domestic supply,

ground water often is unsatisfactory unless treated for removal of iron and manganese, and some wells yield water that is objectionable because of excessive hardness. The following paragraphs discuss in detail the mineral quality of ground water for each hydrographic subunit in which significant quantities of ground water is exploited.

Outlet Creek Subunit (Little Lake Valley)

Nine standard mineral and seven partial analyses are available from 16 wells within and surrounding Little Lake Valley. The partial analyses include determinations for iron and manganese. High concentrations of these two metals in ground water in the vicinity of Willits has been recognized for years as a problem, resulting in reluctant use of water from wells as a source of domestic supply.

Chemical character of ground water varies considerably within the area. Wells in the central and northern portion of the valley floor generally supply a magnesium-calcium bicarbonate type water similar to surface water flowing into Little Lake Valley. However, three shallow wells in the hills west of the valley supply a calcium-sodium bicarbonate or a magnesium-sodium bicarbonate type water, and water from two shallow wells in the southern portion of the valley floor is sodium bicarbonate in type. One of the latter, Well No. 18N/13W-29D1, produced a water with a moderate concentration (233 ppm) of total dissolved solids, but a sodium percentage of 98 percent. Analyses from the other wells showed the following ranges of significant quality characteristics: specific conductance from 110 to 859 micromhos (dissolved solids 70 to 522 ppm), hardness from 33 to 330 ppm, boron 0.04 to 3.8 ppm, percent sodium 11 to

55 percent, iron 0.13 to 9.6 ppm, and manganese 0.00 to 7.1 ppm. Median values for all ground water sources in this subunit are: specific conductance 316 micromhos, hardness 131 ppm, boron 0.17 ppm, percent sodium 33 percent, iron 1.0 ppm, and manganese 1.1 ppm. Thus, with the exception of two wells with high concentrations of boron (3.8 and 1.2 ppm), and the one well exhibiting a high sodium percentage (98 percent), this ground water would be considered a Class 1 irrigation supply. However, the high concentrations of iron and manganese in most of the wells makes this water very undesirable for domestic use. According to U. S. Public Health Service drinking water standards, only 4 of the 16 sampled wells would qualify as a suitable source of domestic supply without treatment.

Laytonville Subunit

Mineral analyses are available from 16 ground water sources (15 wells and 1 spring) in the Laytonville Subunit. The wells in Laytonville Valley draw water from several separate and distinct alluvial areas that function as hydraulically independent basins. For this reason, ground water is quite variable in character and quality; and there seems to be little or no pattern, either by area, depth, or geologic formation.

Of the 16 ground water sources sampled,bicarbonate is the dominant anion in 14; chloride predominates in the other two. The dominant or most prevalent cation is magnesium in 6 wells, calcium in 5, and sodium in 5 ground water sources (4 wells and 1 spring).

The spring that was sampled feeds Sulphur Springs Creek, and yields a sodium chloride type water of very poor quality. A sample collected in March 1955, had a specific conductance of 1,870 micromhos, a chloride

concentration of 456 ppm, and an unusually high boron concentration of 23 ppm. A sample collected the previous September showed almost identical concentrations of major constituents, indicating that the quality of this spring is not significantly affected by winter rains or recent meteoric water. Rather, it suggests a juvenile, or deep-seated water, rising along a fault or fracture in the bedrock.

Well No. 21N/15W-12C2 which is 65 feet deep yields a sodium bicarbonate type water with a boron concentration of 9.8 ppm. The shallow ground water in this area is apparently recharged primarily by water from nearby Sulphur Springs Creek, which yields a sodium bicarbonate type water with a boron concentration of 16 ppm. Well No. 21N/15W-12C1, which is 140 feet deep and is only a short distance from Well No. 21N/15W-12C2, yields a calcium bicarbonate type water with a boron concentration of only 0.2 ppm. Obviously, these two wells are not recharged from the same source.

Despite the variations and extremes just mentioned, a majority of wells in the Laytonville Subunit yield water of good mineral quality, suitable for most beneficial uses. Median values for significant quality characteristics of all sampled ground water in this subunit are as follows: specific conductance 297 micromhos, hardness 133 ppm, boron 0.09 ppm, and percent sodium 28 percent. Determinations for iron were made of ground water from seven sources. Concentrations ranged from 0.03 to 7.9 ppm with a median value of 0.17 ppm.

Round Valley Subunit

Mineral analyses from 24 wells in Round Valley indicate this ground water is a Class 1 irrigation supply. Of necessity ground water is also used domestically, but it is often objectionable for home use unless treated for removal of iron and manganese.

Character of the water generally is the same as the surface water -- calcium-magnesium bicarbonate, and concentrations of calcium and magnesium are generally of a magnitude that classifies the ground water as moderately hard to hard. In water from 5 of the 24 sampled wells, hardness exceeds 200 ppm.

From the northern half of the southern portion of the valley, the ratio of magnesium to calcium appears to increase, accompanied by a slight increase in total dissolved solids. This may be due to the influence of recharge from Turner Creek, which traverses the southern portion of the valley. A single analysis of water from this creek, collected at low flow, indicated a magnesium bicarbonate type water. However, wells in the south are generally deeper than those in the central or northern portions, so that depth rather than areal distribution may be the major correlative factor.

Well No. 22N/12W-21A1 is the only ground water source sampled in Round Valley that yielded a water with sodium as the dominant cation. This water, sodium bicarbonate in type, also had the highest concentrations of total dissolved solids (392 ppm) and of nitrate (8.9 ppm). Since this well is located adjacent to Mill Creek, the only natural outlet for Round Valley waters, it is possible that the quality of this well water is influenced to some degree by irrigation return flows or other waste discharges within the valley.

Median values for selected quality characteristics from all ground water sources in the Round Valley Subunit are as follows: specific conductance 268 micromhos (dissolved solids 160 ppm), hardness 124 ppm, boron 0.11 ppm, and percent sodium 16 percent. Determinations of iron

concentrations, showed a range from 0.03 to 7.4 ppm with a median value of 0.49 ppm. Maximum values for other significant concentrations of heavy metals encountered in Round Valley ground water include manganese 2.0 ppm, arsenic 0.12 ppm, and lead 0.06 ppm.

Lower Eel Subunit

Mineral analyses from more than 50 wells are available to evaluate ground water in the Lower Eel Subunit. Most of these samples were collected in 1952 during a comprehensive ground water investigation by the U. S. Geological Survey in Cooperation with this department. A report of that investigation entitled "Geology and Ground Water Features of the Eureka Area, Humboldt County, California," was published in Geological Survey Water Supply Paper 1470. Subsequently, the Department of Water Resources, through its ground water monitoring program, initiated annual sampling of six new wells, and continued sampling of nine of the wells sampled in 1952. Thus, recent analyses are available from15 wells, several having a nearly continuous ten-year quality record.

In this subunit, ground water is obtained from four different geologic formations -- Recent alluvium, terrace deposits, Hookton formation, and the Carlotta formation. The Recent alluvium in the eastern part of this subunit (T2N, R1W and T3N, R1W) yields a magnesium or calcium bicarbonate type water although magnesium generally is the predominant cation. Nearer the mouth of the Eel River (T3N, R2W), wells in the Recent alluvium usually yield a sodium chloride or magnesium-sodium chloride type water, indicating the influence of brackish water from the estuary. Thus, the Township line between Range 1 West and 2 West approximately delineates the bicarbonate type ground water to the east, and the chloride type water to the west. This range line also is roughly the boundary between the

good quality water to the east, and the highly mineralized water near the coast. In Range 1 West, total dissolved solids generally are less than 300 ppm, and chloride concentrations range from 6 to 47 ppm with a median value of 15 ppm. In Range 2 West near the estuary, concentrations of total dissolved solids have reached as high as 4,000 ppm, with chlorides above 2,000 ppm; concentrations of chloride in this area generally are greater than 100 ppm with a median value of 320 ppm. This wide range from well to well near the estuary probably is due primarily to heavier pumping, resulting in greater drawdown in some wells.

The terrace deposits yield a good quality water to three wells near the town of Rio Dell. Water from two wells was calcium-magnesium bicarbonate in character; the third produced a calcium-sodium bicarbonate type water. Concentrations of total dissolved solids were less than 250 ppm, chloride 20 ppm or less, and iron less than 0.2 ppm.

Analyses are available from two wells that were drilled in or near outcrops of the Hookton formation. Water from a 75-foot well 3N/1W-18D2, is a magnesium-sodium bicarbonate type, of excellent mineral quality, with 119 ppm dissolved solids and 17 ppm chloride. The other well, 3N/2W-2A2, located less than 2 miles from the ocean and about 1,000 feet from McNulty Slough, is 16 feet deep. It yields a sodium-magnesium chloride type water with 998 ppm dissolved solids, and 574 ppm chloride, suggesting the probability of salt-water encroachment.

The Carlotta formation has at least two different water-bearing zones, and yields water of distinctly different types. Water from the upper zone generally is magnesium-sodium bicarbonate in character and of good mineral quality, with concentrations of dissolved solids less than

400 ppm, and chlorides less than 50 ppm. The deeper zone of the Carlotta formation yields a sodium chloride or magnesium chloride type water, with concentrations of dissolved solids generally in excess of 1,000 ppm, and chlorides greater than 200 ppm. It appears that this water is substantially connate in origin rather than the result of recent sea-water intrusion. This conclusion can be confirmed in two ways. First, well 3N/1W-18K1, which penetrates about 400 feet of the Carlotta formation, was sampled at various depths during the process of drilling. Since sampling was accomplished by means of a bailer, which would preclude an extensive pumping depression, an analysis of a sample from a particular depth should be representative of native ground water quality at that depth. Secondly, several wells penetrating the lower zone of this formation have pressure heads considerably above sea level, and higher water levels than adjacent shallow wells. In fact two wells, 3N/2W-32N1 and 32Q1, less than a mile from the ocean, flow over the top of their respective casings approximately 8 feet above sea level.

Disregarding geologic formations and areal distribution, analyses of all ground water sources sampled in the Lower Eel Subunit show the following median values of significant quality characteristics: specific conductance 490 micromhos, hardness 215 ppm, chloride 25 ppm, boron 0.06 ppm, and percent sodium 20 percent. Iron concentrations vary widely from well to well and reach a maximum of 26 ppm in Well No. 3N/2W-24E1 near Loleta. The median value of the most recent iron determination from 45 wells is 0.34 ppm; the median for all iron determinations made since 1952 in this subunit is 0.20 ppm.

The subject of salt-water encroachment was explored in the 1952-53 investigation and discussed in Water Supply Paper 1470. Excerpts from that report are quoted as follows: p. 47.

> "In the Eel River valley, wells near the tidal reach of the river yielded predominantly sodium chloride waters in which chloride concentrations exceeded 400 ppm in 9 wells and 1,000 ppm in 3 wells. A water sample from the Eel River (September 30, 1952), collected about 4 miles from the mouth, contained 8,200 ppm of chloride, indicating that the tidal reach of the river is the principal source of contamination. Two wells at a considerable distance from the estuary (3N/2W-13J1 and 35M1) yielded magnesium chloride waters, whereas wells nearest to the estuary yielded sodium chloride waters. The magnesium chloride waters are probably the result of base-exchange reactions in which the sodium in the water from the estuary has been replaced by magnesium as the estuary water percolates through magnesium-rich alluvial sediments."

and from p. 43:

> " . . . There was an appreciable increase in chloride concentrations at only 1 of 5 wells from August 1952 to August 1953. Well 3N/2W-27G1 showed an increase in chloride concentration from 765 ppm in August 1952 to 1,060 ppm in August 1953. The increase of chloride concentration may or may not be indicative of salt-water encroachment. Unknown factors, such as the local pattern of pumping, the static fresh-water head, the effect of tidal forces, and the duration of pumping prior to sampling, may have had an effect on the quality of water sampled. Additional periodic analyses would be necessary to determine whether salt-water encroachment is occurring."

Since the three wells referred to in the above excerpts were included in the department's continuing ground water monitoring program, additional data is now available to permit further evaluation of the extent of salt-water encroachment in this area. Recent analyses (Appendix B-20) show that chloride concentrations in wells 3N/2W-13J1 and 27G1 increased substantially since 1952. Between 1952 and 1960, the concentration of chloride in well 13J1 increased from 400 to 1,080 ppm, and in well 27G1 from 765 to 2,050 ppm. However, this increase was not a constant upward

trend, but fluctuated considerably from year to year. This fluctuation probably was due largely to differences each year in the pumpage demand for the few days or weeks immediately prior to sampling. It also might be due partially to varying seasonal patterns, and amounts of precipitation from year to year.

Well 3N/2W-35M1, about 1½ miles southeast of well 27G1, showed an improving trend in quality. Although annual fluctuations were appreciable, chloride concentrations decreased from 495 ppm in 1952 to 370 ppm in 1960. Recent analyses from well 3N/1W-18D2 and 30N1, which exhibit an excellent quality water with chloride concentrations of 17 to 12 ppm, respectively, indicate that the brackish ground water near the estuary has not advanced across the Township line between Range 2 West and 1 West.

Eureka Plain Subunit

Comprehensive mineral analyses from 20 wells are available to evaluate ground water quality in the Eureka Plain Subunit. This subunit surrounds all of Humboldt Bay, and includes the southern portion of Arcata Plain from the vicinity of the town of Arcata westward to the Mad River slough.

Wells in the southern portion of Arcata Plain generally are less than 50 feet deep and bottom in Recent alluvium. With the exception of high concentrations of iron, water from these wells is of good mineral quality. Chemical character ranges from calcium bicarbonate to magnesium bicarbonate. Wells in this area west of Arcata yield water with the following ranges of significant quality characteristics: specific conductance from 219 to 459 micromhos, hardness 82 to 233 ppm, boron 0.02 to 0.33 ppm, chloride 10 to 23 ppm, percent sodium 8 to 24 percent, and iron 0.10 to 6.4 ppm.

South of the town of Arcata, on the eastern periphery of Arcata Bay, the Recent alluvium is thinner, and most wells bottom in confined aquifers of the Hookton formation. Most water from these wells is magnesium-sodium bicarbonate in character, and of good mineral quality. Concentrations of chloride in the four shallowest wells sampled were less than 30 ppm, and boron generally less than 0.1 ppm. However, the two deepest wells, 5N/1E-18Q1, 370 feet deep, and well 6N/1E-32F1 with a depth of 640 feet, apparently draw some water of poorer quality from a deeper aquifer. Both of these wells yielded a sodium bicarbonate type water with concentrations of chloride above 100 ppm and boron ranging as high as 2.1 ppm.

South of Eureka, near Buhne Point, are two more deep wells that penetrate the older sediments, probably primarily the Carlotta formation. Both of these wells, 4N/1W-8P1 and 17B1, are 450 feet deep, and yield a magnesium-sodium bicarbonate type water of excellent mineral quality. Specific conductance is less than 170 micromhos, and concentrations of chloride and boron are less than 16 ppm and 0.05 ppm, respectively.

Several analyses from one well, 5N/1W-16L1, are available from the North Spit, representing the quality of water in the dune sand. From 1954 to 1957, this shallow driven well yielded a water of surprisingly good quality, with a maximum specific conductance of 542 micromhos. Chloride concentrations generally are less than 100 ppm, even though character of the water was sodium chloride or sodium-magnesium chloride. The following observations on the dune sand are quoted from Geological Survey Water Supply Paper 1470:

> "The sodium chloride in the water of the dune sand is due (a) largely to the diffusion of salt water across the interface between the fresh-water lens and the salt water and (b) also to

the precipitation, which dissolves salts deposited by the ocean spray and subsequently percolates downward to the fresh-water lens. When water from a well in the North Spit becomes contaminated with sea water, the well is abandoned and a new one is constructed."

Disregarding geologic formations, depth zones, and areal distribution, analyses of all ground water sources sampled in the Eureka Plain Subunit show the following median values of significant quality characteristics: specific conductance 294 micromhos, hardness 119 ppm, boron 0.06 ppm, and percent sodium 24 percent. The median value for the most recent iron determination from each of 19 wells is 0.52 ppm; the median value for all iron determinations made in this subunit is 0.28 ppm.

Effects of Future Projects on Water Quality

Future water projects in the North Coastal area will consist largely of diversions from surface water impoundments for export to areas of deficiency. Much of this exported water will be for municipal use where the amount of treatment required before final distribution to the consumer could be of great economic importance.

Impounding surface water in large reservoirs, properly designed and operated, generally is considered to improve the overall year-around quality of water for domestic or municipal use. Bacterial counts often are lowered; and physical characteristics, such as temperature and suspended sediment content, generally are improved. More importantly, however, a reservoir with a large storage ratio, and multiple-level outlets,can release water of a fairly uniform quality the year around. This is of great benefit to a treatment plant, since once a satisfactory water treatment process has been established, it can be continued with a minimum of modifications

necessitated by seasonal fluctuations in water quality. Thus, the operator of a water treatment plant, may prefer a raw water supply of slightly poorer but constant quality, over a water that is of better but variable quality.

However, there are significant water quality problems which may be encountered in future projects developed to export waters from the North Coastal Area to areas of need. These include excessive turbidity and concentrations of manganese and iron, especially their persistence in water being stored or transported. These two potential problems are discussed separately in the following paragraphs.

Turbidity

Sediment data, and visual observations of surface waters in the North Coastal Area, indicate that turbidity varies considerably from stream to stream. For example, below Lake Pillsbury during the rainy season, Eel River water is milky-gray in color, and this pronounced turbidity is reported to persist for three or four weeks after the last heavy rains of the season. At the other extreme, Trinity River water below Lewiston Dam may remain very clear, even after a heavy rainfall. In places, where the Trinity River does become turbid, the water is brown in color, but clears up much faster than does the gray-colored turbid water in the Eel River.

In recent years, the U. S. Geological Survey, in their cooperative program with this department, has established sampling stations, some continuous and some periodic, to measure suspended sediment in North Coastal Area streams. Data collected thus far indicates extremely high suspended sediment concentrations in many of these streams, and particularly in those located in the Eel River Hydrographic Unit. An example of differences in the suspended sediment load carried by the Eel River and Trinity River may

be given by a comparison of data collected as part of this program. On February 10, 1960, a sample from the Eel River above Dos Rios had a suspended sediment concentration of 1020 ppm, compared to 118 ppm in the Trinity River below Lewiston. Further downstream on the same day, the Eel River at Scotia had a concentration of 3900 ppm, compared to 870 ppm in the Trinity River at Hoopa. Both rivers were in the second day of a falling stage at the time of sample collection. The effect of development of the upper Trinity River in reducing the suspended sediment load on this date is not clear; however, geological differences in the hydrographic units are important, and are reflected by the lower sediment load carried by the Trinity River.

The above concentrations of suspended sediment, if persistent in a raw water supply, are in a range that would require costly treatment if used as the sole source of water by a local municipality. Complete treatment, including coagulation, sedimentation, filtration, and disinfection would probably be necessary before the water could be used for domestic purposes. In addition, sedimentation, if appreciable, could result in a long range problem by causing reservoirs and conduits to "silt-up," thereby losing part of their capacity to store or transport water.

In evaluating the magnitude of the turbidity problem, it should be remembered that excessive turbidity in North Coastal streams is not a year-around phenomenon, but is seasonal in nature and does not persist indefinitely under normal flow conditions. Of importance then, is the determination of the behaviour of the suspended materials following impoundment of the transporting waters. If a significant portion of the suspended material is in a colloidal form, the impounded water may

remain turbid for prolonged periods of time. This of course could result in water quality impairment in natural channels receiving reservoir releases, and may effect the capacity requirements of conduits used for conveying export water. Further study is needed to better define the problem. Special considerations in operation and design of future North Coastal projects may be required in order to avoid serious water quality problems due to turbidity.

Manganese and Iron

Although iron is more abundant than manganese in North Coastal waters, it is not as serious a problem as manganese, particularly in surface water. In the presence of dissolved oxygen and a pH on the alkaline side (above 6.5), ferrous iron in water that does not contain excessive amounts of organic matter is readily oxidized to the ferric form, resulting in a stable precipitate of iron salts.

This same principle of oxidation and precipitation also applies to manganese, but to a much lesser degree than with iron. Manganese in solution is often responsive to aeration, but the resulting precipitate may be unstable so that when subjected to biologic activity accompanied by a lack of dissolved oxygen in the water, the precipitated manganese may go back into solution.

This phenomenon has been observed in many reservoirs, especially those with a marked summer thermocline. As the dissolved oxygen content in the lower strata of water approaches zero, previously precipitated manganese on the reservoir bottom redissolves into the hypolimnion where it remains until the fall turnover. The manganese in solution may be carried for many miles downstream from the dam. The distance that it is carried will vary

with the time of the year, the number of years of discharge, the temperature of the water, and the characteristics of the streambed. Also, a manganese precipitate may remain in place on a stream bottom for a year or longer. Then when conditions are right, it may go into solution and "leap frog" downstream. This "leap frogging" has occurred even when dissolved oxygen is known to be present and is believed to result from some form of biologic process.

Even if future impoundments of North Coastal waters are for local municipal use, several steps can be taken to ameliorate any potential manganese problem. If reservoirs are constructed with multiple-level outlets, vertical selectivity can be obtained which allows the operator to minimize manganese problems. If additional steps are necessary, artificial aeration or pumping to induce artificial turnover can be initiated, thereby preventing stratification and the resulting concentration of manganese and other minerals. Thus, concentrations of manganese and iron d o not appear to be a deterrent to the future conservation and use of surface water in the North Coastal Area.

APPENDIX A

ANALYSES OF SURFACE WATER

APPENDIX A

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ANALYSES OF SURFACE WATER[a]

TRINITY RIVER HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	MDB&M						TRINITY RESERVOIR SUBUNIT																	
Trinity River At Lewiston	33N/8W-19A	Surface Water Monitoring Program Station Number 4a. Results of continuous monthly sampling since April 1951 are published in Water Quality Investigations Report No. 15, and Bulletin No. 65. Following are typical analysis results contained in these publications:																						
		9/12/51	138	67	155	8.2	9.2 / 0.459	12 / 0.99	4.8 / 0.209	0.4 / 0.010	0 / 0.00	87 / 1.43	4.0 / 0.083	5.2 / 0.147	0 / 0.00	0 / 0.00	0.05	14		93	13	72	1	
		9/13/54	268	68	137	7.6	9.3 / 0.464	9.2 / 0.756	4.2 / 0.183	0.8 / 0.020	0 / 0.00	74 / 1.21	3.0 / 0.062	4.5 / 0.127	0.0 / 0.00	0.6 / 0.010	0.10	16	Cu 0.02 Fe 0.04 Zn 0.01 PO_4 0.00 c	84	13	61	0	
		5/4/59	2,290	50	85.6	7.3 / 7.5	5.2 / 0.26	7.5 / 0.62	2.2 / 0.10	0.4 / 0.01	0.0 / 0.00	46 / 0.75	5.8 / 0.12	2.8 / 0.08	0.0 / 0.00	0.6 / 0.01	0.0	14	Fe 0.08 Al 0.11 PO_4 0.00 c	62	10	44	6	
							MIDDLE TRINITY SUBUNIT																	
Grass Valley Creek	33N/9W-26M	7/16/59	10[e]	80	174	7.7	17 / 0.85	5.0 / 0.41	8.5 / 0.37	2.1 / 0.05	0 / 0.00	87 / 1.42	0.6 / 0.01	8.0 / 0.22	0.1 / 0.00	1.7 / 0.03	0.0	25		111	22	63	0	Very turbid
		8/12/59		57	189	7.9 / 7.8	19 / 0.95	5.7 / 0.47	9.2 / 0.40	2.0 / 0.05	0 / 0.00	96 / 1.57	0.0 / 0.00	9.9 / 0.28	0.1 / 0.00	0.3 / 0.00	0.01	22	D.O. 9.4	115	21	71	0	
		9/2/59		56	198	7.4 / 7.8	19 / 0.95	6.9 / 0.57	9.2 / 0.40	2.2 / 0.06	0 / 0.00	102 / 1.67	0.6 / 0.01	11 / 0.31	0.1 / 0.00	0.4 / 0.01	0.03	25	D.O. 9.6	124	20	76	0	Silty
		10/14/59	15[e]	48	197	8.1	21 / 1.05	5.2 / 0.43	8.8 / 0.38	1.9 / 0.05	0 / 0.00	106 / 1.74	1.5 / 0.03	3.9 / 0.11	0.1 / 0.00	0.4 / 0.01	0.02	26	D.O. 10.2	121	20	74	0	
		11/13/59		37	192	7.6 / 7.9	19 / 0.95	6.7 / 0.55	8.5 / 0.37	1.8 / 0.05	0 / 0.00	97 / 1.59	2.1 / 0.04	9.4 / 0.26	0.1 / 0.00	0.3 / 0.00	0.00	25	D.O. 12.5	121	19	75	0	
		12/11/59		40	191	7.5 / 8.1	20 / 1.00	6.1 / 0.50	8.8 / 0.38	1.7 / 0.04	0 / 0.00	97 / 1.59	2.6 / 0.05	9.8 / 0.28	0.1 / 0.00	0.0 / 0.00	0.01	23		120	20	75	0	
		1/15/60		38	185	7.4 / 7.8	18 / 0.90	6.3 / 0.52	8.0 / 0.35	1.0 / 0.02	0 / 0.00	92 / 1.51	3.0 / 0.06	9.0 / 0.25	0.1 / 0.00	0.3 / 0.00	0.03	24	D.O. 12.5	115	20	71	0	Silty
		3/15/60	60[e]	40	122	7.6	11 / 0.55	5.5 / 0.45	4.4 / 0.19	1.2 / 0.03	0 / 0.00	65 / 1.06	1.5 / 0.03	2.2 / 0.06	0.1 / 0.00	0.2 / 0.00	0.01	22	D.O. 10.5	80	16	50	0	Murky
Indian Creek At Douglas City	32N/9W-5	5/6/59			172	8.0													Al 0.02 c					
Reading Creek At Diversion Dam	32N/10W-12P	7/16/59	3[e]	82	234	8.0	34 / 1.70	7.5 / 0.62	4.0 / 0.17	1.6 / 0.04	0 / 0.00	141 / 2.31	4.3 / 0.09	3.9 / 0.11	0.1 / 0.00	0.4 / 0.01	0.04	15		140	6.7	116	0	
		8/12/59		61	276	7.5 / 7.8	39 / 1.95	8.1 / 0.67	6.0 / 0.26	1.5 / 0.04	0 / 0.00	160 / 2.62	3.1 / 0.06	6.3 / 0.18	0.1 / 0.00	0.5 / 0.01	0.03	12	D.O. 7.8	156	9	131	0	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

TRINITY RIVER HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	MDB&M									MIDDLE TRINITY SUBUNIT (Continued)														
Reading Creek At Diversion Dam	32N/10W-12P	9/2/59		60	263	7.7 / 8.0	41 / 2.04	6.1 / 0.50	4.3 / 0.19	1.6 / 0.04	0 / 0.00	154 / 2.52	3.4 / 0.07	3.8 / 0.11	0.1 / 0.00	0.5 / 0.01	0.04	13	D.O. 9.8	150	7	127	1	Clear
		10/14/59	4[e]	53	266	/ 8.2	40 / 2.00	6.1 / 0.50	4.4 / 0.19	1.2 / 0.03	0 / 0.00	150 / 2.46	7.1 / 0.15	3.6 / 0.10	0.1 / 0.00	0.7 / 0.01	0.03	18	D.O. 9.5	155	7	125	2	
		11/13/59		40	254	7.7 / 8.1	38 / 1.90	6.3 / 0.52	4.2 / 0.18	1.1 / 0.03	0 / 0.00	142 / 2.33	7.6 / 0.16	4.7 / 0.13	0.1 / 0.00	0.2 / 0.00	0.00	13	D.O. 12.2	145	7	121	5	
		12/11/59		40	245	7.6 / 8.2	37 / 1.85	6.2 / 0.51	4.2 / 0.18	1.1 / 0.03	0 / 0.00	138 / 2.26	8.2 / 0.17	4.4 / 0.12	0.1 / 0.00	0.0 / 0.00	0.00	11		140	7	118	5	
		1/15/60		38	248	7.9 / 8.0	33 / 1.65	8.1 / 0.67	4.2 / 0.18	0.7 / 0.02	0 / 0.00	126 / 2.06	12 / 0.25	7.0 / 0.20	0.1 / 0.00	0.3 / 0.00	0.03	10	D.O. 12.3	137	7	116	13	
		3/15/60	45[e]	40	176	/ 8.0	24 / 1.20	5.8 / 0.48	2.6 / 0.11	0.8 / 0.02	0 / 0.00	98 / 1.61	5.3 / 0.11	2.2 / 0.06	0.1 / 0.00	0.2 / 0.00	0.02	11	D.O. 11.3	100	6	84	4	Clear
Browns Creek Near Douglas City	10J	6/8/58		54	235	/ 8.0	30 / 1.50	10 / 0.82	4.1 / 0.18	0.7 / 0.02	0 / 0.00	136 / 2.23	7.1 / 0.15	3.6 / 0.10	0.0 / 0.00	0.1 / 0.00	0.03	18		141	7	116	4	
		9/9/58	10[e]		383	/ 8.0	44 / 2.20	13 / 1.10	12 / 0.52	2.5 / 0.06	0 / 0.00	182 / 2.98	13 / 0.27	19 / 0.54	0.3 / 0.02	0.7 / 0.01	0.07	22		216	13	165	16	
		5/19/59	40[e]	53	300	/ 8.1	41 / 2.04	8.5 / 0.70	7.6 / 0.33	0.6 / 0.02	0 / 0.00	159 / 2.61	8.9 / 0.18	11 / 0.31	0.1 / 0.00	0.4 / 0.01	0.26	19	D.O. 10.7	175	11	137	7	Clear
		9/2/59		79	391	8.1 / 7.9	40 / 2.00	14 / 1.20	15 / 0.65	1.5 / 0.04	0 / 0.00	158 / 2.59	8.7 / 0.18	38 / 1.07	0.1 / 0.00	1.1 / 0.02	0.13	21	D.O. 10.3	218	17	160	30	Clear
										WEAVER CREEK SUBUNIT														
Little Browns Creek Near Douglas City	33N/9W-19Q	3/15/60	27[e]	44	121	/ 7.7	10 / 0.50	7.5 / 0.62	1.8 / 0.08	0.3 / 0.01	0 / 0.00	69 / 1.13	2.6 / 0.05	0.3 / 0.01	0.0 / 0.00	0.0 / 0.00	0.03	20	D.O. 10.3	76	7	56	0	Clear and fast
Weaver Creek	33N/10W-36J	6/8/58		58	92.3	/ 7.8	10 / 0.50	3.6 / 0.30	2.9 / 0.13	0.6 / 0.02	0 / 0.00	54 / 0.88	1.2 / 0.02	0.9 / 0.02	0.1 / 0.00	0.4 / 0.01	0.01	23		69	14	40	0	
		9/9/58	10[e]		230	/ 7.9	25 / 1.25	10 / 0.85	4.0 / 0.17	0.7 / 0.02	0 / 0.00	125 / 2.05	9.7 / 0.20	1.5 / 0.04	0.2 / 0.01	0.7 / 0.01	0.07	21		135	7	105	3	
		5/19/59	55[e]	49	115	/ 7.8	15 / 0.75	3.0 / 0.25	2.4 / 0.10	0.2 / 0.00	0 / 0.00	62 / 1.02	0.6 / 0.01	1.0 / 0.03	0.1 / 0.00	0.3	0.20	17	D.O. 10.9	70	9	50	0	Clear
		9/2/59		79	254	7.9 / 7.9	28 / 1.40	13 / 1.10	4.1 / 0.18	0.8 / 0.02	0 / 0.00	150 / 2.46	7.1 / 0.15	2.4 / 0.07	0.1 / 0.00	1.3 / 0.02	0.02	20	D.O. 9.2	151	7	125	2	
		3/15/60	60[e]	46	128	/ 7.7	13 / 0.65	6.4 / 0.53	2.2 / 0.10	0.3 / 0.01	0 / 0.00	70 / 1.15	5.3 / 0.11	0.5 / 0.01	0.0 / 0.00	0.3 / 0.00	0.02	18	D.O. 10.9	80	8	59	2	Clear

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

TRINITY RIVER HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	MDB&M									HELENA SUBUNIT														
North Fork Trinity River Near Helena	34N/11W-21N	5/6/59		49	83.8	7.3 / 7.8	10 / 0.50	2.7 / 0.22	1.7 / 0.07	0.3 / 0.01	0 / 0.00	47 / 0.77	0.2 / 0.00	1.0 / 0.03	0.1 / 0.00	1.0 / 0.02	0.02	11	D.O. 11.4	51	9	36	0	Clear
		9/3/59		60	123	7.2 / 7.3	14 / 0.70	5.1 / 0.42	1.8 / 0.08	0.4 / 0.01	0 / 0.00	66 / 1.08	4.6 / 0.10	0.0 / 0.00	0.1 / 0.00	0.2 / 0.00	0.03	12	D.O. 8.4	70	7	56	2	Clear
North Fork Trinity River At Helena	28N	6/7/58		51	55.8	/ 7.2	6.2 / 0.31	1.8 / 0.15	1.5 / 0.06	0.0 / 0.00	0 / 0.00	29 / 0.48	0.2 / 0.00	1.4 / 0.04	0.0 / 0.00	0.1 / 0.00	0.02	7.5		33	12	23	0	
		9/9/58	30[e]		112	/ 7.6	14 / 0.70	3.9 / 0.32	2.5 / 0.11	0.2 / 0.00	0 / 0.00	59 / 0.97	5.4 / 0.11	0.0 / 0.00	0.1 / 0.00	0.5 / 0.01	0.08	12		68	10	51	3	
		5/6/59			78.7	/ 7.8													Al 0.05 c					Turb. 10
Canyon Creek At Junction City	33N/11W-12N	7/16/59	5[e]	79	74	/ 7.2	9.5 / 0.47	2.1 / 0.17	2.2 / 0.10	0.6 / 0.02	0 / 0.00	41 / 0.67	0.7 / 0.01	1.0 / 0.03	0.0 / 0.00	0.4 / 0.01	0.04	11		48	13	32	0	
		8/11/59		64	102	7.3 / 7.3	9.7 / 0.48	4.9 / 0.40	1.8 / 0.08	0.3 / 0.01	0 / 0.00	57 / 0.93	1.5 / 0.03	0.8 / 0.02	0.0 / 0.00	0.5 / 0.01	0.01	9.2	D.O. 8.9	57	8	44	0	
		9/3/59		60	104	7.2 / 7.3	12 / 0.60	3.6 / 0.30	2.2 / 0.10	0.4 / 0.01	0 / 0.00	53 / 0.87	5.3 / 0.11	0.0 / 0.00	0.1 / 0.00	0.1 / 0.00	0.02	12	D.O. 9.3	62	10	45	2	
		10/14/59	12[e]	56	82.0	/ 7.6	9.6 / 0.48	1.7 / 0.14	1.7 / 0.07	0.3 / 0.01	0 / 0.00	39 / 0.64	2.8 / 0.06	0.0 / 0.00	0.0 / 0.00	1.6 / 0.02	0.03	10	D.O. 9.5	47	10	31	0	
		11/12/59		50	89.6	7.2 / 7.7	10 / 0.50	3.4 / 0.28	1.6 / 0.07	0.2 / 0.00	0 / 0.00	46 / 0.75	4.0 / 0.08	0.2 / 0.00	0.0 / 0.00	0.1 / 0.00	0.00	11	D.O. 10.5	54	8	39	1	
		12/11/59		42	104	7.2 / 7.8	14 / 0.70	2.2 / 0.18	2.2 / 0.10	0.5 / 0.01	0 / 0.00	55 / 0.90	4.6 / 0.10	0.4 / 0.01	0.0 / 0.00	0.0 / 0.00	0.02	11	D.O. 12.4	62	10	44	0	
		1/15/60		40	109	7.3 / 7.7	14 / 0.70	2.9 / 0.24	1.7 / 0.07	0.5 / 0.01	0 / 0.00	52 / 0.85	6.2 / 0.13	0.0 / 0.00	0.1 / 0.00	0.2 / 0.00	0.02	12	D.O. 12.4	64	8	47	4	
		3/15/60		48	81.2	/ 7.4	8.9 / 0.44	3.4 / 0.28	1.8 / 0.08	0.1 / 0.00	0 / 0.00	41 / 0.67	3.4 / 0.07	0.3 / 0.01	0.1 / 0.00	0.1 / 0.00	0.02	12	D.O. 10.3	50	10	36	2	Clear
	HB&M									BURNT RANCH SUBUNIT														
Big French Creek Near Del Loma	5N/8E-29E	7/16/59	9[e]	64	218	/ 8.0	35 / 1.75	5.0 / 0.41	4.9 / 0.21	0.9 / 0.02	0 / 0.00	134 / 2.20	5.1 / 0.11	1.4 / 0.04	0.1 / 0.00	0.1 / 0.00	0.06	17	D.O. 8.4	136	8.8	108	0	
		8/12/59		59	241	7.8 / 7.6	38 / 1.90	4.6 / 0.38	4.0 / 0.17	0.7 / 0.02	0 / 0.00	142 / 2.33	4.8 / 0.10	1.9 / 0.05	0.2 / 0.01	0.4 / 0.01	0.04	16	D.O. 9.6	141	7	114	0	
		9/3/59		56	245	7.6 / 7.8	37 / 1.85	6.4 / 0.53	3.5 / 0.15	0.9 / 0.02	0 / 0.00	142 / 2.33	8.2 / 0.17	0.6 / 0.02	0.2 / 0.01	0.1 / 0.00	0.04	18	D.O. 9.5	145	6	119	3	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

TRINITY RIVER HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	HB&M									BURNT RANCH SUBUNIT (Continued)														
Big French Creek Near Del Loma	5N/8E-29E	10/14/59	6[e]	52	241	8.2	40 / 2.00	3.4 / 0.28	3.2 / 0.14	0.9 / 0.02	0 / 0.00	139 / 2.28	7.7 / 0.16	0.0 / 0.00	0.0 / 0.00	0.4 / 0.01	0.05	17		144	6	114	0	
		11/17/59		41	238	8.2	36 / 1.80	6.3 / 0.52	3.4 / 0.15	0.9 / 0.02	0 / 0.00	140 / 2.29	8.1 / 0.17	2.3 / 0.06	0.1 / 0.00	0.2 / 0.00	0.04	14		140	6	116	1	
		12/11/59		40	236	7.5 / 8.2	39 / 1.75	4.0 / 0.33	3.8 / 0.16	1.2 / 0.03	0 / 0.00	137 / 2.24	8.2 / 0.17	0.8 / 0.02	0.0 / 0.00	0.4 / 0.01	0.06	16	D.O. 13.0	140	6	114	2	
		1/15/60		37	210	7.6 / 8.0	33 / 1.65	4.5 / 0.37	2.8 / 0.12	0.9 / 0.02	0 / 0.00	118 / 1.93	9.0 / 0.19	0.3 / 0.01	0.2 / 0.01	0.3 / 0.00	0.04	15	D.O. 12.5	124	6	101	4	Clear
		3/15/60	120[e]	45	160	7.8	25 / 1.25	3.8 / 0.31	1.8 / 0.08	0.5 / 0.01	0 / 0.00	90 / 1.48	5.1 / 0.11	0.5 / 0.01	0.1 / 0.00	0.2 / 0.00	0.02	13	D.O. 9.0	94	5	78	4	Clear
Trinity River Near Burnt Ranch	5N/7E-19P	Surface Water Monitoring Program Station Number 4b. Results of continuous monthly sampling since April 1958 are published in Bulletin No. 65. Following are typical analysis results contained in this publication:																							
		5/20/58	13,500	52	64.6	9.6 / 7.9	5.6 / 0.28	3.9 / 0.32	1.3 / 0.06	0.5 / 0.01	0 / 0.00	36 / 0.59	2.9 / 0.06	0.8 / 0.02	0.0 / 0.00	0.5 / 0.01	0.0	12	Fe 0.07 Al 0.16 c	46	9	30	0	
		11/12/58	390	51	190	8.0	18 / 0.90	9.5 / 0.78	6.2 / 0.27	0.7 / 0.02	0 / 0.00	98 / 1.61	7.1 / 0.15	10 / 0.28	0.0 / 0.00	0.0 / 0.00	0.0	13	Al 0.06 c	112	14	84	4	
		9/10/59	486	75	210	7.4 / 8.0	20 / 1.00	11 / 0.92	9.5 / 0.41	2.0 / 0.05	0.0 / 0.00	110 / 1.80	13 / 0.27	11 / 0.31	0.1 / 0.01	0.3 / 0.00	0.0	13	PO_4 0.0 As 0.10 c	134	17	96	6	
Trinity River At Salyer	6N/5E-14K	6/8/58		53	80.4	7.6	7.2 / 0.36	4.1 / 0.34	1.5 / 0.06	1.2 / 0.03	0 / 0.00	46 / 0.75	1.6 / 0.03	0.6 / 0.02	0.0 / 0.00	0.2 / 0.00	0.02	11		50	8	35	0	
		9/10/58			204	7.7	21 / 1.05	8.6 / 0.71	5.6 / 0.24	0.8 / 0.02	0 / 0.00	101 / 1.66	9.5 / 0.20	5.4 / 0.15	0.2 / 0.01	0.9 / 0.01	0.10	13		115	12	88	5	
		9/10/59				7.9	25 / 1.25	8.9 / 0.73	6.9 / 0.30	1.1 / 0.03	0 / 0.00	116 / 1.90	6.9 / 0.14	8.8 / 0.25	0.1 / 0.00	0.6 / 0.01	0.07	17		132	13	99	4	
										NEW RIVER SUBUNIT														
New River At Mouth	6N/6E-35P	7/16/59	75[e]		191	7.8	27 / 1.35	6.4 / 0.53	4.0 / 0.17	1.0 / 0.02	0 / 0.00	112 / 1.84	3.8 / 0.08	2.6 / 0.07	0.1 / 0.00	0.6 / 0.01	0.06	14		114	8.2	94	2	
		8/12/59		65	216	8.0	30 / 1.50	6.6 / 0.54	3.6 / 0.16	1.0 / 0.02	0 / 0.00	123 / 2.02	7.2 / 0.15	2.8 / 0.08	0.1 / 0.00	0.3 / 0.00	0.04	18		130	7	102	1	
		9/3/59		62	221	7.2	30 / 1.50	7.0 / 0.58	3.2 / 0.14	0.9 / 0.02	0 / 0.00	120 / 1.97	7.9 / 0.16	2.4 / 0.07	0.1 / 0.00	0.1 / 0.00	0.04	19		130	6	104	6	
		11/12/59			212	8.2	33 / 1.65	5.0 / 0.41	3.4 / 0.15	0.7 / 0.02	0 / 0.00	119 / 1.95	7.9 / 0.16	2.4 / 0.07	0.1 / 0.00	0.3 / 0.00	0.02	16		127	7	103	5	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

TRINITY RIVER HYDROGRAPHIC UNIT

Mineral constituents in parts per million / equivalents per million

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$ Total ppm	Hardness as $CaCO_3$ N.C. ppm	Remarks
	HBBM								UPPER SOUTH FORK SUBUNIT															
South Fork Trinity River Near Forest Glen	1S/7E-13	10/23/58	20[e]	51	198	7.4 / 7.3	23 / 1.15	6.8 / 0.56	6.3 / 0.27	0.5 / 0.01	0 / 0.00	91 / 1.49	10 / 0.21	12 / 0.34	0.1 / 0.01	0.0 / 0.00	0.0	12	D.O. 9.9	116	14	85	10	
										HYAMPOM SUBUNIT														
Hayfork Creek At Hyampom	3N/6E-25B	5/20/58	280[e]	64	224	8.4 / 8.4	28 / 1.40	9.7 / 0.80	6.8 / 0.30	0.9 / 0.02	5 / 0.17	124 / 2.03	7.7 / 0.16	4.5 / 0.13	0.0 / 0.00	0.5 / 0.01	0.1	25	D.O. 10.1 Al 0.05 c	149	12	110	0	
		6/25/58	125[e]	76	245	8.1 / 8.2	29 / 1.45	12 / 0.95	5.3 / 0.23	0.8 / 0.02	0 / 0.00	143 / 2.34	6.7 / 0.14	7.5 / 0.21	0.0 / 0.00	0.1 / 0.00	0.0	20	D.O. 8.4	151	9	120	3	
		7/24/58	100[e]	79	283	7.1 / 7.8	32 / 1.60	13 / 1.06	9.1 / 0.40	1.3 / 0.03	0 / 0.00	151 / 2.47	18 / 0.37	7.3 / 0.20	0.0 / 0.00	0.6 / 0.01	0.01	24	D.O. 7.8	179	13	133	9	
		8/26/58	90[e]	74	307	7.7 / 8.1	33 / 1.65	13 / 1.07	10 / 0.44	0.9 / 0.02	0 / 0.00	157 / 2.57	5.3 / 0.11	16 / 0.45	0.2 / 0.01	1.1 / 0.02	0.00	26	D.O. 9.0	182	14	136	7	
		9/9/58	70[e]	68	315	7.9 / 8.0	32 / 1.60	13 / 1.10	9.5 / 0.41	0.8 / 0.02	0 / 0.00	158 / 2.59	4.6 / 0.10	17 / 0.48	0.1 / 0.00	0.9 / 0.01	0.04	24		179	13	135	5	
		5/19/59	150[e]	59	262	/ 8.0	32 / 1.60	9.7 / 0.80	6.8 / 0.30	0.7 / 0.02	0 / 0.00	144 / 2.36	5.8 / 0.12	8.9 / 0.25	0.1 / 0.00	1.1 / 0.02	0.03	22	D.O. 10.3 Al 0.05 c	158	11	120	2	
South Fork Trinity River At Hyampom	25L	10/22/58			222	/ 8.8	27 / 1.35	9.5 / 0.78	6.6 / 0.29	2.1 / 0.05	7.0 / 0.23	101 / 1.66	14 / 0.29	8.5 / 0.24		0 / 0.00	0.20	12		136[d]	12	106	12	
		5/20/58	300[e]	64	97.6	/ 8.0	12 / 0.60	3.6 / 0.30	1.9 / 0.08	0.5 / 0.01	0 / 0.00	51 / 0.84	3.8 / 0.08	1.5 / 0.04	0.0 / 0.00	0.4 / 0.01	0.0	12	Cu 0.02 c	61	8	45	3	
		6/25/58	160[e]	74	152	8.0 / 7.9	18 / 0.90	7.2 / 0.59	2.8 / 0.12	0.6 / 0.02	0 / 0.00	83 / 1.36	7.7 / 0.16	3.3 / 0.09	0.0 / 0.00	0.0 / 0.00	0.0	14	D.O. 7.2	95	7	74	6	
		7/24/58	200[e]	80	184	7.0 / 8.0	24 / 1.20	6.3 / 0.52	4.2 / 0.18	0.6 / 0.02	0 / 0.00	95 / 1.56	8.7 / 0.18	5.1 / 0.14	0.0 / 0.00	0.3 / 0.00	0.03	12	D.O. 7.2	108	9	86	8	
		8/26/58	60[e]	76	223	7.8 / 7.8	27 / 1.35	8.4 / 0.69	5.0 / 0.22	0.7 / 0.02	0 / 0.00	111 / 1.82	12 / 0.25	5.4 / 0.15	0.0 / 0.00	0.9 / 0.01	0.00	13	D.O. 7.7	126	10	102	11	
		9/9/58	50[e]	73	232	7.5 / 7.7	28 / 1.40	7.8 / 0.64	5.6 / 0.24	0.6 / 0.02	0 / 0.00	114 / 1.87	12 / 0.25	7.5 / 0.21	0.0 / 0.00	0.8 / 0.01	0.07	13		131	10	102	9	
		5/19/59		57	138	/ 7.6	18 / 0.90	4.1 / 0.34	2.6 / 0.11	0.4 / 0.01	0 / 0.00	70 / 1.15	5.1 / 0.11	2.4 / 0.07	0.0 / 0.00	0.9 / 0.01	0.04	11	Cu 0.01 Pb 0.01 Zn 0.01 As 0.01 c	78	8	62	5	
	MDBM									HAYFORK VALLEY SUBUNIT														
Hayfork Creek Near Hayfork	31N/11W-23N	6/8/58		55	229	/ 8.2	26 / 1.30	10 / 0.86	6.0 / 0.26	0.6 / 0.02	0 / 0.00	132 / 2.16	4.1 / 0.08	5.6 / 0.16	0.2 / 0.01	0.7 / 0.01	0.04	23		141	11	108	0	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

TRINITY RIVER HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	MDB&M						HAYFORK VALLEY SUBUNIT (Continued)																	
Hayfork Creek Near Hayfork	31N/11W-23N	9/9/58	20[e]		384	8.0	34 / 1.70	15 / 1.22	20 / 0.87	1.1 / 0.03	0 / 0.00	158 / 2.59	7.6 / 0.16	35 / 0.99	0.1 / 0.00	0.8 / 0.01	0.08	25		217	23	146	16	
		5/19/59	35[e]	58	256	7.9	29 / 1.45	8.4 / 0.69	8.4 / 0.36	0.5 / 0.01	0 / 0.00	134 / 2.20	3.6 / 0.07	10 / 0.28	0.1 / 0.00	0.1 / 0.00	0.23	22	D.O. 10.0	148	14	107	0	Clear
		9/2/59		63	483	7.7 / 8.0	38 / 1.90	16 / 1.34	31 / 1.35	1.2 / 0.03	0 / 0.00	162 / 2.66	4.9 / 0.10	66 / 1.86	0.1 / 0.00	0.7 / 0.01	0.10	24	D.O. 9.2	262	29	162	29	Clear
		9/30/60	5[e]	58	444	8.2	35 / 1.75	17 / 1.37	30 / 1.30	1.1 / 0.03	0 / 0.00	163 / 2.67	5.6 / 0.12	58 / 1.64	0.0 / 0.00	0.3 / 0.00	0.08	21	D.O. 8.5	248	29	156	22	
Barker Creek Near Hayfork	9B	9/9/58	5[e]		280	8.1	38 / 1.90	10 / 0.82	4.8 / 0.21	1.0 / 0.02	0 / 0.00	167 / 2.74	6.2 / 0.13	2.9 / 0.08	0.3 / 0.02	0.4 / 0.01	0.05	19		165	7	136	0	
		5/19/59	3.5[e]	61	246	8.0	37 / 1.85	6.7 / 0.55	3.2 / 0.14	0.6 / 0.02	0 / 0.00	147 / 2.41	4.8 / 0.10	1.1 / 0.03	0.1 / 0.00	0.3 / 0.00	0.17	16	D.O. 9.5	142	5	120	0	
		9/2/59		71	266	7.2 / 7.9	38 / 1.90	9.2 / 0.76	4.9 / 0.21	1.0 / 0.02	0 / 0.00	164 / 2.69	4.8 / 0.10	0.6 / 0.02	0.1 / 0.00	1.2 / 0.02	0.05	18	D.O. 8.8	159	7	133	0	
		3/15/60	25[e]	42	220	7.9	31 / 1.55	8.1 / 0.67	2.8 / 0.12	0.7 / 0.02	0 / 0.00	130 / 2.13	5.6 / 0.12	1.0 / 0.03	0.1 / 0.00	0.3 / 0.00	0.03	16	D.O. 10.0	130	5	111	4	Clear and swift
Big Creek Near Hayfork	7H	6/8/58		54	205	8.0	33 / 1.65	4.2 / 0.35	2.9 / 0.13	0.9 / 0.02	0 / 0.00	126 / 2.06	2.8 / 0.06	1.7 / 0.05	0.0 / 0.00	0.1 / 0.00	0.00	14		122	6	100	0	
		5/19/59	15[e]	53	214	7.9	35 / 1.75	3.5 / 0.29	3.2 / 0.14	0.9 / 0.02	0 / 0.00	126 / 2.06	4.9 / 0.10	1.0 / 0.03	0.1 / 0.00	0.1 / 0.00	0.18	14	D.O. 10.2	125	6	102	0	Clear
		9/2/59		70	251	7.7 / 8.0	43 / 2.14	3.4 / 0.28	4.2 / 0.18	1.1 / 0.03	0 / 0.00	149 / 2.44	5.3 / 0.11	1.1 / 0.03	0.1 / 0.00	0.8 / 0.01	0.06	16	D.O. 8.9	148	7	121	0	Clear
		9/30/60	1.5[e]	60	257	8.2	36 / 1.80	8.0 / 0.66	5.0 / 0.22	1.2 / 0.03	0 / 0.00	155 / 2.54	6.6 / 0.14	1.0 / 0.03	0.0 / 0.00	0.2 / 0.00	0.05	15		149	8	123	0	
		3/15/60	36[e]	42	175	7.8	27 / 1.35	4.2 / 0.35	2.2 / 0.10	0.7 / 0.02	0 / 0.00	101 / 1.66	4.3 / 0.09	0.5 / 0.01	0.0 / 0.00	0.2 / 0.00	0.02	14	D.O. 10.8	103	5	85	2	Clear and fast
Hayfork Creek At Hayfork	31N/12W-11K	11/13/58	20[e]		303	8.0	35 / 1.75	10 / 0.83	10 / 0.44	1.0 / 0.02	0 / 0.00	146 / 2.39	3.1 / 0.06	18 / 0.51	0.1 / 0.00	0.9 / 0.01	0.16	16	Al 0.04 c	166	14	129	9	
		12/22/58		45	288	7.6 / 8.1	33 / 1.65	11 / 0.91	9.3 / 0.40	0.8 / 0.02	0 / 0.00	145 / 2.38	6.7 / 0.14	15 / 0.42	0.0 / 0.00	0.2 / 0.00	0.08	17	D.O. 10.5	164	13	128	9	
		2/18/59		43	149	7.8	18 / 0.90	5.8 / 0.48	2.7 / 0.12	0.5 / 0.01	0 / 0.00	84 / 1.38	3.8 / 0.08	2.0 / 0.06	0.0 / 0.00	0.6 / 0.01	0.1	17		92	8	69	0	
		3/12/59	150[e]	43	183	8.2	22 / 1.10	8.5 / 0.70	5.5 / 0.24	0.5 / 0.01	0 / 0.00	110 / 1.80	4.8 / 0.10	3.0 / 0.08	0.0 / 0.00	0.0 / 0.00	0.0	22	D.O. 11.8	120	12	90	0	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

TRINITY RIVER HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	MDB&M									HAYFORK VALLEY SUBUNIT (Continued)														
Hayfork Creek At Hayfork	31N/12W-11K	4/16/59	90[e]	49	199	7.7 / 7.9	28 / 1.40	6.1 / 0.50	3.8 / 0.16	0.6 / 0.02	0 / 0.00	115 / 1.88	3.1 / 0.06	3.9 / 0.11	0.1 / 0.00	0.4 / 0.01	0.18	18	D.O. 10.8	120	8	95	1	
		5/19/59	75[e]	63	254	/ 8.0	31 / 1.55	8.9 / 0.73	6.2 / 0.27	0.7 / 0.02	0 / 0.00	134 / 2.20	5.8 / 0.12	9.3 / 0.26	0.2 / 0.01	0.7 / 0.01	0.03	18	D.O. 9.5	147	10	114	4	
		6/17/59	30[e]	70	275	/ 7.9	34 / 1.70	9.2 / 0.76	8.5 / 0.37	1.0 / 0.02	0 / 0.00	145 / 2.38	3.3 / 0.07	12 / 0.34	0.0 / 0.00	0.7 / 0.01	0.13	18	D.O. 9.5	158	13	123	4	
		7/10/59	25[e]	68	307	/ 8.0	32 / 1.60	11 / 0.94	12 / 0.52	1.0 / 0.02	0 / 0.00	142 / 2.33	6.1 / 0.13	22 / 0.62	0.0 / 0.00	0.5 / 0.01	0.05	14	D.O. 8.1	169	17	127	11	
		9/30/60	5[e]	63	361	/ 8.2	35 / 1.75	15 / 1.23	15 / 0.65	1.0 / 0.02	0 / 0.00	155 / 2.54	5.4 / 0.11	35 / 0.99	0.1 / 0.00	0.1 / 0.00	0.05	20	D.O. 8.6	203	18	149	22	
										HAYFORK CREEK SUBUNIT														
							No data available for this subunit.																	
	HB&M									LOWER SOUTH FORK SUBUNIT														
South Fork Trinity River Near Salyer	6N/5E-27A	10/18/50			336	/ 8.6	31 / 1.55	12 / 0.98	8.0 / 0.35	4.4 / 0.11	26 / 0.87	88 / 1.45	13 / 0.28	10 / 0.28		0.2 / 0.00	0.08	16		164[d]	12	126	11	
	22E	6/7/58		60	166	/ 7.9	20 / 1.00	6.6 / 0.54	3.3 / 0.14	0.4 / 0.01	0 / 0.00	98 / 1.61	0.2 / 0.00	2.9 / 0.08	0.0 / 0.00	0.2 / 0.00	0.01	13		100	8	77	0	
		11/12/58		53	270	/ 8.0	32 / 1.60	10 / 0.82	6.7 / 0.29	0.8 / 0.02	0 / 0.00	132 / 2.16	11 / 0.23	10 / 0.28	0.0 / 0.00	0.4 / 0.01	0.06	16	D.O. 11.3	152	11	121	13	
		12/1/58		46	258	7.6 / 8.0	30 / 1.50	9.7 / 0.80	6.2 / 0.27	0.6 / 0.02	0 / 0.00	126 / 2.06	12 / 0.25	8.4 / 0.24	0.1 / 0.00	0.2 / 0.00	0.06	14	D.O. 12.2	143	10	115	12	
		1/19/59		44	162	7.3 / 8.0	18 / 0.90	7.3 / 0.60	2.8 / 0.12	0.6 / 0.02	0 / 0.00	85 / 1.39	4.1 / 0.08	3.9 / 0.11	0.6 / 0.03	0.4 / 0.01	0.05	15	D.O. 12.0	95	7	75	5	
		2/2/59		43	150	7.9 / 7.3	18 / 0.90	6.9 / 0.57	3.1 / 0.13	0.1 / 0.00	0 / 0.00	83 / 1.36	5.8 / 0.12	2.8 / 0.08	0.1 / 0.01	0.0 / 0.00	0.0	16	D.O. 12.0	94	8	74	6	
		3/5/59		47	143	7.6 / 8.1	16 / 0.80	6.8 / 0.56	2.7 / 0.12	0.6 / 0.02	0 / 0.00	80 / 1.34	5.8 / 0.12	2.0 / 0.06	0.0 / 0.00	0.6 / 0.01	0.1	17	D.O. 12.4	92	8	68	1	
		4/8/59		52	137	7.5 / 7.7	16 / 0.80	5.6 / 0.46	2.4 / 0.10	0.4 / 0.01	0 / 0.00	74 / 1.21	4.1 / 0.08	1.8 / 0.05	0.0 / 0.00	0.5 / 0.01	0.08	14	D.O. 11.5	81	7	63	2	Clear
		5/6/59		55	162	7.4 / 8.1	19 / 0.95	6.7 / 0.55	3.4 / 0.15	0.6 / 0.02	0 / 0.00	88 / 1.44	5.9 / 0.12	3.4 / 0.10	0.0 / 0.00	0.4 / 0.01	0.02	14	D.O. 11.0 Fe 0.01 Mn 0.02 c	96	9	75	3	
		6/3/59		63	195	7.5 / 7.7	24 / 1.20	6.6 / 0.54	4.6 / 0.20	0.5 / 0.01	0 / 0.00	104 / 1.70	4.9 / 0.10	3.5 / 0.10	0.1 / 0.00	0.6 / 0.01	0.11	15	D.O. 9.8	111	10	87	2	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

TRINITY RIVER HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	HB&M									LOWER SOUTH FORK SUBUNIT (Continued)														
South Fork Trinity River Near Salyer	6N/5E-22E	7/16/59		72	239	7.9 / 7.9	28 / 1.40	9.0 / 0.74	5.6 / 0.24	0.8 / 0.02	0 / 0.00	126 / 2.06	7.1 / 0.15	5.6 / 0.16	0.0 / 0.00	0.4 / 0.01	0.08	12	D.O. 7.6	130	10	107	4	
		8/5/59		77	254	7.6 / 7.8	29 / 1.45	11 / 0.93	6.0 / 0.26	0.8 / 0.02	0 / 0.00	133 / 2.18	12 / 0.25	5.4 / 0.15	0.1 / 0.00	0.5 / 0.01	0.06	17	D.O. 7.1	147	10	119	10	
		5/2/60	700[e]		168	/ 7.7	19 / 0.95	6.9 / 0.57	3.4 / 0.15	0.4 / 0.01	0 / 0.00	88 / 1.44	5.8 / 0.12	2.4 / 0.07	0.1 / 0.00	0.2 / 0.00	0.03	16	D.O. 9.1	97	9	76	4	Clear
		9/30/60			254	/ 8.2	29 / 1.45	11 / 0.91	7.2 / 0.31	0.7 / 0.02	0 / 0.00	134 / 2.20	13 / 0.27	7.8 / 0.22	0.1 / 0.00	0.2 / 0.00	0.05	19		154	12	118	8	
	15Q	9/10/58	190[e]		217	/ 7.8	23 / 1.15	9.8 / 0.81	6.0 / 0.26	1.0 / 0.02	0 / 0.00	114 / 1.87	10 / 0.21	5.8 / 0.16	0.2 / 0.01	1.1 / 0.02	0.12	14		127	12	98	5	
										WILLOW CREEK SUBUNIT														
Horse Mountain Creek below an Ore Concentrating Mill	6N/4E-34F	10/15/59			241	/ 7.9	4.0 / 0.20	29 / 2.38	1.7 / 0.07	0.5 / 0.01	0 / 0.00	156 / 2.56	1.8 / 0.04	3.0 / 0.08	0.0 / 0.00	0.1 / 0.00	0.05	15		132	3	129	1	
										HOOPA SUBUNIT														
Trinity River Near Hoopa	8N/5E-31K	Surface Water Monitoring Program Station Number 4. Results of continuous monthly sampling since April 1951 are published in Water Quality Investigations Report No. 15, and Bulletin No. 65. Following are typical analysis results contained in these publications:																							
		9/12/51	470	68	215	8.0	19 / 0.95	13 / 1.07	5.4 / 0.235	0.40 / 0.010	0 / 0.00	116 / 1.90	8.6 / 0.179	7.5 / 0.212	0 / 0.00	0 / 0.00	0.07	15		126	10	101	6	
		5/5/54	9,370	59	107	7.5 / 7.9	11 / 0.55	5.7 / 0.469	1.4 / 0.061	0.3 / 0.008	0 / 0.00	60 / 0.98	4.4 / 0.092	1.1 / 0.031	0.0 / 0.00	0.1 / 0.002	0.10	11	Al 0.04 Zn 0.02 Fe 0.04 c	65	6	51	2	
		9/10/59	424	74	222	7.6 / 7.2	18 / 0.90	15 / 1.22	6.1 / 0.27	1.1 / 0.03	0.0 / 0.00	120 / 1.97	11 / 0.23	7.8 / 0.22	0.1 / 0.01	0.2 / 0.00	0.1	14	Fe 0.02 Al 0.02 PO_4 0.0 c	132	11	106	8	
Trinity River Near Weitchpec	9N/4E-10	10/18/50			158		13 / 0.65	9.1 / 0.75	5.0 / 0.22	5.6 / 0.14	24 / 0.80	32 / 0.52	7.0 / 0.20	9.1 / 0.19		0.0 / 0.00	0.20	0.5		89[d]	12	70	4	
		6/7/58		57	94.7	/ 7.7	9.3 / 0.46	4.6 / 0.38	1.8 / 0.08	0.3 / 0.01	0 / 0.00	54 / 0.89	0.8 / 0.02	1.0 / 0.03	0.0 / 0.00	0.1 / 0.00	0.01	12		57	9	42	0	Slightly turbid
		5/6/59		56	127	7.5 / 8.0	14 / 0.70	5.4 / 0.44	3.2 / 0.14	0.8 / 0.02	0 / 0.00	70 / 1.15	4.1 / 0.08	2.5 / 0.07	0.1 / 0.00	1.0 / 0.02	0.05	13	D.O. 9.9	78	11	57	0	
		9/30/60	160[e]	68	229	/ 8.1	25 / 1.25	10 / 0.85	6.2 / 0.27	0.9 / 0.02	0 / 0.00	119 / 1.95	11 / 0.23	7.4 / 0.21	0.1 / 0.00	0.4 / 0.01	0.04	15	D.O. 8.6	134	11	105	7	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	HB&M									SNOW CAMP AND BEAVER SUBUNITS														
Redwood Creek Near Green Point	6N/3E-11N	6/7/58		57	106	7.7	13 / 0.65	1.8 / 0.15	4.1 / 0.18	0.5 / 0.01	0 / 0.00	48 / 0.79	7.2 / 0.15	2.2 / 0.06	0.0 / 0.00	0.1 / 0.00	0.0	7.5		60	18	40	1	
		9/10/58	20[e]		176	7.7	26 / 1.30	2.2 / 0.18	4.2 / 0.18	0.8 / 0.02	0 / 0.00	78 / 1.28	14 / 0.29	3.6 / 0.10	0.3 / 0.02	0.3 / 0.00	0.21	6.4		96	11	74	10	
		5/5/59		54	90	7.3 / 6.8	14 / 0.70	0.0 / 0.00	2.1 / 0.09	0.4 / 0.01	0 / 0.00	38 / 0.62	3.4 / 0.07	2.9 / 0.08	0.1 / 0.00	0.3 / 0.00	0.06	6.3	D.O. 10.5	48	11	35	4	
		9/9/59	15[e]	57	182	7.8	30 / 1.50	0.5 / 0.04	4.6 / 0.20	1.0 / 0.02	0 / 0.00	84 / 1.38	13 / 0.27	4.5 / 0.13	0.1 / 0.00	0.6 / 0.01	0.10	5.7	D.O. 10.0	101	11	77	8	
										ORICK SUBUNIT														
Redwood Creek At Orick	10N/1E-4	8/18/54		63	140	7.2	20 / 1.00	2.6 / 0.21	4.6 / 0.20	0.6 / 0.02	0 / 0.00	64 / 1.05	9.7 / 0.20	6.4 / 0.18	0.2 / 0.01	0.4 / 0.01	0.02	8.7	Fe 0.02 c	85	14	60	8	
		4/17/58	1,080[e]	54	75	7.2 / 7.8	10 / 0.50	1.2 / 0.10	3.3 / 0.14	1.7 / 0.04	0 / 0.00	36 / 0.59	4.6 / 0.10	2.7 / 0.08	0.2 / 0.01	0.3 / 0.00	0.02	7.2	D.O. 9.9	49	18	30	0	
		9/4/58	30[e]		140	7.5	19 / 0.95	2.1 / 0.17	5.2 / 0.23	0.7 / 0.02	0 / 0.00	63 / 1.03	5.1 / 0.11	6.9 / 0.19	0.1 / 0.00	0.8 / 0.01	0.03	10		81	17	56	4	
		Surface Water Monitoring Program Station Number 3b. Results of continuous monthly sampling since November 1958 are published in Bulletin No. 65. Following are typical analysis results contained in this publication:																						
		12/3/58	143	53	141	7.2	21 / 1.05	1.6 / 0.13	4.3 / 0.19	0.6 / 0.02	0 / 0.00	57 / 0.93	15 / 0.31	6.0 / 0.17	0.0 / 0.00	0.0 / 0.00	0.0	0.0		86	14	59	12	
		4/7/59	1,100	58	76.8	7.2	10 / 0.50	1.7 / 0.14	2.3 / 0.10	0.3 / 0.01	0.0 / 0.00	32 / 0.52	4.8 / 0.10	4.2 / 0.15	0.0 / 0.00	0.2 / 0.00	0.0	4.9		44	13	32	6	
		9/1/59	18	68	131	7.0	17 / 0.85	4.3 / 0.35	5.5 / 0.24	1.0 / 0.03	0.0 / 0.00	73 / 1.20	4.0 / 0.08	6.2 / 0.17	0.1 / 0.01	0.4 / 0.01	0.0	7.8	Fe 0.07 PO_4 0.00 e	82	16	60	0	
										EGG LAGOON SUBUNIT														
McDonald Creek	29L	8/18/54		59	77	6.9	5.0 / 0.25	1.6 / 0.13	6.8 / 0.30	0.6 / 0.02	0 / 0.00	20 / 0.33	4.4 / 0.09	10 / 0.28	0.3 / 0.02	0.5 / 0.01	0.08	7.2	Fe 0.07 Al 0.01 c	46	42	19	3	
										LITTLE RIVER SUBUNIT														
Little River At Crannell	7N/1E-9D	6/6/58		61	65	7.1	5.1 / 0.25	3.0 / 0.25	2.5 / 0.11	0.5 / 0.01	0 / 0.00	26 / 0.43	1.3 / 0.03	4.8 / 0.14	0.0 / 0.00	0.8 / 0.01	0.04	9.0		40	18	25	4	
		9/4/58	20[e]		98	7.3	8.3 / 0.41	2.3 / 0.19	5.4 / 0.23	0.6 / 0.02	0 / 0.00	37 / 0.61	1.6 / 0.03	6.7 / 0.19	0.1 / 0.00	0.7 / 0.01	0.02	11		55	27	30	0	
		5/6/59		54	59	7.1	6.4 / 0.32	0.0 / 0.00	3.4 / 0.15	0.4 / 0.01	0 / 0.00	19 / 0.31	1.0 / 0.02	5.1 / 0.14	0.0 / 0.00	1.7 / 0.03	0.02	7.7	D.O. 9.5	36	31	16	0	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As) are 0.00 except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	HB&M									RUTH SUBUNIT														
Mad River Near Ruth	2S/7E-11D	10/21/50			84	7.1	11 / 0.55	2.2 / 0.18	3.3 / 0.14	1.9 / 0.05	0 / 0.00	44 / 0.72	6.5 / 0.14	3.5 / 0.10		0.3 / 0.00	0.04	7.4		58[d]	16	36	0	
Mad River At Town of Mad River	1N/6E-21K	10/24/50			109	8.2	14 / 0.70	3.0 / 0.25	3.6 / 0.16	2.4 / 0.06	0 / 0.00	56 / 0.92	8.1 / 0.17	1.9 / 0.05		0.1 / 0.00	0.04	4.5		65[d]	13	47	1	
		4/18/58	750[e]	47	65	7.2	8.0 / 0.40	1.9 / 0.16	2.4 / 0.10	1.0 / 0.03	0 / 0.00	31 / 0.51	7.7 / 0.16	1.5 / 0.04	0.0 / 0.00	0.5 / 0.01	0.00	9.9	D.O. 9.7	48	14	28	3	
		5/20/58	120[e]	66	77	9.8 / 7.9	10 / 0.50	2.4 / 0.20	2.2 / 0.10	0.6 / 0.02	0 / 0.00	37 / 0.61	5.8 / 0.12	2.5 / 0.07	0.0 / 0.00	0.7 / 0.01	0.0	11	Al 0.01 [c] D.O. 7.7	53	12	35	5	
		6/25/58	35[e]	76	92	7.8 / 7.4	12 / 0.60	2.4 / 0.20	2.2 / 0.10	0.8 / 0.02	0 / 0.00	44 / 0.72	7.1 / 0.15	2.1 / 0.06	0.0 / 0.00	0.1 / 0.00	0.0	8.1	D.O. 7.4	57	11	40	4	
		7/24/58	35[e]	80	105	7.2 / 7.7	16 / 0.80	1.4 / 0.12	3.4 / 0.15	0.9 / 0.02	0 / 0.00	54 / 0.88	5.9 / 0.12	2.5 / 0.07	0.1 / 0.00	0.1 / 0.00	0.03	7.6	D.O. 7.0	65	14	46	2	
		8/26/58	10[e]	82	121	7.5 / 7.6	17 / 0.85	1.8 / 0.15	3.8 / 0.16	0.8 / 0.02	0 / 0.00	61 / 1.00	6.1 / 0.13	1.5 / 0.04	0.2 / 0.01	1.1 / 0.02	0.00	5.6	D.O. 7.6	68	14	50	0	
		9/9/58	10[e]	68	124	7.7 / 7.5	16 / 0.80	1.9 / 0.16	3.4 / 0.15	0.8 / 0.02	0 / 0.00	61 / 1.00	2.5 / 0.05	2.3 / 0.06	0.0 / 0.00	1.1 / 0.02	0.01	6.0		64	13	48	0	
		10/23/58	10[e]	56	123	7.3 / 7.4	18 / 0.90	2.4 / 0.20	3.3 / 0.14	0.5 / 0.01	0 / 0.00	63 / 1.03	6.7 / 0.14	2.2 / 0.06	0.1 / 0.00	0.1 / 0.00	0.0	5.6	D.O. 9.3	70	11	55	3	
		11/13/58	10[e]	58	128	/ 7.5	18 / 0.90	1.4 / 0.12	2.8 / 0.12	0.8 / 0.02	0 / 0.00	62 / 1.02	3.4 / 0.07	0.8 / 0.02	0.2 / 0.01	1.0 / 0.02	0.20	4.7	Al 0.02 [c]	63	10	51	0	
		12/22/58		44	117	7.0 / 7.5	15 / 0.75	2.6 / 0.21	3.2 / 0.14	0.8 / 0.02	0 / 0.00	54 / 0.88	8.1 / 0.17	1.5 / 0.04	0.0 / 0.00	0.4 / 0.01	0.07	5.2	D.O. 8.2	63	12	48	4	
		3/6/59	200[e]	45	66	/ 7.3	9.2 / 0.46	1.2 / 0.10	1.9 / 0.08	0.2 / 0.01	0 / 0.00	32 / 0.52	5.8 / 0.12	1.0 / 0.03	0.0 / 0.00	0.0 / 0.00	0.1	11		46	15	28	2	
		4/10/59	300[e]	50	80	/ 7.4	10 / 0.50	1.4 / 0.12	1.8 / 0.08	0.4 / 0.01	0 / 0.00	36 / 0.59	4.4 / 0.09	0.3 / 0.01	0.0 / 0.00	0.4 / 0.01	0.07	8.0		45	11	31	1	
		5/7/59	70[e]	56	88	/ 7.5	12 / 0.60	1.0 / 0.08	2.6 / 0.11	0.5 / 0.01	0 / 0.00	40 / 0.66	5.3 / 0.11	1.0 / 0.03	0.0 / 0.00	1.3 / 0.02	0.02	8.0	D.O. 9.2	52	14	34	1	
		6/9/59	40[e]	64	99	7.3	15 / 0.75	0.4 / 0.03	2.8 / 0.12	0.6 / 0.02	0 / 0.00	46 / 0.75	4.8 / 0.10	1.8 / 0.05	0.0 / 0.00	0.9 / 0.01	0.13	5.0	D.O. 7.7	54	13	39	1	
		7/15/59	12[e]	75	111	/ 7.4	16 / 0.80	2.2 / 0.18	3.2 / 0.14	0.9 / 0.02	0 / 0.00	58 / 0.95	13 / 0.27	1.4 / 0.04	0.1 / 0.00	0.3 / 0.00	0.05	6.0	D.O. 7.6	72	12	49	1	
										BUTLER VALLEY SUBUNIT														
Mad River above Boulder Creek	4N/3E-5N	10/28/52	50[e]		253	8.1	35 / 1.75	7.4 / 0.61	7.8 / 0.34	1.0 / 0.03	0 / 0.00	132 / 2.16	19 / 0.40	4.5 / 0.13	0.0 / 0.00	0.2 / 0.00	0.16	8.2		148	12	118	10	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As) are 0.00 except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	HB&M									BUTLER VALLEY SUBUNIT (Continued)														
Boulder Creek	4N/3E-5E	10/28/52	5[e]		256	7.9	36 / 1.80	6.5 / 0.54	7.8 / 0.34	0.7 / 0.02	0 / 0.00	132 / 2.16	16 / 0.33	6.5 / 0.18	0.0 / 0.00	0.3 / 0.00	0.03			146	13	117	8	
	6R	10/28/52	5[e]		257	7.4	35 / 1.75	7.1 / 0.58	8.7 / 0.38	1.3 / 0.03	0 / 0.00	139 / 2.28	11 / 0.23	6.5 / 0.18	0.0 / 0.00	0.9 / 0.01	0.05			147	14	117	3	
Mad River At Maple Creek	6D	5/20/58	250[e]	61	118	9.6 / 8.1	16 / 0.80	3.4 / 0.28	3.5 / 0.15	1.2 / 0.03	0 / 0.00	64 / 1.05	6.7 / 0.14	1.8 / 0.05	0.0 / 0.00	0.4 / 0.01	0.1	10	Al 0.05 Zn 0.02 [c] D.O. 8.6	75	12	54	2	
		6/25/58	120	65	165	8.0	22 / 1.10	5.1 / 0.42	4.6 / 0.20	0.9 / 0.02	0 / 0.00	89 / 1.46	9.6 / 0.20	2.6 / 0.07	0.0 / 0.00	0.2 / 0.00	0.1	10	D.O. 6.2	99	11	76	3	
		7/24/58	45[e]	66	223	7.1 / 7.8	35 / 1.75	4.5 / 0.37	4.9 / 0.21	1.1 / 0.03	0 / 0.00	120 / 1.97	13 / 0.27	2.5 / 0.07	0.1 / 0.00	0.3 / 0.00	0.07	10	D.O. 7.3	129	9	106	8	
		8/26/58		66	267	7.3 / 8.0	39 / 1.95	6.0 / 0.49	6.2 / 0.27	1.3 / 0.03	0 / 0.00	138 / 2.26	18 / 0.37	3.4 / 0.10	0.2 / 0.01	1.0 / 0.02	0.16	8.7	D.O. 7.6	152	10	122	9	
		9/11/58	10[e]	64	274	7.4 / 8.1	41 / 2.05	6.7 / 0.55	6.5 / 0.28	1.0 / 0.03	0 / 0.00	148 / 2.43	16 / 0.33	6.0 / 0.17	0.1 / 0.00	0.3 / 0.00	0.1	11		162	10	130	9	
		5/6/59		57	119	7.6	18 / 0.90	1.0 / 0.08	3.1 / 0.13	0.8 / 0.02	0 / 0.00	57 / 0.93	5.4 / 0.11	1.4 / 0.04	0.1 / 0.00	1.2 / 0.02	0.03	6.0	D.O. 9.3	65	12	49	2	
		9/27/60	15[e]	61	280	8.3	43 / 2.14	6.6 / 0.54	7.2 / 0.31	1.2 / 0.03	0 / 0.00	146 / 2.39	20 / 0.42	9.8 / 0.28	0.1 / 0.00	0.4 / 0.01	0.15	10	D.O. 7.4	170	10	134	14	
Mad River Above North Fork	6N/2E-31R	10/21/52		62	265	8.0	37 / 1.85	7.0 / 0.58	7.4 / 0.32	1.1 / 0.3	0 / 0.00	136 / 2.23	19 / 0.40	5.2 / 0.15	0.0 / 0.00	0.7 / 0.01	0.07	10		154	12	121	10	
	30Q	10/18/50			223	8.8	25 / 1.25	8.6 / 0.71	7.3 / 0.32	5.4 / 0.14	6 / 0.20	100 / 1.64	18 / 0.38	5.2 / 0.15			0.12	1.4		126[d]	13	98	6	
										NORTH FORK SUBUNIT														
North Fork Mad River	28A	10/21/52		53	146	7.6	17 / 0.85	4.7 / 0.39	6.1 / 0.26	1.3 / 0.03	0 / 0.00	73 / 1.20	6.6 / 0.14	5.0 / 0.14	0.0 / 0.00	0.3 / 0.00	0.02	6.3		83	17	62	2	
										BLUE LAKE SUBUNIT														
Lindsay Creek	6N/1E-14K	10/21/52		52	78	7.4	3.0 / 0.15	2.8 / 0.23	7.4 / 0.32	1.1 / 0.03	0 / 0.00	26 / 0.43	1.4 / 0.03	8.5 / 0.24	0.1 / 0.00	1.5 / 0.02	0.04	16		55	44	19	0	
Mad River Near Arcata	15	10/21/52		58	213	7.4	31 / 1.55	5.0 / 0.41	6.1 / 0.26	1.3 / 0.03	0 / 0.00	115 / 1.89	8.0 / 0.17	5.5 / 0.16	0.0 / 0.00	0.3 / 0.00	0.26	10		124	12	98	4	
		4/29/53			91	7.4	13 / 0.65	1.9 / 0.16	3.4 / 0.15	1.3 / 0.03	0 / 0.00	46 / 0.75	5.5 / 0.12	3.0 / 0.08	0.3 / 0.02	0.3 / 0.00	0.17	8.9		60	15	40	3	
		9/11/58	20[e]		287	8.0	38 / 1.90	6.3 / 0.52	5.4 / 0.23	1.2 / 0.03	0 / 0.00	137 / 2.24	11 / 0.23	6.6 / 0.19	0.1 / 0.00	0.6 / 0.01	0.20	12		148	8	121	9	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As) are 0.00 except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	HB&M						BLUE LAKE SUBUNIT (Continued)																	
Mad River Near Arcata	6N/1E-15	Surface Water Monitoring Program Station Number 6a. Results of continuous monthly sampling since November 1958 are published in Bulletin No. 65. Following are typical analysis results contained in this publication:																						
		12/2/58	770	57	217	7.7	33 / 1.65	6.2 / 0.51	5.2 / 0.23	0.7 / 0.02	0 / 0.00	112 / 1.84	19 / 0.40	6.5 / 0.18	0.0 / 0.00	0.0 / 0.00	0.1	9.4		144	10	116	15	
		4/8/59	1,040	54	114	7.3	15 / 0.75	3.0 / 0.25	2.8 / 0.12	0.6 / 0.02	0.0 / 0.00	60 / 0.98	3.8 / 0.08	3.0 / 0.08	0.0 / 0.00	0.0 / 0.00	0.0	12		70	11	50	1	
		9/9/59	16	70	250	7.8	36 / 1.80	6.8 / 0.56	6.1 / 0.27	1.5 / 0.04	0.0 / 0.00	138 / 2.26	8.0 / 0.17	6.8 / 0.19	0.0 / 0.00	0.2 / 0.00	0.0	10	PO_4 0.00 Al 0.06 Cu 0.03 e	143	10	118	5	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As) are 0.00 except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

EEL RIVER HYDROGRAPHIC UNIT

Mineral constituents in parts per million / equivalents per million

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$ Total ppm	Hardness as $CaCO_3$ N.C. ppm	Remarks
	MDB&M									LAKE PILLSBURY SUBUNIT														
Rice Fork Eel River Near Lake Pillsbury	17N/9W-16H	2/6/61		45	176	8.2	18 / 0.90	7.5 / 0.62	6.7 / 0.29	0.2 / 0.01	0 / 0.00	94 / 1.54	9.0 / 0.19	3.0 / 0.08	0.1 / 0.01	0.4 / 0.01	0.7	16		108	16	76	0	
Eel River Below Lake Pillsbury	18N/10W-15Q	2/6/61		44	106	7.6	12 / 0.60	4.4 / 0.36	2.4 / 0.10	0.3 / 0.01	0 / 0.00	57 / 0.93	4.0 / 0.08	2.5 / 0.07	0.1 / 0.01	0.2 / 0.00	0.2	11		65	9	48	1	
Eel River Near Van Arsdale Res.	18N/11W-30H	10/26/50			166	9.0	20 / 1.00	6.4 / 0.53	6.3 / 0.27	2.8 / 0.07	8.9 / 0.30	78 / 1.28	6.9 / 0.14	3.6 / 0.10		0 / 0	0.36	4.3		98	15	76	0	
										WILLITS RIDGE SUBUNIT														
Wheelbarrow Cr. Near Willits	19N/13W-17F	9/30/53			144	7.2	12 / 0.60	7.8 / 0.64	5.6 / 0.24	0.6 / 0.02	0 / 0.00	72 / 1.18	5.0 / 0.10	7.2 / 0.20	0.0 / 0.00	0.1 / 0.00	0.10	13		87	16	62	3	
Eel River At Hearst	19N/12W-20G	10/26/50			291	9.0	14 / 0.70	16 / 1.32	23 / 1.00	5.2 / 0.13	16 / 0.53	134 / 2.20	7.8 / 0.16	12 / 0.34		0 / 0	0.5	8.3		168	32	101	0	
Eel River Near Dos Rios	21N/13W-31J	Surface Water Monitoring Program Station Number 5d. Results of continuous monthly sampling since April 1958 are published in Bulletin Nos. 65-58 and 65-59. Following are typical analysis results contained in these publications:																							
		5/19/58	371	70	146	8.2	17 / 0.85	5.5 / 0.45	4.8 / 0.21	1.1 / 0.03	0 / 0.00	82 / 1.34	6.7 / 0.14	1.2 / 0.03	0.1 / 0.01	0.6 / 0.01	0.2	13	Al 0.06 Cu 0.02 Zn 0.03 c	90	14	65	0	
		11/12/58	20	59	265	8.0	31 / 1.55	8.9 / 0.73	7.8 / 0.34	1.2 / 0.03	0 / 0.00	130 / 2.13	14 / 0.29	6.4 / 0.18	0.2 / 0.01	0.7 / 0.01	0.61	6.0	Al 0.06 c	141	13	114	7	
		9/15/59	41.2	63	235	7.8	25 / 1.25	9.1 / 0.75	12 / 0.52	1.4 / 0.04	0 / 0.00	116 / 1.90	17 / 0.35	10 / 0.28	0.0 / 0.00	0.0 / 0.00	0.4	13	Zn 0.03 PO_4 0.0 c	145[d]	20	100	5	
	18F	10/26/50			267	8.7	24 / 1.20	11 / 0.91	13 / 0.56	6.0 / 0.15	18 / 0.60	92 / 1.51	19 / 0.40	12 / 0.34		0 / 0	0.92	4.7		153	20	105	0	
										OUTLET CREEK SUBUNIT														
Berry Creek Near Willits	18N/13W-10M	5/8/53	2[e]		177	7.6	18 / 0.90	7.9 / 0.65	6.1 / 0.26	1.2 / 0.03	0 / 0.00	100 / 1.64	6.4 / 0.13	3.5 / 0.10	0.1 / 0.01	0.4 / 0.01	0.03	16	Fe 0.1 c	109	14	77	0	
Moore Creek Near Willits	28H	5/7/53	2[e]	45	105	7.5	7.8 / 0.39	5.7 / 0.47	4.1 / 0.18	1.0 / 0.03	0 / 0.00	53 / 0.87	5.8 / 0.12	3.0 / 0.08	0.2 / 0.01	0.6 / 0.01	0.01	10	Fe 0.1 c	64	17	43	0	
Morris Lake Near Willits	33J	3/9/45				7.6	14 / 0.70	2.6 / 0.21	2.9 / 0.13		0 / 0.00	51 / 0.84	5.1 / 0.11	4 / 0.11		0 / 0		12	Fe 0.26 c	52	8	46		Brown and Caldwell Lab.
Davis Creek Near Willits	28J	5/7/53	15[e]	55	114	7.5	12 / 0.60	4.7 / 0.39	4.5 / 0.20	1.2 / 0.03	0 / 0.00	62 / 1.02	5.1 / 0.11	2.5 / 0.07	0.2 / 0.01	1.1 / 0.02	0.04	14	Fe 0.3 c	76	13	49	0	
Haehl Creek Near Willits	30J	5/7/53	3[e]	57	144	7.7	10 / 0.50	7.6 / 0.63	6.9 / 0.30	1.1 / 0.03	0 / 0.00	70 / 1.15	10 / 0.21	4.0 / 0.11	0.1 / 0.01	1.1 / 0.02	0.06	10	Fe 0.2 c	85	21	56	0	
Baechtel Creek Near Willits	30M	5/7/53	8[e]	61	113	7.4	10 / 0.50	5.0 / 0.41	5.9 / 0.22	1.5 / 0.04	0 / 0.00	57 / 0.93	7.0 / 0.15	3.0 / 0.08	0.3 / 0.02	1.0 / 0.02	0.04	13	Fe 0.5 c	74	19	46	0	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

EEL RIVER HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	MDB&M									OUTLET CREEK SUBUNIT (Continued)														
Broaddus Creek Near Willits	18N/14W-14R	5/7/53	10[e]	54	127	7.3	10 / 0.50	5.7 / 0.47	6.1 / 0.27	1.1 / 0.03	0 / 0.00	63 / 1.03	7.8 / 0.16	3.0 / 0.08	0.2 / 0.01	0.3 / 0.01	0.09	11	Fe 0.1 c	76	21	48	0	
Willits Creek Near Willits	11B	5/8/53	10[e]	46	87.2	7.4	8.2 / 0.41	2.5 / 0.21	7.4 / 0.32	1.0 / 0.03	0 / 0.00	48 / 0.79	3.3 / 0.07	3.8 / 0.11	0.3 / 0.02	0.4 / 0.01	0.01	16	Fe 0.6 Zn 0.02c	66	33	31	0	
Outlet Creek Near Willits	19N/13W-31D	5/8/53	35[e]	52	138	7.3	12 / 0.60	5.9 / 0.49	7.8 / 0.34	1.4 / 0.04	0 / 0.00	70 / 1.15	6.1 / 0.13	4.2 / 0.12	0.2 / 0.01	0.7 / 0.01	0.19	13	Fe 0.3 c	86	23	54	0	
		9/14/60	0		513											0.8 / 0.01	2.4							
Ryan Creek Near Willits	19N/14W-24P	9/14/60	0.1[e]		128											0.5 / 0.01	0.27							
Sherwood Creek	6E	9/17/53			110	8.0	8.1 / 0.40	4.6 / 0.38	7.8 / 0.34	0.7 / 0.02	0 / 0.00	60 / 0.98	0.4 / 0.01	5.0 / 0.14	0.2 / 0.01	0.4 / 0.01	0.00	4.6		61	30	39	0	Clear
Outlet Creek Near Arnold	11N	9/14/60	2[e]		240											0.6 / 0.01	0.34							
Reeves Creek Near Arnold	11P	9/14/60	0.5[e]		192											0.5 / 0.01	0.24							
Outlet Creek Near Arnold	11N	9/14/60	2[e]		224											0.5 / 0.01	0.29							
Long Valley Creek Near Laytonville	21N/14W-31Q	3/4/53	1[e]	35	132	7.1	9.7 / 0.48	8.2 / 0.67	5.4 / 0.24	1.1 / 0.03	0 / 0.00	70 / 1.15	5.3 / 0.11	5.0 / 0.14	0.1 / 0.01	0.7 / 0.01	0.6	25.2	c	78	17	58	1	
Long Valley Creek At Longvale	20N/14W-28M	9/14/60	0.5[e]		528											0.6 / 0.01	9.9							
Outlet Creek At Longvale	28L	9/30/53			351	7.6	35 / 1.75	12 / 0.99	22 / 0.96	1.4 / 0.04	0 / 0.00	171 / 2.80	6.6 / 0.14	26 / 0.73	0.1 / 0.01	0.5 / 0.01	2.0	10		200	26	137	0	Clear
Outlet Creek Near Longvale	21N/13W-31R	Surface Water Monitoring Program Station Number 5b. Results of continuous monthly sampling since April 1958 are published in Bulletin Nos. 65-58 and 65-59. Following are typical analysis results contained in these publications:																							
		6/24/58	18	77	234	8.0	26 / 1.30	8.3 / 0.68	21 / 0.91	1.7 / 0.04	2 / 0.07	145 / 2.38	7.7 / 0.16	9.7 / 0.27	0.0 / 0.00	0.3 / 0.00	0.9	9.3	Total Alkalinity 149	158	31	99	0	
		12/21/58	100	48	310	7.4	30 / 1.50	13 / 1.06	15 / 0.65	1.1 / 0.03	0 / 0.00	153 / 2.51	13 / 0.27	19 / 0.54	0.3 / 0.02	0.4 / 0.01	0.1	13		180	20	128	3	
		2/17/59	4,510		58.2	7.4 / 7.2	4.8 / 0.24	2.9 / 0.24	2.6 / 0.11	1.3 / 0.03	0.0 / 0.00	29 / 0.48	3.8 / 0.08	2.2 / 0.06	0.1 / 0.01	0.3 / 0.00	0.1	10		42[d]	18	24	0	
										WILDERNESS SUBUNIT														
Middle Fork Eel River Above Black Butte River	23N/11W-28B	7/16/59	15[e]	80	264	7.4	32 / 1.60	6.8 / 0.56	12 / 0.52	1.4 / 0.04	0 / 0.00	106 / 1.74	17 / 0.35	20 / 0.56	0.1 / 0.00	0.1 / 0.00	0.08	7.0		148	19	108	21	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

EEL RIVER HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	MDB&M										WILDERNESS SUBUNIT (Continued)													
Middle Fork Eel River Above Black Butte River	23N/11W-28B	8/5/59	10[e]	72	284	7.8 / 7.3	37 / 1.85	7.7 / 0.63	17 / 0.74	2.3 / 0.06	0 / 0.00	113 / 1.85	24 / 0.50	31 / 0.87	0.1 / 0.00	0.0 / 0.00	0.22	5.4		181	22	124	31	
		9/15/59	15[e]	70	407	7.8 / 7.8	40 / 2.00	9.0 / 0.74	25 / 1.09	1.4 / 0.04	0 / 0.00	117 / 1.92	28 / 0.58	48 / 1.35	0.1 / 0.00	0.1 / 0.00	0.57	7.5		218	28	137	41	
		10/7/59	20[e]	58	336	/ 8.2	37 / 1.85	7.2 / 0.59	17 / 0.74	1.5 / 0.04	0 / 0.00	115 / 1.88	24 / 0.50	29 / 0.82	0.1 / 0.00	0.3 / 0.00	0.35	5.7		178	23	122	28	
		11/5/59	14[e]	50	356	/ 8.3	38 / 1.90	8.3 / 0.68	20 / 0.87	1.0 / 0.02	0 / 0.00	119 / 1.95	24 / 0.50	35 / 0.99	0.1 / 0.00	0.1 / 0.00	0.47	5.8		191	25	129	31	
		12/9/59	12[e]	38	399	/ 8.2	43 / 2.14	6.6 / 0.54	24 / 1.04	1.1 / 0.03	0 / 0.00	124 / 2.03	25 / 0.52	43 / 1.21	0.0 / 0.00	0.0 / 0.00	0.54	6.5		211	28	134	32	
		1/12/60	30[e]	38	198	/ 7.6	24 / 1.20	2.9 / 0.24	8.7 / 0.38	0.7 / 0.02	0 / 0.00	71 / 1.16	17 / 0.35	11 / 0.31	0.2 / 0.01	0.0 / 0.00	0.16	6.0		106	21	72	14	
		9/13/60		71	382	/ 8.1	41 / 2.03	10 / 0.78	23 / 0.97	1 / 0.03	0 / 0.00	124 / 2.03	30 / 0.62	42 / 1.18	0 / 0	0 / 0	0.42	7		216	26	141	39	
											BLACK BUTTE RIVER SUBUNIT													
Black Butte River	28J	7/16/59	7[e]	81	257	8.0 / 7.2	39 / 1.95	6.2 / 0.51	5.6 / 0.24	1.2 / 0.03	0 / 0.00	116 / 1.90	33 / 0.69	2.6 / 0.07	0.1 / 0.00	0.1 / 0.00	0.13	8.6		152	9	123	28	
		8/5/59	7[e]	72	274	7.8 / 7.2	38 / 1.90	6.1 / 0.50	7.2 / 0.31	2.0 / 0.05	0 / 0.00	103 / 1.69	46 / 0.96	3.0 / 0.08	0.1 / 0.00	0.2 / 0.00	0.25	7.4		161	11	120	36	
		9/15/59	12[e]	69	279	8.0 / 7.8	39 / 1.95	6.7 / 0.55	7.0 / 0.30	0.8 / 0.02	0 / 0.00	104 / 1.70	51 / 1.06	2.2 / 0.06	0.2 / 0.01	0.3 / 0.00	0.04	10		168	11	125	40	
		10/7/59	12[e]	58	306	/ 8.2	45 / 2.24	5.8 / 0.48	6.5 / 0.28	1.0 / 0.02	0 / 0.00	125 / 2.05	45 / 0.94	2.2 / 0.06	0.1 / 0.00	0.4 / 0.01	0.06	6.7		174	9	136	34	
		11/5/59	7[e]	48	306	/ 8.3	46 / 2.30	6.6 / 0.54	6.0 / 0.26	0.7 / 0.02	0 / 0.00	130 / 2.13	42 / 0.87	3.0 / 0.08	0.2 / 0.01	0.2 / 0.00	0.06	6.5		175	8	142	35	
		12/9/59	6[e]	36	320	/ 8.3	50 / 2.50	5.6 / 0.46	6.8 / 0.30	0.8 / 0.02	2 / 0.07	140 / 2.29	41 / 0.85	3.0 / 0.08	0.0 / 0.00	0.0 / 0.00	0.07	8.8		186	9	148	31	
		1/12/60	18[e]	40	292	/ 8.0	43 / 2.14	5.6 / 0.46	6.4 / 0.28	0.8 / 0.02	0 / 0.00	105 / 1.72	52 / 1.08	2.9 / 0.08	0.2 / 0.01	0.3 / 0.00	0.10	7.4		171	10	130	44	
		9/13/60		72	262	/ 8.2	35 / 1.76	6 / 0.54	8 / 0.34	1 / 0.02	0 / 0.00	93 / 1.51	50 / 1.04	4 / 0.11	0 / 0	0 / 0	0.11	5		155	13	115	39	
											EEL SUBUNIT													
Middle Fork Eel River Below Black Butte River	28E	6/4/58			99.6	/ 7.7	13 / 0.65	3.3 / 0.27	1.0 / 0.04	0.8 / 0.02	0 / 0.00	50 / 0.82	6.6 / 0.14	0.6 / 0.02	0.1 / 0.00	0.5 / 0.01	0.04	8.8		59	4	46	5	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated

ANALYSES OF SURFACE WATER[a]

EEL RIVER HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	MDB&M										EEL SUBUNIT (Continued)													
Middle Fork Eel River Below Black Butte River	23N/11W-28E	5/14/59		59	104	/7.7	14 / 0.70	2.4 / 0.20	2.7 / 0.12	0.6 / 0.02	0 / 0.00	49 / 0.80	10 / 0.21	1.6 / 0.04	0.2 / 0.01	0.0 / 0.00	0.35	7.3		63	12	45	5	
		5/5/60		57	123	7.0 / 7.7	16 / 0.80	3.2 / 0.26	2.8 / 0.12	0.7 / 0.02	0 / 0.00	58 / 0.95	8.2 / 0.17	1.3 / 0.04	0.1 / 0.00	0.1 / 0.00	0.04	8.1		68	10	53	5	
Williams Creek	30N	7/16/59	2[e]	82	230	8.2 / 7.4	27 / 1.35	11 / 0.91	4.2 / 0.18	1.0 / 0.02	0 / 0.00	130 / 2.13	12 / 0.25	1.9 / 0.05	0.1 / 0.00	0.1 / 0.00	0.09	7.6		129	7	113	6	
		8/5/59		74	212	8.0 / 7.2	24 / 1.20	8.5 / 0.70	5.1 / 0.22	1.3 / 0.03	0 / 0.00	111 / 1.82	15 / 0.31	1.9 / 0.05	0.0 / 0.00	0.3 / 0.00	0.05	4.4		114	10	95	4	
		9/15/59	1[e]	65	235	7.8 / 7.9	24 / 1.20	11 / 0.91	6.0 / 0.26	1.0 / 0.02	0 / 0.00	118 / 1.93	19 / 0.40	1.5 / 0.04	0.0 / 0.00	0.2 / 0.00	0.10	2.5		123	11	106	9	
		10/7/59	3[e]	57	290	/8.3	34 / 1.70	14 / 1.15	4.8 / 0.21	1.2 / 0.03	1 / 0.03	153 / 2.51	20 / 0.42	1.7 / 0.05	0.1 / 0.00	0.7 / 0.01	0.06	8.0		162	7	142	14	
		11/5/59	2[e]	46	292	/8.3	35 / 1.75	14 / 1.15	4.7 / 0.20	0.8 / 0.02	1 / 0.03	156 / 2.56	20 / 0.42	2.5 / 0.07	0.1 / 0.00	0.1 / 0.00	0.08	6.0		161	6	146	16	
		12/9/59	1[e]	34	297	/8.3	35 / 1.75	14 / 1.15	5.1 / 0.22	0.8 / 0.02	2 / 0.07	154 / 2.52	22 / 0.46	2.1 / 0.06	0.0 / 0.00	0.4 / 0.01	0.09	7.3		165	7	144	14	
		1/12/60	10[e]	40	188	/7.8	22 / 1.10	6.8 / 0.56	3.6 / 0.16	0.8 / 0.02	0 / 0.00	83 / 1.36	20 / 0.42	1.3 / 0.04	0.2 / 0.01	0.4 / 0.01	0.08	7.5		104	9	83	15	
		9/13/60	1[e]	68	288	/8.1	32 / 1.62	16 / 1.26	7 / 0.27	1 / 0.02	0 / 0.00	163 / 2.66	18 / 0.39	4 / 0.13	0 / 0	0 / 0	0	5		164	9	144	11	
Middle Fork Eel River Below Williams Creek	23N/12W-36Q	7/16/59	25[e]	81	259	8.2 / 7.3	34 / 1.70	6.1 / 0.50	9.3 / 0.40	1.2 / 0.03	0 / 0.00	109 / 1.79	21 / 0.44	14 / 0.39	0.1 / 0.00	0.1 / 0.00	0.19	6.7		147	15	110	21	
		8/5/59	20[e]	74	312	8.0 / 7.4	36 / 1.80	6.8 / 0.56	14 / 0.61	1.6 / 0.04	0 / 0.00	105 / 1.72	29 / 0.60	24 / 0.68	0.1 / 0.00	0.0 / 0.00	0.32	5.4		169	20	118	32	
		9/15/59	25[e]	68	369	7.6 / 8.1	40 / 2.00	8.0 / 0.66	20 / 0.87	1.3 / 0.03	0 / 0.00	114 / 1.87	34 / 0.71	35 / 0.99	0.1 / 0.00	0.1 / 0.00	0.43	8.0		203	24	133	40	
		10/7/59		62	320	/8.2	38 / 1.90	7.8 / 0.64	12 / 0.52	1.1 / 0.03	0 / 0.00	115 / 1.88	30 / 0.62	20 / 0.56	0.1 / 0.00	0.3 / 0.00	0.25	5.6		171	17	127	33	
		11/5/59	15[e]	53	335	/8.3	41 / 2.04	7.5 / 0.62	14 / 0.61	0.9 / 0.02	0 / 0.00	121 / 1.98	30 / 0.62	24 / 0.68	0.1 / 0.00	0.1 / 0.00	0.33	4.8		182	18	133	34	
		12/9/59	12[e]	38	365	/8.3	46 / 2.30	6.1 / 0.50	17 / 0.74	1.0 / 0.02	1 / 0.03	129 / 2.11	31 / 0.64	28 / 0.79	0.0 / 0.00	0.1 / 0.00	0.35	6.4		200	21	140	33	
Middle Fork Eel River Near Covelo	22N/12W-2R	10/26/50			160	/9.0	21 / 1.05	4.9 / 0.40	5.2 / 0.23	5.2 / 0.13	8.0 / 0.27	54 / 0.89	18 / 0.37	4.2 / 0.12		0	0.08	3.9		97	12	73	15	

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b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated

ANALYSES OF SURFACE WATER[a]

EEL RIVER HYDROGRAPHIC UNIT

Mineral constituents in parts per million / equivalents per million

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$ Total ppm	Hardness as $CaCO_3$ N.C. ppm	Remarks
	MDB&M									ETSEL SUBUNIT (Continued)														
Eden Creek	20N/12W-10E	7/21/53	0.2[e]	77	274	8.1	34 / 1.70	12 / 0.99	5.6 / 0.24	0.9 / 0.02	0 / 0.00	154 / 2.52	16 / 0.33	2.5 / 0.07	0.1 / 0.01	0.3 / 0.01	0.04	15		162	8	134	8	
	21N/12W-34D	7/21/53	2[e]	77	288	8.0	32 / 1.60	17 / 1.40	4.8 / 0.21	1.1 / 0.03	0 / 0.00	176 / 2.88	10 / 0.21	2.5 / 0.07	0.1 / 0.01	0.5 / 0.01	0.03	15		170	6	150	6	
Middle Fork Eel River At Dos Rios	21N/13W-6B	Surface Water Monitoring Program Station Number 5c. Results of continuous monthly sampling since April 1958 are published in Bulletin Nos. 65-58 and 65-59. Following are typical analysis results contained in these publications:																							
		4/16/58	5,290	47	116	7.8	14 / 0.70	4.6 / 0.38	4.1 / 0.18	1.4 / 0.04	0 / 0.00	65 / 1.07	7.7 / 0.16	0.5 / 0.01	0.2 / 0.01	0.5 / 0.01	0.00	11		76	14	54	1	
		10/22/58	29	60	343	7.7 / 7.7	39 / 1.95	12 / 0.97	13 / 0.57	1.1 / 0.03	0 / 0.00	139 / 2.28	34 / 0.71	19 / 0.54	0.1 / 0.01	0.0 / 0.00	0.2	9.4		196	16	146	32	
		9/15/59	14	68	352	7.8	38 / 1.90	11 / 0.90	17 / 0.74	1.8 / 0.05	0.0 / 0.00	115 / 1.88	43 / 0.90	29 / 0.82	0.0 / 0.00	0.0 / 0.00	0.3	10	Fe 0.08 Al 0.01 Zn 0.3 PO_4 0.00 c	207	21	140	46	
										ROUND VALLEY SUBUNIT														
Mill Creek Near Covelo	23N/13W-36D	3/4/53	5[e]	62	191	7.8	23 / 1115	6.8 / 0.56	5.4 / 0.23	0.8 / 0.02	0 / 0.00	99 / 1.62	13 / 0.27	3.5 / 0.10	0 / 0	0.2 / 0.00	0.07	12	Zn 0.01 c	114	12	85	4	
Unnamed Creek Near Covelo	23N/12W-19M	3/4/53	0.5[e]	50	167	7.5	12 / 0.60	11 / 0.90	6.1 / 0.27	1.2 / 0.03	0 / 0.00	95 / 1.56	5.7 / 0.12	4.2 / 0.12	0.1 / 0.01	1.1 / 0.02	0.04	7.8	c	96	15	75	0	
Short Creek Near Covelo	28K	3/4/53	4[e]	48	129	7.1	12 / 0.60	5.5 / 0.45	5.0 / 0.22	1.1 / 0.03	0 / 0.00	60 / 0.98	13 / 0.27	3.5 / 0.10	0 / 0	0.2 / 0.00	0.01	918	c	80	17	53	3	
Town Creek Near Covelo	22N/13W-2G	3/4/53	4[e]	57	243	7.3	26 / 1.30	11 / 0.91	6.9 / 0.30	0.9 / 0.02	0 / 0.00	125 / 2.05	16 / 0.33	5.8 / 0.16	0.1 / 0.01	0.1 / 0.00	0.04	14	c	142	12	110	8	
Red Wing Creek Near Covelo	24P	3/4/53	4[e]	60	286	8.0	28 / 1.31	11 / 0.91	16 / 0.70	0.9 / 0.02	0 / 0.00	134 / 2.20	23 / 0.48	13 / 0.37	0 / 0	0.1 / 0.00	0.18	13	c	171	23	115	5	
Turner Creek Near Covelo	24J	3/30/55	1[e]	61	374	8.1	28 / 1.40	25 / 2.08	11 / 0.48	1.2 / 0.03	0 / 0.00	182 / 2.98	41 / 0.86	5.2 / 0.15			0.11				12	174	25	
Mill Creek At Valley Outlet	22N/12W-22K	3/4/53	70[e]	60	266	8.6	26 / 1.30	16 / 1.32	7.4 / 0.32	1.0 / 0.03	6 / 0.20	144 / 2.36	12 / 0.25	4.8 / 0.13	0.1 / 0.01	0.8 / 0.01	0.07	13	c	158	11	131	3	
										NORTH FORK SUBUNIT														
North Fork Eel River	24N/13W-7J	5/14/59	52[e]	63	197	8.1	26 / 1.30	6.3 / 0.52	4.8 / 0.21	1.0 / 0.02	0 / 0.00	101 / 1.66	17 / 0.35	25 / 0.07	0.1 / 0.00	0.0 / 0.00	0.24	8.4		116	10	91	8	
		9/15/59	25[e]	66	311	7.8 / 8.0	34 / 1.70	11 / 0.88	13 / 0.56	1.4 / 0.04	0 / 0.00	128 / 2.10	36 / 0.75	12 / 0.34	0.2 / 0.01	0.5 / 0.01	0.19	11		182	18	129	24	
	HB&M									BELL SPRINGS AND SEQUOIA SUBUNITS														
Eel River At Alderpoint	3S/5E-27D	9/3/58	120[e]		293	8.0	38 / 1.90	8.3 / 0.68	10 / 0.44	1.9 / 0.05	0 / 0.00	137 / 2.24	27 / 0.56	8.3 / 0.23	0.1 / 0.00	1.1 / 0.02	0.27	9.5		171	14	129	17	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

EEL RIVER HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	HB&M								BELL SPRINGS AND SEQUOIA SUMMITS (Continued)															
Eel River Near McCann	2S/3E-4A	10/24/50			277	8.4	31 / 1.55	9.8 / 0.80	9.3 / 0.40	4.8 / 0.12	0 / 0.00	131 / 2.15	25 / 0.52	10 / 0.28		0 / 0	0.23	7.4		162	14	118	10	
		Surface Water Monitoring Program Station Number 5. Results of continuous monthly sampling since April 1951 are published in Water Quality Investigations Report No. 1, and Bulletin Nos. 65, 65-57, 65-58, and 65-59. Following are typical analysis results contained in these publications:																						
	3A	5/9/51		61	151	7.6 / 8.0	20 / 1.00	5.3 / 0.436	3.5 / 0.152	0.9 / 0.023	0 / 0.00	81 / 1.33	11 / 0.23	3.0 / 0.085		0 / 0.00	0.20	9.6		93	9	72	5	
		9/14/54		64	281	7.4 / 7.9	36 / 1.80	8.8 / 0.724	8.6 / 0.374	1.3 / 0.033	0 / 0.00	138 / 2.26	21 / 0.44	8.0 / 0.226	0.1 / 0.005	0.3 / 0.005	0.21	10	Zn 0.01 c	162	13	126	13	
		9/7/59		70	280	7.8 / 7.6	37 / 1.85	9.6 / 0.79	8.6 / 0.37	1.4 / 0.04	0.0 / 0.00	141 / 2.31	22 / 0.46	5.5 / 0.16	0.1 / 0.01	0.7 / 0.01	0.2	7.0	Fe 0.02 Al 0.02 c	161	12	132	16	
	MDB&M								LAYTONVILLE SUMMIT															
South Fork Eel River Near Branscomb	22N/16W-32F	10/26/50			162	8.1	12 / 0.60	5.1 / 0.42	20 / 0.87	2.1 / 0.05	0 / 0.00	88 / 1.44	7.1 / 0.15	7.2 / 0.20		0 / 0	0.73	15		112	45	51	0	
Elder Creek Near Branscomb	29G	10/10/62	20[e]	55	86	7.4 / 7.5	8.6 / 0.43	2.4 / 0.20	5.5 / 0.24	0.4 / 0.01	0 / 0.00	47 / 0.77	0.4 / 0.01	2.8 / 0.08	0.1 / 0.01	1.4 / 0.02	0.0	13		58	27	32	0	
Tenmile Creek Near Laytonville	21N/14W-20D	3/3/53	0.5[e]	50	139	7.6	13 / 0.65	7.5 / 0.62	4.5 / 0.20	0.7 / 0.02	0 / 0.00	72 / 1.18	10 / 0.21	4.0 / 0.11	0 / 0	0.1 / 0.00	0.08	12	c	87	13	63	4	
Cahto Creek Near Laytonville	21N/15W-22F	3/3/53	3[e]	38	92.6	7.2	8.3 / 0.41	3.0 / 0.25	7.0 / 0.30	0.7 / 0.02	0 / 0.00	52 / 0.85	3.7 / 0.08	3.0 / 0.08	0 / 0	0.2 / 0.00	0.06	17	Fe 0.1 c	68	31	33	0	
Sulphur Springs Creek Near Laytonville	12B	3/3/53	0.7[e]	60	1,620	7.8	80 / 3.99	12 / 0.99	246 / 10.70	3.5 / 0.09	0 / 0.00	246 / 4.03	5.6 / 0.12	395 / 11.14	0.3 / 0.02	1.9 / 0.03	16	36	c	918	68	249	48	
Tenmile Creek	11H	3/4/53	5[e]	40	187	7.5	17 / 0.85	5.6 / 0.46	13 / 0.57	0.7 / 0.02	0 / 0.00	82 / 1.34	4.9 / 0.10	17 / 0.48	0 / 0	0.2 / 0.00	0.53	15	Zn 0.02 c	114	30	65	0	
Mill Creek Near Laytonville	15F	3/3/53	4[e]	40	86.9	7.5	7.4 / 0.37	3.3 / 0.27	7.4 / 0.32	0.7 / 0.02	0 / 0.00	48 / 0.79	5.7 / 0.12	3.0 / 0.08	0 / 0	0.1 / 0.00	0.07	15	Fe 0.1 c	66	33	32	0	
Mud Springs Cr. Near Laytonville	10B	3/3/53	5[e]	35	95.3	7.5	5.3 / 0.26	5.3 / 0.44	7.4 / 0.32	0.9 / 0.02	0 / 0.00	56 / 0.92	2.2 / 0.05	3.5 / 0.10	0 / 0	0.2 / 0.00	0.04	14	c	66	31	35	0	
Big Rock Creek Near Laytonville	22N/15W-27L	3/3/53	4[e]	38	96.4	7.5	7.9 / 0.39	4.7 / 0.39	5.8 / 0.25	0.9 / 0.02	0 / 0.00	53 / 0.87	4.1 / 0.09	4.0 / 0.11	0 / 0	0.2 / 0.00	0.01	13	Fe 0.1 c	67	24	39	0	
Spring at Head of Lewis Creek	14G	3/3/53	0.25[e]	44	200	7.3	22 / 1.10	8.3 / 0.66	7.8 / 0.34	0.4 / 0.01	0 / 0.00	117 / 1.92	7.2 / 0.15	3.0 / 0.08	0 / 0	0.2 / 0.00	0.39	25	c	132	16	89	0	
Tenmile Creek	22E	3/3/53	15[e]	42	128	7.1	12 / 0.60	4.5 / 0.37	7.8 / 0.34	0.6 / 0.02	0 / 0.00	63 / 1.03	5.1 / 0.11	7.0 / 0.20	0.1 / 0.01	0.3 / 0.01	0.21	11	Zn 0.02 c	79	26	48	0	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

EEL RIVER HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	MDB&M						LAKE BERRYESSA AND KUMBOLDT REDWOODS SUBUNIT																	
South Fk. Eel River Near Lakes Flat	23N/17W-24R	10/26/50			170	9.1	21 / 1.05	4.2 / 0.34	10 / 0.44	3.6 / 0.09	8.9 / 0.30	77 / 1.26	7.4 / 0.15	7.5 / 0.21		0.1 / 0.00	0.35	11		112	23	70	0	
South Fk. Eel River Near Leggett	23B	9/3/58	30[e]		230	7.9	18 / 0.90	14 / 1.12	8.8 / 0.38	1.0 / 0.02	0 / 0.00	128 / 2.10	5.4 / 0.11	6.3 / 0.18	0.1 / 0.00	0.9 / 0.01	0.23	11		129	16	101	0	
Hollow Tree Cr. Near Hales Grove	28E	9/16/53			132	7.8	6.4 / 0.32	8.3 / 0.68	7.4 / 0.32	0.9 / 0.02	0 / 0.00	70 / 1.15	2.3 / 0.05	5.0 / 0.14	0.2 / 0.01	3.0 / 0.05	0.00	16		84	24	50	0	
Caulborn Creek Near Moody	24N/18W-5B	10/8/53			104	7.4	9.4 / 0.47	3.1 / 0.26	6.9 / 0.30	0.6 / 0.01	0 / 0.00	47 / 0.77	3.8 / 0.08	6.0 / 0.17	0.1 / 0.01	0.2 / 0.00	0.04	15		68	29	36	0	
	HB&M																							
South Fk. Eel River At Hartsocks Inn	5S/3E-24C	10/1/60	25[e]		251	8.1	28 / 1.40	9.7 / 0.80	9.2 / 0.40	1.2 / 0.03	0 / 0.00	137 / 2.24	9.0 / 0.19	7.0 / 0.20	0.1 / 0.00	0.3 / 0.00	0.15	13		145	15	110	0	
South Fk. Eel River Near Miranda	3S/4E-30C	10/24/50			273	8.4	30 / 1.50	11 / 0.91	9.3 / 0.40	2.8 / 0.07	5.9 / 0.20	135 / 2.21	15 / 0.31	7.6 / 0.21		0.0 / 0.00	0.11	9.1		157	14	120	0	
		Surface Water Monitoring Program Station Number 7. Results of continuous monthly sampling since April 1951 are published in Water Quality Investigations Report No. 15, and Bulletin Nos. 65, 65-57, 65-58, and 65-59. Following are typical analysis results contained in these publications:																						
	30E	9/10/51	22	68	238	8.0	26 / 1.30	9.7 / 0.798	9.0 / 0.391	1.1 / 0.028	0 / 0.00	130 / 2.13	8.0 / 0.167	8.5 / 0.240	0 / 0.00	0.38 / 0.006	0.17	6.7		133	16	105	0	
		5/4/54	603	60	151	7.7 / 8.1	16 / 0.80	5.5 / 0.452	5.9 / 0.257	0.5 / 0.013	0 / 0.00	79 / 1.30	7.4 / 0.154	3.5 / 0.099	0.1 / 0.005	0.1 / 0.002	0.00	15	Al 0.01 Fe 0.10 c	93	17	62	0	
		9/8/59	32	70	246	7.9 / 7.9	27 / 1.35	9.6 / 0.79	10 / 0.44	1.8 / 0.05	0.0 / 0.00	134 / 2.20	8.0 / 0.17	8.5 / 0.24	0.1 / 0.01	0.4 / 0.01	0.1	4.0	Al 0.03 c	136	17	107	0	
South Fk. Eel River Near Dyerville	1S/2E-26C	10/24/50			229	8.6	22 / 1.10	11 / 0.91	9.5 / 0.41	4.4 / 0.11	0 / 0.00	127 / 2.08	11 / 0.23	7.4 / 0.21		0.0 / 0.00	0.11	6.7		135	16	100	0	
							LOWER EEL SUBUNIT																	
Eel River Near Dyerville	23L	10/24/50			236	8.7	25 / 1.25	10 / 0.82	9.7 / 0.42	1.9 / 0.05	6.0 / 0.20	96 / 1.57	18 / 0.38	8.5 / 0.24		0.0 / 0.00	0.30	9.8		136	17	104	15	
Eel River At Rio Del	1N/1E-5N	10/20/52		60	291	7.8	37 / 1.85	10 / 0.82	12 / 0.52	1.5 / 0.04	0 / 0.00	158 / 2.59	11 / 0.23	9.0 / 0.25	0.1 / 0.01	0.8 / 0.01	0.05	8.9		168	16	133	4	
		4/28/53			113	7.4	15 / 0.75	3.2 / 0.26	4.0 / 0.17	1.7 / 0.04	0 / 0.00	61 / 1.00	5.1 / 0.11	2.5 / 0.07	0.5 / 0.03	0.7 / 0.01	0.09	11		74	14	51	1	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

EEL RIVER HYDROGRAPHIC UNIT

Mineral constituents in parts per million / equivalents per million

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$ Total ppm	Hardness as $CaCO_3$ N.C. ppm	Remarks
	HB&M									LOWER EEL SUBUNIT (Continued)														
Eel River At Scotia	1N/1E-5G	Surface Water Monitoring Program Station Number 6. Results of continuous monthly sampling since April 1951 are published in Water Quality Investigations Report No. 15, and Bulletin Nos. 65, 65-57, 65-58, and 65-59. Following are typical analysis results contained in these publications:																						
		5/20/52	4,140	63	151	7.8 / 7.5	19 / 0.95	5.1 / 0.419	3.0 / 0.130	0.8 / 0.020	0 / 0.00	83 / 1.36	5.0 / 0.104	1.9 / 0.054	0.0 / 0.00	0.4 / 0.006	0.08	8.9	c	85	9	68	0	
		9/14/54	208	64	323	7.8 / 8.2	42 / 2.10	9.5 / 0.784	12 / 0.522	1.3 / 0.033	0 / 0.00	172 / 2.82	17 / 0.354	8.5 / 0.240	0.1 / 0.005	0.7 / 0.011	0.13	14	Cu 0.01 Fe 0.02 As 0.01 c	190	15	144	3	
		9/8/59	76	75	243	8.3 / 7.6	24 / 1.20	11 / 0.92	11 / 0.48	1.6 / 0.04	0.0 / 0.00	120 / 1.97	17 / 0.35	8.2 / 0.23	0.2 / 0.01	0.5 / 0.01	0.2	3.4	Fe 0.02 Al 0.03 c	136	18	106	8	
Price Creek Near Fortuna	2N/1W-27H	10/20/52		58	571	7.8	60 / 2.99	13 / 1.07	41 / 1.78	2.6 / 0.07	0 / 0.00	196 / 3.21	58 / 1.21	49 / 1.38	0.2 / 0.01	0.6 / 0.01	0.23	8.8		330	30	203	42	
Williams Creek Near Ferndale	2N/2W-12L	10/20/52		54	433	7.4	28 / 1.40	26 / 2.14	24 / 1.04	3.4 / 0.09	0 / 0.00	203 / 3.33	13 / 0.27	34 / 0.96	0.2 / 0.01	1.4 / 0.02	0.00	19		249	22	177	10	
Russ Creek Near Ferndale	4W	10/20/52		54	804	7.4	56 / 2.79	50 / 4.11	41 / 1.78	6.8 / 0.17	0 / 0.00	311 / 5.10	91 / 1.89	56 / 1.58	0.3 / 0.02	1.2 / 0.02	0.02	20		476	20	345	90	
Fleener Creek Near Ferndale	2N/3W-13H	8/17/54		60	715	7.8	26 / 1.30	23 / 1.89	87 / 3.78	6.6 / 0.17	0 / 0.00	188 / 3.08	26 / 0.54	119 / 3.36	0.4 / 0.02	2.0 / 0.03	0.12	23	Fe 1.8 Al 0.01 c	406	53	160	6	Green and Dirty
										VAN DUZEN RIVER SUBUNIT														
Van Duzen River Near Dinsmore	1N/5E-4N	10/24/50			148	8.1	18 / 0.90	5.2 / 0.43	3.8 / 0.17	2.4 / 0.06	0 / 0.00	79 / 1.30	10 / 0.21	1.6 / 0.04		0.0 / 0.00	0.04	10		90	11	66	2	
Van Duzen River At Bridgeville	1N/3E-14A	10/24/50			203	8.5	26 / 1.30	5.5 / 0.45	5.7 / 0.25	3.6 / 0.09	0 / 0.00	108 / 1.77	15 / 0.31	3.4 / 0.10		0.0 / 0.00	0.10	7.1		120	12	87	0	
		10/19/52		59	223	7.9	29 / 1.45	7.3 / 0.60	8.2 / 0.36	0.7 / 0.02	0 / 0.00	115 / 1.88	13 / 0.27	6.2 / 0.18	0.0 / 0.00	1.4 / 0.02	0.07	8.5		131	15	102	8	
Van Duzen River Near Bridgeville	1TG	Surface Water Monitoring Program Station Number 5a. Results of continuous monthly sampling since April 1958 are published in Bulletin Nos. 65-58 and 65-59. Following are typical analysis results contained in these publications:																						
		9/9/58	6.4	64	256	7.6 / 7.8	32 / 1.60	7.8 / 0.64	7.5 / 0.33	1.7 / 0.04	0 / 0.00	131 / 2.15	13 / 0.27	4.9 / 0.14	0.1 / 0.01	1.0 / 0.02	0.09	8.5		141	13	112	5	
		2/18/59	9,700	43	71.5	7.4 / 7.3	8.8 / 0.44	1.5 / 0.12	3.5 / 0.15	0.7 / 0.02	0.0 / 0.00	37 / 0.61	1.9 / 0.04	2.5 / 0.07	0.1 / 0.01	0.0 / 0.00	0.2	10		47	21	28	0	
		9/8/59	7	68	257	7.9 / 7.6	35 / 1.75	7.4 / 0.61	9.0 / 0.39	1.9 / 0.05	0.0 / 0.00	135 / 2.21	23 / 0.48	5.8 / 0.16	0.1 / 0.01	0.7 / 0.01	0.2	8.4	Fe 0.01 Al 0.06 c	159	14	118	7	
Van Duzen River Near Fortuna	2N/1W-23Q	10/20/52		58	299	7.8	40 / 2.00	10 / 0.82	9.2 / 0.40	1.0 / 0.03	0 / 0.00	161 / 2.64	14 / 0.29	9.0 / 0.25	0.1 / 0.01	0.6 / 0.01	0.00	10		173	12	141	9	
										YAGER CREEK SUBUNIT														
Yager Creek Near Carlotta	2N/1E-10H	10/20/52		59	282	8.0	37 / 1.85	7.3 / 0.60	12 / 0.52	1.3 / 0.03	0 / 0.00	146 / 2.39	12 / 0.25	12 / 0.34	0.1 / 0.01	0.6 / 0.01	0.02	9.6		164	17	122	3	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

EEL RIVER HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	HB&M									YAGER CREEK SUBUNIT (Continued)														
Unnamed Tributary to Yager Creek	2N/1E-16D	9/9/58	10[e]		315	8.0	41 / 2.04	8.5 / 0.70	9.0 / 0.39	1.6 / 0.04	0 / 0.00	160 / 2.62	13 / 0.27	9.6 / 0.27	0.2 / 0.01	0.8 / 0.01	0.07	10		172	12	137	6	
										EUREKA PLAIN SUBUNIT														
Jacoby Creek Near Arcata	5N/1E-10H	10/21/52		54	224	7.5	21 / 1.05	11 / 0.90	10 / 0.44	1.4 / 0.04	0 / 0.00	112 / 1.84	8.7 / 0.18	11 / 0.31	0.1 / 0.01	0.5 / 0.01	0.00	14		133	18	98	6	
Freshwater Cr. Near Eureka	4N/1E-4A	10/21/52		51	259	7.3	19 / 0.95	12 / 0.99	18 / 0.78	2.1 / 0.05	0 / 0.00	114 / 1.87	15 / 0.31	16 / 0.45	0.1 / 0.01	1.1 / 0.02	0.03	11		150	28	97	3	
Elk River Near Fields Landing	4N/1W-26E	10/21/52		49	236	7.1	11 / 0.55	9.7 / 0.80	22 / 0.96	2.3 / 0.06	0 / 0.00	77 / 1.26	9.1 / 0.19	29 / 0.82	0.1 / 0.01	1.8 / 0.03	0.03	16		139	40	67	4	
Salmon Creek Near Loleta	3N/1W-9F	10/20/52		53	538	7.4	28 / 1.40	18 / 1.48	50 / 2.17	4.2 / 0.11	0 / 0.00	144 / 2.36	17 / 0.35	85 / 2.40	0.2 / 0.01	1.3 / 0.02	0.37	12		287	42	144	26	
Little Salmon Creek Near Loleta	9P	10/20/52		54	235	7.0	9.9 / 0.49	14 / 1.15	16 / 0.70	4.4 / 0.11	0 / 0.00	97 / 1.59	2.6 / 0.05	22 / 0.62	0.1 / 0.01	4.1 / 0.07	0.00	19		140	28	82	3	
										CAPE MENDOCINO SUBUNIT														
Bear River At Capetown	1N/3W-13M	8/17/54		70	259	8.1	36 / 1.80	4.9 / 0.40	10 / 0.44	1.2 / 0.03	0 / 0.00	120 / 1.97	23 / 0.48	9.6 / 0.27	0.2 / 0.01	0.3 / 0.01	0.11	7.3	Fe 0.02 Al 0.02 c	152	16	110	12	
		9/3/58	20[e]		338	8.0	46 / 2.30	6.6 / 0.54	12 / 0.52	2.0 / 0.05	0 / 0.00	152 / 2.49	31 / 0.64	7.4 / 0.21	0.2 / 0.01	1.0 / 0.02	0.16	9.8		190	15	142	17	
		5/7/59	180[e]	69	243	8.1	34 / 1.70	4.6 / 0.38	8.4 / 0.36	1.5 / 0.04	0 / 0.00	101 / 1.66	27 / 0.56	7.0 / 0.20	0.6 / 0.03	0.2 / 0.00	0.54	11		145	14	104	21	
		5/4/60		51	208	7.7	26 / 1.30	3.6 / 0.30	9.0 / 0.39	0.8 / 0.02	0 / 0.00	74 / 1.21	24 / 0.50	9.7 / 0.27	0.2 / 0.01	0.0 / 0.00	0.13	11		120	19	80	19	
Singley Creek Near Capetown	1N/3W-34D	8/17/54		68	396	8.1	54 / 2.70	6.6 / 0.55	20 / 0.87	1.6 / 0.04	0 / 0.00	167 / 2.74	39 / 0.81	21 / 0.59	0.5 / 0.03	0.2 / 0.00	0.13	10	Fe 0.01 c	235	21	162	25	
Davis Creek	1S/3W-14A	10/19/54	10	63	257	7.9	32 / 1.60	4.7 / 0.38	12 / 0.52	1.0 / 0.03	0 / 0.00	94 / 1.54	31 / 0.65	12 / 0.34	0.3 / 0.02	2.0 / 0.03	0.20	10	Fe 0.01 c	151	21	99	22	
Mattole River	5S/2E-27H	8/25/53			72.1	7.4	4.4 / 0.22	2.8 / 0.23	6.0 / 0.26	0.6 / 0.02	0 / 0.00	36 / 0.59	2.1 / 0.04	4.2 / 0.12	0.0 / 0.00	0.2 / 0.00	0.0	14	Fe 0.1	52	36	22	0	
	4S/2E-6R	10/24/50			135	8.5	15 / 0.75	4.3 / 0.35	7.2 / 0.31	1.3 / 0.03	0 / 0.00	62 / 1.02	11 / 0.23	4.5 / 0.13		0.0 / 0.00	0.50	12		86	22	55	4	
Mattole River Near Petrolia	2S/2W-11E	10/24/50			188	9.2	18 / 0.90	5.6 / 0.46	8.5 / 0.37	5.1 / 0.13	10 / 0.33	62 / 1.02	23 / 0.48	4.5 / 0.13		0.0 / 0.00	0.50	0.8		106	20	68	1	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated.

ANALYSES OF SURFACE WATER[a]

EEL RIVER HYDROGRAPHIC UNIT

Source	Location number	Date sampled	Discharge in cfs	Temp. in °F	Specific conductance (micromhos at 25°C)	pH Field / Lab.	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Silica (SiO_2)	Other constituents	Total[b] dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Remarks
	HB&M									CAPE MENDOCINO SUBUNIT (Continued)														
Mattole River Near Petrolia	2S/2W-11E	4/16/58		58	132	8.0	17 / 0.85	2.6 / 0.21	6.1 / 0.26	1.7 / 0.04	0 / 0.00	65 / 1.06	10 / 0.21	3.0 / 0.08	0.2 / 0.01	0.2 / 0.00	0.03	14		87	19	53	0	
		9/3/58	70		260	7.9	34 / 1.70	5.1 / 0.42	9.0 / 0.39	1.5 / 0.04	0 / 0.00	120 / 1.97	20 / 0.42	5.4 / 0.15	0.1 / 0.00	1.1 / 0.02	0.10	10		145	15	106	8	
		Surface Water Monitoring Program Station Number 7a. Results of continuous monthly sampling since January 1959 are published in Bulletin No. 69-59. Following are typical analysis results contained in this publication:																						
		2/4/59	1,270	48	132	7.4	15 / 0.75	3.8 / 0.31	5.6 / 0.24	1.1 / 0.03	0.0 / 0.00	60 / 0.98	11 / 0.23	4.1 / 0.14	0.1 / 0.01	0.1 / 0.00	0.1	15		87	18	53	4	
		6/2/59	155	64	213	7.3	28 / 1.40	5.4 / 0.44	7.9 / 0.34	1.1 / 0.03	0.0 / 0.00	104 / 1.70	17 / 0.35	5.9 / 0.17	0.0 / 0.00	0.2 / 0.00	0.0	11	Fe 0.01 PO_4 0.05 Al 0.02 c	128	15	92	7	
		9/9/59	28	73	255	7.8	35 / 1.75	6.2 / 0.51	9.5 / 0.41	1.8 / 0.05	0.0 / 0.00	121 / 1.98	23 / 0.48	6.0 / 0.17	0.2 / 0.01	0.1 / 0.00	0.1	7.4	Al 0.04 Cu 0.03 c	149	15	113	14	
Mattole River	2S/2W-10C	8/17/54		69	222	8.0	31 / 1.55	4.3 / 0.36	7.9 / 0.34	0.9 / 0.02	0 / 0.00	108 / 1.77	19 / 0.40	6.0 / 0.17	0.1 / 0.01	0.4 / 0.01	0.04	13	c	136	15	95	6	

a. Analyses by Department of Water Resources or U. S. Geological Survey unless otherwise noted in remarks column.
b. Calculated from analyzed constituents except as otherwise noted.
c. Iron (Fe), Aluminum (Al), Manganese (Mn), Copper (Cu), Lead (Pb), Zinc (Zn), Arsenic (As), Chromium (Cr) are 0.00 ppm except as shown.
d. Gravimetric Determination.
e. Estimated.

APPENDIX B

ANALYSES OF GROUND WATER

APPENDIX B

TABLE OF CONTENTS

ANALYSES OF GROUND WATER

Trinity River Hydrographic Unit

Owner and use	State well number and other number M D B & M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents	a Total dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by c
									HAYFORK VALLEY SUBUNIT														
Wheeler, T. D. Domestic	31N/11W-3E1	7/7/59	72	129	7.5	14 / 0.70	4.1 / 0.34	5.6 / 0.24	0.8 / 0.02	0 / 0.00	66 / 1.08	4.4 / 0.09	4.9 / 0.14	0.6 / 0.01	0.0 / 0.00	0.15	20		88	18	52	0	D.W.R.
Jess Knolton Domestic	31N/11W-7Q1	7/8/59	66	191	8.1	24 / 1.20	7.0 / 0.58	4.2 / 0.18	1.3 / 0.03	0 / 0.00	114 / 1.87	3.0 / 0.06	1.5 / 0.04	0.6 / 0.01	0.1 / 0.00	0.39	22		120	9	89	0	D.W.R.
H. A. Reynolds Domestic	31N/11W-8M1	7/8/59	67	114	6.9	11 / 0.55	5.0 / 0.41	3.4 / 0.15	1.0 / 0.02	0 / 0.00	68 / 1.11	1.0 / 0.02	0.8 / 0.02	0.2 / 0.00	0.1 / 0.00	0.11	23		79	13	48	0	D.W.R.
		7/26/60		139	7.9	14 / 0.70	5.6 / 0.46	4.7 / 0.20	1.4 / 0.04	0 / 0.00	78 / 1.28	0.0 / 0.00	3.0 / 0.08	0.9 / 0.01	0.0 / 0.00	0.11	23	d	91	14	58	0	D.W.R.
		6/ /61		128	7.0	14 / 0.70	4.6 / 0.38	3.8 / 0.16	1.0 / 0.02	0 / 0.00	74 / 1.21	0.8 / 0.02	1.1 / 0.03	0.2 / 0.00	0.0 / 0.00	0.08	23		84	13	54	0	D.W.R.
		6/6/62		109	7.7	11 / 0.55	4.5 / 0.37	3.8 / 0.16	1.0 / 0.02	0 / 0.00	66 / 1.08	1.0 / 0.02	0.0 / 0.00	0.3 / 0.00	0.0 / 0.00	0.09	22		76	14	46	0	D.W.R.
W. Washburn Domestic	31N/11W-9A1	7/8/59	60	252	8.5	16 / 0.80	21 / 1.74	4.7 / 0.20	0.4 / 0.01	4 / 0.13	158 / 2.46	6.1 / 0.13	1.4 / 0.04	0.3 / 0.00	0.2 / 0.01	0.09	25		153	7	127	0	D.W.R.
Owner unknown Domestic	31N/11W-9C1	7/7/59	61	312	7.3	44 / 2.20	11 / 0.90	5.8 / 0.25	1.1 / 0.03	0 / 0.00	189 / 3.10	7.1 / 0.15	2.0 / 0.06	4.9 / 0.08	0.1 / 0.00	0.15	18		187	7	154	0	D.W.R.
A. Laffanchini Domestic	31N/12W-5G1	7/8/59	60	210	8.0	19 / 0.95	11 / 0.90	6.6 / 0.29	1.3 / 0.03	0 / 0.00	118 / 1.93	3.1 / 0.06	3.9 / 0.11	3.9 / 0.06	0.1 / 0.00	0.10	17		124	13	94	0	D.W.R.
Al Scheublin Domestic	31N/12W-7J1	7/8/59	68	246	8.3	37 / 1.85	5.7 / 0.47	4.2 / 0.18	1.2 / 0.03	2 / 0.07	144 / 2.36	4.8 / 0.10	1.1 / 0.03	0.3 / 0.00	0.1 / 0.00	0.09	14		141	7	116	0	D.W.R.
Alma Norgaar Domestic	31N/12W-11L1	7/7/59	63	123	7.3	10 / 0.50	5.6 / 0.46	5.6 / 0.24	0.4 / 0.01	0 / 0.00	62 / 1.02	1.0 / 0.02	4.3 / 0.12	4.0 / 0.06	0.0 / 0.00	0.14	19		80	20	48	0	D.W.R.
Trinity Alps Lumber Company Domestic	31N/12W-11N1	7/7/59	64	155	7.6	16 / 0.80	6.6 / 0.54	5.2 / 0.23	0.4 / 0.01	0 / 0.00	86 / 1.41	2.0 / 0.04	4.2 / 0.12	2.1 / 0.03	0.0 / 0.00	0.15	24		103	14	67	0	D.W.R.
Reid Hood Domestic	31N/12W-11Q1	7/8/59	58	252	8.0	32 / 1.60	8.5 / 0.70	7.1 / 0.31	0.2 / 0.00	0 / 0.00	142 / 2.33	7.2 / 0.15	3.6 / 0.10	2.8 / 0.04	0.1 / 0.00	0.08	22		154	12	115	0	D.W.R.
		7/26/60		274	8.1	35 / 1.75	9.4 / 0.77	8.5 / 0.37	0.3 / 0.01	0 / 0.00	154 / 2.52	6.9 / 0.14	4.7 / 0.13	0.0 / 0.00	0.1 / 0.00	0.02	23	Zn 0.53 d	164	13	126	0	D.W.R.
		6/ /61		270	7.3	35 / 1.75	8.9 / 0.73	7.7 / 0.33	0.2 / 0.00	0 / 0.00	155 / 2.54	7.6 / 0.16	4.2 / 0.12	0.8 / 0.01	0.0 / 0.00	0.02	25		165	12	124	0	D.W.R.
		6/6/62		248	7.6	29 / 1.45	8.9 / 0.73	7.6 / 0.33	0.4 / 0.01	0 / 0.00	144 / 2.36	7.1 / 0.15	2.8 / 0.08	0.4 / 0.01	0.01 / 0.00	0.05	22		149	13	109	0	D.W.R.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn) and Chromium (Cr), reported here as 0.00 except as shown.

32305-E-G 6-61 500 SPO

ANALYSES OF GROUND WATER

Trinity River Hydrographic Unit

Owner and use	State well number and other number (M D B & M)	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents	Total dissolved solids in ppm [a]	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by [c]
						HAYFORK VALLEY SUBUNIT (Continued)																	
E. J. Stout Domestic	31N/12W-12J1	7/8/59	66	193	7.8	17 / 0.85	9.6 / 0.79	7.3 / 0.32	1.3 / 0.03	0 / 0.00	108 / 1.77	5.1 / 0.11	2.1 / 0.06	2.6 / 0.04	0.1 / 0.00	0.11	23		121	16	82	0	D.W.R.
Jim Langberg Domestic	31N/12W-12L1	7/8/59	59	212	7.6	19 / 0.95	9.8 / 0.81	7.8 / 0.34	1.0 / 0.02	0 / 0.00	108 / 1.77	5.6 / 0.12	3.8 / 0.11	9.3 / 0.15	0.1 / 0.00	0.07	24		133	16	88	0	D.W.R.
		7/26/60		225	8.0	21 / 1.05	10 / 0.82	8.0 / 0.35	0.9 / 0.02	0 / 0.00	114 / 1.87	4.9 / 0.10	4.8 / 0.14	6.8 / 0.11	0.1 / 0.00	0.06	24	d	136	15	96	3	D.W.R.
		6/ /61		195	6.7	20 / 1.00	7.8 / 0.64	7.0 / 0.30	0.9 / 0.02	0 / 0.00	105 / 1.72	5.1 / 0.11	3.1 / 0.09	2.6 / 0.04	0.0 / 0.00	0.03	24		122	15	82	0	D.W.R.
F. R. Smith Domestic	31N/12W-12R1	7/8/59	65	201	7.8	24 / 1.20	8.3 / 0.68	3.8 / 0.16	0.9 / 0.02	0 / 0.00	120 / 1.97	4.4 / 0.09	0.0 / 0.00	0.7 / 0.01	0.1 / 0.00	0.08	17		118	8	94	0	D.W.R.
Chas. L. Brown, Jr. Domestic, Irrigation	31N/12W-13F1	7/8/59	54	209	7.3	18 / 0.90	9.2 / 0.76	7.1 / 0.31	0.7 / 0.02	0 / 0.00	80 / 1.31	1.8 / 0.04	6.7 / 0.19	27 / 0.44	0.1 / 0.00	0.04	27		137	16	83	17	D.W.R.
Trinity Alps Lumber Company	31N/12W-14F1	7/7/59	66	843	8.3	16 / 0.80	1.9 / 0.16	162 / 7.05	0.9 / 0.02	2 / 0.07	196 / 3.21	3.3 / 0.07	164 / 4.62	1.0 / 0.02	0.0 / 0.00	0.12	8.8		457	88	48	0	D.W.R.
J. D. Rourke Domestic	31N/12W-14L1	7/7/59	54	246	7.8	24 / 1.20	11 / 0.90	11 / 0.48	0.2 / 0.00	0 / 0.00	137 / 2.24	3.0 / 0.06	9.2 / 0.26	2.6 / 0.04	0.0 / 0.00	0.19	27		155	19	105	0	D.W.R.
Jesse Ranch Domestic	31N/12W-15K1	7/7/59	60	258	7.9	25 / 1.25	11 / 0.90	11 / 0.48	0.1 / 0.00	0 / 0.00	156 / 2.56	1.3 / 0.03	2.9 / 0.08	0.4 / 0.01	0.1 / 0.00	0.18	32		161	18	109	0	D.W.R.
		8/20/60		239	8.1	22 / 1.10	13 / 1.04	9.2 / 0.40	0.2 / 0.00	0 / 0.00	145 / 2.38	0.0 / 0.00	2.9 / 0.08	0.4 / 0.01	0.0 / 0.00	0.13	33	Fe 0.02 Al 0.02 Cu 0.02 Zn 0.06 d		152	16	107	0	D.W.R.
		6/ /61		238	7.9	24 / 1.20	11 / 0.90	9.3 / 0.40	0.2 / 0.00	0 / 0.00	139 / 2.28	2.0 / 0.04	5.1 / 0.14	2.1 / 0.03	0.1 / 0.00	0.14	31		153	16	105	0	D.W.R.
		6/6/62		269	8.2	23 / 1.15	14 / 1.13	11 / 0.48	0.2 / 0.00	0 / 0.00	143 / 2.34	4.0 / 0.08	11 / 0.31	5.6 / 0.09	0.1 / 0.00	0.27	30		169	17	114	0	D.W.R.
Dave Reiels Domestic	31N/12W-21K1	7/7/59	54	311	7.9	19 / 0.95	23 / 1.93	10 / 0.44	0.2 / 0.00	0 / 0.00	186 / 3.05	3.1 / 0.06	7.1 / 0.20	0.2 / 0.00	0.2 / 0.01	0.06	27		182	13	144	0	D.W.R.
J. R. Morris Domestic	32N/11W-35G1	7/7/59	58	362	7.6	43 / 2.14	11 / 0.90	12 / 0.52	2.4 / 0.06	0 / 0.00	174 / 2.85	13 / 0.27	18 / 0.51	3.2 / 0.05	0.0 / 0.00	0.15	16		205	14	153	10	D.W.R.
		7/26/60		443	8.3	52 / 2.59	13 / 1.09	18 / 0.78	2.8 / 0.07	0 / 0.00	195 / 3.20	12 / 0.25	33 / 0.93	2.4 / 0.04	0.1 / 0.00	0.04	19	Zn 0.38 d		248	17	184	24	D.W.R.
		6/ /61		322	7.1	37 / 1.85	8.9 / 0.73	14 / 0.61	2.6 / 0.07	0 / 0.00	158 / 2.59	12 / 0.25	18 / 0.34	1.9 / 0.03	0.1 / 0.00	0.04	23		190	19	129	0	D.W.R.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn) and Chromium (Cr), reported here as 0.00 except as shown.

32505-B-G 6-61 500 SPO

ANALYSES OF GROUND WATER

Trinity River Hydrographic Unit

Owner and use	State well number and other number M D B & M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents	Total dissolved solids[a] in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by[c]
						HAYFORK VALLEY SUBUNIT (Continued)																	
J. R. Morris Domestic	32N/11W-35Q1	6/6/62		342	8.1	35 / 1.75	10 / 0.82	15 / 0.65	2.7 / 0.07	0 / 0.00	153 / 2.51	12 / 0.25	18 / 0.51	5.4 / 0.09	0.1 / 0.00	0.09	17		190	20	129	4	D.W.R.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), and Chromium (Cr), reported here as 0.00 except as shown.

32505-B-G 6-61 500 SPO

ANALYSES OF GROUND WATER

Mad River-Redwood Creek Hydrographic Unit

Mineral constituents in parts per million / equivalents per million (shown as ppm / epm)

Owner and use	State well number and other number (H B & M)	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents	Total dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$ Total ppm	Hardness as $CaCO_3$ N.C. ppm	Analyzed by c
								BLUE LAKE SUBUNIT															
Ace Bulb Farm Irrigation, Domestic	6N/1W-1H1	2/14/57	61	151	6.8	4.7 / 0.24	5.2 / 0.42	14 / 0.61	0.5 / 0.01	0 / 0.00	29 / 0.48	0.0 / 0.00	19 / 0.54	9.1 / 0.15	0.0 / 0.00	0.00	15		82[a]		33		D.W.R.
		12/4/57		159	7.3	4.8 / 0.24	6.6 / 0.54	15 / 0.65	0.6 / 0.02	0 / 0.00	30 / 0.49	5.8 / 0.12	22 / 0.62	16 / 0.26	0.0 / 0.00	0.00	17		103[a]	45	39	14	U.S.G.S.
		9/10/58		208	6.5	5 / 0.26	7 / 0.60	16 / 0.69	0 / 0	0 / 0.00	31 / 0.52	7 / 0.14	23 / 0.66	20 / 0.32	0.1 / 0.01	0.0	13		128[b]	43	43		D.W.R.
		9/3/59		166	6.9	6.4 / 0.32	5.4 / 0.44	17 / 0.74	0.5 / 0.01	0 / 0.00	28 / 0.46	6.0 / 0.12	21 / 0.59	20 / 0.32	0.3 / 0.02	0.1	19	Fe 0.28	110[a]	49	38	15	U.S.G.S.
		7/21/60		178	7.0	5.4 / 0.27	6.0 / 0.49	17 / 0.74	0.4 / 0.01	0 / 0.00	30 / 0.49	3.1 / 0.06	18 / 0.51	29 / 0.47	0.0 / 0.00	0.03	14	Fe 0.38	108[a]	49	38	13	D.W.R.
		8/4/61		174	6.9	5.3 / 0.26	6.3 / 0.52	16 / 0.70	0.6 / 0.02	0 / 0.00	30 / 0.49	4.3 / 0.09	20 / 0.56	26 / 0.42	0.0 / 0.00	0.04	15	Fe 0.39 Cu 0.01 Pb 0.02 Zn 3.6 d	108[a]	47	39	14	D.W.R.
J. M. Vieira Industrial	1P1	9/11/52		2,400	7.6	22 / 1.10	18 / 1.48	442 / 19.22	54 / 1.38		318 / 5.12		528 / 14.89			0.48		Fe 0.08		83	129	0	U.S.G.S.
		2/12/57	46	4,920	7.5	43 / 2.15	94 / 7.72	842 / 36.63	32 / 0.82	0 / 0.00	105 / 1.72	175 / 3.64	1,460 / 41.17	0.6 / 0.01	0.1 / 0.01	0.29	16		2,710[a]		494		D.W.R.
		12/4/57	50	7,770	7.6	96 / 4.79	209 / 17.21	1,230 / 53.50	48 / 1.23	0 / 0.00	94 / 1.54	315 / 6.56	2,520 / 71.06	2.2 / 0.04	0.2 / 0.01	0.56	18		4,480[a]	70	1,100	1,020	U.S.G.S.
		9/11/58		8,583	7.3	95 / 4.74	217 / 17.86	1,419 / 61.70	54 / 1.38	0 / 0.00	72 / 1.18	337 / 7.03	2,736 / 77.14	0 / 0	0 / 0	0.1	10		5,448[b]	72	1,125		D.W.R.
		9/9/59		18,400	7.5	211 / 10.53	512 / 42.11	3,410 / 148.34	164 / 4.20	0 / 0.00	87 / 1.43	790 / 16.45	6,560 / 184.99	8.0 / 0.18	0.0 / 0.00	1.1	13	Fe 21	11,710[a] 12,780[b]	72	2,630	2,579	U.S.G.S.
	1P2	8/25/60		450	8.2	18 / 0.90	24 / 2.02	35 / 1.52	4.6 / 0.12	0 / 0.00	196 / 3.21	0.0 / 0.00	42 / 1.18	5.6 / 0.09	0.2 / 0.01	0.09	21	Fe 6.6	246[a]	33	146	0	D.W.R.
		10/14/61		402	7.6	18 / 0.90	23 / 1.86	28 / 1.22	4.4 / 0.11	0 / 0.00	192 / 3.15	0.0 / 0.00	29 / 0.82	5.4 / 0.09	0.2 / 0.01	0.07	20	Fe 2.1 Mn 1.8 Zn 0.36 d	222[a]	30	138	0	D.W.R.
Catherine M. Turner Irrigation	6N/1E-7B1	9/15/52	54	253	7.3	21 / 1.05	9.1 / 0.75	16 / 0.70	1.3 / 0.03		98 / 1.61		26 / 0.73			0.05		Fe 0.03		28	90	10	U.S.G.S.
Owner Unknown Irrigation	7H1	9/12/52		373	7.5								14 / 0.39										U.S.G.S.
Joe E. Silva Irrigation, Stock	7J1	9/12/52	53	454	7.6	54 / 2.70	19 / 1.56	10 / 0.44	5.9 / 0.15		240 / 3.93		16 / 0.45			0.07		Fe 0.05		9	213	16	U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr)~~ reported here as 0.00 except as shown.

ANALYSES OF GROUND WATER

Mad River-Redwood Creek Hydrographic Unit

Owner and use	State well number and other number H B & M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents	Total dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by c
									BLUE LAKE SUBUNIT (Continued)														
Ed Letter Irrigation, Domestic	6N/1E-7K1	9/12/52		382	7.4					0 / 0.00	206 / 3.38		10 / 0.28										U.S.G.S.
Frank Coleman Domestic, Irrigation	7M1	9/11/52		436	7.2	39 / 1.95	25 / 2.06	16 / 0.70	2.2 / 0.06		250 / 4.10		19 / 0.54			0.11		Fe 3.6		15	200	0	U.S.G.S.
		8/20/54		479	7.7	48 / 2.40	28 / 2.29	14 / 0.61	1.8 / 0.05	0 / 0.00	285 / 4.67	7.7 / 0.16	18 / 0.51	0.0 / 0.00	0.2 / 0.01	0.11	17	Fe 0.005 Mn 0.4 Zn 0.2 d	275[a]	11	234	0	U.S.G.S.
		2/12/57	44	475	6.7	45 / 2.25	29 / 2.35	13 / 0.57	2.2 / 0.06	0 / 0.00	267 / 4.38	9.2 / 0.19	19 / 0.54	0.4 / 0.01	0.0 / 0.00	0.01	20		269[a]		230		D.W.R.
		12/4/57	50	517	7.1	47 / 2.35	33 / 2.69	15 / 0.65	2.5 / 0.06	0 / 0.00	288 / 4.72	7.7 / 0.16	25 / 0.70	0.8 / 0.01	0.2 / 0.01	0.33	25		299[a]	11	252	16	U.S.G.S.
		9/12/58		492	7.6	46 / 2.28	30 / 2.52	15 / 0.63	1.9 / 0.05	0 / 0.00	272 / 4.47	3 / 0.07	26 / 0.73	0 / 0	0.3 / 0.01	0.71	22		371[b]	11	240		D.W.R.
		9/9/59		495	8.3	30 / 1.50	40 / 3.30	10 / 0.44	3.3 / 0.08	6 / 0.20	278 / 4.56	5 / 0.10	23 / 0.65	0.1 / 0.00	0.0 / 0.00	0.1	22	Fe 15	277[a] 275[b]	8	240	2	U.S.G.S.
		8/25/60		473	8.4	41 / 2.04	30 / 2.44	14 / 0.61	2.2 / 0.06	5 / 0.17	254 / 4.16	2.8 / 0.06	27 / 0.76	0.3 / 0.00	0.1 / 0.00	0.12	19	Fe 12	266[a]	12	224	8	D.W.R.
		10/24/61		445	8.2	39 / 1.95	26 / 2.17	15 / 0.65	2.4 / 0.06	0 / 0.00	249 / 4.08	1.3 / 0.03	25 / 0.70	1.0 / 0.02	0.2 / 0.01	0.13	20	Fe 14 Pb 0.01 Mn 0.74 Zn 0.20 d	252[a]	13	206	2	D.W.R.
Joe Bugenig Irrigation, Domestic	7Q1	9/11/52		443	7.2					0 / 0.00	271 / 4.44		9.0 / 0.25										U.S.G.S.
Charles Barber Domestic	8H1	9/9/59		182	6.7	10 / 0.50	2.7 / 0.22	20 / 0.87	1.8 / 0.05	0 / 0.00	31 / 0.51	0.0 / 0.00	20 / 0.56	36 / 0.58	0.1 / 0.01	0.2	20	Fe 0.35	126[a]	53	36	11	U.S.G.S.
		7/21/60		178	7.0	7.8 / 0.39	2.8 / 0.23	19 / 0.83	1.4 / 0.04	0 / 0.00	17 / 0.28	0.8 / 0.02	16 / 0.45	44 / 0.71	0.0 / 0.00	0.04	19	Fe 0.32	119[a]	56	31	17	D.W.R.
		8/25/61		211	7.0	11 / 0.55	7.2 / 0.59	15 / 0.65	3.4 / 0.09	0 / 0.00	41 / 0.67	18 / 0.37	17 / 0.48	25 / 0.40	0.2 / 0.01	0.02	31	Fe 0.05 Pb 0.02 Cu 0.02 Zn 4.2 d	148[a]	34	57	23	D.W.R.
N. T. Peugh Irrigation	16N1	9/12/52	54	327	7.6	35 / 1.75	17 / 1.40	7.4 / 0.32	1.8 / 0.05		168 / 2.75		10 / 0.28			0.05		Fe 0.08		9	157	20	U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), and Chromium (Cr) reported here as 0.00 except as shown.

32505-B-G 6-61 500 SPO

ANALYSES OF GROUND WATER

Mad River-Redwood Creek Hydrographic Unit

Owner and use	State well number and other number H B & M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents	Total dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by c
										BLUE LAKE SUBUNIT (Continued)													
N. T. Peugh Irrigation	6N/1E-16N1	9/10/58		391	7.4	44 / 2.18	22 / 1.82	8 / 0.35	1.5 / 0.04	0 / 0.00	189 / 3.10	49 / 1.03	7 / 0.20	2 / 0.03	0.1 / 0.0	0.0	22		294[b]	8	200		D.W.R.
Mrs. Iversen Irrigation	17D1	9/11/52	52	383	7.1					0 / 0.00	227 / 3.72		12 / 0.34										U.S.G.S.
		9/11/58		455	7.8	41 / 2.05	25 / 2.06	9 / 0.38	1 / 0.03	0 / 0.00	218 / 3.57	17 / 0.36	22 / 0.62	0 / 0	0.5 / 0.02	1.1	27		304[b]	8	205		D.W.R.
		9/9/59		442	8.3	38 / 1.90	31 / 2.58	6.8 / 0.30	0.0 / 0.00	6 / 0.20	230 / 3.77	21 / 0.44	17 / 0.48	0.5 / 0.01	0.0 / 0.00	0.1	34	Fe 7.0	268[a] 277[b]	6	224	26	U.S.G.S.
		8/25/60		419	8.1	44 / 2.20	23 / 1.92	8.7 / 0.38	1.1 / 0.03	0 / 0.00	249 / 4.08	0.3 / 0.01	12 / 0.34	1.4 / 0.02	0.2 / 0.01	0.13	36	Fe 7.6	249[a]	8	206	2	D.W.R.
		8/4/61		398	8.3	44 / 2.20	22 / 1.84	8.7 / 0.38	1.2 / 0.03	0 / 0.00	248 / 4.06	1.5 / 0.03	11 / 0.31	1.6 / 0.02	0.2 / 0.01	0.11	40	Fe 2.2 Mn 2.3 Cu 0.02 Pb 0.02 Zn 0.13 d	252[a]	8	202	0	D.W.R.
William Parton Irrigation	17E2	9/29/52	54	384	7.1	34 / 1.70	25 / 2.06	11 / 0.48	1.4 / 0.04	0 / 0.00	226 / 3.70	4.4 / 0.09	12 / 0.34	0.6 / 0.01	0.0 / 0.00	0.18	35	Fe 6.5	241[a]	11	188	2	U.S.G.S.
J. R. Harris Irrigation	25H1	9/16/52	54	168	7.5	15 / 0.75	8.0 / 0.66	9.4 / 0.41	1.2 / 0.03		82 / 1.34		7.0 / 0.20			0.03		Fe 0.04		22	70	3	U.S.G.S.
Domingo Silva Domestic	6N/2E-29E1	9/16/52	53	84.7	6.3	4.4 / 0.22	3.2 / 0.26	5.8 / 0.25	3.8 / 0.10		18 / 0.30		8.0 / 0.23			0.02		Fe 0.18		30	24	9	U.S.G.S.
Domingo Silva Irrigation	30H1	9/16/52		140	7.8	20 / 1.00	2.4 / 0.20	5.0 / 0.22	0.9 / 0.02		74 / 1.21		4.0 / 0.11			0.02		Fe 0.05		15	60	0	U.S.G.S.
J. L. Newhart Irrigation	31C1	9/16/52	55	244	7.9	37 / 1.85	5.9 / 0.49	5.8 / 0.25	1.2 / 0.03		132 / 2.16		4.0 / 0.11			0.06		Fe 0.02		10	117	8	U.S.G.S.
A. Caprile Irrigation	32C1	9/16/52		184	7.8	28 / 1.40	4.9 / 0.40	5.4 / 0.24	1.4 / 0.04		98 / 1.61		5.0 / 0.14			0.03		Fe 0.15		11	90	10	U.S.G.S.
G. A. Curtis Domestic	7N/1E-18Q1	9/9/59		294	6.2	14 / 0.70	15 / 1.24	22 / 0.96	1.1 / 0.03	0 / 0.00	168 / 2.75	0.0 / 0.00	14 / 0.39	0.1 / 0.00	0.0 / 0.00	0.1	21	Fe 3.0	173[a]	32	97	0	U.S.G.S.
		7/21/60		266	8.0	14 / 0.70	14 / 1.14	19 / 0.83	1.0 / 0.02	0 / 0.00	133 / 2.18	1.8 / 0.04	12 / 0.34	7.0 / 0.11	0.0 / 0.00	0.05	24	Fe 0.23	158[a]	31	92	0	D.W.R.
		8/4/61		292	8.2	16 / 0.80	16 / 1.32	22 / 0.96	1.0 / 0.02	0 / 0.00	153 / 2.51	2.0 / 0.04	12 / 0.34	14 / 0.22	0.0 / 0.00	0.04	26	Fe 0.39 Cu 0.01 Pb 0.01 Zn 0.11 d	184[a]	31	106	0	D.W.R.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), and Chromium (Cr), reported here as 0.00 except as shown.

32505-B-G 6-61 500 SPO

ANALYSES OF GROUND WATER

Mad River-Redwood Creek Hydrographic Unit

Owner and use	State well number and other number H B & M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents	Total dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by c
MAD LAKE SUBUNIT (Continued)																							
Earl Converse Domestic	7N/1E-29D1	9/14/59		332	7.0	13 / 0.65	21 / 1.71	15 / 0.65	1.0 / 0.03	0 / 0.00	44 / 0.72	8.0 / 0.17	24 / 0.68	92 / 1.48	0.0 / 0.00	0.0	21	Fe 1.7	217[a]	21	118	82	U.S.G.S.
Tom Gralty	30B1	9/9/59		115	6.9	6.4 / 0.32	4.6 / 0.38	11 / 0.48	0.8 / 0.02	0 / 0.00	40 / 0.66	8.0 / 0.17	9.0 / 0.25	5.4 / 0.09	0.2 / 0.01	0.0	26	Fe 0.44	91[a]	40	35	2	U.S.G.S.
		7/21/60		113	6.9	4.3 / 0.21	5.0 / 0.41	8.4 / 0.36	0.4 / 0.01	0 / 0.00	39 / 0.64	3.6 / 0.07	6.6 / 0.19	5.0 / 0.08	0.0 / 0.00	0.04	23	Fe 0.22	75[a]	36	31	0	D.W.R.
		8/14/61		113	7.2	4.5 / 0.22	5.6 / 0.46	8.7 / 0.38	0.5 / 0.01	0 / 0.00	42 / 0.69	7.6 / 0.16	6.5 / 0.18	6.3 / 0.10	0.1 / 0.00	0.04	24	Fe 0.07 Pb 0.02 Cu 0.02 Zn 2.9 d	85[a]	36	34	0	D.W.R.
J. W. Holt Domestic	31D1	6/7/51		213									34 / 0.96								47		U.S.G.S.
BRUCK SUBUNIT																							
Fred Lundblade Domestic, Irrigation	10N/1E-4C1	8/18/54	58	157	6.9	22 / 1.10	2.5 / 0.20	6.3 / 0.27	0.9 / 0.02	0 / 0.00	65 / 1.07	9.9 / 0.21	9.5 / 0.27	5.5 / 0.09	0.1 / 0.01	0.05	14	Fe 0.04 d		17	65	12	U.S.G.S.
Cal-Pacific Redwood Company Domestic (not drinking)	5C1	8/19/54	56	562	6.2	12 / 0.60	14 / 1.19	75 / 3.26	2.2 / 0.06	0 / 0.00	96 / 1.57	0.7 / 0.01	130 / 3.67	0.8 / 0.01	0.2 / 0.01	0.11	23	Fe 0.02 Mn 0.005 d	305[a]	64	90	11	U.S.G.S.
A. N. Bain Domestic, Irrigation	11N/1E-32J1	8/19/54	62	582	7.6	29 / 1.45	14 / 1.13	58 / 2.52	21 / 0.54	0 / 0.00	109 / 1.79	45 / 0.94	99 / 2.79	1.7 / 0.03	0.0 / 0.00	0.12	11	Fe 0.02 Zn 0.005 d	333[a]	45	129	40	U.S.G.S.
BIG LAGOON SUBUNIT																							
Melvin Foss Domestic, Irrigation	10N/1E-29L1	8/18/54	55	92.6	7.1	5.0 / 0.25	2.1 / 0.17	7.8 / 0.34	0.6 / 0.02	0 / 0.00	20 / 0.33	4.1 / 0.09	13 / 0.37	0.6 / 0.01	0.1 / 0.01	0.03	7.2	Zn 0.03 d	50[a]	44	21	5	U.S.G.S.
	29N1	8/18/54	56	100	7.2	7.0 / 0.35	2.7 / 0.22	7.3 / 0.32	0.9 / 0.02	0 / 0.00	26 / 0.43	4.1 / 0.09	14 / 0.40	0.7 / 0.01	0.1 / 0.01	0.15	6.5	Fe 0.02 Zn 4.0 d	56[a]	35	28	7	U.S.G.S.
Melvin Foss Irrigation	29M2	8/18/54	56	96.2	7.1	5.5 / 0.27	3.5 / 0.29	7.1 / 0.31	0.9 / 0.02	0 / 0.00	23 / 0.38	5.4 / 0.11	14 / 0.40	1.8 / 0.03	0.0 / 0.00	0.09	8.0	Al 0.005 d	57[a]	35	28	9	U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), and Chromium (Cr), reported here as 0.00 except as shown.

32505-B-C 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number MDB&M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	a Total dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by c
						OUTLET CREEK SUBUNIT (LITTLE LAKE VALLEY)																	
E. H. Maize Irrigation	18N/13W-6H1	11/11/50		316	7.7													Fe 0.47 Mn 2.6			148		D.W.R.
-----	8C1	11/11/50		658	8.1													Fe 0.36 Mn 4.6			330		D.W.R.
G. Mott Domestic	8K1	6/9/53		591	7.3	51 / 2.54	35 / 2.88	30 / 1.30	0.8 / 0.02	0 / 0.00	392 / 6.42	0.3 / 0.01	8.5 / 0.24	1.0 / 0.02	0.3 / 0.02	1.2	25	Fe 2.7	346	19	271	0	U.S.G.S.
I. Washburn Stock and Irrigation	8L2	11/11/50		507	7.9								2.5 / 0.07					Fe 0.96 Mn 7.1			232		D.W.R.
Southwick Irrigation	17N2	11/11/50		352	7.5								26 / 0.74					Fe 1.0 Mn 2.6			148		D.W.R.
Don Coleman Irrigation	18H1	6/9/53	64	395	7.5	27 / 1.35	17 / 1.40	31 / 1.35	1.4 / 0.04	0 / 0.00	255 / 4.18	0.7 / 0.02	4.0 / 0.11	0.3 / 0.00	0.2 / 0.01	0.17	38	Fe 1.7	245	33	137	0	U.S.G.S.
Clifton Higgs Domestic	20A1	6/9/53		296	6.9	24 / 1.20	16 / 1.32	11 / 0.48	0.4 / 0.01	0 / 0.00	142 / 2.33	7.6 / 0.16	15 / 0.42	9.0 / 0.15	0.1 / 0.00	0.04	17	Fe 0.13 Mn 0.09	170	16	126	9	U.S.G.S.
P. Regano Stock and Irrigation	20P2	11/11/50		144	6.5								4 / 0.11					Fe 1.0 Mn 0.94			54		D.W.R.
P. Regano Irrigation	20P3	11/11/50		160	8.8								5 / 0.14					Fe 1.0 Mn 1.2			62		D.W.R.
William Burrell Domestic	29C1	5/21/52			6.4	9.6 / 0.48	7.9 / 0.65	31 / 1.37			108 / 1.77	6.5 / 0.14	21 / 0.59				1.5	Fe 9.6	130	55	72		D.W.R.
Ed Hayes Domestic	29D1	6/9/53		312	6.8	0.0 / 0.00	0.7 / 0.06	75 / 3.26	0.1 / 0.00	0 / 0.00	188 / 3.08	0.5 / 0.01	10 / 0.28	0.2 / 0.00	0.2 / 0.01	0.06	54	Fe 0.6	233	98	3	0	U.S.G.S.
Anderson Domestic	18N/14W-2P1	9/30/53		110	6.7	8.9 / 0.44	2.6 / 0.21	7.8 / 0.34	1.1 / 0.03	0 / 0.00	49 / 0.80	2.6 / 0.05	5.5 / 0.16	0.4 / 0.01	0.1 / 0.00	0.10	17		70	33	33	0	U.S.G.S.
R. E. Sanders Domestic	12H1	6/9/53	66	446	7.1	40 / 2.00	12 / 0.99	32 / 1.39	1.2 / 0.03	0 / 0.00	154 / 2.52	2.1 / 0.04	62 / 1.75	0.0 / 0.00	0.3 / 0.02	3.8	29	Fe 8.3 Mn 0.71	258	32	149	23	U.S.G.S.
J. S. Long Stock and Domestic	13N1	6/9/53		859	7.3	50 / 2.50	49 / 4.03	80 / 3.48	3.3 / 0.08	0 / 0.00	564 / 9.24	21 / 0.44	8.5 / 0.24	2.0 / 0.03	0.4 / 0.02	0.41	30	Fe 1.3 Mn 0.02	522	34	326	0	U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr)~~, reported here as 0.00 except as shown.

32505-B-G 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number MDB&M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	a Total dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by c
									OUTLET CREEK SUBUNIT (LITTLE LAKE VALLEY) (Continued)														
------ Stock	19N/12W-31Q1	9/1/53	57	119	6.9	7.6 / 0.38	5.3 / 0.44	8.0 / 0.35	0.9 / 0.02	0 / 0.00	50 / 0.82	4.7 / 0.10	10 / 0.28	0.7 / 0.01	0.1 / 0.00	0.41	13		75	29	41	0	U.S.G.S.
B. Shedd Stock and Domestic	19N/13W-31C1	6/9/53		189	6.9	26 / 1.30	5.2 / 0.43	5.2 / 0.23	0.8 / 0.02	0 / 0.00	108 / 1.77	5.2 / 0.11	3.0 / 0.09	0.2 / 0.00	0.0 / 0.00	0.05	17	Fe 0.2 Mn 0.00	116	11	86	0	U.S.G.S.
									EYSEL SUBUNIT														
Eden Valley Ranch Irrigation and Domestic	21N/12W-34M1	7/21/53	63	236	7.5	24 / 1.20	13 / 1.07	5.2 / 0.23	0.8 / 0.02	0 / 0.00	136 / 2.23	11 / 0.23	3.0 / 0.09	0.4 / 0.01	0.1 / 0.00	0.02	15		140	9	113	2	U.S.G.S.
J. H. Baxter Unused spring	21N/13W-9	9/25/58	48	252	8.0	2.40				0 / 0.00	149 / 2.44		3.9 / 0.11								120		D.W.R.
	22	9/3/58	60	218	7.9	1.85				0 / 0.00	95 / 1.56		2.4 / 0.07								93		D.W.R.
	27	9/2/58	45	159	7.9	1.42				0 / 0.00	94 / 1.54		1.7 / 0.05								71		D.W.R.
	33	9/5/58	48	300	8.2	2.88				0 / 0.00	183 / 3.00		3.0 / 0.08								144		D.W.R.
									LAYTONVILLE SUBUNIT														
John E. Gates Domestic	21N/14W-19M1	6/3/53		101	6.8	6.5 / 0.32	7.2 / 0.59	3.4 / 0.15	0.3 / 0.01	0 / 0.00	59 / 0.97	2.4 / 0.05	4.2 / 0.12	0.1 / 0.00	0.0 / 0.00	0.05	13	Fe 7.9	66	14	46	0	D.W.R.
C. Merrill Stock and Domestic	30K1	11/19/52		858	7.8	52 / 2.59	51 / 4.19	62 / 2.70	0.5 / 0.01	0 / 0.00	438 / 7.18	32 / 0.67	40 / 1.16	0.9 / 0.01	0.3 / 0.02	0.13	18		472	28	339	0	U.S.G.S.
George Newhall Irrigation	31J1	11/18/52		462	7.6	28 / 1.40	26 / 2.14	34 / 1.48	1.1 / 0.03	0 / 0.00	262 / 4.29	2.5 / 0.05	22 / 0.62	0.8 / 0.01	0.0 / 0.00	0.07	0.5		244	29	177	0	U.S.G.S.
State Division of Forestry Domestic and Fire Control	21N/15W-1K1	8/27/53		442	7.6	49 / 2.45	20 / 1.65	19 / 0.83	1.3 / 0.03	0 / 0.00	272 / 4.46	1.2 / 0.03	14 / 0.40	0.2 / 0.00	0.4 / 0.02	0.07	45	Fe 0.10	284	17	204	0	U.S.G.S.
Elesa Cole and Elaina Reesa Unused Spring	1Q1	9/24/54	69	1,820	7.1	90 / 4.49	9.6 / 0.79	273 / 11.87	3.2 / 0.08	0 / 0.00	280 / 4.59		440 / 12.41							69	264	34	U.S.G.S.
		3/30/55	70	1,870	7.1	96 / 4.79	9.8 / 0.81	281 / 12.22	3.2 / 0.08	0 / 0.00	274 / 4.49	4.8 / 0.10	456 / 12.86	1.8 / 0.03	0.3 / 0.02	23	36	Fe 0.03	1,050	68	280	55	U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr)~~ reported here as 0.00 except as shown.

32505-E-C 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number MDB&M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	a Total dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by c
										LAYTONVILLE SUBUNIT (Continued)													
P. Oldenburg Domestic -- Unused	21N/15W-11R2	11/24/52		87	6.4	4.4 / 0.22	3.0 / 0.25	11 / 0.48	0.8 / 0.02	0 / 0.00	40 / 0.66	0.6 / 0.01	8.5 / 0.24	2.7 / 0.04	0.1 / 0.00	0.10	28		79	50	23	0	U.S.G.S.
Cutler Domestic	12C1	11/5/52		312	7.9	44 / 2.20	4.7 / 0.39	17 / 0.74	0.3 / 0.01	0 / 0.00	171 / 2.80	0.4 / 0.01	18 / 0.51	0.6 / 0.01	0.1 / 0.00	0.22	22		191	22	129	0	U.S.G.S.
Cutler Abandoned	12C2	11/5/52		608	7.8	49 / 2.45	4.4 / 0.36	73 / 3.17	1.6 / 0.04	0 / 0.00	236 / 3.87	4.5 / 0.09	73 / 2.06	1.5 / 0.02	0.0 / 0.00	9.8	5.2		338	53	140	0	U.S.G.S.
Laytonville Water Company Municipal	13B1	11/5/52		387	7.6	26 / 1.30	18 / 1.48	31 / 1.35	0.6 / 0.02	0 / 0.00	208 / 3.41	2.3 / 0.05	2.3 / 0.65	0.9 / 0.02	0.0 / 0.00	1.0	32		237	33	139	0	U.S.G.S.
C. C. Brown Domestic	14A1	11/24/52		93	6.4	4.9 / 0.25	3.3 / 0.27	9.8 / 0.43	0.4 / 0.01	0 / 0.00	42 / 0.69	0.4 / 0.01	7.5 / 0.21	2.9 / 0.05	0.0 / 0.00	0.04	28		78	45	26	0	U.S.G.S.
Ray Evans Domestic -- Unused	24A1	6/5/53		267	7.1	35 / 1.75	11 / 0.91	5.4 / 0.24	0.7 / 0.02	0 / 0.00	158 / 2.59	7.3 / 0.15	3.0 / 0.09	1.7 / 0.03	0.1 / 0.00	0.05	15	Fe 0.8	157	8	133	3	U.S.G.S.
Gerald Oden Domestic	24B1	11/21/52		297	7.3	13 / 0.65	8.0 / 0.66	34 / 1.48	1.0 / 0.03	0 / 0.00	82 / 1.34	3.0 / 0.06	48 / 1.35	0.8 / 0.01	0.0 / 0.00	0.09	8.8		157	53	65	0	U.S.G.S.
P. Pierson Domestic	21N/16W-22K1	8/26/53		122	7.2	11 / 0.55	3.1 / 0.26	9.2 / 0.40	0.5 / 0.01	0 / 0.00	59 / 0.97	1.4 / 0.03	8.5 / 0.24	0.2 / 0.00	0.0 / 0.00	1.2	16	Fe 0.17	80	33	40	0	U.S.G.S.
----- Domestic	26C1	8/26/53		294	7.8	44 / 2.20	6.6 / 0.54	10 / 0.44	0.5 / 0.01	0 / 0.00	183 / 3.00	5.3 / 0.11	2.8 / 0.08	0.1 / 0.00	0.0 / 0.00	0.04	20	Fe 0.09	179	14	137	0	U.S.G.S.
George Daniels Stock and Domestic	22N/15W-22E1	11/7/52		185	6.8	15 / 0.75	9.1 / 0.75	7.8 / 0.34	0.4 / 0.01	0 / 0.00	80 / 1.31	1.8 / 0.04	19 / 0.54	0.2 / 0.00	0.0 / 0.00	0.08	13		106	18	75	9	U.S.G.S.
W. Woodruff Domestic	35B1	6/3/53		86	6.8	6.3 / 0.31	4.2 / 0.35	4.1 / 0.18	0.6 / 0.02	0 / 0.00	41 / 0.67	2.6 / 0.05	4.5 / 0.13	0.1 / 0.00	0.2 / 0.01	0.07	13	Fe 0.6	56	21	33	0	U.S.G.S.
										ROUND VALLEY SUBUNIT													
Spencer Ranch Unused Spring	22N/12W-1	8/20/59	56	356	8.3	46 / 2.30	15 / 1.24	6.8 / 0.30	0.8 / 0.02	2 / 0.07	223 / 3.65	7.4 / 0.15	2.1 / 0.06	0.4 / 0.01	0.1 / 0.00	0.12	18		209	8	177	0	D.W.R.
Dr. R. E. Welch Stock and Domestic	5F1	4/3/52	59	409									3.5 / 0.10								166		D.W.R.
Claude Swayze Domestic	5L1	10/30/52		319	7.5	30 / 1.50	17 / 1.40	16 / 0.70	0.6 / 0.02	0 / 0.00	202 / 3.31	1.0 / 0.02	3.0 / 0.09	1.6 / 0.03	0.0 / 0.00	0.06	29		198	19	145	0	U.S.G.S.
W. B. Mooy Irrigation and Domestic	6L2	8/31/60		411	8.5	46 / 2.30	20 / 1.64	15 / 0.65	0.8 / 0.02	12 / 0.40	245 / 4.02	0.0 / 0.00	3.7 / 0.10	2.5 / 0.04	0.2 / 0.01	0.11	27	Fe 2.6	250	14	197	0	D.W.R.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr)~~, reported here as 0.00 except as shown.

32505-B-G 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number MDB&M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	Total dissolved solids in ppm[a]	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by[c]
											ROUND VALLEY SUBUNIT (Continued)												
W. B. Mooy Irrigation and Domestic	22N/12W-6L2	8/16/61		412	8.1	46 / 2.30	20 / 1.64	16 / 0.70	0.8 / 0.02	0 / 0.00	272 / 4.46	0.0 / 0.00	3.3 / 0.09	2.6 / 0.04	0.1 / 0.00	0.14	28	Fe 0.15; As 0.01; Cu 0.06; Pb 0.01; Mn 2.0; Zn 0.04 d	251	15	198	0	D.W.R.
Hugh MacKenzie Domestic	7K4	5/19/53		243	7.7	14 / 0.70	17 / 1.40	13 / 0.57	0.4 / 0.01	0 / 0.00	135 / 2.21	8.9 / 0.19	7.8 / 0.22	1.0 / 0.02	0.1 / 0.00	0.13	20	Fe 2.0	149	21	105	0	U.S.G.S.
J. MacKenzie Irrigation	8F1	8/31/60	69	237	8.2	15 / 0.75	16 / 1.35	12 / 0.52	0.5 / 0.01	0 / 0.00	138 / 2.26	8.1 / 0.17	6.5 / 0.18	0.4 / 0.01	0.2 / 0.01	0.12	20	Fe 2.2	149	20	105	0	D.W.R.
J. D. Rohrbough Stock and Irrigation	8H1	11/12/52		224	7.5	15 / 0.75	12 / 0.99	15 / 0.65	0.6 / 0.02	0 / 0.00	114 / 1.87	11 / 0.23	7.8 / 0.22	1.7 / 0.03	0.0 / 0.00	0.0	12		131	27	87	0	U.S.G.S.
C. B. Rohn - (H) Ranch Irrigation	19F1	8/31/60		541	8.5	33 / 1.65	39 / 3.23	10 / 0.44	0.5 / 0.01	9 / 0.30	263 / 4.31	22 / 0.46	5.2 / 0.15	3.7 / 0.06	0.1 / 0.00	0.07	25	Fe 0.13	278	8	244	13	D.W.R.
		8/16/61		498	8.4	34 / 1.70	44 / 3.61	11 / 0.48	0.6 / 0.02	2 / 0.07	304 / 4.98	25 / 0.52	5.5 / 0.16	4.2 / 0.07	0.1 / 0.00	0.08	27	Fe 0.04; Cu 0.03; Pb 0.02; Zn 0.18 d	302	8	266	14	D.W.R.
	19D3	9/23/54	62	567	7.4	32 / 1.60	39 / 3.20	37 / 1.61	0.7 / 0.02	0 / 0.00	346 / 5.67	13 / 0.27	13 / 0.37		0.0 / 0.00	0.12				25	240	0	U.S.G.S.
C. B. Rohn - (H) Ranch Stock and Domestic	19M1	10/30/52		442	7.5	30 / 1.50	38 / 3.13	10 / 0.44	0.3 / 0.01	0 / 0.00	258 / 4.23	27 / 0.56	6.0 / 0.17	2.3 / 0.04	0.0 / 0.00	0.24	26		267	9	231	20	U.S.G.S.
P. J. Rohrbough Domestic	21A1	11/12/52		691	7.8	27 / 1.35	29 / 2.38	93 / 4.04	0.8 / 0.02	0 / 0.00	460 / 7.54	1.2 / 0.02	5.0 / 0.14	8.9 / 0.14	0.0 / 0.00	0.18	0		392	52	186	0	U.S.G.S.
Hallum Lumber Company Industrial	22N/13W-1E1	10/30/52		249	7.7	27 / 1.35	10 / 0.82	8.7 / 0.38	1.0 / 0.03	0 / 0.00	134 / 2.20	14 / 0.29	5.0 / 0.14	0.7 / 0.01	0.0 / 0.00	0.08	9.2		142	15	108	0	U.S.G.S.
C. F. Gutcher Domestic	1J1	10/30/52		209	7.6	22 / 1.10	9.5 / 0.78	6.9 / 0.30	0.7 / 0.02	0 / 0.00	114 / 1.87	11 / 0.23	3.2 / 0.09	0.9 / 0.02	0.0 / 0.00	0.11	6.0		116	14	94	1	U.S.G.S.
Byron Hurt Domestic	1J4	8/31/60		228	8.2	23 / 1.15	8.9 / 0.73	10 / 0.44	0.7 / 0.02	0 / 0.00	116 / 1.90	13 / 0.27	5.1 / 0.14	0.3 / 0.00	0.2 / 0.01	0.10	17	Fe 0.49	136	19	94	0	D.W.R.
		8/16/61		214	7.9	21 / 1.05	11 / 0.93	6.8 / 0.30	0.6 / 0.02	0 / 0.00	113 / 1.85	10 / 0.21	4.2 / 0.12	3.6 / 0.06	0.1 / 0.00	0.11	13	Fe 0.16; Pb 0.06; Mn 0.01; Zn 0.45 d	126	13	99	6	D.W.R.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr).~~ Reported here as 0.00 except as shown.

32505-B-C 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	[a] Total dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by [c]
	MIRAN																						
ROUND VALLEY SUBUNIT (Continued)																							
R. T. Hurt Irrigation	22N/13W-12K1	8/31/60		366	8.4	30 / 1.50	19 / 1.58	20 / 0.87	0.7 / 0.02	3 / 0.10	212 / 3.47	4.8 / 0.10	7.0 / 0.20	1.2 / 0.02	0.2 / 0.01	0.11	23	Fe 0.53	213	22	154	0	D.W.R.
		8/16/61		348	8.2	34 / 1.70	17 / 1.38	20 / 0.87	0.6 / 0.02	0 / 0.00	216 / 3.54	6.2 / 0.13	6.8 / 0.19	0.2 / 0.00	0.3 / 0.02	0.11	23	Fe 0.99, As 0.02, Pb 0.02, Mn 1.8, Zn 0.01 [d]	214	22	154	0	D.W.R.
E. F. Rohrbough Domestic	13A1	8/31/60	50	266	8.0	28 / 1.40	8.8 / 0.72	12 / 0.52	0.6 / 0.02	0 / 0.00	124 / 2.03	12 / 0.25	9.3 / 0.26	3.2 / 0.05	0.1 / 0.00	0.18	14	Fe 0.23	149	20	106	4	D.W.R.
		8/16/61		244	8.0	20 / 1.00	12 / 0.98	13 / 0.56	0.8 / 0.02	0 / 0.00	116 / 1.90	13 / 0.27	10 / 0.28	2.4 / 0.04	0.1 / 0.00	0.18	15	Fe 0.04, Zn 0.23 [d]	143	22	99	4	D.W.R.
Glenn Barrass Domestic Spring	23N/10W-34R1	8/18/58	63	268	7.2	2.48							2.0 / 0.06								124		D.W.R.
Glenn Barrass Unused Spring	23N/11W-36B1	8/18/58	60	220	7.8	1.88							3.4 / 0.10								94		D.W.R.
Rhyne Domestic	23N/12W-26E1	10/6/53		348	7.2	20 / 1.00	19 / 1.56	20 / 0.87	0.6 / 0.02	0 / 0.00	138 / 2.26	8.8 / 0.18	25 / 0.71	16 / 0.26	0.1 / 0.00	0.35	17		194	25	128	15	U.S.G.S.
Crawford Lumber Company Industrial and Domestic	28N1	6/4/53		266	6.9	27 / 1.35	12 / 0.99	13 / 0.57	0.7 / 0.02	0 / 0.00	157 / 2.57	8.4 / 0.18	3.5 / 0.10	2.9 / 0.05	0.1 / 0.00	0.14	15	Fe 7.4	160	19	117	0	U.S.G.S.
		8/31/60		250	8.3	24 / 1.20	11 / 0.92	9.7 / 0.42	0.8 / 0.02	0 / 0.00	136 / 2.23	7.4 / 0.15	3.0 / 0.08	3.3 / 0.05	0.0 / 0.00	0.08	17	Fe 0.63	143	16	106	0	D.W.R.
		8/16/61		221	7.4	23 / 1.15	10 / 0.83	9.0 / 0.39	0.8 / 0.02	0 / 0.00	126 / 2.06	6.6 / 0.14	2.7 / 0.08	1.8 / 0.03	0.1 / 0.00	0.08	16	Fe 0.15, Mn 0.30, Al 0.01, As 0.02, Cu 0.01, Zn 0.08 [d]	132	16	99	0	D.W.R.
Rose Goodwin Domestic	29P2	6/4/53		433	8.3	52 / 2.60	17 / 1.40	19 / 0.83	0.6 / 0.02	0 / 0.00	290 / 4.75	0.2 / 0.00	3.8 / 0.11	0.4 / 0.01	0.2 / 0.01	0.18	33	Fe 3.9	269	17	200	0	U.S.G.S.
George Gravier Irrigation	31N1	4/3/52		246	8.3	26 / 1.30	13 / 1.07	7.2 / 0.31	0.7 / 0.02	0 / 0.00	146 / 2.39	9.4 / 0.20	3.0 / 0.09	0.2 / 0.00	0.0 / 0.00	0.04	17		148	12	118	0	U.S.G.S.
		8/31/60	60	257	8.2	27 / 1.35	11 / 0.91	8.8 / 0.38	0.7 / 0.02	0 / 0.00	140 / 2.29	10 / 0.21	3.5 / 0.10	0.7 / 0.01	0.1 / 0.00	0.07	18	Fe 0.84	149	14	113	0	D.W.R.
		8/16/61		241	7.7	29 / 1.45	9.6 / 0.79	8.2 / 0.36	0.8 / 0.02	0 / 0.00	141 / 2.31	6.4 / 0.13	3.3 / 0.09	0.5 / 0.01	0.1 / 0.00	0.06	14	Fe 1.5, Zn 0.05, Al 0.02, As 0.01, Cu 0.04, Pb 0.01, Mn 0.24	141	14	112	0	D.W.R.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr)~~ reported here as 0.00 except as shown.

32505-B-G 6-61 500 SFO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	Total dissolved solids in ppm[a]	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by[c]
	HBB&M																						
						ROUND VALLEY SUBUNIT (Continued)																	
Elmer Bauer Domestic, Stock and Irrigation	23N/12W-33L1	6/4/53		613	8.3	61 / 3.04	36 / 2.96	31 / 1.35	0.5 / 0.01	0 / 0.00	424 / 6.95	0.8 / 0.02	4.5 / 0.13	1.2 / 0.02	0.6 / 0.03	0.14	30	Fe 1.6	374	18	300	0	U.S.G.S.
		8/31/60		616	8.3	63 / 3.14	37 / 3.01	28 / 1.22	0.5 / 0.01	0 / 0.00	425 / 6.96	0.0 / 0.00	5.2 / 0.15	4.0 / 0.06	0.5 / 0.03	0.21	32		379	16	308	0	D.W.R.
		8/16/61		609	8.3	66 / 3.29	32 / 2.68	30 / 1.30	0.6 / 0.02	0 / 0.00	427 / 7.00	0.0 / 0.00	3.1 / 0.09	4.0 / 0.06	0.4 / 0.02	0.17	30	Fe 0.37 Al 0.03 As 0.12 Cu 0.05 Pb 0.02 Mn 2.0 Zn 0.14	376	18	299	0	D.W.R.
W. Romb Stock and Domestic	23N/13W-25A1	11/13/52		328	7.8	40 / 2.00	13 / 1.07	12 / 0.52	0.8 / 0.02	0 / 0.00	210 / 3.44	0.9 / 0.02	2.8 / 0.08	2.0 / 0.03	0.0 / 0.00	0.09	24		199	14	153	0	U.S.G.S.
W. V. Clarke Domestic, Stock and Irrigation	25P1	8/31/60		248	8.2	31 / 1.55	8.4 / 0.69	5.8 / 0.25	0.9 / 0.02	0 / 0.00	130 / 2.13	11 / 0.23	4.0 / 0.11	2.1 / 0.03	0.1 / 0.00	0.07	13	Fe 3.6	140	10	112	5	D.W.R.
		8/16/61		232	7.8	33 / 1.65	6.7 / 0.55	5.2 / 0.23	1.0 / 0.02	0 / 0.00	127 / 2.08	11 / 0.23	3.1 / 0.09	1.5 / 0.02	0.0 / 0.00	0.07	12	Fe 0.03 Zn 0.04 d	136	9	110	6	D.W.R.
Walter R. Card Domestic	35Q1	10/30/52		256	7.2	30 / 1.50	9.5 / 0.78	13 / 0.57	0.5 / 0.01	0 / 0.00	158 / 2.59	5.8 / 0.12	2.5 / 0.07	0.5 / 0.01	0.0 / 0.00	0.0	8.5		148	20	114	0	U.S.G.S.
C. A. Gray Irrigation	36P2	8/16/61		223	7.8	24 / 1.20	10 / 0.82	7.0 / 0.30	0.9 / 0.02	0 / 0.00	116 / 1.90	9.0 / 0.19	4.2 / 0.12	5.6 / 0.09	0.0 / 0.00	0.11	16	Fe 0.22 Al 0.14 Mn 0.02 Zn 0.08 d	134	13	101	6	D.W.R.
						LAKE HENDRY SUBUNIT																	
J. Senteney Irrigation	23N/17W-10A1	8/24/53		206	6.9	20 / 1.00	9.3 / 0.77	8.6 / 0.37	0.6 / 0.02	0 / 0.00	114 / 1.87	3.5 / 0.07	6.8 / 0.19	3.2 / 0.05	0.0 / 0.00	0.05	22	Fe 0.06	130	17	88	0	U.S.G.S.
J. O. Sutton Domestic	11E1	8/24/53		318	7.0	17 / 0.85	24 / 1.97	15 / 0.65	0.5 / 0.01	0 / 0.00	204 / 3.34	1.6 / 0.03	3.2 / 0.09	0.6 / 0.1	0.1 / 0.0	0.44	29	Fe 1.9	192	19	141	0	U.S.G.S.
R. F. Romero Domestic	24N/17W-6D1	8/26/53		81	7.1	7.2 / 0.36	3.1 / 0.26	5.8 / 0.25	0.2 / 0.01	0 / 0.00	46 / 0.75	1.6 / 0.03	2.8 / 0.08	1.5 / 0.02	0.0 / 0.00	0.03	20	Fe 0.56	65	29	31	0	U.S.G.S.
	HBB&M																						
Division of Beaches and Parks Domestic	5S/3E-13M1	8/14/52		246	7.4	28 / 1.40	11 / 0.91	8.0 / 0.35	0.7 / 0.02	0 / 0.00	139 / 2.28	8.4 / 0.18	7.5 / 0.21	0.2 / 0.00	0.0 / 0.00	0.14	19		151	13	115	1	U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr)~~, reported here as 0.00 except as shown.

32505-B-C 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number HBMM	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	Total dissolved solids in ppm[a]	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by[c]
LOWER EEL SUBUNIT																							
D. N. Gould Irrigation	2N/1E-16J1	8/7/52	54	235	6.9	5.2 / 0.26	20 / 1.64	12 / 0.52	1.0 / 0.03		118 / 1.93		9.0 / 0.25			0.15		Fe 0.0		21	95	0	U.S.G.S.
J. Victoria, Jr. Irrigation	1911	8/11/52	55	315	7.8	47 / 2.34	8.4 / 0.69	9.2 / 0.40	1.0 / 0.03		176 / 2.88		6.0 / 0.17			0.02		Fe 0.0		12	152	8	U.S.G.S.
Alex Capaul Irrigation	2N/1W-4D1	2/14/57	58	444	6.4	62 / 3.09	14 / 1.14	8.6 / 0.37	2.0 / 0.05	0 / 0.00	247 / 4.05	25 / 0.52	5.9 / 0.17	2.7 / 0.04	0.0 / 0.00	0.10	12		253[a]	8	212		D.W.R.
		9/9/58		492	7.6	65 / 3.27	18 / 1.53	10 / 0.44	1.9 / 0.05	0 / 0.00	261 / 4.29	32 / 0.67	12 / 0.34	8.0 / 0.14	0.0 / 0.00	0.18	13	Fe 0.0	384[b]	8	240		D.W.R.
		7/23/59		406	7.7	52 / 2.59	17 / 1.39	10 / 0.44	2.2 / 0.06	0 / 0.00	219 / 3.59	26 / 0.54	8.5 / 0.24	7.4 / 0.12	0.2 / 0.01	0.1	17	Fe 0.0	248[a]	10	199	19	U.S.G.S.
		7/20/60		425	7.8	51 / 2.54	18 / 1.46	9.2 / 0.40	2.2 / 0.06	0 / 0.00	207 / 3.39	31 / 0.64	7.8 / 0.22	8.7 / 0.14	0.1 / 0.00	0.15	15	Fe 0.88	245[a]	9	200	30	D.W.R.
		9/5/61		481	7.8	67 / 3.34	18 / 1.46	8.8 / 0.38	2.4 / 0.06	0 / 0.00	260 / 4.26	26 / 0.54	8.0 / 0.22	8.5 / 0.14	0.1 / 0.00	0.13	14	Fe 0.05 Zn 0.08 [d]	281[a]	7	240	27	D.W.R.
John Saottini Irrigation	6J2	8/15/52	54	423	6.9	32 / 1.60	29 / 2.38	14 / 0.61	2.0 / 0.05		212 / 3.47		17 / 0.48			0.02		Fe 0.0		13	199	25	U.S.G.S.
L. F. Lucchini Irrigation	6Q1	8/15/52	56	380	7.4	22 / 1.10	25 / 2.06	21 / 0.91	1.2 / 0.03		188 / 3.08		26 / 0.73			0.0		Fe 2.5		22	158	4	U.S.G.S.
Harold Wilson Irrigation	7A1	12/11/56	54	299	6.6	18 / 0.90	22 / 1.84	10 / 0.44	1.3 / 0.03	0 / 0.00	173 / 2.84	1.9 / 0.04	15 / 0.42	0.1 / 0.00	0.2 / 0.01	0.0	29		182[a]	14	137	0	U.S.G.S.
		10/3/57		305	8.0	18 / 0.90	22 / 1.84	11 / 0.48	1.7 / 0.04	0 / 0.00	1.72 / 2.82	0.0 / 0.00	15 / 0.42	0.6 / 0.01	0.0 / 0.00	0.09	28		181[a]	15	137	0	U.S.G.S.
		9/10/58		313	7.7	19 / 0.93	23 / 1.91	10 / 0.46	1.0 / 0.03	0 / 0.00	172 / 2.81	4.0 / 0.09	11 / 0.30	0.0 / 0.00	0.4 / 0.02		24	Fe 0.12	234[b]	14	142		D.W.R.
		10/1/59		309	8.1	28 / 1.40	18 / 1.52	12 / 0.52	2.1 / 0.05	0 / 0.00	172 / 2.82	5.0 / 0.10	16 / 0.45	5.3 / 0.09	0.2 / 0.01	0.0	25		197[a]	15	146	5	U.S.G.S.
Emil Calanchini Irrigation	7F1	9/17/59		437	8.0	29 / 1.45	30 / 2.47	19 / 0.83	0.0 / 0.00	0 / 0.00	186 / 3.05	47 / 0.98	25 / 0.71	1.0 / 0.02	0.2 / 0.01	0.0	21	Fe 0.0	264[a] 256[b]	17	196	43	U.S.G.S.
		7/20/60		435	8.3	31 / 1.55	28 / 2.29	16 / 0.70	1.7 / 0.04	0 / 0.00	177 / 2.90	46 / 0.96	23 / 0.65	1.1 / 0.02	0.3 / 0.02	0.04	24	Fe 1.0	258[a]	15	192	47	D.W.R.
J. Lourenzo Domestic	8A1	6/9/51		439									19 / 0.54								211		U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr)~~, reported here as 0.00 except as shown.

32505-E-G 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number HB&M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	Total dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by c
										LOWER EEL SUBUNIT (Continued)													
L. Laffranchi Irrigation	2N/1W-8D2	8/15/52	55	415	7.1	31 / 1.55	27 / 2.22	15 / 0.65	2.0 / 0.05		200 / 3.28		18 / 0.51			0.02		Fe 0.01		15	188	24	U.S.G.S.
J. E. Barri Irrigation	8M1	8/18/52	54	325	7.4	18 / 0.90	22 / 1.81	15 / 0.65	1.5 / 0.04		156 / 2.56		18 / 0.51			0.0		Fe 0.96		19	135	8	U.S.G.S.
Wm. Renner Irrigation	9A1	8/12/52	56	318	8.1	36 / 1.80	14 / 1.15	11 / 0.48	1.3 / 0.03		164 / 2.69		7.5 / 0.21			0.07		Fe 0.03		14	147	13	U.S.G.S.
J. L. Silva Irrigation	9C1	8/12/52	54	459	7.5	57 / 2.84	20 / 1.64	13 / 0.57	1.3 / 0.03		240 / 3.93		12 / 0.34			0.05		Fe 0.00		11	224	28	U.S.G.S.
City of Fortuna Municipal	11G1	6/8/51	55	235									11 / 0.31								93		
Albert Johnson Irrigation and Domestic	12D1	8/27/52		231	8.0	15 / 0.75	12 / 0.99	20 / 0.87	0.9 / 0.02		122 / 2.00		12 / 0.34			0.0		Fe 0.09		33	87	0	U.S.G.S.
		12/13/56	56	204	7.2	13 / 0.65	10 / 0.85	15 / 0.65	0.8 / 0.02	0 / 0.00	110 / 1.80	5.8 / 0.12	11 / 0.31	0.3 / 0.00	0.2 / 0.01	0.0	27		137[a]	30	75	0	U.S.G.S.
		10/3/57		211	7.9	10 / 0.50	12 / 0.96	15 / 0.65	1.0 / 0.03	0 / 0.00	106 / 1.74	9.6 / 0.20	9.0 / 0.25	0.4 / 0.01	0.0 / 0.00	0.02	28		137[a]	30	73	0	U.S.G.S.
		9/11/58		206	7.5	10 / 0.50	11 / 0.89	17 / 0.74	0.7 / 0.02	0 / 0.00	104 / 1.70	6 / 0.12	13 / 0.34	0.0 / 0.00	0.2 / 0.01	0.0	20	Fe 0.01	154[b]	34	69		D.W.R.
		9/17/59		203	7.9	13 / 0.65	9.4 / 0.77	17 / 0.74	0.8 / 0.02	0 / 0.00	105 / 1.72	5.0 / 0.10	10 / 0.28	0.9 / 0.01	0.0 / 0.00	0.0	26	Fe 1.4	134[a]	34	71	0	U.S.G.S.
		8/5/60		185	7.9	9.6 / 0.48	8.3 / 0.68	14 / 0.61	0.9 / 0.02	0 / 0.00	80 / 1.31	5.8 / 0.12	11 / 0.31	1.6 / 0.02	0.2 / 0.01	0.04	23	Fe 0.35	113[a]	34	58	0	D.W.R.
		9/12/61		201	7.8	13 / 0.65	9.1 / 0.75	14 / 0.61	0.8 / 0.02	0 / 0.00	100 / 1.64	4.6 / 0.10	10 / 0.28	1.1 / 0.02	0.2 / 0.01	0.02	27	Fe 0.34 Al 0.01 Mn 0.20 Zn 0.02 d	129[a]	30	70	0	D.W.R.
R. Regli Irrigation and Domestic	15C2	8/14/52	54	415	8.2	58 / 2.89	17 / 1.40	9.2 / 0.40	1.3 / 0.03		234 / 3.84		7.0 / 0.20			0.03		Fe 0.0		8	215	23	U.S.G.S.
J. Berti Irrigation	15G1	8/14/52	54	437	7.5	59 / 2.94	17 / 1.40	9.6 / 0.42	1.3 / 0.03		234 / 3.84		7.5 / 0.21			0.07		Fe 0.0		9	217	25	U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr)~~ - reported here as 0.00 except as shown.

32505-B-G 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number HB&M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	Total dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by c
										LOWER EEL SUBUNIT (Continued)													
H. B. Harbers Irrigation	2N/1W-16E1	8/14/52	55	386	7.7	40 / 2.00	18 / 1.48	16 / 0.70	1.7 / 0.04		202 / 3.31		14 / 0.40			0.02		Fe 5.4		17	174	8	U.S.G.S.
Carl I. Christensen Irrigation	17C1	8/15/52		413	7.1	26 / 1.30	24 / 1.97	25 / 1.09	2.5 / 0.06		206 / 3.38		18 / 0.51			0.03		Fe 0.24		25	164	0	U.S.G.S.
Charles Anderson Irrigation	17G1	8/15/52	52	560	6.9	31 / 1.55	31 / 2.55	41 / 1.78	3.1 / 0.08		220 / 3.61		48 / 1.35			0.04		Fe 0.88		30	205	24	U.S.G.S.
		12/14/56	54	448	6.8	32 / 1.60	22 / 1.80	26 / 1.13	3.6 / 0.09	0 / 0.00	172 / 2.82	54 / 1.12	26 / 0.73	1.0 / 0.02	0.3 / 0.02	0.08	12		262[a]	24	170	29	U.S.G.S.
		10/4/57		982	8.1	34 / 1.70	47 / 3.84	98 / 4.26	7.9 / 0.20	0 / 0.00	352 / 5.77	29 / 0.60	137 / 3.86	4.3 / 0.07	0.1 / 0.01	0.33	21		552[a]	43	277	0	U.S.G.S.
		9/10/58		524	7.6	28 / 1.40	28 / 2.32	43 / 1.89	2.8 / 0.07	0 / 0	221 / 3.61	30 / 0.62	46 / 1.30	0 / 0	0.2 / 0.01	0.35	19		381[b]	33	186		D.W.R.
		7/23/59		495	6.5	32 / 1.60	32 / 2.64	28 / 1.22	2.7 / 0.07	0 / 0.00	228 / 3.74	47 / 0.98	25 / 0.70	0.3 / 0.00	0.2 / 0.01	0.0	22	Fe 3.3	301[a]	22	212	25	U.S.G.S.
		7/20/60		632	8.3	36 / 1.80	35 / 2.86	43 / 1.87	2.9 / 0.07	0 / 0.00	228 / 3.74	77 / 1.60	41 / 1.16	1.5 / 0.02	0.2 / 0.01	0.11	21	Fe 1.6	370[a]	28	233	46	D.W.R.
		8/31/61		559	7.9	34 / 1.70	31 / 2.58	32 / 1.39	2.7 / 0.07	0 / 0.00	212 / 3.47	55 / 1.14	38 / 1.07	0.8 / 0.01	0.1 / 0.00	0.08	22	Fe 1.5	320[a]	24	214	40	D.W.R.
Regli Bros. Irrigation	17H1	8/15/52	55	539	7.0	36 / 1.80	34 / 2.80	29 / 1.26	2.7 / 0.07		258 / 4.23		23 / 0.65			0.04		Fe 0.38		21	230	18	U.S.G.S.
Jake Hawkins Irrigation	22C1	9/30/52	54	341	7.3	33 / 1.65	15 / 1.23	14 / 0.61	1.6 / 0.04	0 / 0.00	154 / 2.52	28 / 0.58	16 / 0.45	2.0 / 0.03	0.1 / 0.01	0.06	19	Fe 0.15	205[a]	17	144	18	U.S.G.S.
Van Harpen Lumber Co. Industrial and Domestic	26L1	8/6/52	58	404	8.4	37 / 1.85	21 / 1.73	19 / 0.83	1.1 / 0.03		220 / 3.61		20 / 0.56			0.07		Fe 0.01		19	179	0	U.S.G.S.
J. F. Voll Industrial and Domestic	36H1	8/6/52	55	410	7.0	44 / 2.20	12 / 0.99	28 / 1.22	1.6 / 0.04		208 / 3.41		20 / 0.56			0.05		Fe 0.00		27	159	0	U.S.G.S.
Terkelsen Irrigation	2N/2W-12F1	9/27/52	58	490	7.7	25 / 1.25	26 / 2.14	38 / 1.65	5.4 / 0.14	0 / 0.00	214 / 3.51	42 / 0.87	24 / 0.68	0.2 / 0.00	0.1 / 0.01	0.26	25	Fe 0.51	292[a]	32	170	0	U.S.G.S.
Sonnick Christiansen Irrigation	3N/1W-5K1	9/17/59		145	7.1	7.2 / 0.36	5.4 / 0.44	15 / 0.65	1.3 / 0.03	0 / 0.00	56 / 0.92	2.0 / 0.04	17 / 0.48	0.4 / 0.01	0.1 / 0.01	0.0	34	Fe 1.4	111[a]	44	40	0	U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr),~~ reported here as 0.00 except as shown.

32505-B-G 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number HB&M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	Total dissolved solids in ppm[a]	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by[c]
										LOWER EEL SUBUNIT (Continued)													
Sonnick Christiansen Irrigation	3N/1W-5K1	8/29/60		158	7.6	6.2 / 0.31	6.0 / 0.49	14 / 0.61	0.9 / 0.02	0 / 0.00	56 / 0.92	3.0 / 0.06	16 / 0.45	0.5 / 0.01	0.2 / 0.01	0.04	33	Fe 2.7	108[a]	43	40	0	D.W.R.
		10/16/61		142	7.5	6.2 / 0.31	5.7 / 0.47	13 / 0.56	0.8 / 0.02	0 / 0.00	56 / 0.92	2.1 / 0.04	14 / 0.39	0.4 / 0.01	0.2 / 0.01	0.0	31	Fe 0.40 Zn 0.08 d	101[a]	41	39	0	D.W.R.
Chris Peterson Irrigation and Domestic	1802	6/8/51		169									20 / 0.55								42		U.S.G.S.
		8/21/54		163	7.6	5.2 / 0.26	8.9 / 0.73	14 / 0.61	0.6 / 0.02	0 / 0.00	67 / 1.10	2.3 / 0.05	16 / 0.45	1.4 / 0.02	0.2 / 0.01	0.05	30	Fe 0.01 Zn 0.06 d	112[a]	38	49	0	U.S.G.S.
		2/13/57	50	144	6.5	3.7 / 0.19	5.9 / 0.48	12 / 0.52	1.5 / 0.04	0 / 0.00	33 / 0.54	5.1 / 0.11	18 / 0.51	3.8 / 0.06	0.0 / 0.00	0.0	18		84[a]		34		D.W.R.
		10/3/57		166	7.7	2.8 / 0.14	10 / 0.86	15 / 0.65	0.9 / 0.02	0 / 0.00	67 / 1.10	8.3 / 0.17	14 / 0.39	1.3 / 0.02	0.0 / 0.00	0.09	36		121[a]	39	50	0	U.S.G.S.
		9/10/58		169	7.1	4 / 0.21	8 / 0.69	14 / 0.60	0.7 / 0.02	0 / 0	56 / 0.92	5 / 0.10	18 / 0.51	2.2 / 0.04	0.2 / 0.01	0	29	Fe 0.0	114[b]	39	45		D.W.R.
		9/11/59		163	7.7	4.0 / 0.20	9.7 / 0.80	16 / 0.70	0.0 / 0.00	0 / 0.00	68 / 1.11	1.0 / 0.02	17 / 0.48	1.9 / 0.03	0.0 / 0.00	0.0	36	Fe 0.0	119[a] 112[b]	41	50	0	U.S.G.S.
Golden State Co., Ltd. Industrial	18K1	9/30/59		1,160	8.0	49 / 2.45	89 / 7.35	77 / 3.35	4.5 / 0.12	0 / 0.00	296 / 4.85	72 / 1.50	245 / 6.91	1.0 / 0.02	0.1 / 0.01	0.0	26		710[a]	25	490	247	U.S.G.S.
		9/17/60		1,280	8.0	62 / 3.09	74 / 6.08	77 / 3.35	3.9 / 0.10	0 / 0.00	264 / 4.33	24 / 0.50	270 / 7.61	2.0 / 0.03	0.3 / 0.02	0.08	27	Fe 5.7	670[a]	26	459	243	D.W.R.
	18K3	9/7/60		508	8.4	26 / 1.30	40 / 3.32	21 / 0.91	3.1 / 0.08	5 / 0.17	271 / 4.44	24 / 0.50	15 / 0.42	1.3 / 0.02	0.4 / 0.02	0.08	25	Fe 0.33	294[a]	16	231	1	D.W.R.
		10/17/61		491	8.2	30 / 1.50	37 / 3.02	21 / 0.91	2.8 / 0.07	0 / 0.00	281 / 4.60	23 / 0.48	14 / 0.39	1.3 / 0.02	0.4 / 0.02	0.07	25	Fe 0.95 Cu 0.02 Pb 0.01 Mn 0.24 Zn 0.06 d	292[a]	16	226	0	D.W.R.
A. S. Tanferani Irrigation	18M1	8/20/52	53	526	8.4	30 / 1.50	40 / 3.29	23 / 1.00	1.5 / 0.04		238 / 3.90		47 / 1.33			0.0		Fe 9.1		17	240	28	U.S.G.S.
J. Genzoli Irrigation	18N1	8/19/52	53	391	7.1	20 / 1.00	25 / 2.06	21 / 0.91	1.5 / 0.04		164 / 2.69		34 / 0.96			0.01		Fe 7.1		23	153	18	U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr)~~ reported here as 0.00 except as shown.

32505-B-G 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number HBMM	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	a Total dissolved solids in ppm	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by c
LOWER EEL SUBUNIT (Continued)																							
J. J. Hansen Irrigation	3N/1W-19R1	8/27/52	53	478	8.0	42 / 2.10	31 / 2.55	13 / 0.57	2.1 / 0.05		228 / 3.74		25 / 0.71			0.04		Fe 0.0		11	232	46	U.S.G.S.
Chester Goble Irrigation	29C1	2/14/57	56	745	6.6	46 / 2.30	49 / 4.07	32 / 1.39	3.8 / 0.10	0 / 0.00	337 / 5.52	28 / 0.58	63 / 1.78	0.2 / 0.00	0.2 / 0.01	0.18	18		406[a]		319		D.W.R.
		12/4/57		574	8.5	29 / 1.45	42 / 3.47	30 / 1.30	3.3 / 0.08	11 / 0.37	271 / 4.44	13 / 0.27	38 / 1.07	1.3 / 0.02	0.1 / 0.01	0.05	17		318[a]	21	246	6	U.S.G.S.
		9/9/58		528	7.8	29 / 1.46	38 / 3.10	29 / 1.23	3.1 / 0.08	0 / 0.00	286 / 4.68	16 / 0.33	27 / 0.76	1 / 0.02	0.9 / 0.05	0.08	17	Fe 0.0	394[b]	20	228		D.W.R.
		10/5/59		628	8.1	33 / 1.65	49 / 4.03	33 / 1.44	4.5 / 0.12	0 / 0.00	312 / 5.11	30 / 0.62	56 / 1.58	0.0 / 0.00	0.2 / 0.01	0.0	20		380[a]	20	284	28	U.S.G.S.
		8/19/60		544	8.4	31 / 1.55	39 / 3.23	27 / 1.17	2.8 / 0.07	5 / 0.17	275 / 4.51	25 / 0.52	26 / 0.73	3.6 / 0.06	0.4 / 0.02	0.16	25	Fe 0.64	320[a]	19	239	5	D.W.R.
		8/31/61		497	8.3	29 / 1.45	35 / 2.85	25 / 1.09	2.8 / 0.07	0 / 0.00	278 / 4.56	16 / 0.33	18 / 0.51	1.8 / 0.03	0.4 / 0.02	0.13	19	Fe 0.84 Al 0.01 Mn 0.31 Zn 0.01 d	284[a]	20	215	0	D.W.R.
Humboldt Creamery Assn. Industrial	29H1	9/15/59		315	7.7	18 / 0.90	21 / 1.74	19 / 0.83	2.0 / 0.05	0 / 0.00	177 / 2.90	15 / 0.31	10 / 0.28	1.9 / 0.03	0.4 / 0.02	0.1	29	Fe 0.08	203[a]	24	132	0	U.S.G.S.
		8/19/60		390	8.2	22 / 1.10	27 / 2.22	19 / 0.83	1.9 / 0.05	0 / 0.00	214 / 3.51	17 / 0.35	9.5 / 0.27	2.5 / 0.04	0.4 / 0.02	0.10	27	Fe 0.50	231[a]	20	166	0	D.W.R.
Ray Tedson Irrigation and Domestic	30N1	8/20/52	54	434	8.2	42 / 2.10	28 / 2.30	10 / 0.44	1.5 / 0.04		228 / 3.74		12 / 0.34			0.04		Fe 0.09		9	220	33	U.S.G.S.
		8/21/54	62	501	8.0	62 / 3.09	25 / 2.03	7.8 / 0.34	1.5 / 0.04	0 / 0.00	275 / 4.51	22 / 0.46	12 / 0.34	8.8 / 0.14	0.1 / 0.01	0.06	17	Fe 0.01 Zn 0.06 d	291[a]	6	256	30	U.S.G.S.
		2/13/57	48	514	6.6	64 / 3.19	25 / 2.06	8.4 / 0.37	1.7 / 0.04	0 / 0.00	296 / 4.85	23 / 0.48	9.3 / 0.26	4.7 / 0.08	0.0 / 0.00	0.10	15		297[a]		263		D.W.R.
		10/3/57		376	8.0	27 / 1.35	27 / 2.21	9.8 / 0.43	1.6 / 0.04	0 / 0.00	186 / 3.05	29 / 0.60	11 / 0.31	6.6 / 0.11	0.0 / 0.00	0.08	20		224[a]	11	178	25	U.S.G.S.
		9/11/58		542	7.8	65 / 3.23	27 / 2.19	9 / 0.40	1.5 / 0.04	0 / 0	291 / 4.76	25 / 0.53	20 / 0.55	9 / 0.15	0.3 / 0.01		16		414[b]	7	271		D.W.R.
		10/1/59		526	8.1	48 / 2.40	37 / 3.08	11 / 0.48	0.0 / 0.00	0 / 0.00	306 / 5.02	23 / 0.48	12 / 0.34	6.0 / 0.10	0.0 / 0.00	0.1	15	Fe 0.0	303[a] 305[b]	8	274	23	U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr)~~ - reported here as 0.00 except as shown.

32505-B-G 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number HBMM	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	Total dissolved solids in ppm[a]	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by[c]
										LOWER EEL SUBUNIT (Continued)													
Ray Tedson Irrigation and Domestic	3N/1W-30M1	9/6/60		505	8.3	59 / 2.94	26 / 2.17	9.8 / 0.43	1.6 / 0.04	0 / 0.00	271 / 4.44	26 / 0.54	11 / 0.31	11 / 0.18	0.1 / 0.00	0.10	17	Fe 2.7	295[a]	8	256	34	D.W.R.
		10/23/61		453	8.2	44 / 2.20	27 / 2.26	9.8 / 0.43	1.8 / 0.05	0 / 0.00	224 / 3.67	28 / 0.58	12 / 0.34	17 / 0.27	0.1 / 0.00	0.15	19	Fe 0.02, Cu 0.01, Pb 0.01, Zn 0.27 [d]	269[a]	9	223	39	D.W.R.
William Trutalli Irrigation	31E1	9/25/52	54	546	7.4	65 / 3.24	28 / 2.30	12 / 0.52	1.9 / 0.05	0 / 0.00	294 / 4.82	24 / 0.50	15 / 0.42	11 / 0.18	0.0 / 0.00	0.46	15	Fe 0.02	317[a]	9	277	36	U.S.G.S.
J. Godinho Irrigation	31J1	8/18/52	54	453	8.0	53 / 2.64	26 / 2.14	11 / 0.48	1.2 / 0.03		274 / 4.49		10 / 0.28			0.05		Fe 0.20		9	239	14	U.S.G.S.
Otto Knaus Irrigation	31L1	8/18/52	54	506	7.6	64 / 3.19	27 / 2.22	12 / 0.52	1.3 / 0.03		294 / 4.82		15 / 0.42			0.03		Fe 0.00		9	270	30	U.S.G.S.
Fred Bahnsen Domestic and Stock	32F1	6/9/51		616									27 / 0.76								264		U.S.G.S.
City of Fortuna Unused Observation	34J1	9/17/50		696	7.3								48 / 1.35					Fe 1.03, Mn 1.24			290		Brown & Caldwell
	34J2	6/17/31											28 / 0.79								212		Brown & Caldwell
J. V. Toste, Jr. Irrigation and Observation	3N/2W-2A1	6/8/51	56	132									19 / 0.54								32		U.S.G.S.
	2A2	6/8/51		1,830									508 / 14.33								445		U.S.G.S.
		8/29/53		1,560									455 / 12.83								385		U.S.G.S.
		8/21/54	57	1,520	7.1	54 / 2.69	55 / 4.53	135 / 5.87	2.0 / 0.05	0 / 0.00	54 / 0.88	25 / 0.52	418 / 11.79	5.2 / 0.08	0.1 / 0.01	0.01	18	Fe 0.02, Zn 0.1 [d]	739[a]	45	361	317	U.S.G.S.
		9/10/58		1,868	7.1	69 / 3.47	79 / 6.51	184 / 8.00	2.8 / 0.07	0 / 0.00	74 / 1.22	27 / 0.56	566 / 15.95	2.0 / 0.04	0.3 / 0.02	0	16		1,164[b]	44	499		D.W.R.
		10/1/59		1,890	7.1	54 / 2.69	73 / 5.99	191 / 8.31	0.0 / 0.00	0 / 0.00	24 / 0.39	15 / 0.31	570 / 16.07	4.0 / 0.06	0.0 / 0.00	0.0	6.9	Fe 0.0	926[a] / 1,188[b]	49	434	414	U.S.G.S.
		8/29/60		1,420	7.8	48 / 2.40	60 / 4.91	121 / 5.26	1.5 / 0.04	0 / 0.00	56 / 0.92	13 / 0.27	396 / 11.17	5.3 / 0.08	0.0 / 0.00	0.09	20	Fe 0.27	693[a]	42	366	320	D.W.R.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), and Chromium (Cr) - reported here as 0.00 except as shown.

32505-B-G 6-61 500 SPO

ANALYSES OF GROUND WATER

KEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number HBBM	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	Total dissolved solids in ppm[a]	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by c
LOWER KEL SUBUNIT (Continued)																							
J. V. Toste, Jr. Irrigation and Observation	3N/2W-2A2	10/25/61		1,960	7.8	72 / 3.59	69 / 5.80	178 / 7.74	2.3 / 0.06	0 / 0.00	78 / 1.28	24 / 0.50	574 / 16.19	6.8 / 0.11	0.2 / 0.01	0.06	20	Fe 0.10 Pb 0.01 Zn 0.05 d	998[a]	42	520	456	D.W.R.
Andrew Flocchini Stock	13D1	6/8/51		1,530									408 / 11.51								310		U.S.G.S.
E. Tanferani Irrigation	13J1	8/19/52	53	1,590	7.3	80 / 3.99	99 / 8.14	79 / 3.44	3.7 / 0.09		284 / 4.65		400 / 11.28			0.02		Fe 4.3		22	606	374	U.S.G.S.
		10/3/57		1,670	7.5	84 / 4.19	102 / 8.41	75 / 3.26	4.8 / 0.12	0 / 0.00	307 / 5.03	17 / 0.35	390 / 11.00	5.6 / 0.09	0.1 / 0.01	0.09	12		842[a]	20	630	378	U.S.G.S.
		9/10/58		4,660	7.5	263 / 13.11	270 / 22.21	313 / 13.60	6.9 / 0.18	0 / 0.00	200 / 3.28	115 / 2.40	1,502 / 42.36	0 / 0	0.2 / 0.01	0	22		2,904[b]	27	1,766		D.W.R.
		10/5/59		3,100	7.9	161 / 8.03	189 / 15.57	152 / 6.61	5.5 / 0.14	0 / 0.00	214 / 3.51	31 / 0.65	900 / 25.38	1.9 / 0.03	0.0 / 0.00	0.0	14		1,560[a]	22	1,180	1,000	U.S.G.S.
		8/12/60		3,610	8.0	163 / 8.31	217 / 17.84	242 / 10.53	5.5 / 0.14	0 / 0.00	251 / 4.11	75 / 1.56	1,080 / 30.46	2.6 / 0.04	0.3 / 0.02	0.11	38	Fe 6.5	1,950[a]	29	1,300	1,090	D.W.R.
McClosky Ranch Stock	14L1	9/22/50			7.1	33 / 1.65	40 / 3.29	326 / 14.17			485 / 7.95	44 / 0.92	362 / 10.21			0.9	18	Fe + Al 3.2	1,090[a]		250		Twining Laboratories, Fresno
Albert Pedrazzini Domestic and Stock	15K1	6/8/51		809									101 / 2.85								258		
W. P. Newhous Unused	16H1	6/8/51		7,200									2,040 / 57.53								880		
Irven Thompsen Stock	23K2	8/19/52		1,160	8.2					0 / 0.00	316 / 5.18		198 / 5.41										
Irven Thompsen Irrigation	24E1	8/19/52		5,880	7.4	192 / 9.58	254 / 20.89	712 / 30.96	8.0 / 0.20		510 / 8.36		1,810 / 51.05			0.08		Fe 26		50	1,520	1,110	U.S.G.S.
Louis De Mello Irrigation	25M1	8/20/52	53	2,150	8.3	65 / 3.24	70 / 5.76	250 / 10.87	1.5 / 0.04		196 / 3.21		570 / 16.08			0.06		Fe 0.67		55	450	290	U.S.G.S.
		8/29/53		2,290									590 / 16.64								555		U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr)~~--- reported here as 0.00 except as shown.

32505-B-C 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number HBMM	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	Total dissolved solids in ppm[a]	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by[c]
										LOWER EEL SUBUNIT (Continued)													
John Byker Irrigation	3N/2W-26K1	8/21/52	54	902	7.3					0 0.00	228 3.74		162 4.57										U.S.G.S.
Manual G. Silva Irrigation	26N1	8/21/52		3,520	8.1	107 5.34	125 10.28	418 18.18	6.0 0.15		278 4.56		1,000 28.20			0.06		Fe 0.43		54	781	553	U.S.G.S.
		8/29/53		3,610									1,020 28.76								750		U.S.G.S.
A. C. Enos Irrigation	26P1	8/20/52	54	778	8.6					12 0.40	210 3.44		130 3.67										U.S.G.S.
Ross Goble Domestic and Stock	26R2	6/9/51		733									86 2.43								260		U.S.G.S.
Pete Soatini Irrigation	26R3	8/21/52	54	803	8.3					0 0.00	203 3.33		142 4.00										U.S.G.S.
P. M. Christiansen Irrigation	27Q1	8/21/52	54	2,480	8.3	78 3.89	120 9.87	295 12.83	15 0.38		284 4.65		765 21.58			0.08		Fe 1.0		48	688	456	U.S.G.S.
		8/29/53		3,670									1,060 29.89								840		U.S.G.S.
		12/13/56	54	2,530	6.7	76 3.79	103 8.43	264 11.48	12 0.31	0 0.00	263 4.31	38 0.79	685 19.32	1.8 0.03	0.1 0.00	0.12	26		1,340[a]	48	611	395	U.S.G.S.
		10/3/57		1,340	7.8	60 2.99	71 5.81	88 3.83	5.2 0.13	0 0.00	231 3.79	31 0.65	300 8.46	3.2 0.05	0.1 0.01	0.08	21		694[a]	30	88	0	U.S.G.S.
		9/10/58		5,421	7.6	124 6.18	193 15.91	704 30.60	1.9 0.05	0 0.00	288 4.72	112 2.34	1,615 45.56	3 0.05	0.0 0.00	0	18	Fe 0.01	3,446[b]	58	1,104		D.W.R.
		10/1/59		1,500	7.7	60 2.99	88 7.21	111 4.83	0.4 0.01	0 0.00	208 3.41	29 0.60	382 10.77	2.3 0.04	0.0 0.00	0.1	21	Fe 0.0	796[a] 960[b]	32	510	339	U.S.G.S.
		9/6/60		6,290	8.2	140 6.99	267 21.98	786 34.19	22 0.56	0 0.00	225 3.69	145 3.02	2,050 57.81	6.0 0.10	0.3 0.02	0.26	26	Fe 2.6	3,550[a]	54	1,450	1,270	D.W.R.
		8/31/61		6,860	7.9	194 9.68	281 23.09	770 33.50	22 0.56	0 0.00	228 3.74	151 3.14	2,150 60.63	7.6 0.12	0.2 0.01	0.20	24	Fe 2.0 Mn 4.6 Zn 0.02 [d]	3,710	50	1,640	1,450	D.W.R.
Carl Lorensen Irrigation	27N1	8/22/52	54	1,280	8.5					9 0.30	244 4.00		274 7.73										U.S.G.S.
Russ Connick Co. Irrigation	32Q1	9/30/52	54	1,080	7.4	28 1.40	30 2.47	146 6.35	4.4 0.11		226 3.70	22 0.46	220 6.20	0.0 0.00	0.3 0.02	0.1	24	Fe 0.14	586[a]	62	194	8	U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), and Chromium (Cr), reported here as 0.00 except as shown.

32505-B-G 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number HB&M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	Total dissolved solids in ppm[a]	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by c
										LOWER EEL SUBUNIT (Continued)													
Russ Connick Co. Irrigation	3N/2W-32Q1	2/13/57		858	7.2	28 / 1.40	22 / 1.80	114 / 4.96	3.8 / 0.10	0 / 0.00	223 / 3.65	16 / 0.33	153 / 4.31	0.6 / 0.01	0.5 / 0.03	0.14	22		470[a]		160		D.W.R.
		9/25/57		1,260	7.9	36 / 1.80	36 / 3.00	164 / 7.13	4.8 / 0.12	0 / 0.00	226 / 3.70	23 / 0.48	275 / 7.76	1.6 / 0.03	0.3 / 0.02	0.03	25		677[a]	59	240	55	U.S.G.S.
		9/9/58		602	7.5	11 / 0.53	22 / 1.75	78 / 3.40	2.8 / 0.07	0 / 0.00	138 / 2.27	27 / 0.56	106 / 2.98	0.0 / 0.00	0.9 / 0.04	0	15	Fe 0.01	404[b]	59	114		D.W.R.
		7/21/59		1,000	8.0	29 / 1.45	32 / 2.63	142 / 6.18	5.2 / 0.13	0 / 0.00	231 / 3.79	49 / 1.02	198 / 5.58	1.3 / 0.02	0.5 / 0.03	0.1	28	Fe 0.88	599[a]	59	204	15	U.S.G.S.
		7/20/60		1,020	8.4	24 / 1.20	28 / 2.30	142 / 6.18	3.3 / 0.08	4 / 0.13	225 / 3.69	23 / 0.48	194 / 5.47	0.9 / 0.01	0.4 / 0.02	0.13	23	Fe 0.20	553[a]	63	175	0	D.W.R.
		10/25/61		1,700	8.2	43 / 2.14	54 / 4.47	220 / 9.57	4.4 / 0.11	0 / 0.00	220 / 3.60	40 / 0.83	411 / 11.59	2.3 / 0.04	0.5 / 0.03	0.15	24	Fe 0.62 Cu 0.03 Pb 0.01 Mn 1.6 Zn 0.05 d	907[a]	59	331	151	D.W.R.
Boynton and Boynton Domestic and Stock	34K1	8/21/52		606	7.9					0 / 0.00	229 / 3.75		66 / 1.86										U.S.G.S.
Arthur L. Kercheval Irrigation	35B1	8/21/52		1,210	8.3					0 / 0.00	174 / 2.85		278 / 7.84										U.S.G.S.
A. C. Enos Irrigation	35C1	8/20/52	54	820	8.2					0 / 0.00	240 / 3.93		136 / 3.84										U.S.G.S.
H. Bertelsen Irrigation	35G1	8/22/52	54	1,930	7.2					0 / 0.00	285 / 4.67		435 / 12.27										U.S.G.S.
P. C. Lorenzen Irrigation	35M1	8/22/52	54	1,940	7.5	87 / 4.34	108 / 8.88	119 / 5.17	16 / 0.41		232 / 3.80		495 / 13.96			0.04		Fe 1.3		28	661	471	U.S.G.S.
		8/29/53		1,760									450 / 12.69								615		U.S.G.S.
		12/13/56	54	911	6.6	42 / 2.10	49 / 4.06	57 / 2.48	9.6 / 0.25	0 / 0.00	235 / 3.85	17 / 0.35	172 / 4.85	0.6 / 0.01	0.0 / 0.00	0.07	27		490[a]	28	308	115	U.S.G.S.
		10/3/57		1,370	8.1	56 / 2.79	68 / 5.61	101 / 4.39	13 / 0.33	0 / 0.00	251 / 4.11	28 / 0.58	310 / 8.74	0.6 / 0.01	0.1 / 0.01	0.07	29		730[a]	33	420	214	U.S.G.S.
		9/10/58		1,699	7.6	72 / 3.60	85 / 7.00	134 / 5.85	14 / 0.35	0 / 0.00	235 / 3.85	28 / 0.58	425 / 11.97	1.0 / 0.01	0.2 / 0.01	0.14	24		1,084[b]	34	530		D.W.R.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr)~~ reported here as 0.00 except as shown.

32505-E-G 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number HBMM	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	Total dissolved solids in ppm[a]	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by[c]
LOWER EEL SUBUNIT (Continued)																							
P. C. Lorenzen Irrigation	3N/2W-35M1	10/1/59		1,090	8.3	40 / 2.00	61 / 5.00	80 / 3.48	1.8 / 0.05	6 / 0.20	244 / 4.00	25 / 0.52	216 / 6.09	1.7 / 0.03	0.0 / 0.00	0.1	29		581[a] / 663[b]	33	350	140	U.S.G.S.
		9/6/60		1,560	8.4	58 / 2.89	87 / 7.18	108 / 4.70	18 / 0.46	4 / 0.13	226 / 3.74	30 / 0.62	370 / 10.43	4.9 / 0.08	0.1 / 0.00	0.14	26	Fe 1.4	818[a]	31	504	310	D.W.R.
		10/11/61		1,130	7.9	47 / 2.34	60 / 4.95	78 / 3.39	13 / 0.33	0 / 0.00	265 / 4.34	31 / 0.64	212 / 5.98	1.1 / 0.02	0.2 / 0.01	0.08	27	Fe 1.6 Mn 0.05 Zn 0.01 [d]	599[a]	31	365	148	D.W.R.
EUREKA PLAIN SUBUNIT																							
P. G. & E. Industrial	4N/1W-8P1	9/15/59		158	7.6	7.2 / 0.36	8.3 / 0.68	13 / 0.57	1.7 / 0.04	0 / 0.00	66 / 1.08	6.0 / 0.12	16 / 0.45	0.0 / 0.00	0.2 / 0.01	0.0	24	Fe 0.35	110[a]	35	52	0	U.S.G.S.
		8/29/60		163	7.7	5.9 / 0.29	8.9 / 0.73	11 / 0.48	1.5 / 0.04	0 / 0.00	66 / 1.08	3.0 / 0.06	14 / 0.39	0.5 / 0.01	0.1 / 0.00	0.04	21	Fe 0.26	98[a]	31	51	0	D.W.R.
		10/16/61		157	7.5	5.9 / 0.29	8.9 / 0.73	11 / 0.48	1.7 / 0.04	0 / 0.00	67 / 1.10	3.3 / 0.07	14 / 0.39	0.1 / 0.00	0.1 / 0.00	0.02	22	Fe 0.12 Cu 0.01 Zn 0.04 [d]	100[a]	31	51	0	D.W.R.
Pete Lorenzen Irrigation	16H1	9/11/59		549	8.4	45 / 2.25	31 / 2.51	36 / 1.57	6.5 / 0.17	6 / 0.20	300 / 4.92	35 / 0.73	26 / 0.73	0.0 / 0.00	0.1 / 0.00	0.0	46	Fe 1.3	380[a]	24	238	0	U.S.G.S.
		9/15/60		527	8.3	39 / 1.95	28 / 2.27	30 / 1.30	5.4 / 0.14	0 / 0.00	277 / 4.54	10 / 0.21	29 / 0.82	6.5 / 0.10	0.1 / 0.00	0.21	48	Fe 0.02	332[a]	23	211	0	D.W.R.
		10/13/61		536	8.3	41 / 2.04	27 / 2.20	32 / 1.39	5.8 / 0.15	0 / 0.00	290 / 4.75	5.1 / 0.11	28 / 0.79	6.1 / 0.10	0.1 / 0.00	0.18	47	Fe 0.76 Zn 0.03 [d]	334[a]	24	212	0	D.W.R.
P. G. & E. Industrial	17H1	9/15/59		161	8.2	8.0 / 0.40	8.3 / 0.68	12 / 0.52	1.6 / 0.04	0 / 0.00	70 / 1.15	2.6 / 0.05	14 / 0.39	0.3 / 0.00	0.0 / 0.00	0.0	21	Fe 0.11	102[a]	32	54	0	U.S.G.S.
		8/29/60		168	7.8	7.9 / 0.39	8.1 / 0.67	12 / 0.52	1.6 / 0.04	0 / 0.00	68 / 1.11	3.1 / 0.06	14 / 0.39	0.5 / 0.01	0.1 / 0.00	0.02	23	Fe 0.13	103[a]	32	53	0	D.W.R.
		10/16/61		161	7.8	7.4 / 0.37	8.4 / 0.69	11 / 0.48	1.6 / 0.04	0 / 0.00	70 / 1.15	2.8 / 0.06	14 / 0.39	0.3 / 0.00	0.2 / 0.01	0.04	21	Fe 0.11 Cu 0.01 Pb 0.01 Zn 0.03 [d]	101[a]	30	53	0	D.W.R.
F. G. Ensley Domestic	5N/1E-4M1	6/7/51		194									11 / 0.31								78		U.S.G.S.
		9/10/58		156	7.6	7 / 0.36	9 / 0.72	11 / 0.49	0.3 / 0.01	0 / 0.00	67 / 1.10	6 / 0.13	13 / 0.34	0.0 / 0.00	0.0 / 0.00	1.7	16	Fe 0.25	111[b]	31	54		D.W.R.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr),~~ reported here as 0.00 except as shown.

32305-E-G 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number HB&M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	Total dissolved solids in ppm[a]	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by[c]
						EUREKA PLAIN SUBUNIT (Continued)																	
Jacoby Creek School Domestic	5N/1E-4H2	9/9/59		399	8.1	23 / 1.15	21 / 1.71	34 / 1.48	3.6 / 0.09	0 / 0.00	210 / 3.44	5.0 / 0.10	30 / 0.85	0.8 / 0.01	0.5 / 0.03	0.1	22	Fe 0.14	243[a]	33	143	0	U.S.G.S.
		8/11/60		410	8.3	23 / 1.15	21 / 1.71	30 / 1.30	3.3 / 0.08	0 / 0.00	211 / 3.46	1.3 / 0.03	28 / 0.79	1.6 / 0.02	0.2 / 0.01	0.12	19	Fe 0.26	232[a]	31	143	0	D.W.R.
		8/4/61		404	8.4	23 / 1.15	20 / 1.67	31 / 1.35	3.8 / 0.10	2 / 0.07	207 / 3.39	2.1 / 0.04	27 / 0.76	1.3 / 0.02	0.0 / 0.00	0.14	18	Fe 0.11 Cu 1.3 Pb 0.01 Zn 0.08 [d]	230[a]	32	141	0	D.W.R.
Lane Portland Lumber Company Industrial	8J1	8/5/52	60	273	8.2	15 / 0.75	12 / 0.99	29 / 1.26	1.5 / 0.04		154 / 2.52		16 / 0.45			0.01		Fe 0.32		42	87	0	U.S.G.S.
		2/13/57	62	289	6.9	16 / 0.80	12 / 0.98	27 / 1.17	1.5 / 0.04	0 / 0.00	153 / 2.51	0.5 / 0.01	17 / 0.48	0.0 / 0.00	0.1 / 0.01	0.01	39		188[a]	39	89		D.W.R.
		12/4/57	64	305	7.1	17 / 0.85	13 / 1.11	30 / 1.30	1.9 / 0.05	0 / 0.00	164 / 2.69	1.0 / 0.02	21 / 0.59	0.0 / 0.00	0.1 / 0.01	0.32	38		203[a]	39	98	0	U.S.G.S.
		9/10/58		302	8.5	14 / 0.71	16 / 1.31	30 / 1.30	1.5 / 0.04	6 / 0.20	151 / 2.49	0.0 / 0.00	21 / 0.59	0.0 / 0.00	0.0 / 0.00	0	29		226[b]	39	98		D.W.R.
		9/11/59		301	8.0	17 / 0.85	16 / 1.31	30 / 1.30	1.3 / 0.03	0 / 0.00	170 / 2.79	7.0 / 0.15	18 / 0.51	1.8 / 0.03	0.1 / 0.01	0.0	37	Fe 1.1	212[a]	37	108	0	U.S.G.S.
		8/25/60		308	8.1	17 / 0.85	12 / 0.99	27 / 1.17	1.5 / 0.04	0 / 0.00	158 / 2.59	0.0 / 0.00	19 / 0.54	0.9 / 0.01	0.1 / 0.00	0.00	39	Fe 4.2	194[a]	38	94	0	D.W.R.
		8/25/61		301	8.0	18 / 0.90	12 / 0.99	28 / 1.22	1.5 / 0.04	0 / 0.00	160 / 2.62	1.3 / 0.03	18 / 0.51	0.0 / 0.00	0.0 / 0.00	0.00	39	Fe 2.4 Pb 0.02 Zn 0.32 [d]	197[a]	38	96	0	D.W.R.
Arcata Redwood Co. Industrial and Domestic	18Q1	9/10/58		872	7.6	13 / 0.63	17 / 1.38	155 / 6.75	4.9 / 0.13	0 / 0.00	343 / 5.61	0.0 / 0.00	116 / 3.27	1.0 / 0.02	0.0 / 0.00	0.72	37		634[b]	75	100		D.W.R.
		9/11/59		874	8.1	18 / 0.90	14 / 1.14	157 / 6.83	0.2 / 0.01	0 / 0.00	350 / 5.74	1.0 / 0.02	115 / 3.24	1.1 / 0.02	0.2 / 0.01	1.7	49	Fe 0.4	529[a] 527[b]	77	102	0	U.S.G.S.
		8/11/60		869	8.4	16 / 0.80	15 / 1.22	157 / 6.83	4.4 / 0.11	4 / 0.13	337 / 5.52	0.0 / 0.00	114 / 3.21	2.2 / 0.04	0.1 / 0.00	2.1	48	Fe 2.6	529[a]	76	101	0	D.W.R.
		10/12/61		869	7.8	16 / 0.80	15 / 1.24	150 / 6.52	4.4 / 0.11	0 / 0.00	343 / 5.62	0.0 / 0.00	109 / 3.07	2.1 / 0.03	0.2 / 0.01	1.7	50	Fe 0.40 Cu 0.01 Zn 0.05 [d]	517[a]	75	102	0	D.W.R.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), and Chromium (Cr), reported here as 0.00 except as shown.

32505-E-G 6-61 500 SPO

ANALYSES OF GROUND WATER

KEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number HB&M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	Total dissolved solids in ppm[a]	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by[c]
						HUMBOLDT PLAIN SUBUNIT (Continued)																	
L. L. Spinney Domestic, Stock, and Observation	5N/1E-20Q1	6/7/51	54	271									26 0.79								82		U.S.G.S.
		9/10/58		373	7.7	14 0.69	14 1.15	25 1.12	1.5 0.04	0 0.00	116 1.90	4 0.08	35 0.99	0.0 0.00	0.0 0.00	0	24		238[b]	37	92		D.W.R.
		9/11/59		279	8	10 0.50	14 1.18	26 1.13	0.0 0.00	0 0.00	116 1.90	1.0 0.02	32 0.90	0.2 0.00	0.0 0.00	0.0	43	Fe 0.1	183[a] 174[b]	40	84	0	U.S.G.S.
		8/25/60		284	7.9	14 0.70	12 0.96	24 1.04	1.7 0.04	0 0.00	109 1.79	1.5 0.03	30 0.85	0.7 0.01	0.1 0.00	0.01	42	Fe 0.15	180[a]	38	83	0	D.W.R.
		10/12/61		274	7.6	14 0.70	12 0.96	22 0.96	1.4 0.04	0 0.00	110 1.80	2.0 0.04	30 0.85	0.3 0.00	0.1 0.00	0.00	39	Fe 0.01 Al 0.01 Zn 0.01 [d]	175[a]	36	83	0	D.W.R.
Hammond Lumber Co. Industrial	5N/1W-16L1	5/18/54	57	462	7.2	9.3 0.46	21 1.73	50 2.17	3.2 0.08	0 0.00	114 1.87	14 0.29	77 2.17	1.7 0.03	0.1 0.00	0.42	17		250[a]	49	110	16	U.S.G.S.
		8/20/54	58	536	7.4	12 0.60	21 1.75	60 2.61	3.2 0.08	0 0.00	95 1.56	38 0.79	96 2.71	0.0 0.00	0.3 0.02	0.08	16	Fe 0.01 Zn 0.04 [d]	294[a]	52	117	39	U.S.G.S.
		2/12/57	48	442	6.8	11 0.55	17 1.39	48 2.09	3.5 0.09	0 0.00	98 1.61	15 0.31	75 2.12	5.3 0.09	0.1 0.00	0.04	15		238[a]	51	97		D.W.R.
		12/4/57	52	542	7.6	12 0.60	23 1.92	58 2.52	4.2 0.11	0 0.00	130 2.13	1.0 0.02	101 2.85	8.0 0.13	0.2 0.01	0.29	4.4		276[a]	49	126	19	U.S.G.S.
Chris Strong Irrigation	6N/1E-17N1	9/10/52	54	294	7.2					0 0.00	153 2.51		11 0.31										U.S.G.S.
Chester E. Hunt Irrigation and Domestic	18J1	9/11/52	54	412	7.8					0 0.00	240 3.93		12 0.34										U.S.G.S.
		2/12/57	48	485	6.5	44 2.20	27 2.24	12 0.52	6.0 0.15	0 0.00	237 3.88	27 0.56	23 0.65	3.0 0.05	0.0 0.00	0.09	13		272[a]	10	222		D.W.R.
		12/4/57	55	459	7.2	47 2.35	28 2.31	9.2 0.40	1.3 0.03	0 0.00	254 4.16	17 0.35	16 0.45	0.3 0.00	0.2 0.01	0.33	27		271[a]	8	233	25	U.S.G.S.
Gerald Nicholson Irrigation and Stock	18M1	9/11/52		374	8.1					0 0.00	231 3.79		10 0.28										U.S.G.S.
Walter Lorensen Irrigation	18N1	9/11/52	54	419	7.7	48 2.40	21 1.73	10 0.44	1.1 0.03		250 4.10		13 0.37			0.06		Fe 1.4		9	206	1	U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), and Chromium (Cr) -- reported here as 0.00 except as shown.

32505-E-G 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number HB&M	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	Total dissolved solids in ppm[a]	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by c
EUREKA PLAIN SUBUNIT (Continued)																							
Mrs. C. Iverson Irrigation	6N/1E-19B1	9/10/52		276	7.8	23 / 1.15	17 / 1.40	9.4 / 0.41	1.1 / 0.03		152 / 2.49		13 / 0.37			0.02		Fe 3.5		14	127	3	U.S.G.S.
N. Holgersen Domestic, Stock, Industrial and Observation	19Q1	6/7/51		398									15 / 0.42								190		U.S.G.S.
		9/10/58		387	8.0	50 / 2.50	15 / 1.20	10 / 0.44	1 / 0.03	0 / 0.00	224 / 3.66	11 / 0.22	15 / 0.42	0 / 0	0.4 / 0.02	0.14	19		304[b]	10	185		D.W.R.
		9/9/59		379	8.1	50 / 2.50	14 / 1.18	7.1 / 0.31	0.0 / 0.00	0 / 0.00	226 / 3.70	1.0 / 0.02	12 / 0.34	0.6 / 0.01	0.0 / 0.00	0.1	26	Fe 1.2	222[a] 236[b]	8	184	0	U.S.G.S.
		8/25/60		370	8.3	53 / 2.64	12 / 1.02	9.8 / 0.43	1.1 / 0.03	0 / 0.00	227 / 3.72	0.0 / 0.00	12 / 0.34	0.9 / 0.01	0.1 / 0.00	0.06	23	Fe 1.0	224[a]	10	183	0	D.W.R.
		8/4/61		374	8.3	52 / 2.59	13 / 1.09	10 / 0.44	1.2 / 0.03	0 / 0.00	235 / 3.85	0.0 / 0.00	11 / 0.31	1.0 / 0.02	0.1 / 0.00	0.07	24	Fe 0.51 As 0.01 Pb 0.01 Mn 0.58 Zn 0.19 d	228[a]	11	184	0	D.W.R.
Janes School District Public Supply and Observation	20C1	6/7/51		214									10 / 0.28								88		U.S.G.S.
E. St. Louis Irrigation	20J1	9/12/52	54	219	7.1	12 / 0.60	13 / 1.07	12 / 0.52	0.8 / 0.02		86 / 1.41		17 / 0.48			0.03		Fe 0.52		24	83	13	U.S.G.S.
J. C. Souza Irrigation and Domestic	20L1	9/10/52		252	7.1					0 / 0.00	99 / 1.62		12 / 0.34										U.S.G.S.
Fred Bullwinkeo Irrigation	20M1	9/10/52	55	246	7.4					0 / 0.00	138 / 2.26		9.0 / 0.25										U.S.G.S.
R. Gilardoni Irrigation and Stock	29L1	9/12/52	55	259	6.8	18 / 0.90	16 / 1.32	11 / 0.48	1.1 / 0.03		116 / 1.90		13 / 0.37			0.04		Fe 3.6		18	111	16	U.S.G.S.
Manual Barcelles Irrigation, Domestic and Stock	30B1	9/8/52	54	285	7.7					0 / 0.00	113 / 1.85		20 / 0.56										U.S.G.S.
L. A. Moxon Irrigation	30E1	9/8/52		287	7.6	19 / 0.95	19 / 1.56	11 / 0.48	1.5 / 0.04		120 / 1.97		13 / 0.37			0.03		Fe 6.4		16	126	27	U.S.G.S.
John Avila Irrigation	30G1	9/25/52	54	271	7.2	18 / 0.90	18 / 1.48	7.8 / 0.34	1.0 / 0.03	0 / 0.00	120 / 1.97	18 / 0.38	15 / 0.42	0.1 / 0.00	0.3 / 0.02	0.07	24	Fe 0.10	161[a]	12	119	21	U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr),~~ - reported here as 0.00 except as shown.

32505-B-G 6-61 500 SPO

ANALYSES OF GROUND WATER

EEL RIVER HYDROGRAPHIC UNIT

Owner and use	State well number and other number HBMM	Date sampled	Temp in °F	Specific conductance (micromhos at 25° C)	pH	Mineral constituents in parts per million / equivalents per million: Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO_3)	Bicarbonate (HCO_3)	Sulfate (SO_4)	Chloride (Cl)	Nitrate (NO_3)	Fluoride (F)	Boron (B)	Silica (SiO_2)	Other constituents[d]	Total dissolved solids in ppm[a]	Percent sodium	Hardness as $CaCO_3$: Total ppm	Hardness as $CaCO_3$: N.C. ppm	Analyzed by c
						EUREKA PLAIN SUBUNIT (Continued)																	
Mrs. Elmer North Domestic and Stock	6N/1E-30N1	6/7/51		213									24 / 0.96								47		U.S.G.S.
		8/20/54	60	361	7.3	47 / 2.35	15 / 1.22	8.8 / 0.38	1.6 / 0.04	0 / 0.00	214 / 3.51	0.2 / 0.00	12 / 0.34	5.3 / 0.09	0.3 / 0.02	0.18	45	Fe 0.40 Mn 0.04 d	240[a]	10	178	3	U.S.G.S.
		9/10/58		363	7.5	67 / 2.33	12 / 1.01	10 / 0.44	1 / 0.03	0 / 0.00	203 / 3.33	1 / 0.02	16 / 0.45	0.0 / 0.00	0.4 / 0.02	0	20	Fe 0.41	294[b]	11	167		D.W.R.
		9/9/59		349	8.4	52 / 2.59	17 / 1.41	9.7 / 0.42	1.1 / 0.03	6 / 0.20	210 / 3.44	21 / 0.44	10 / 0.28	3.5 / 0.06	0.0 / 0.00	0.0	32	Fe 1.1	255[a]	9	200	18	U.S.G.S.
		8/25/60		364	8.4	49 / 2.44	13 / 1.04	8.4 / 0.36	1.2 / 0.03	2 / 0.07	210 / 3.44	0.0 / 0.00	12 / 0.34	0.3 / 0.00	0.2 / 0.01	0.06	31	Fe 1.2	221[a]	9	174	0	D.W.R.
		10/14/61		334	8.5	46 / 2.30	11 / 0.92	9.0 / 0.39	1.2 / 0.03	7 / 0.23	190 / 3.11	0.0 / 0.00	11 / 0.31	0.4 / 0.01	0.2 / 0.01	0.05	31	Fe 0.82 Al 0.01 Pb 0.01 Zn 0.15 d	211[a]	11	161	0	D.W.R.
Arcata Plywood Co. Industrial	32F1	9/29/52	59	761	8.0	15 / 0.75	15 / 1.23	159 / 6.91	8.5 / 0.22		210 / 3.44		138 / 3.89			0.02		Fe 0.05		76	60	0	U.S.G.S.
		2/12/57	58	813	7.1	15 / 0.75	11 / 0.87	140 / 6.09	8.7 / 0.22	0 / 0.00	250 / 4.10	0.3 / 0.01	137 / 3.86	1.4 / 0.02	0.3 / 0.02	0.07	29		466[a]		81		D.W.R.
		12/4/57	60	812	7.2	13 / 0.65	13 / 1.03	141 / 6.13	9.0 / 0.23	0 / 0.00	240 / 3.93	19 / 0.40	132 / 3.72	0.8 / 0.01	0.2 / 0.01	0.75	28		475[a]	76	84	0	U.S.G.S.
		9/10/58		798	7.3	9 / 0.47	13 / 1.11	143 / 6.20	8 / 0.20	0 / 0.00	254 / 4.16	2 / 0.04	125 / 3.52	1.0 / 0.02	0.7 / 0.04	0.72	21	Fe 0.55	556[b]	77	79		D.W.R.
		9/11/59		782	8.1	15 / 0.75	11 / 0.89	141 / 6.13	9.2 / 0.24	0 / 0.00	260 / 4.29	7.0 / 0.15	122 / 3.44	1.3 / 0.02	0.1 / 0.00	0.4	29	Fe 0.38	465[a]	77	82	0	U.S.G.S.
		8/25/60		780	8.4	13 / 0.65	12 / 0.95	130 / 5.66	7.2 / 0.18	5 / 0.17	261 / 4.28	2.1 / 0.04	101 / 2.85	2.4 / 0.04	0.2 / 0.01	0.59	27	Fe 0.40	428[a]	76	80	0	D.W.R.
		7/31/61		758	8.2	14 / 0.70	11 / 0.90	131 / 5.70	7.0 / 0.18	0 / 0.00	273 / 4.47	0.2 / 0.00	103 / 2.90	2.6 / 0.04	0.2 / 0.01	0.59	27	Fe 0.61 Al 0.02 Zn 0.01 d	430[a]	76	80	0	D.W.R.
Brightwood Lumber Company Industrial and Domestic	6N/1W-26R1	9/8/52	55	446	7.8	60 / 2.99	15 / 1.23	14 / 0.61	2.0 / 0.05		268 / 4.39		11 / 0.31			0.06		Fe 0.54		12	211	0	U.S.G.S.

a. Determined by addition of constituents.
b. Gravimetric determination.
c. Analysis by U.S. Geological Survey, Quality of Water Branch (U.S.G.S.), Pacific Chemical Consultants (P.C.C.), or State Department of Water Resources (D.W.R.), as indicated.
d. Iron (Fe), Aluminum (Al), Arsenic (As), Copper (Cu), Lead (Pb), Manganese (Mn), Zinc (Zn), ~~and Chromium (Cr)~~ - reported here as 0.00 except as shown.

32505-B-G 6-61 500 SPO

APPENDIX C

SUMMARY BY HYDROGRAPHIC SUBUNIT OF SIGNIFICANT WATER QUALITY CHARACTERISTICS

APPENDIX C

TABLE OF CONTENTS

SUMMARY BY HYDROGRAPHIC SUBUNIT
OF SIGNIFICANT WATER QUALITY CHARACTERISTICS
EEL RIVER HYDROGRAPHIC UNIT

Hydrographic subunit	Average		Range/Median				Number of analyses evaluated	Number of analyses exceeding USPHS limits	Maximum concentration of other constituents
	Chemical classification	Irrigation class	Specific conductance in micromhos	Hardness in ppm	Percent sodium	Boron in ppm			
Lake Pillsbury - Surface Water	calcium bicarbonate	1	95-285/140	42-133/60	6-17/14	0.0-1.5/0.3	100	1	Manganese 0.26 ppm
Willis Ridge - Surface Water	calcium bicarbonate	1	88-340/200	42-136/90	7-35/15	0.0-1.1/0.2	60	0	
Outlet Creek - Surface Water	calcium-magnesium bicarbonate	1	58-528/215	24-164/80	8-33/20	0.0-9.9/0.4	70	4	Iron 0.6 ppm
- Ground Water	calcium-magnesium bicarbonate	1	110-859/315	3-330/130	11-98/33	0.04-3.8/0.17	16	12	Iron 9.6 ppm Manganese 7.1 ppm
Wilderness - Surface Water	calcium bicarbonate	1	198-407/345	72-141/125	19-28/24	0.16-0.57/0.4	8	0	
Butte River - Surface Water	calcium bicarbonate	1	257-320/285	115-148/125	8-13/10	0.04-0.25/0.1	8	0	
Etsel - Surface Water	calcium bicarbonate	1	91-374/215	40-152/90	4-24/12	0.0-0.7/0.1	70	1	Arsenic 0.03 ppm
- Ground Water	calcium-magnesium bicarbonate	1	236	113	9	0.02	1	0	
Round Valley - Surface Water	calcium-magnesium bicarbonate	1	129-374/245	53-174/110	11-23/12	0.01-0.18/0.07	7	0	
- Ground Water	calcium-magnesium bicarbonate	1	209-691/270	87-308/125	8-52/16	0.0-0.35/0.11	27	10	Iron 7.4 ppm, Arsenic 0.12 ppm Manganese 2.0 ppm, Lead 0.06 ppm
North Fork - Surface Water	calcium bicarbonate	1	197-311/	91-129/	10-18/	0.19-0.24/	2	0	
Sequoia and Bell Springs - Surface Water	calcium bicarbonate	1	101-399/205	41-204/95	8-26/12	0.0-0.3/0.1	100	0	
Laytonville - Surface Water	calcium-sodium bicarbonate	1	86-1620/130	32-249/50	13-68/30	0.0-16/0.08	11	1	Chloride 395 ppm
- Ground Water	variable	1	86-1870/300	23-339/135	8-69/28	0.04-23/0.1	17	5	Iron 7.9 ppm
Lake Benbow and Humboldt Redwoods - Surface Water	calcium bicarbonate	1	76-273/180	28-124/75	9-29/17	0.0-0.5/0.1	100	0	
Lake Benbow - Ground Water	calcium-magnesium bicarbonate	1	81-318/225	31-141/100	13-29/18	0.03-0.44/0.1	4	2	Iron 1.9 ppm
Lower Eel - Surface Water	calcium bicarbonate	1	98-804/220	43-345/100	8-53/13	0.0-0.5/0.1	100	2	Iron 1.8 ppm, Manganese 0.10 ppm
- Ground Water	magnesium-calcium bicarbonate	1	132-7200/490	32-1640/215	6-62/20	0.0-0.9/0.06	65	32	Iron 26 ppm, Chloride 2150 ppm, Manganese 4.6 ppm

SUMMARY BY HYDROGRAPHIC SUBUNIT
OF SIGNIFICANT WATER QUALITY CHARACTERISTICS
EEL RIVER HYDROGRAPHIC UNIT

Hydrographic subunit	Average		Range/Median				Number of analyses evaluated	Number of analyses exceeding USPHS limits	Maximum concentration of other constituents
	Chemical classification	Irrigation class	Specific conductance in micromhos	Hardness in ppm	Percent sodium	Boron in ppm			
Van Duzen River - Surface Water	calcium bicarbonate	1	71-319/160	23-152/70	4-21/11	0.0-0.2/0.1	50	0	
Yager Creek - Surface Water	calcium bicarbonate	1	282-315/	122-137/	12-17/	0.02-0.07/	2	0	
Eureka Plain - Surface Water	magnesium-sodium bicarbonate	1	224-538/235	67-144/95	18-42/28	0.00-0.37/0.03	5	0	
- Ground Water	magnesium-calcium bicarbonate	1	156-869/295	51-233/120	8-76/24	0.0-1.7/0.06	20	13	Iron 6.4 ppm, Copper 1.3 ppm, Manganese 0.58 ppm
Cape Mendocino - Surface Water	calcium bicarbonate	1	72-396/180	22-162/80	10-36/16	0.0-0.5/0.1	50	0	

SUMMARY BY HYDROGRAPHIC SUBUNIT
OF SIGNIFICANT WATER QUALITY CHARACTERISTICS
TRINITY RIVER HYDROGRAPHIC UNIT

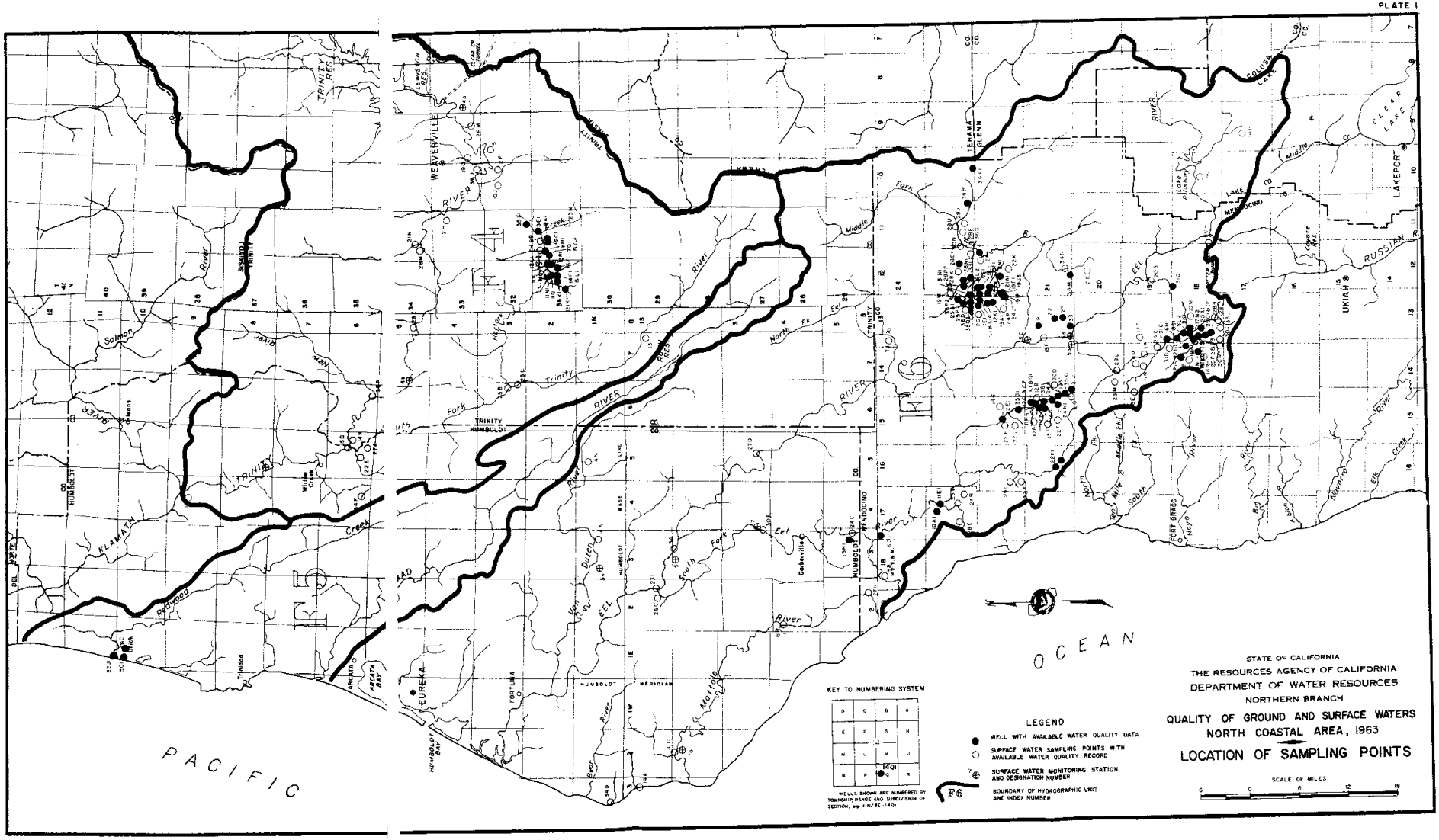
Hydrographic subunit	Average		Range				Number of analyses evaluated	Number of analyses exceeding USPHS limits	Remarks
	Chemical classification	Irrigation class	Specific conductance in micromhos	Hardness in ppm	Percent sodium	Boron in ppm			
Trinity Reservoir - Surface Water	magnesium bicarbonate	1	63-198	27-84	5-24	0.00-0.23	100	0	Heavy metals negligible
Middle Trinity - Surface Water	calcium bicarbonate	1	122-391	50-165	6-22	0.00-0.26	21	0	Heavy metals negligible
Weaver Creek - Surface Water	calcium bicarbonate	1	92-254	40-125	7-14	0.01-0.20	6	0	
Helena - Surface Water	calcium bicarbonate	1	56-123	23-56	7-13	0.01-0.08	13	0	Heavy metals negligible
Burnt Ranch - Surface Water	calcium-magnesium bicarbonate	1	65-214	30-100	4-20	0.00-0.15	50	0	Heavy metals negligible
New River - Surface Water	calcium bicarbonate	1	191-212	94-104	6-8	0.02-0.04	4	0	Never sampled during rainy season
Upper South Fork - Surface Water	calcium bicarbonate	1	98-232	45-106	7-14	0.00-0.20	8	0	Arsenic 0.01 ppm, Lead 0.01 ppm
Hayfork Valley - Surface Water	calcium bicarbonate	1	149-483	69-162	5-29	0.00-0.23	23	0	Heavy metals negligible
- Ground Water	calcium-magnesium bicarbonate	1	109-843	46-184	7-88	0.02-0.39	33	0	Zinc 0.53 ppm
Hayfork Creek - Surface Water	calcium bicarbonate	1	224-315	110-136	9-14	0.00-0.04	6	0	Heavy metals negligible
Hyampom - Surface Water	calcium bicarbonate	1	98-315	45-136	7-14	0.00-0.20	14	0	Heavy metals negligible
Lower South Fork - Surface Water	calcium bicarbonate	1	137-336	63-126	7-12	0.00-0.12	15	0	Manganese 0.02 ppm
Willow Creek - Surface Water	magnesium bicarbonate	1	241	129	3	0.05	1	0	
Hoopa - Surface Water	calcium bicarbonate	1	90-243	44-120	3-13	0.00-0.20	100	0	Heavy metals negligible

SUMMARY BY HYDROGRAPHIC SUBUNIT
OF SIGNIFICANT WATER QUALITY CHARACTERISTICS
MAD RIVER-REDWOOD CREEK HYDROGRAPHIC UNIT

Hydrographic subunit	Average		Range				Number of analyses evaluated	Number of analyses exceeding USPHS limits	Remarks
	Chemical classification	Irrigation class	Specific conductance in micromhos	Hardness in ppm	Percent sodium	Boron in ppm			
Snow Camp and Beaver - Surface Water	calcium bicarbonate	1	90-182	35-77	11-18	0.0-0.21	4	0	
Orick - Surface Water	calcium bicarbonate	1	64-158	26-68	7-23	0.0-0.2	50	0	Iron 0.17 ppm
- Ground Water	calcium-sodium bicarbonate-chloride	1	157-582	65-129	17-64	0.05-0.12	3	0	
Big Lagoon - Surface Water	sodium-calcium bicarbonate-chloride	1	77	19	42	0.08	1	0	Iron 0.07 ppm
- Ground Water	sodium-calcium chloride-bicarbonate	1	93-100	21-28	35-44	0.03-0.15	3	0	
Little River - Surface Water	calcium bicarbonate	1	59-98	16-30	18-31	0.02-0.04	3	0	
Ruth - Surface Water	calcium bicarbonate	1	65-128	28-55	10-16	0.00-0.20	16	0	Heavy metals negligible
Butler Valley - Surface Water	calcium bicarbonate	1	118-280	49-134	9-14	0.03-0.16	12	0	Heavy metals negligible
North Fork - Surface Water	calcium bicarbonate	1	146	62	17	0.02	1	0	
Blue Lake - Surface Water	calcium bicarbonate	1	78-287	19-136	5-44	0.0-0.26	50	0	Iron 0.10 ppm
- Ground Water 1/	calcium-magnesium bicarbonate	1	85-517	24-252	6-56	0.00-1.1	43	18	Iron 15.0 ppm, Nitrate 92 ppm, Manganese 2.3 ppm

1/ Does not include Well No. 6N/1W-1P1 subject to intense sea-water intrusion.

PLATE I

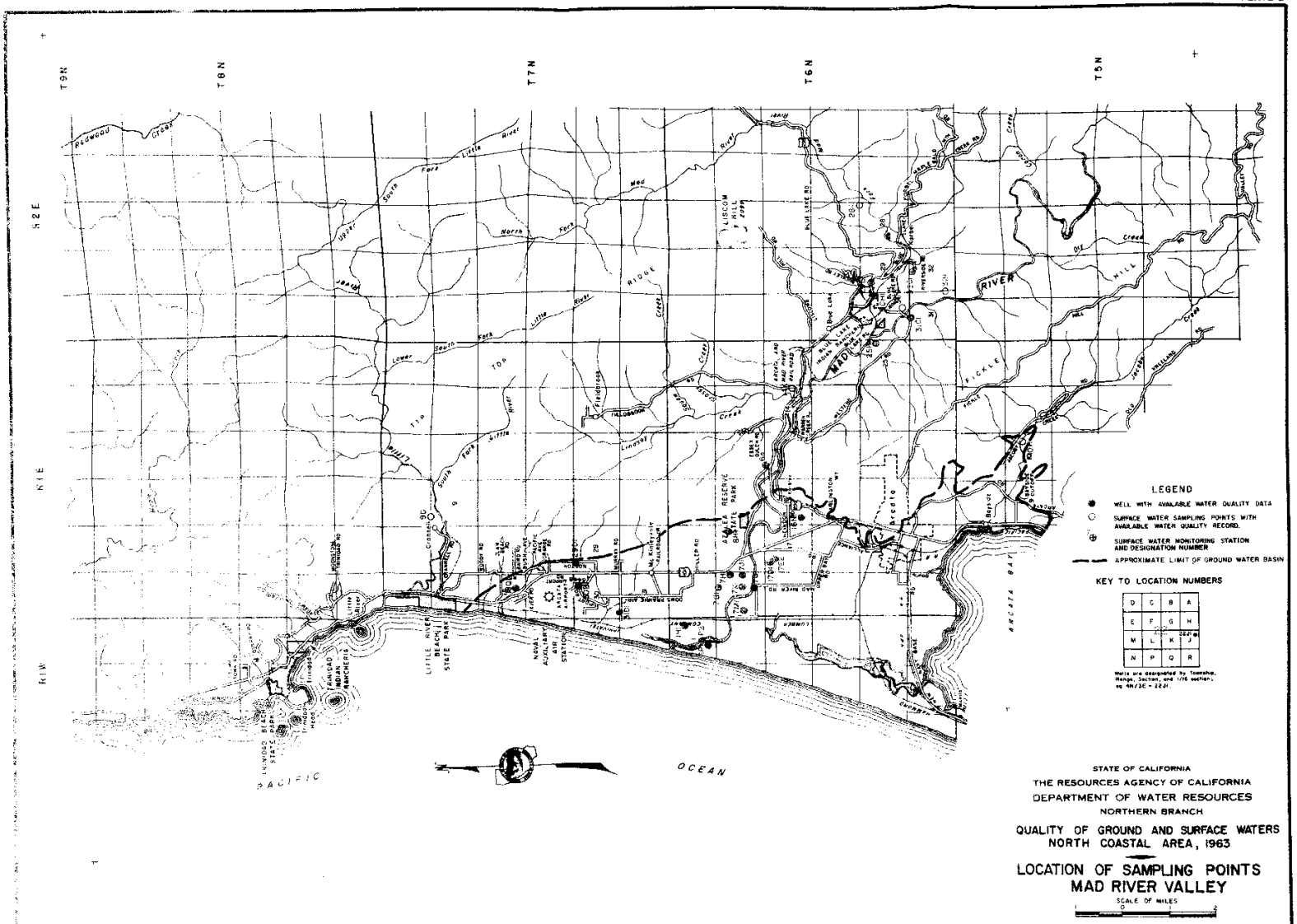


STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

QUALITY OF GROUND AND SURFACE WATERS NORTH COASTAL AREA, 1963

LOCATION OF SAMPLING POINTS

PLATE 2



STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
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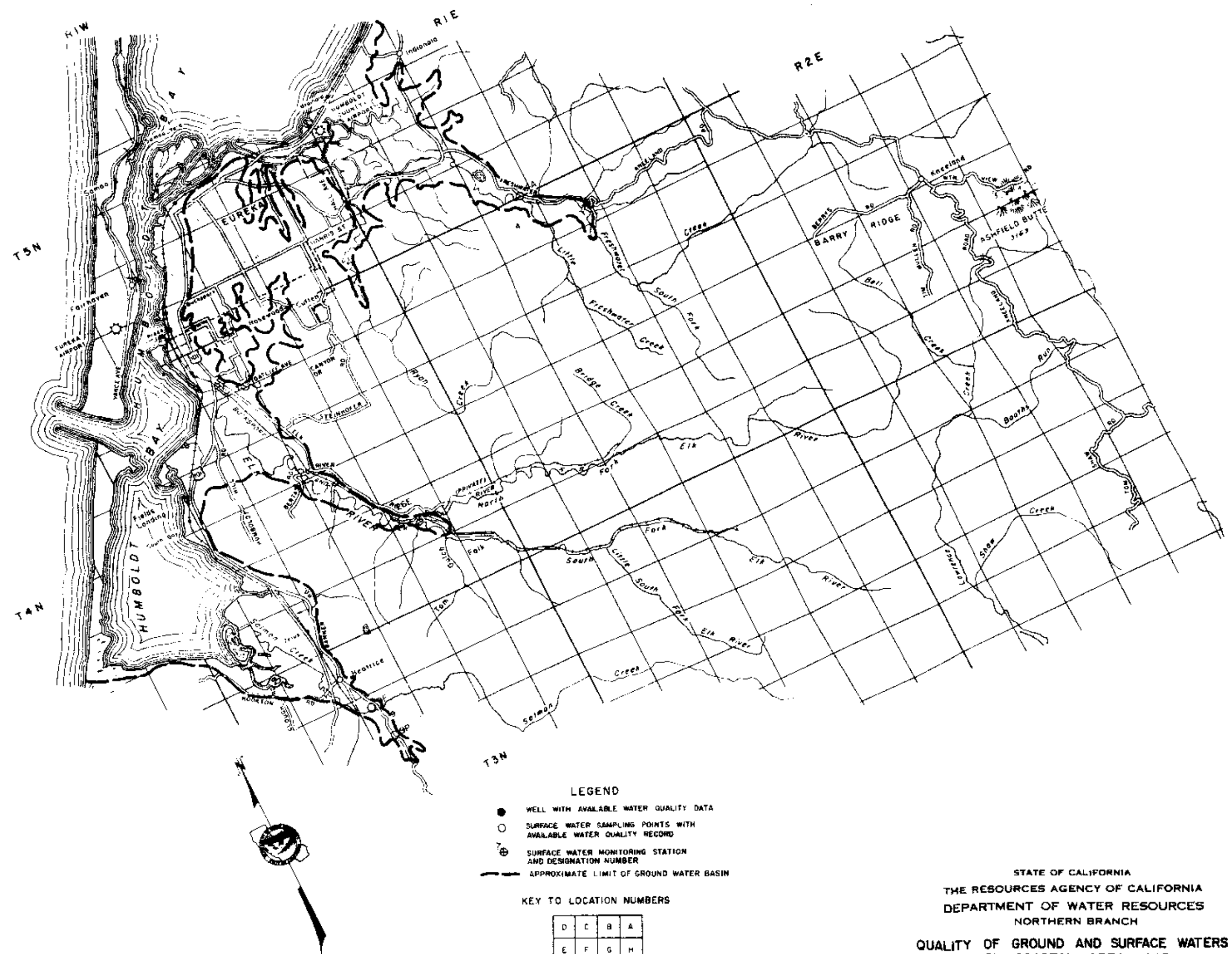
NORTHERN BRANCH

QUALITY OF GROUND AND SURFACE WATERS
NORTH COASTAL AREA, 1963

LOCATION OF SAMPLING POINTS
MAD RIVER VALLEY

SCALE OF MILES
0 1 2



LEGEND

- ● WELL WITH AVAILABLE WATER QUALITY DATA
- ○ SURFACE WATER SAMPLING POINTS WITH AVAILABLE WATER QUALITY RECORD
- 7⊕ SURFACE WATER MONITORING STATION AND DESIGNATION NUMBER
- ▬ ▬ APPROXIMATE LIMIT OF GROUND WATER BASIN

KEY TO LOCATION NUMBERS

D	C	B	A
E	F	G	H
M	L	K	J 22J1 ●
N	P	Q	R

Wells are designated by Township, Range, Section, and 1/16 section; eg 4N/3E - 22J1

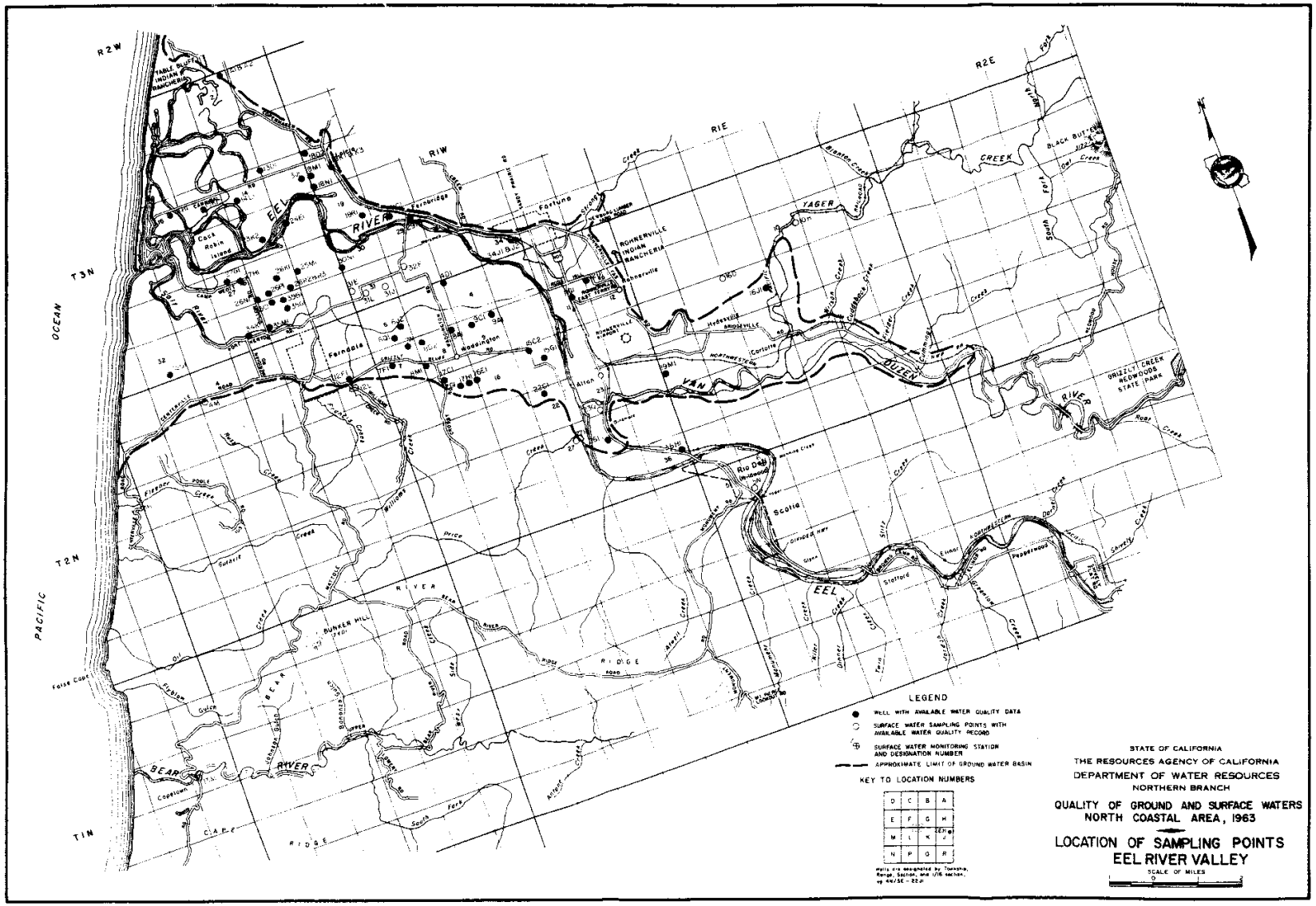
STATE OF CALIFORNIA
THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF WATER RESOURCES
NORTHERN BRANCH

QUALITY OF GROUND AND SURFACE WATERS
NORTH COASTAL AREA, 1963

LOCATION OF SAMPLING POINTS
EUREKA PLAIN

SCALE OF MILES
1 0 1 2

PLATE 4



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NORTHERN BRANCH

QUALITY OF GROUND AND SURFACE WATERS NORTH COASTAL AREA, 1963

LOCATION OF SAMPLING POINTS EEL RIVER VALLEY