



RUSSIAN RIVER WATER QUALITY MONITORING RESULTS

SANTA ROSA SUBREGIONAL LONG-TERM WASTEWATER PROJECT

Prepared for

**City of Santa Rosa
and
U.S. Army Corps of Engineers**

MAY 1996

Prepared by:

**Merritt Smith Consulting
Environmental Science and Communication**
3675 Mt. Diablo Blvd. #120 Lafayette, CA 94549

For

HARLAND BARTHOLOMEW & ASSOCIATES, INC.

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AUTHORS

This report was prepared by Marcie L. Commins, Ph.D.

1.0 SUMMARY

This Technical Report summarizes water quality data in the Russian River. These data are provided in support of the evaluation of potential impacts from implementation of Project alternatives (see *Water Quality Impacts Analysis Report* Technical Report, MSC 1996). Water quality collections were made during the spring and summer of 1994 and 1995 in the Russian River. The results are described for nutrients, metals, pathogens and other parameters indicative of water quality. Data are grouped by location with respect to the Subregional System discharge (which enters the River at the Laguna de Santa Rosa), and are described as above the Laguna or below the Laguna.

EPA criteria for the protection of aquatic organisms exist for un-ionized ammonia and metals. Results of the 1994-95 monitoring indicate that there were no exceedances of un-ionized ammonia or metals in the River. The North Coast Regional Water Quality Control Board Basin Plan states a minimum dissolved oxygen criterion. Measurements of dissolved oxygen fell below the Basin Plan minimum at times during the diel studies.

2.0 INTRODUCTION

2.1 PURPOSE AND OBJECTIVE

Water quality monitoring was conducted on the Russian River during 1994 and 1995 to provide data to calibrate the QUAL2E model. The model is being adapted to determine potential Project impacts on water quality in the Laguna de Santa Rosa and the Russian River. Results of the modeling are described in the *Russian River Water Quality Model* Technical Report (MSC 1996), and potential Project impacts on water quality are described in the *Water Quality Impacts Analysis* Technical Report (MSC 1996). The purpose of this Technical Report is to provide a summary of water quality data in support of the evaluation of potential impacts of the Project on the Russian River. Water quality data are not evaluated in this report. Potential project impacts are assessed in the *Water Quality Impact Analysis* Technical Report (MSC 1996). The Subregional System discharges reclaimed water to the Laguna de Santa Rosa which enters the River just downstream of Wohler Bridge. Data are reported here relative to the location of the Laguna (e.g., above or below the Laguna).

2.2 SCOPE OF THIS TECHNICAL REPORT

This Technical Report contains the following sections:

- Monitoring Plan. This section describes the methods and analyses used for the 1994-95 Russian River water quality monitoring.
- Monitoring Results. This section describes the results of the 1994-95 Russian River water quality monitoring.
- Summary of Russian River Water Quality Data. This section presents a summary of existing Russian River water quality data. Existing water quality data includes the data reported here for the first time and historical data, most of which was collected by the North Coast Regional Water Quality Control Board (Regional Board).

This report does not seek to provide a detailed analysis of Russian River data. That analysis (including an analysis of impacts of reclaimed water discharge and statistical trends of data in the River above and below the Laguna) is presented in the technical report entitled, *Water Quality Impacts Analysis* Technical Report (MSC 1996).

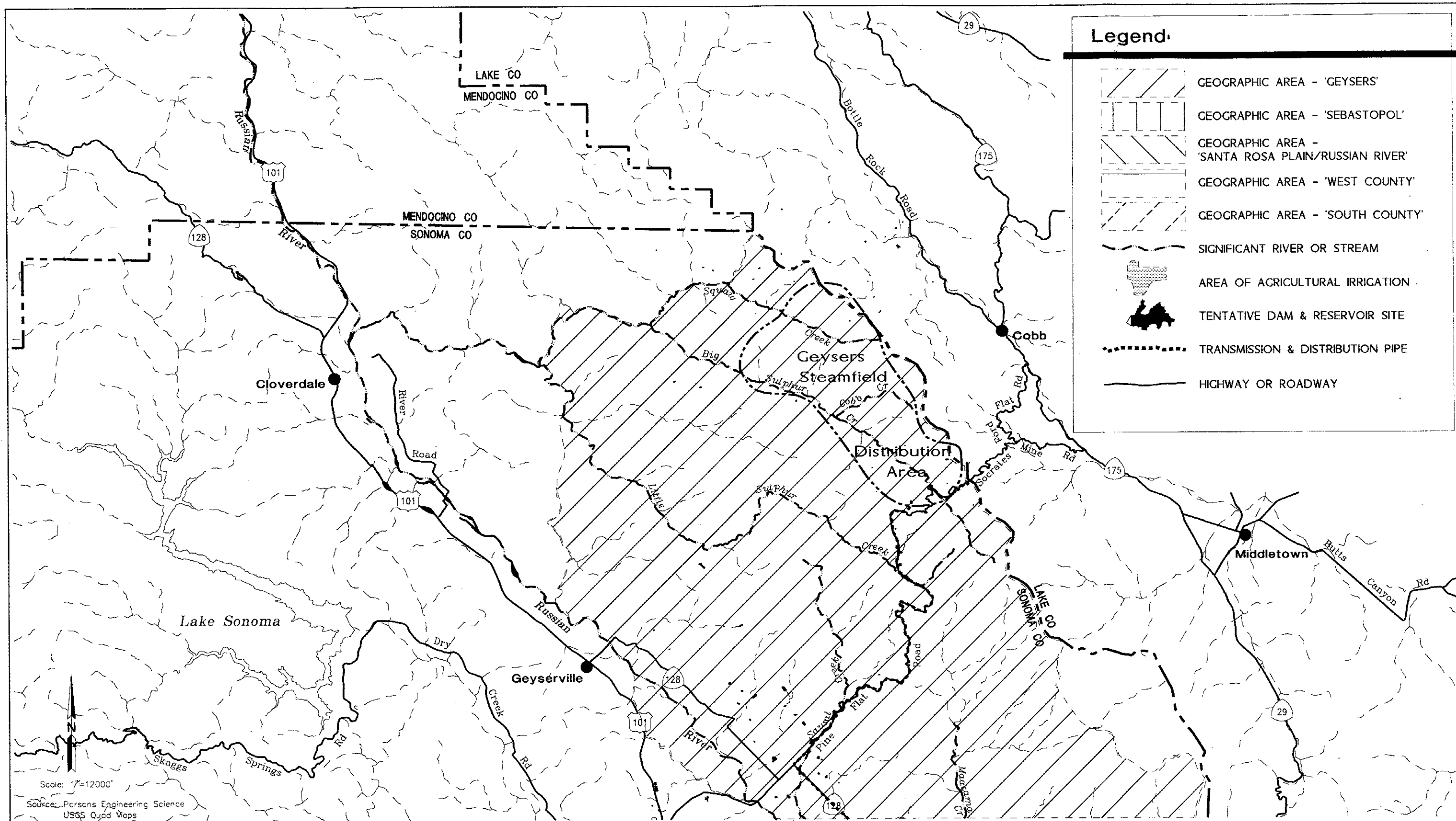
3.0 MONITORING PLAN

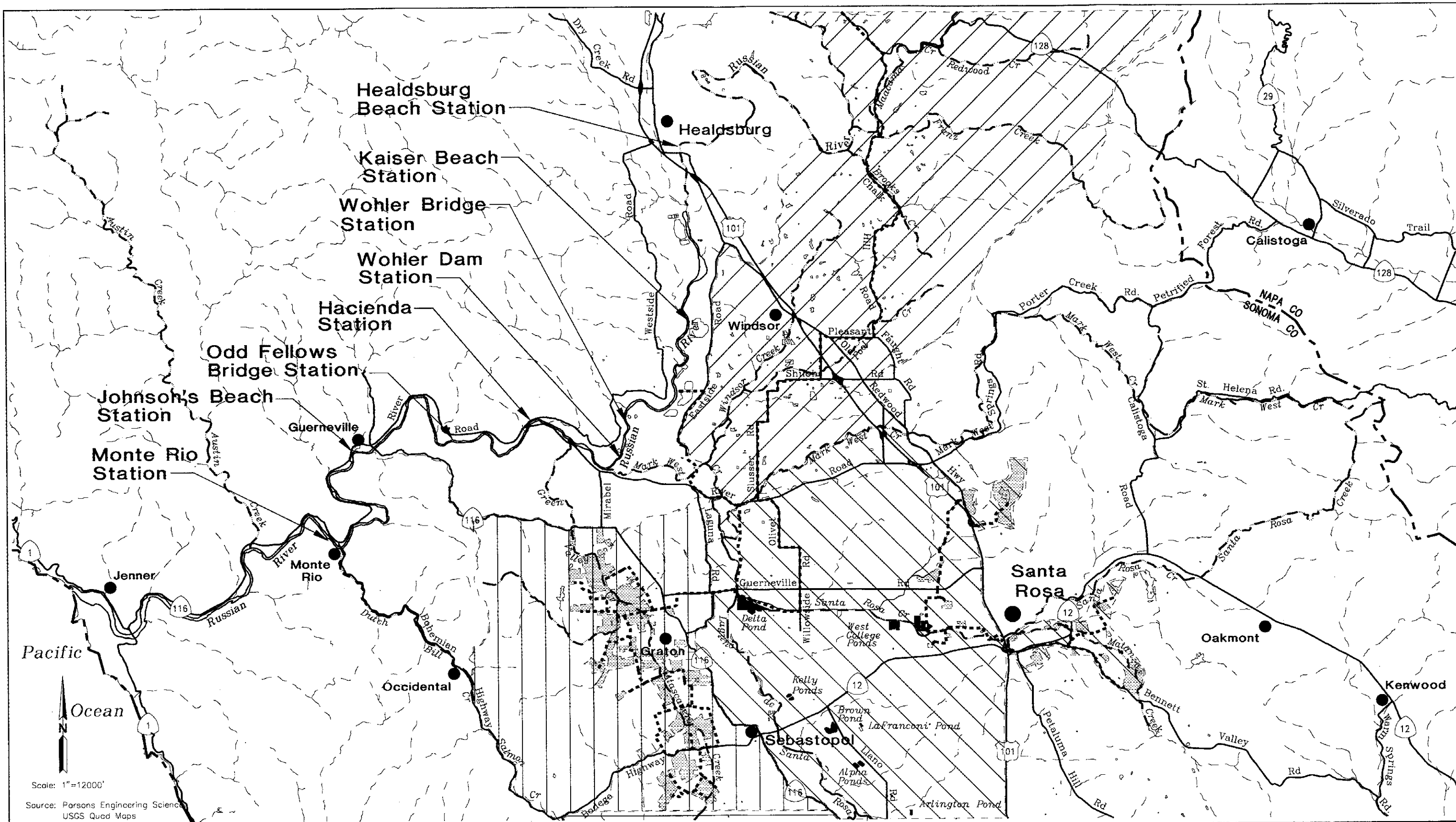
Water samples were collected for water quality analyses on the Russian River in May and September 1994 and monthly between February and August 1995. Bacteriology samples were collected in May and July 1994. Samples for nutrients and field parameters (temperature, dissolved oxygen, and conductivity) were usually taken in the River at two stations below the confluence with the Laguna de Santa Rosa and one station above the confluence with the Laguna for nutrients. Samples for metals were taken at one station above and one below the confluence of the Laguna. Figure 1 shows the sampling locations.

The flooding in the winter /spring of 1995 necessitated changing some sampling locations. Samples were collected by wading into the water and dipping laboratory-prepared sample bottles below the surface at three different locations on cross-section (whenever possible) within a station. At all times, care was taken not to entrain sediment into the samples. Field measurements of temperature, conductivity, dissolved oxygen, and pH were made at the time of sample collection. The following parameters were measured by a certified laboratory (NET, Santa Rosa): nitrate, nitrite, ammonia, total Kjeldahl nitrogen (TKN), dissolved orthophosphate, total phosphate, total organic carbon (TOC), dissolved organic carbon (DOC), total dissolved solids (TDS), total suspended solids (TSS), hardness, chlorophyll *a*, phaeophytin, and total and dissolved metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc). Not all of the constituents were analyzed on some of the dates. Table 1 shows station locations, dates of collection, and constituents analyzed.

The component of ammonia that is most toxic to aquatic organisms is the un-ionized fraction. Therefore, the concentration of un-ionized ammonia was estimated using the methods from the San Francisco Bay Regional Water Quality Control Plan (San Francisco Bay Regional Water Quality Control Board 1991). These concentrations were then compared to the EPA criteria for ammonia for the protection of aquatic organisms (USEPA 1986). The concentrations of dissolved metals were compared to the EPA criteria for dissolved metals for the protection of aquatic organisms (USEPA 1995). The metals criteria that are hardness related were calculated for the hardness of each sample. If the hardness was not known, the average hardness for that portion of the River (above or below the confluence with the Laguna) was used.

In association with a special study of effluent quality, samples were taken in the Russian River at Kaiser Beach (above the confluence with the Laguna) on 27 October, 8 November, 30 November, and 14 December 1994 and analyzed for organics, total and dissolved metals, *Giardia lamblia* cysts, *Cryptosporidium* oocysts, *Legionella* species, *Salmonella* species, *Shigella*, heterotrophic plate count, total coliforms, and enteric viruses.





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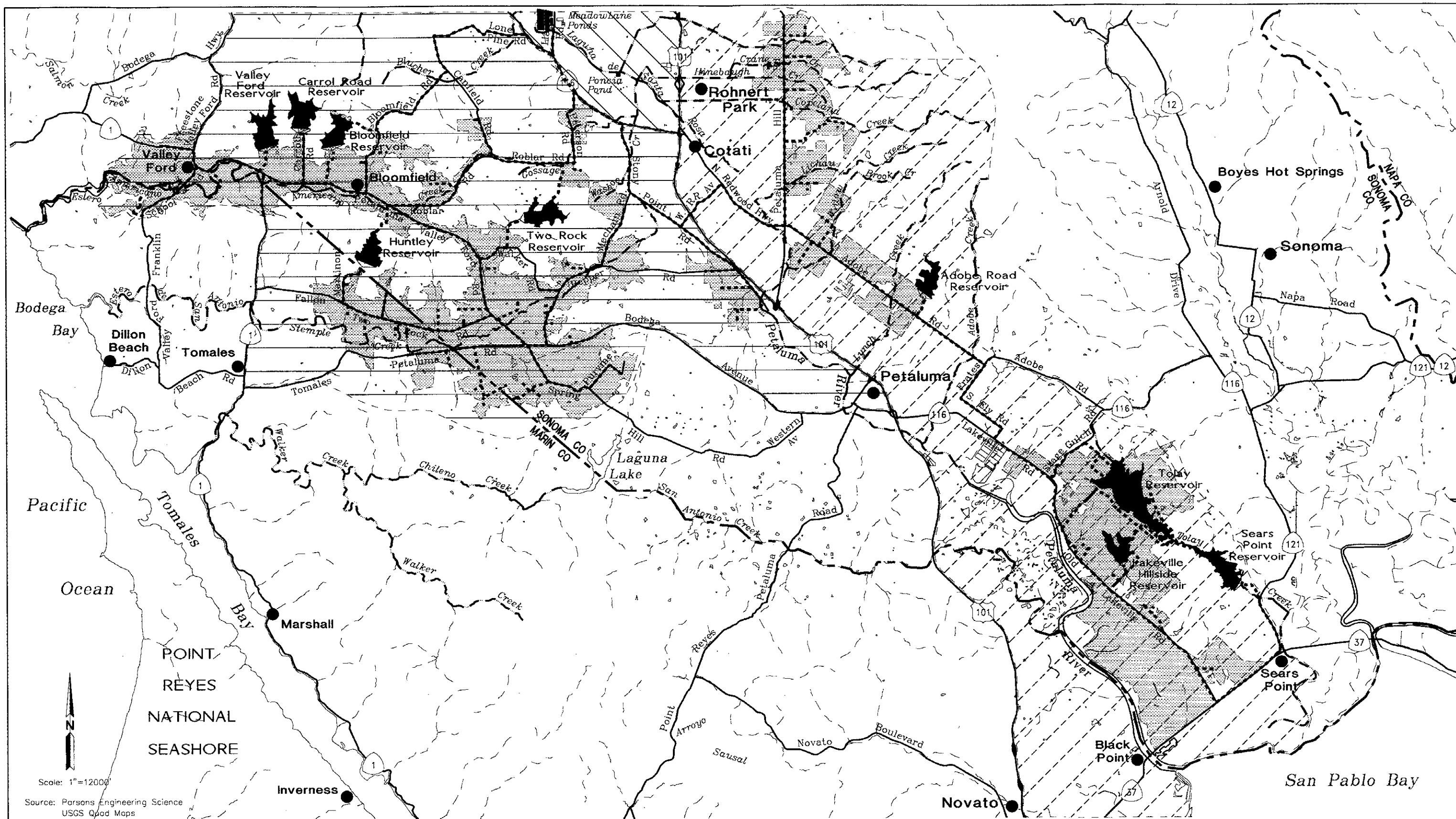


Santa Rosa

Subregional Long-Term
Wastewater Project

RUSSIAN RIVER
WATER QUALITY
MONITORING STATIONS

Figure 1b



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Santa Rosa

Subregional Long-Term
Wastewater Project

RUSSIAN RIVER
WATER QUALITY
MONITORING STATIONS

Figure 1c

Dissolved oxygen, temperature, and conductivity diel studies were conducted in the Russian River in May, July, and September 1994 and May and August 1995 using Hydrolab's DataSonde III *in situ* probe/data loggers. On each occasion, the instruments were calibrated prior to deployment, and then deployed in two or three locations in the Russian River. The instruments made one-half hourly or hourly measurements of dissolved oxygen, temperature and conductivity generally at depths of two to five feet from the surface. The membrane on the dissolved oxygen probe becomes fouled at some unknown and variable time after deployment (depending on factors such as biological activity in the water column). The DataSondes were deployed for one to four and one half days which is a short enough duration to preclude fouling. Longer durations of deployment were not utilized. Data were downloaded from the instruments after retrieval. When the DataSondes were retrieved in the May 1994 diel study, it was discovered that the water level in the Russian River dropped sometime near the beginning of the study (apparently due to cessation of discharge from Warm Springs Reservoir). The DataSonde deployed at the Kaiser site was dry so it was removed, re-calibrated, and re-deployed the next day. Thus, the time for the May 1995 Kaiser diel did not coincide with the diel studies at the other two stations.

Table 1.

Russian River Sample Collections (1994-95)

Location	Dates Samples Collected	Constituents
Oddfellows Bridge (below Laguna)	19 May, 20 Sept. 1994, 16 Feb., 13 Apr., 11 May, 8 June, 20 July, 16 Aug. 1995	Temperature, dissolved oxygen, pH, conductivity, nitrate, nitrite, ammonia, TKN, dissolved orthophosphate, total phosphate, TOC, DOC, TDS, TSS, hardness, chlorophyll <i>a</i> , phaeophytin, total and fecal coliforms, total and dissolved metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc), and diel studies.
Monte Rio (below Laguna)	19 May 1994, 16 Feb., 13 Apr., 11 May, 8 June, 20 July, 16 Aug. 1995	Temperature, dissolved oxygen, pH, conductivity, nitrate, nitrite, ammonia, TKN, dissolved orthophosphate, total phosphate, TOC, DOC, TDS, TSS, hardness, chlorophyll <i>a</i> , phaeophytin, total and fecal coliforms, total and dissolved metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc), and diel studies.
Johnson's Beach (below Laguna)	13 July 1994	Total and fecal coliforms
Hacienda ^a (below Laguna)	16 March 1995	Temperature, dissolved oxygen, pH, conductivity, nitrate, nitrite, ammonia, TKN, dissolved orthophosphate, TOC, DOC, hardness, and total and dissolved metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc).

Table 1.

Russian River Sample Collections (1994-95)

Location	Dates Samples Collected	Constituents
Kaiser Beach (above Laguna)	20 Sept. 1994, 16 March, 13 Apr., 11 May, 8 June, 20 July, 16 Aug. 1995	Temperature, dissolved oxygen, pH, conductivity, nitrate, nitrite, ammonia, TKN, dissolved orthophosphate, total phosphate, TOC, DOC, TDS, TSS, hardness, chlorophyll <i>a</i> , phaeophytin, total and dissolved metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc), and diel studies.
Kaiser Beach (effluent study) (above Laguna)	27 Oct., 8 Nov., 30 Nov., and 14 Dec. 1994,	Total and dissolved metals, organics, biological samples, and alkylphenols
Healdsburg Beach (above Laguna)	13 July 1994	Total and fecal coliforms
Wohler Dam (above Laguna)	19 May 1994	Temperature, dissolved oxygen, pH, conductivity, nitrate, ammonia, TKN, dissolved orthophosphate, total phosphate, TOC, TDS, TSS, chlorophyll <i>a</i> , total and fecal coliforms, and total metals (cadmium, chromium, copper, lead, nickel, and zinc).
Wohler Bridge ^a (above Laguna)	16 Feb. 1995	Temperature, dissolved oxygen, pH, conductivity, nitrate, nitrite, ammonia, TKN, dissolved orthophosphate, total phosphate, TOC, DOC, TDS, TSS, hardness, chlorophyll <i>a</i> , phaeophytin, and total and dissolved metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc).

^a These samples were taken when regular stations were inaccessible due to flooding

4.0 MONITORING RESULTS

This section presents the results of the 1994-95 monitoring in the Russian River for nutrients, dissolved oxygen, conductivity, chlorophyll *a*, metals, organics, and diel dissolved oxygen. Complete 1994-95 monitoring results are presented in Appendix 1. The data from the special effluent study are presented in Appendix 2.

4.1 DATA COLLECTED ABOVE THE LAGUNA

The concentrations of nutrients, dissolved oxygen, conductivity, and chlorophyll *a* in the Russian River above the confluence with the Laguna during the 1994-95 period covered in this report are shown in Table 2.

4.1.1 Conductivity above the Laguna

Conductivity in the Russian River above the confluence with the Laguna during this study period ranged from 129 to 255 $\mu\text{mhos/cm}$ with an average of 207 $\mu\text{mhos/cm}$. The minimum conductivity occurred during the March 1995 flood.

4.1.2 Dissolved Oxygen above the Laguna

Dissolved oxygen in the Russian River above the confluence with the Laguna ranged from 8.9 to 10.4 mg/L with an average of 9.3 mg/L. None of the dissolved oxygen measurements taken at the time other water quality parameters were measured were below the North Coast Region Water Quality Control Plan (Basin Plan) minimum for the Russian River of 7.0 mg/L. However, measurements of dissolved oxygen over a 24 hour period at times fell below the Basin Plan minimum (which is an instantaneous minimum). Diel variations in dissolved oxygen in the Russian River are discussed in a separate section below.

4.1.3 Nitrate above the Laguna

The concentration of nitrate in the Russian River above the confluence with the Laguna ranged from below detection (0.03 mg-N/L) to 2.90 mg-N/L with an average of 0.50 mg-N/L. For concentrations below the detection limit, one half the detection limit was used for calculating averages.

4.1.4 Total Ammonia above the Laguna

The concentration of total ammonia in the Russian River above the confluence with the Laguna ranged from below detection (0.05 mg-N/L) to 0.06 mg-N/L with an average of 0.03 mg-N/L. Only one value of ammonia was detectable. For concentrations below the detection limit, one half the detection limit was used for calculating averages.

4.1.5 Un-ionized Ammonia above the Laguna

The un-ionized form of ammonia is the fraction that is generally toxic to aquatic life. Un-ionized ammonia was calculated from total ammonia using guidelines developed by the San Francisco Regional Water Quality Control Board (SFRWQCB 1991). The concentration of un-ionized ammonia in the Russian River above the confluence with the Laguna was below detection in eight of nine measurements. The one detectable value for un-ionized ammonia was 4.02 µg-N/L. When total ammonia analyses are below detection, un-ionized ammonia (based on total ammonia) is also below detection. Since the fraction of un-ionized ammonia is dependent on total dissolved solids, temperature, and pH, the estimated detection limits for un-ionized ammonia concentrations below detection were variable. None of the un-ionized concentrations exceeded the EPA's guidelines for the protection of aquatic organisms.

4.1.6 Total Kjeldahl Nitrogen above the Laguna

The concentration of TKN in the Russian River above the confluence with the Laguna ranged from 0.10 to 0.50 mg/L with an average of 0.20 mg/L. There was one value below detection with a detection limit equal to the maximum TKN measured. Inclusion (or exclusion) of this high non-detectable value did not alter the average TKN.

4.1.7 Dissolved Orthophosphate above the Laguna

The concentration of dissolved orthophosphate in the Russian River above the confluence with the Laguna ranged from below detection (0.02 mg-P/L) to 0.66 mg-P/L with an average of 0.09 mg-P/L.

4.1.8 Chlorophyll *a* above the Laguna

The concentration of planktonic chlorophyll *a* in the Russian River above the confluence with the Laguna was below detection at all times it was measured.

4.1.9 Metals above the Laguna

The concentration of metals that were found in detectable quantities in the Russian River above the confluence with the Laguna are shown in Table 3 (includes only dates where detectable metals were present). Detectable metals include total barium, chromium, copper, lead, nickel, silver, and zinc. Total and dissolved arsenic, cadmium, mercury, and selenium, and dissolved chromium, copper, lead and silver were not found in detectable concentrations in the River above the confluence with the Laguna. Barium was found in detectable concentrations at Kaiser in the four samples collected in association with the special effluent study. None of the dissolved metals exceeded the EPA criterion for that metal. In May 1994, when dissolved metals were not measured, total metal concentrations did not exceed the EPA metals criteria. Calcium and magnesium were found in detectable concentrations on all occasions that they were measured. The calcium and magnesium data can be found in Appendices 1 and 2.

Table 2.

Water Quality in the Russian River Above the Laguna

Station	Date	Conductivity (µmhos/cm)	DO (mg/L)	Nitrate (mg-N/L)	Total Ammonia (mg-N/L)	Un-ionized ammonia (µg-N/L)	TKN (mg/L)	Ortho- phosphate (mg-P/L)	Chloro- phyll <i>a</i> (mg/L)
Kaiser	20-Sep-94	221	9.0	0.03 ^a	0.05 ^a	1.10 ^a	0.10	0.02 ^a	0.01 ^a
Kaiser	16-Mar-95 ^c	129	9.2	0.16	0.05 ^a	0.20 ^a	0.50	0.66	NA ^b
Kaiser	13-Apr-95	180	9.0	2.90	0.05 ^a	0.49 ^a	0.20	0.04	NA ^b
Kaiser	11-May-95	218	9.0	0.48	0.05 ^a	0.040 ^a	0.50 ^a	0.02 ^a	NA ^b
Kaiser	8-Jun-95	250	9.2	0.33	0.05 ^a	0.018 ^a	0.11	0.03	0.01 ^a
Kaiser	20-Jul-95	242	9.7	0.07	0.06	4.02	0.18	0.03	NA ^b
Kaiser	16-Aug-95	232	9.1	0.03 ^a	0.05 ^a	13.8 ^a	0.12	0.02 ^a	0.01 ^a
Wohler Dam	19-May-94	255	8.9	0.22	0.05 ^a	1.83	0.16	0.02 ^a	0.01 ^a
Wohler Bridge	16-Feb-95	135	10.4	0.31	0.05 ^a	0.31 ^a	0.20	0.04	NA ^b
Average		207	9.3	0.50	0.03		0.20	0.09	

^a The concentration was below the reporting limit. The value shown is the reporting limit. Half the reporting limit was used for calculating averages.

^b Not available.

^c Samples taken during a flood.

Table 3.

Concentration of Metals in the Russian River Above the confluence with the
Laguna (mg/L)

Station	Date	Total Ba	Total Cr	Total Cu	Total Pb	Total Ni	Total Ag	Total Zn	Hardness
Kaiser	27-Oct-94	0.06	-	-	-	-	-	-	-
Kaiser	8-Nov-94	0.08	-	-	-	-	-	-	-
Kaiser	30-Nov-94	0.08	-	-	-	-	-	-	-
Kaiser	14-Dec-94	0.07	-	-	-	-	-	-	-
Kaiser	16-Mar-95	-	0.036	0.019	0.007	0.051	0.001 ^a	0.05 ^a	110
Kaiser	13-Apr-95	-	0.018	0.005	0.002 ^a	0.022	0.001 ^a	0.04	97
Kaiser	11-May-95	-	0.005	0.005 ^a	0.002 ^a	0.005	0.001 ^a	0.03	130
Kaiser	16-Aug-95	-	0.005 ^a	0.005 ^a	0.002 ^a	0.005 ^a	0.003	0.05 ^a	90
Wohler Dam	19-May-94	-	0.005 ^a	0.005 ^a	0.005	0.005 ^a	0.001 ^a	0.01 ^a	NA ^b
Wohler Bridge	16-Feb-95	-	0.011	0.005 ^a	0.003	0.012	0.001 ^a	0.05 ^a	81
average		0.07	0.011	0.0052	0.00327	0.014	0.00109	0.022	102

^a The concentration was below the reporting limit. The value shown is the reporting limit. Half the reporting limit was used for calculating averages.

^b Not available.

4.2 DATA COLLECTED BELOW THE LAGUNA

The concentrations of nutrients, dissolved oxygen, conductivity, and chlorophyll *a* in the Russian River below the confluence with the Laguna during the 1994-95 period covered in this report are shown in Table 4.

4.2.1 Conductivity below the Laguna

Conductivity in the Russian River below the confluence with the Laguna during this study period ranged from 125 to 278 $\mu\text{mhos/cm}$ with an average of 215 $\mu\text{mhos/cm}$. The minimum conductivity at both the Monte Rio and the Oddfellows stations occurred during the March 1995 flood.

4.2.2 Dissolved Oxygen below the Laguna

Dissolved oxygen in the Russian River below the confluence with the Laguna ranged from 7.9 to 10.4 mg/L with an average of 8.9 mg/L. None of the dissolved oxygen measurements taken at the time other

water quality parameters were measured were below the North Coast Region Water Quality Control Plan (Basin Plan) minimum for the Russian River of 7.0 mg/L. However, measurements of dissolved oxygen over a 24-hour period at times fell below the Basin Plan instantaneous minimum. Diel variations in dissolved oxygen in the Russian River are discussed below.

4.2.3 Nitrate below the Laguna

The concentration of nitrate in the Russian River below the confluence with the Laguna ranged from below detection (0.03 mg-N/L) to 1.80 mg-N/L with an average of 0.39 mg-N/L. For concentrations below the detection limit, one half the detection limit was used for calculating averages.

4.2.4 Total Ammonia

The concentration of total ammonia in the Russian River below the confluence with the Laguna ranged from below detection (0.05 mg-N/L) to 0.10 mg-N/L with an average of 0.03 mg-N/L. Only one total ammonia value was detectable. For concentrations below the detection limit, one half the detection limit was used for calculating averages.

4.2.5 Un-ionized Ammonia below the Laguna

The concentration of un-ionized ammonia in the Russian River below the confluence with the Laguna was below detection in fifteen of seventeen measurements. The detectable concentrations of un-ionized ammonia were 0.97 and 1.07 µg-N/L. The detection limit for total ammonia was 0.05 mg-N/L. The variation of the un-ionized ammonia concentrations estimated from total ammonia that was below detection was due to variation in TDS, pH, and temperature of the water at the times the samples were collected. None of the un-ionized concentrations exceeded the EPA's guidelines for the protection of aquatic organisms.

4.2.6 Total Kjeldahl Nitrogen below the Laguna

The concentration of total Kjeldahl nitrogen (TKN) in the Russian River below the confluence with the Laguna ranged from below detection (0.10 or 0.50 mg/L) to 0.70 mg/L with an average of 0.27 mg/L.

4.2.7 Dissolved Orthophosphate below the Laguna

The concentration of dissolved orthophosphate in the Russian River below the confluence with the Laguna ranged from below detection (0.02 mg-P/L) to 0.80 mg-P/L with an average of 0.12 mg-P/L.

4.2.8 Chlorophyll *a* below the Laguna

The concentration of planktonic chlorophyll *a* in the Russian River below the confluence with the Laguna was below detection at all times it was measured.

Table 4.

Water Quality in the Russian River Below the Laguna

Station	Date	Conductivity (µmhos/cm)	DO (mg/L)	Nitrate (mg-N/L)	Total Ammonia (mg-N/L)	Un-ionized ammonia (µg-N/L)	TKN (mg/L)	Ortho- phosphate (mg-P/L)	Chloro- phyll a (mg/L)
Monte Rio	19-May-94	278	8.8	0.11	0.05 ^a	1.59 ^a	0.23	0.05	0.01 ^a
Monte Rio	16-Feb-95	148	10.0	0.45	0.05 ^a	0.39 ^a	0.40	0.09	NA ^b
Monte Rio	16-Mar-95 ^c	125	8.6	0.26	0.10	1.07	0.70	0.55	NA ^b
Monte Rio	13-Apr-95	190	8.0	1.6	0.05 ^a	0.57 ^a	0.30	0.05	NA ^b
Monte Rio	11-May-95	235	9.0	0.5	0.05 ^a	0.037 ^a	0.50 ^a	0.04	NA ^b
Monte Rio	8-Jun-95	218	10.4	0.14	0.05 ^a	0.16 ^a	0.15	0.02	0.01 ^a
Monte Rio	20-Jul-95	260	8.5	0.03 ^a	0.05 ^a	1.18 ^a	0.13	0.04	NA ^b
Monte Rio	16-Aug-95	238	7.9	0.03 ^a	0.05 ^a	1.46 ^a	0.47	0.02 ^a	0.01 ^a
Oddfellows	19-May-94	275	8.4	0.14	0.05 ^a	0.42 ^a	0.27	0.04	0.01 ^a
Oddfellows	20-Sep-94	218	8.9	0.03 ^a	0.05 ^a	1.03 ^a	0.10 ^a	0.02 ^a	0.01 ^a
Oddfellows	16-Feb-95	147	10.0	0.53	0.05 ^a	0.31 ^a	0.30	0.09	NA ^b
Oddfellows	13-Apr-95	200	8.9	1.8	0.05 ^a	0.57 ^a	0.10 ^a	0.08	NA ^b
Oddfellows	11-May-95	233	8.8	0.5	0.05 ^a	0.037 ^a	0.50 ^a	0.04	NA ^b
Oddfellows	8-Jun-95	261	9.7	0.21	0.05 ^a	0.16 ^a	0.12	0.03	0.01 ^a
Oddfellows	20-Jul-95	258	8.7	0.08	0.05 ^a	1.18 ^a	0.16	0.04	NA ^b
Oddfellows	16-Aug-95	238	7.9	0.05	0.05 ^a	9.59 ^a	0.10 ^a	0.02 ^a	0.01 ^a
Hacienda	16-Mar-95 ^c	132	8.6	0.25	0.09	0.97	0.70	0.80	NA ^b
Average		215	8.9	0.39	0.03		0.27	0.12	

^a The concentration was below the reporting limit. The value shown is the reporting limit. Half the reporting limit was used for calculating averages.

^b Not available.

^c Samples taken during a flood.

4.2.9 Metals Below the Laguna

The concentration of metals that were found in detectable quantities in the Russian River below the confluence with the Laguna are shown in Table 5 (includes only dates where detectable metals were present). These metals include total chromium, copper, lead, nickel, silver, and zinc, and dissolved nickel and zinc. Total and dissolved arsenic, cadmium, mercury, and selenium, and dissolved chromium, copper, lead, and nickel were not found in detectable concentrations in the River below the confluence with the Laguna. None of the dissolved metals found in detectable concentrations exceeded the EPA criterion for that metal. In May 1994, when dissolved metals were not measured, total metal

concentrations did not exceed the EPA metals criteria. Calcium and magnesium were found in detectable concentrations on all occasions that they were measured. The calcium and magnesium data can be found in Appendices 1 and 2.

Table 5.

Concentration of Detectable Metals in the Russian River Below the Confluence with the Laguna
(mg/L)

Station	Date	Total Cr	Total Cu	Total Pb	Total Ni	Dissolved Ni	Total Ag	Total Zn	Dissolved Zn	Hardness
Monte Rio	16-Feb-95	0.011	0.007	0.002	0.016	0.005	0.001 ^a	0.02	0.09	88
Monte Rio	16-Aug-95	0.005 ^a	0.005 ^a	0.003	0.005 ^a	0.005 ^a	0.001 ^a	0.05 ^a	0.05 ^a	100
Oddfellows	19-May-94	0.005 ^a	0.005 ^a	0.002 ^a	0.005 ^a	NA ^b	0.001 ^a	0.01	NA ^b	NA ^b
Oddfellows	20-Sep-94	0.005 ^a	0.005 ^a	0.002 ^a	0.005 ^a	0.005 ^a	0.001 ^a	0.01	0.01	94
Oddfellows	16-Feb-95	0.010	0.005 ^a	0.003	0.013	0.005 ^a	0.001 ^a	0.01	0.07	81
Oddfellows	13-Apr-95	0.010	0.005	0.002 ^a	0.015	0.005 ^a	0.001 ^a	0.13	0.05 ^a	100
Oddfellows	11-May-95	0.005 ^a	0.005 ^a	0.002 ^a	0.005 ^a	0.005 ^a	0.001	0.02	0.05 ^a	120
Hacienda	16-Mar-95	0.026	0.013	0.009	0.049	0.005 ^a	0.001 ^a	0.05 ^a	0.05 ^a	95
average		0.008	0.004	0.002	0.011	0.003	0.001	0.03	0.04	97

^a The concentration was below the reporting limit. The value shown is the reporting limit. Half the reporting limit was used for calculating averages.

^b Not available.

4.3 ORGANIC COMPOUNDS

The concentrations of organic compounds in the Russian River above the Laguna were measured on four occasions in October through December 1994 to provide baseline data for a human health risk assessment (Parsons ES 1995). The only detectable organic compounds were found in the Russian River at Kaiser Beach on 14 December 1994. These organics were di(2-ethylhexyl)phthalate (0.70 µg/L) and simazine (0.08 µg/L). The concentration of di(2-ethylhexyl)phthalate does not exceed the EPA guideline for phthalate esters of 3.0 µg/L. There is no water quality standard for the protection of aquatic organisms for simazine.

4.4 DIEL DISSOLVED OXYGEN

The results of the five diel dissolved oxygen studies on the Russian River are presented in Figures 2-6. Dissolved oxygen in the Russian River during 18-20 May 1994 ranged from 7.1 to 8.7 mg/L at Oddfellows and 6.6 to 9.3 mg/L at Monte Rio (Figure 2). Dissolved oxygen at Monte Rio fell below the

Basin Plan minimum for the Russian River of 7.0 mg/L on both mornings of this study. It is not specified in the Basin Plan whether the dissolved oxygen minimum is an instantaneous minimum or a time average minimum. The more stringent instantaneous minimum is assumed here.

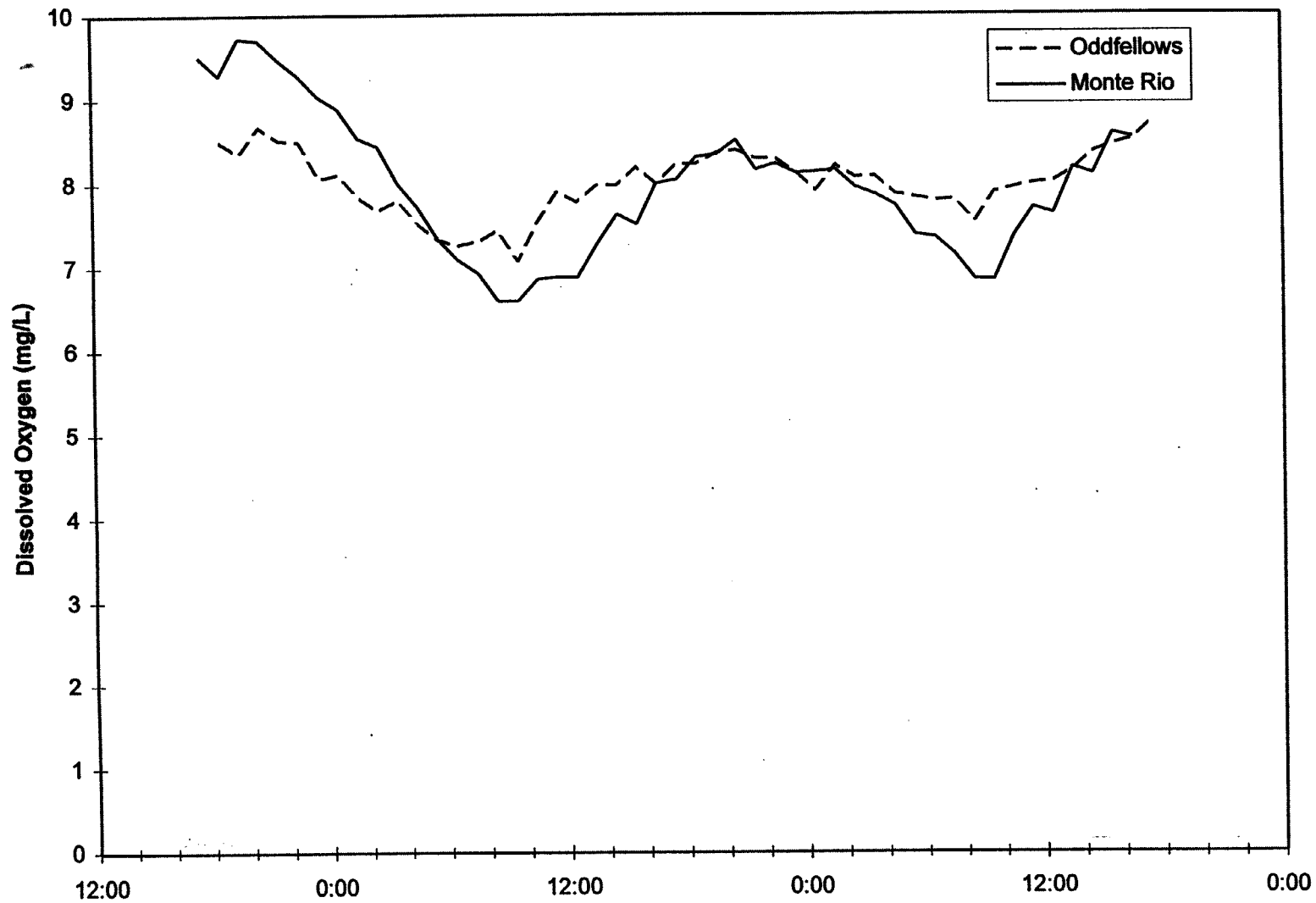
Dissolved oxygen in the Russian River during 19-20 July 1994 ranged from 7.7 to 9.3 mg/L at Kaiser beach and from 6.8 to 7.7 mg/L at Oddfellows (Figure 3). Dissolved oxygen at Oddfellows fell below the Basin Plan minimum on the one night/early morning of the study.

Dissolved oxygen in the Russian River during 12-16 September 1994 ranged from 6.8 to 9.1 mg/L at Kaiser beach and from 7.1 to 8.3 mg/L at Monte Rio (Figure 4). Dissolved oxygen at Kaiser fell below the Basin Plan minimum on the last morning of the study.

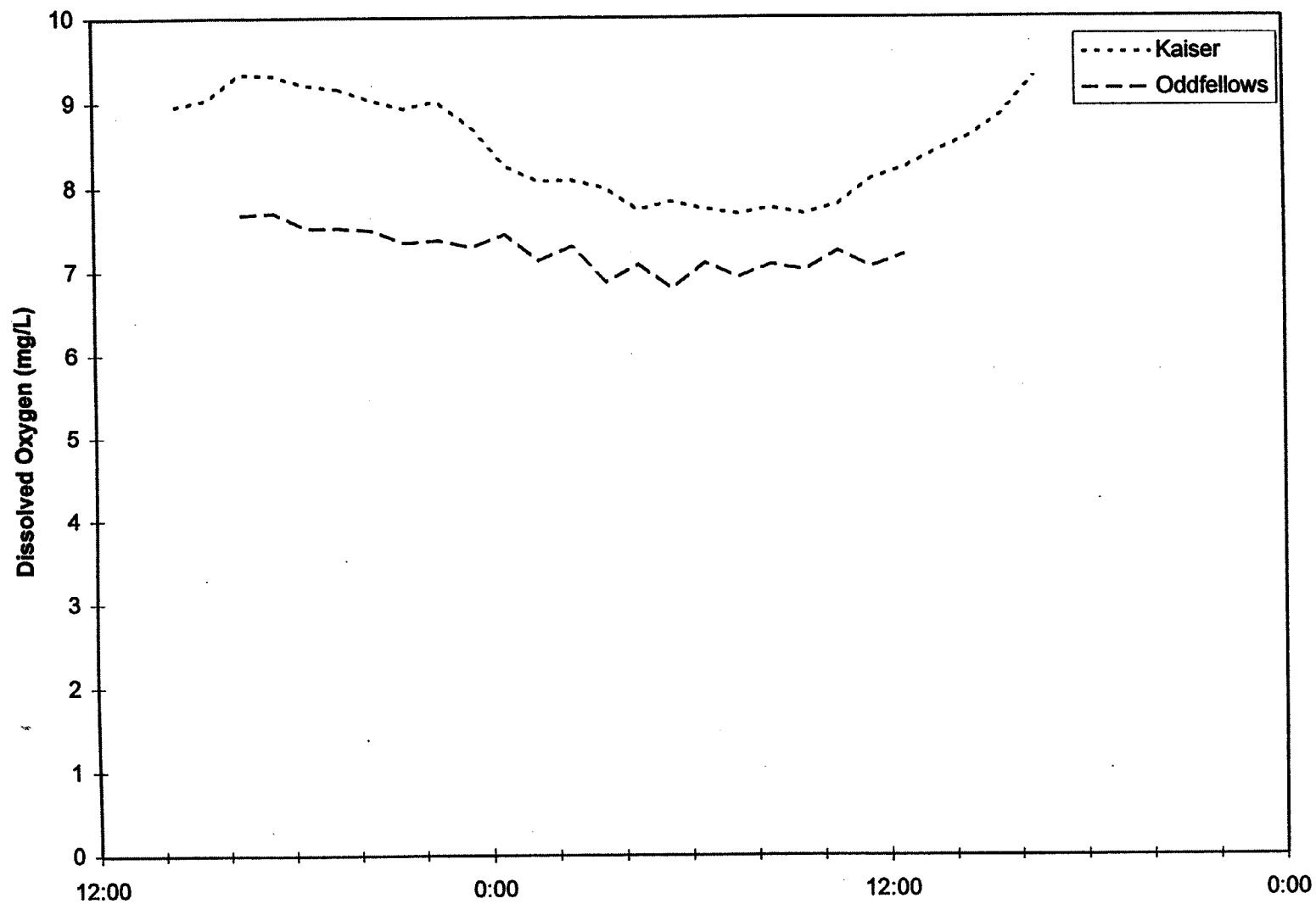
Dissolved oxygen in the Russian River in May 1995 was very constant, ranging from 8.4 to 8.6 mg/L at Kaiser, 8.3 to 9.4 mg/L at Oddfellows, and 8.4 to 9.5 at Monte Rio (Figure 5). No dissolved oxygen measurements were below the Basin Plan minimum of 7.0 mg/L.

Dissolved oxygen in the Russian River during 9-11 August 1995 (Figure 6) ranged from 7.1 to 9.4 mg/L at Kaiser, 6.9 to 8.0 mg/L at Oddfellows, and 7.0 to 8.8 mg/L at Monte Rio. Dissolved oxygen at Oddfellows fell to slightly below the Basin Plan minimum on both mornings of the study.

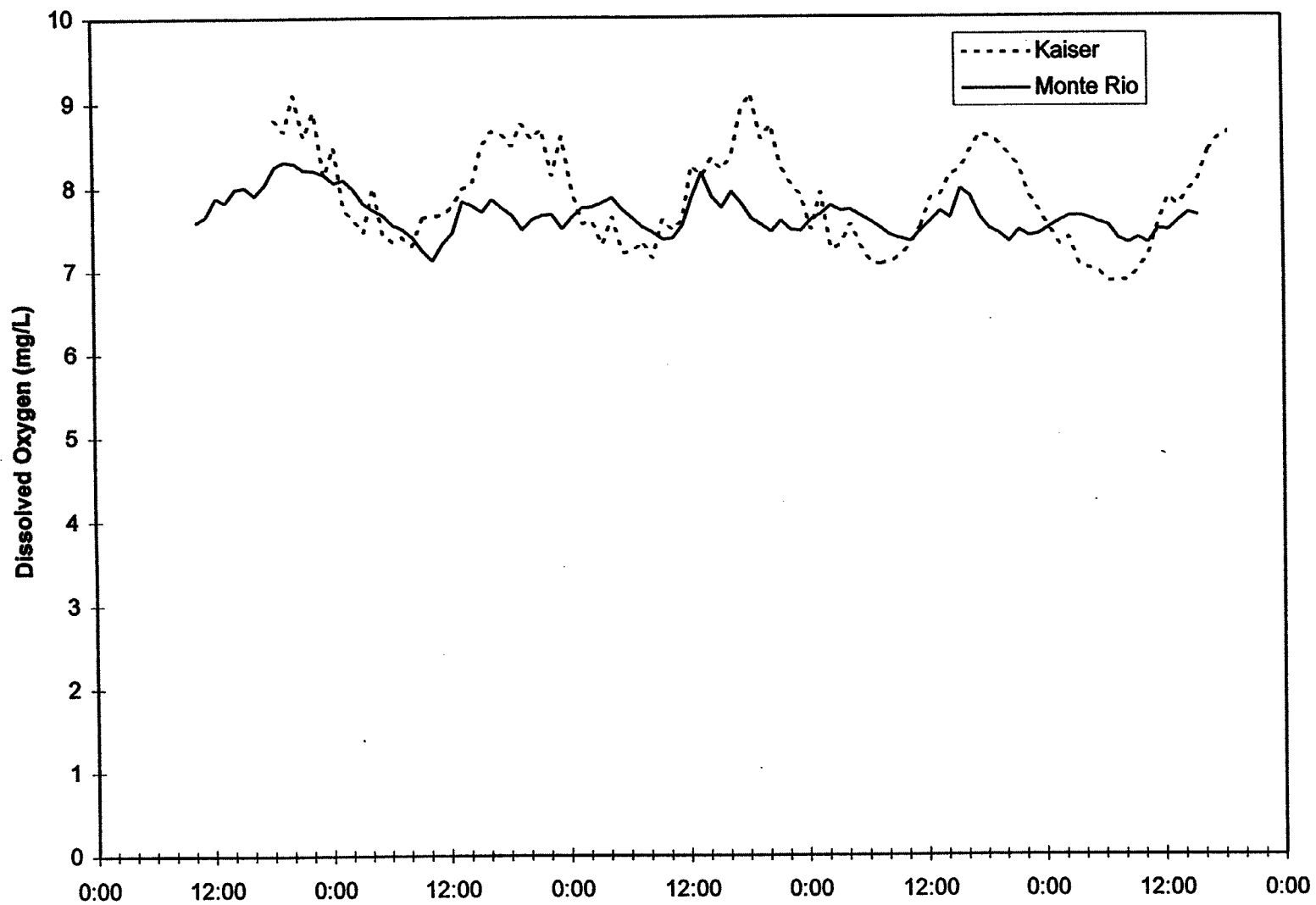
**Figure 2. Dissolved Oxygen in the Russian River
May 18-20 1994**

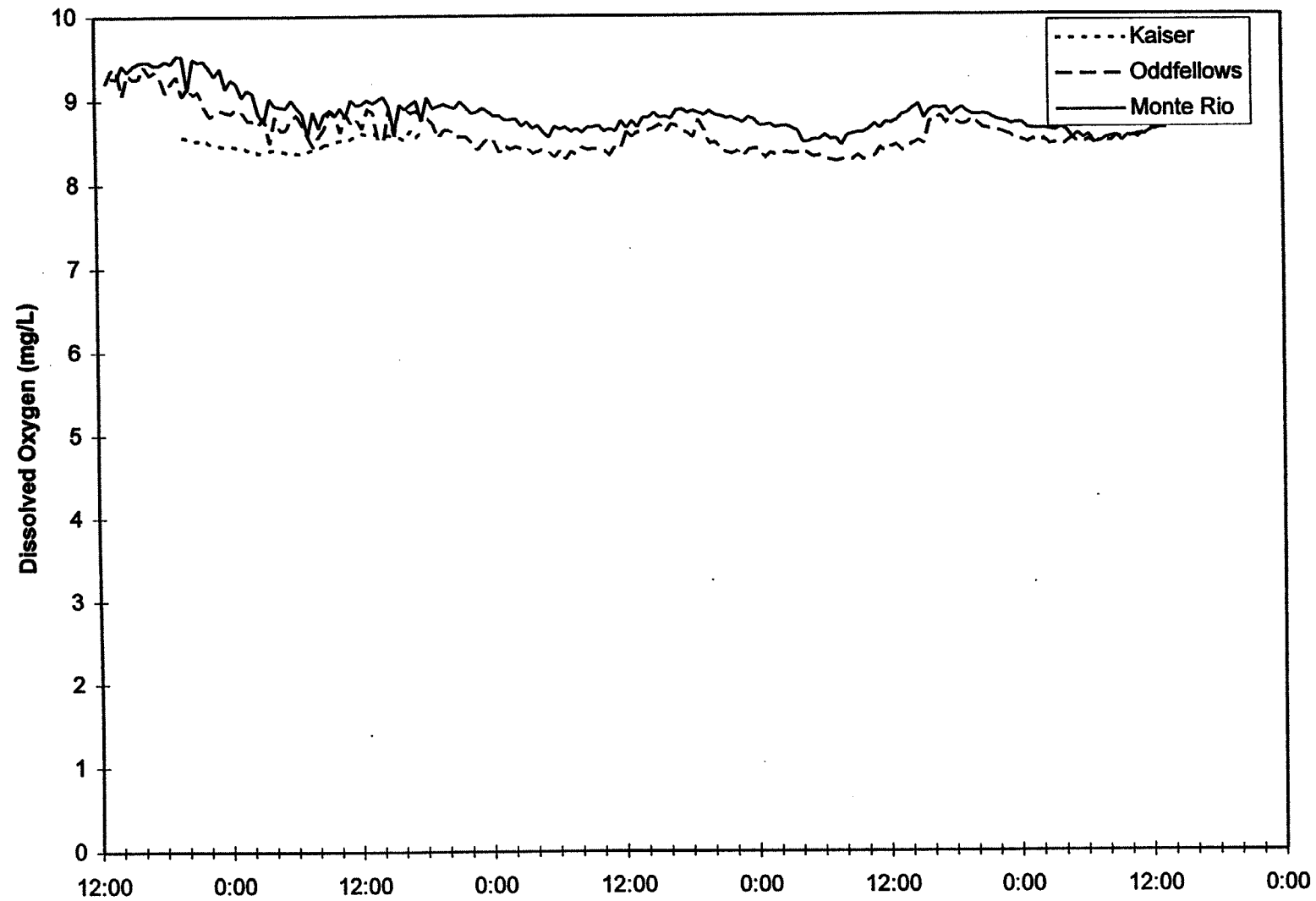


**Figure 3. Dissolved Oxygen in the Russian River
July 19-20 1994**

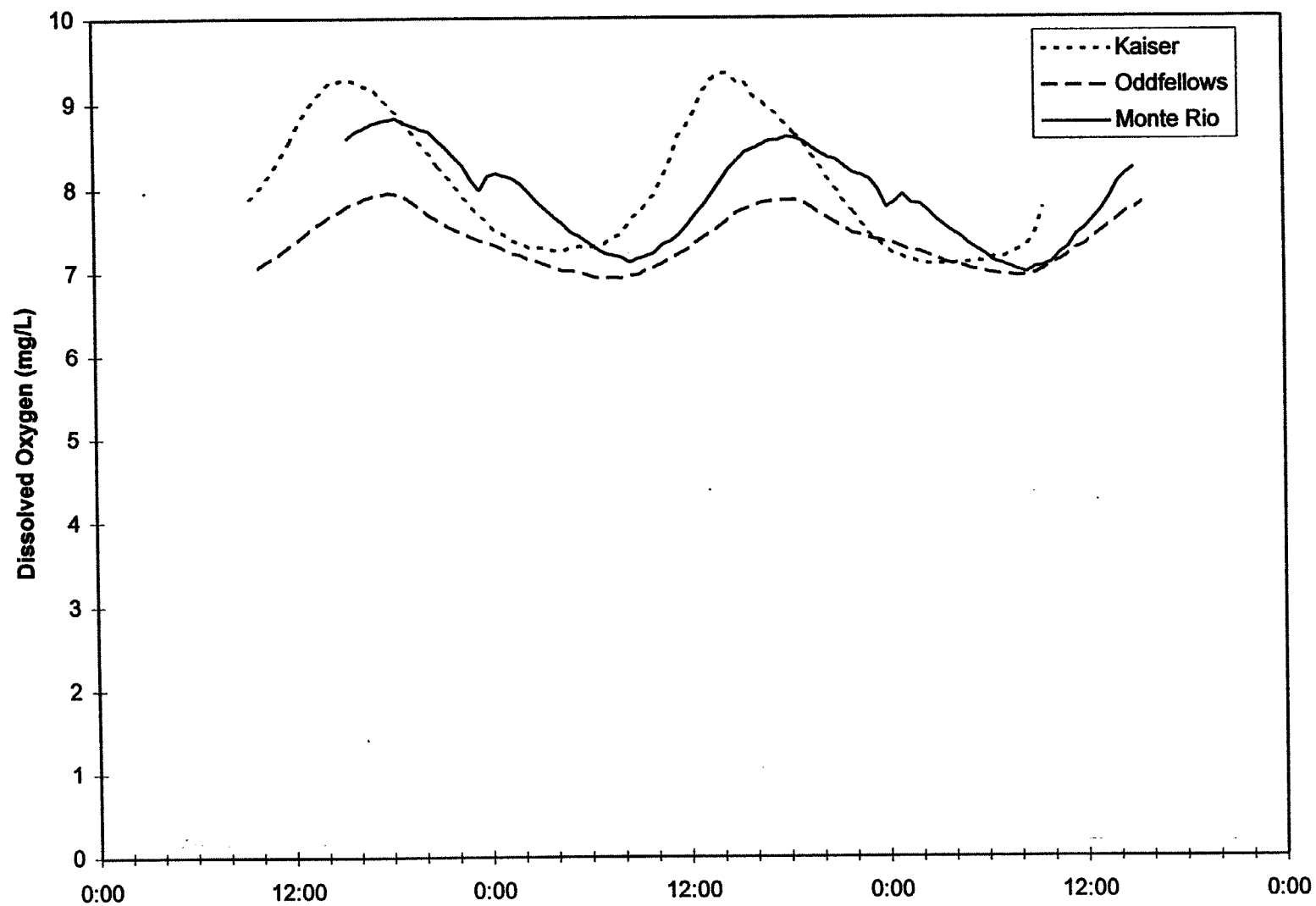


**Figure 4. Dissolved Oxygen in the Russian River
September 12-16 1994**



May 1995

**Figure 6. Dissolved Oxygen in the Russian River
August 9-11 1995**



5.0 SUMMARY OF RUSSIAN RIVER WATER QUALITY DATA

This presents a summary of existing Russian River water quality data. Existing water quality data includes the data reported here for the first time and pre-existing data most of which was collected by the North Coast Regional Water Quality Control Board (Regional Board).

5.1 WATER QUALITY CONSTITUENTS (OTHER THAN METALS AND ORGANICS)

Water quality data were collected on the Russian River by the Regional Board between September 1985 through October 1993 and in the summer of 1995. The averages presented in this section include the water quality data collected by the Long-Term EIR/S Project Team in May 1994 through August 1995 (summarized previously in this report). Additional bacteriological data were obtained from Sonoma County Water Agency and from the County of Sonoma Environmental Health Department.

Table 6 contains a summary of data (other than metals and organics discussed later in this report) from stations representative of conditions in the River above and below the confluence with the Laguna. These stations are Healdsburg Memorial Beach, Kaiser Beach, and Wohler Bridge above the Laguna; and Oddfellows Bridge, Johnson's Beach and Monte Rio below the Laguna. The complete data sets are presented in Appendices 1, 3, 4, and 5. Regional Board Sampling Locations are given in Appendix 9.

Table 6.

Average Seasonal Water Quality in the Russian River

	Above Laguna				Below Laguna			
	Winter	Spring	Summer	Fall	Winter	Spring	Summer	Fall
Conductivity (µmhos/cm)	247	244	268	235	289	257	261	234
Turbidity (NTU)	4.45	8.86	3.28	0.88	9.16	9.38	3.90	1.13
Dissolved oxygen (mg/L)	11.6	9.8	8.8	9.4	11.8	9.5	8.7	9.4
Nitrate (mg-N/L)	0.29	0.32	0.07	0.04	0.56	0.41	0.08	0.04
Ammonia (mg-N/L)	0.04	0.03	0.04	0.04	0.12	0.05	0.03	0.07
TKN (mg /L)	0.25	0.18	0.23	0.23	0.28	1.15	0.26	0.21
Dissolved orthophosphate (mg-P/L)	0.02	0.03	0.01	0.01	0.20	0.10	0.04	0.03
Chlorophylla (mg/L)	0.002	0.008	0.031	0.003	0.005	0.012	0.022	0.002
Total coliforms (mpn/100 ml) [‡]	706	306	248	104	737	210	292	302
Fecal coliforms (mpn/100 ml) [‡]	53	46	147	18	169	28	44	17
^a geometric means								

5.2 METALS

In addition to the metals samples collected in 1994-95 described previously, samples for total metals analysis were collected by the Regional Board in 1985-86 and October 1992. The only detectable metal in the Regional Board samples was total zinc which was found in detectable concentrations on two dates at Wohler Bridge (above the Laguna). The concentrations of all other metals were below detection. Table 7 presents the average concentrations for detectable metals above and below the Laguna using both the 1985-86 and 1994-95 data. Stations used are Healdsburg Memorial Beach, Kaiser Beach, and Wohler Bridge above the Laguna and Oddfellows Bridge, Johnson's Beach and Monte Rio below the Laguna. Non-detectable data for which the detection limit is greater than four times the maximum detectable value were not included in averages. Complete data are presented in Appendices 1, 2 and 6.

Table 7.

Average Concentrations of Metals in the Russian River Found in
Detectable Concentrations(mg/L).

Station	Below the Laguna ^a	Above the Laguna ^a
Total barium	NA ^b	0.073
Total chromium	0.0060	0.0081
Total copper	0.0076	0.0083
Total lead	0.0024	0.0020
Total nickel	0.0109	0.0167
Dissolved nickel	0.0028	ND ^c
Total silver	0.0006	0.0014
Total zinc	0.0150	0.0150
Dissolved zinc	0.0900	ND

^a Half the reporting limit was used for calculating averages for data below detection.

^b NA = no data available

^c ND = all data below detection

5.3 ORGANICS

Samples for the analysis of organic compounds in the Russian River were conducted by the Regional Board in 1985-86 and October 1992. The concentration of organic compounds in the Russian River were also measured on four occasions in October through December 1994. The only detectable organic compounds were found in the Russian River at Kaiser Beach (above the Laguna) on 14 December 1994. These organics were di(2-ethylhexyl)phthalate (0.70 µg/L) and simazine (0.08 µg/L). Complete data are presented in Appendices 2 and 7.

The California Environmental Protection Agency Department of Pesticide Regulation (in cooperation with the California Department of Fish and Game) is conducting a study to monitor pesticides in four California rivers including the Russian River (Cal EPA 1995). The results to date have been summarized in memoranda from Carissa Ganapathy, Department of Pesticide Regulation dated 7 June 1995 and 3 October 1995. Copies of these memoranda are presented in Appendix 7. Samples were collected in the Russian River about one mile upstream of Highway 116 Bridge in Guerneville between August 1994 through August 1995. Dimethoate and diazinon were found in detectable concentrations on one occasion each (0.11 and 0.076 $\mu\text{g/L}$, respectively). No other pesticides were found in detectable concentrations.

6.0 REFERENCES

- California Environmental Protection Agency Department of Pesticide Regulation June, and October 1995. Four River Monitoring Study, Russian River Semiannual Reports.
- Merritt Smith Consulting 1994. Field Sampling and Quality Assurance Project Plan (QAPP), Effluent and Receiving Water Quality Characterization.
- Merritt Smith Consulting 1996. *Russian River Water Quality Model* Technical Report. Santa Rosa Subregional Long-Term Wastewater Project.
- Merritt Smith Consulting 1996. *Water Quality Impacts Analysis* Technical Report. Santa Rosa Subregional Long-Term Wastewater Project.
- North Coast Regional Water Quality Control Board 1994. Water Quality Control Plan for the North Coast Region.
- Parsons Engineering Science, Inc. 1996. *Human Health Risks from Chemical and Biological Components of Reclaimed Water* Technical Report. Santa Rosa Subregional Long-Term Wastewater Project.
- San Francisco Bay Regional Water Quality Control Board 1991. Instructions for calculating the unionized fraction of ammonia from total ammonia concentrations. Appendix B of the Water Quality Control Plan. San Francisco Bay Basin Region (2).
- U.S. Environmental Protection Agency 1986. Quality Criteria for Water 1986. Update #1.
- U.S. Environmental Protection Agency. 1995. 40 CFR Part 131. Interim Final Rule: Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants; States' Compliance-Revision of Metals Criteria. Vol. 60, No. 086, Part IV, 60 FR 22229.

7.0 APPENDICES

Appendix 1
Russian River Water Quality - 1994-95 Data

5/13/96

* after a number indicates below reporting limit. Number shown is reporting limit

Station	Date	Temp C	DO ppm	pH	Condo µmhos/cm	TDS mg/L	TSS mg/L	Nitrate mg-N/L	Nitrite mg/L	Total Ammonia mg-N/L	Un-Ioniz Ammon µgN-L	TKN mg-N/L
Healdsburg Beach	13-Jul-94											
Kaiser	20-Sep-94	20.1	9	8.1	221	160	4 *	0.03 *		0.05 *	0.82	0.1
Kaiser storm	16-Mar-95	14	9.2	7.5	129			0.16	0.12	0.05 *	0.18	0.5
Kaiser	13-Apr-95	13.5	9	7.9	180			2.9	0.03 *	0.05 *	0.46	0.2
Kaiser	11-May-95	16.9	9	6.7	218			0.48	0.03 *	0.05 *	0.037	0.5 *
Kaiser	8-Jun-95	20	9.2	6.3	250	170		0.33	0.03 *	0.05 *	0.014	0.11
Kaiser	20-Jul-95	23	9.7	8.2	242	160		0.07	0.03 *	0.06	4.02	0.18
Kaiser	16-Aug-95	22.5	9.1	9.4	232	86		0.03 *		0.05 *	13.8	0.12
Wohler Dam	19-May-94	17.8	8.9	8.4	255	180	5.6	0.22		0.05 *	1.59	0.16
Wohler Bridge	16-Feb-95	11	10.4	7.8	135			0.31	0.03 *	0.05 *	0.31	0.2
Monte Rio	19-May-94	18.2	8.8	8.4	278	200	4 *	0.11		0.05 *	1.59	0.23
Monte Rio	16-Feb-95	11	10	7.9	148			0.45	0.03 *	0.05 *	0.39	0.4
Monte Rio storm	16-Mar-95	14.5	8.6	7.6	125			0.26	0.11	0.1	1.07	0.7
Monte Rio	13-Apr-95	14	8	8	190			1.6	0.03 *	0.05 *	0.57	0.3
Monte Rio	11-May-95	18.1	9	6.7	235			0.5	0.03 *	0.05 *	0.04	0.5 *
Monte Rio	8-Jun-95	20.2	10.4	7.4	218	170		0.14	0.03 *	0.05 *	0.16	0.15
Monte Rio	20-Jul-95	22	8.5	8.1	260	170		0.03 *	0.03 *	0.05 *	1.18	0.13
Monte Rio	16-Aug-95	21.5	7.85	8.2	238	150		0.03 *		0.05 *	1.46	0.47
Oddfellows	19-May-94	18	8.4	7.8	275	210	6.8	0.14		0.05 *	0.42	0.27
Oddfellows	20-Sep-94	20.5	8.9	8.2	218	150	4 *	0.03 *		0.05 *	1.03	0.1 *
Oddfellows	16-Feb-95	11	10	7.8	147			0.53	0.03 *	0.05 *	0.31	0.3
Oddfellows	13-Apr-95	13.8	8.9	8	200			1.8	0.03 *	0.05 *	0.57	0.1 *
Oddfellows	11-May-95	17.4	8.8	6.7	233			0.5	0.03 *	0.05 *	0.04	0.5 *
Oddfellows	8-Jun-95	20.3	9.7	7.4	261	180		0.21	0.03 *	0.05 *	0.16	0.12
Oddfellows	20-Jul-95	22	8.7	8.1	258	160		0.08	0.03 *	0.05 *	1.18	0.16
Oddfellows	16-Aug-95	21.5	7.9	9.2	238	150		0.05		0.05 *	9.59	0.1 *
Hacienda storm	16-Mar-95	14.5	8.6	7.6	132			0.25	0.11	0.09	0.97	0.7
Johnson's Beach	13-Jul-94											

Appendix 1

Russian River Water Quality - 1994-95 Data

* after a number indicates below reporting limit. Number shown is reporting limit

Station	Date	Ortho P mg-P/L	total P mg-P/L	TOC mg/L	DOC mg/L	Chlor a mg/L	Phaeoph mg/L	Total Coliform mpn/100m	Fecal Coliform mpn/100m	Hardness (CaCO3) mg/L	Total As mg/L
Healdsburg Beach	13-Jul-94							240	130		
Kaiser	20-Sep-94	0.02 *	0.02	1.3		0.01 *	0.01 *			99	
Kaiser storm	16-Mar-95	0.66		2.1	1.9					110	0.005 *
Kaiser	13-Apr-95	0.04		1	1					97	0.005 *
Kaiser	11-May-95	0.02 *		1 *	1.5					130	0.005 *
Kaiser	8-Jun-95	0.03				0.01 *	0.01 *				
Kaiser	20-Jul-95	0.03									
Kaiser	16-Aug-95	0.02 *		1.5	1.6	0.01 *	0.01 *			90	0.005 *
Wohler Dam	19-May-94	0.02 *	0.03	1.1		0.01 *		3500	490		
Wohler Bridge	16-Feb-95	0.04		2	1.9					81	0.005 *
Monte Rio	19-May-94	0.05	0.13	1.1		0.01 *		350	130		
Monte Rio	16-Feb-95	0.09		2.8	2.8					88	0.005 *
Monte Rio storm	16-Mar-95	0.55									
Monte Rio	13-Apr-95	0.05									
Monte Rio	11-May-95	0.04									
Monte Rio	8-Jun-95	0.02				0.01 *	0.01 *				
Monte Rio	20-Jul-95	0.04									
Monte Rio	16-Aug-95	0.02 *		2	2	0.01 *	0.01 *			100	0.005 *
Oddfellows	19-May-94	0.04	0.08	0.5 *		0.01 *		240	33		
Oddfellows	20-Sep-94	0.02 *	0.03	1.4		0.01 *	0.01 *			94	
Oddfellows	16-Feb-95	0.09		3.2	2.8					81	0.005 *
Oddfellows	13-Apr-95	0.08		2	3					100	0.005 *
Oddfellows	11-May-95	0.04		1 *	1 *					120	0.005 *
Oddfellows	8-Jun-95	0.03				0.01 *	0.01 *				
Oddfellows	20-Jul-95	0.04									
Oddfellows	16-Aug-95	0.02 *		2	2	0.01 *	0.01 *			100	0.005 *
Hacienda storm	16-Mar-95	0.8		3.7	3.1					95	0.005 *
Johnson's Beach	13-Jul-94							240	130		

Appendix 1
Russian River Water Quality - 1994-95 Data

5/13/96

* after a number indicates below reporting limit. Number shown is reporting limit

Station	Date	Dissolved As mg/L	Total Cd mg/L	Dissolved Cd mg/L	Ca	Total Cr mg/L	Dissolved Cr mg/L	Total Cr+6 mg/l	Dissolved Cr+6 mg/L	Total Cu mg/L	Dissolved Cu mg/L
Healdsburg Beach	13-Jul-94										
Kaiser	20-Sep-94		0.0005 *	0.0005 *	20	0.005 *	0.005 *			0.005 *	0.005 *
Kaiser storm	16-Mar-95	0.005 *	0.0005 *	0.0005 *	17	0.036	0.005 *			0.019	0.005 *
Kaiser	13-Apr-95	0.005 *	0.0005 *	0.0005 *	19	0.018	0.005 *			0.005	0.005 *
Kaiser	11-May-95	0.005 *	0.0005 *	0.0005 *	26	0.005	0.005 *			0.005 *	0.005 *
Kaiser	8-Jun-95										
Kaiser	20-Jul-95										
Kaiser	16-Aug-95	0.005 *	0.0005 *	0.0005 *	18	0.005 *	0.005 *			0.005 *	0.005 *
Wohler Dam	19-May-94		0.0005 *			0.005 *				0.005 *	
Wohler Bridge	16-Feb-95	0.005 *	0.0005 *	0.0005 *	16	0.011	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *
Monte Rio	19-May-94		0.0005 *			0.005 *				0.005 *	
Monte Rio	16-Feb-95	0.005 *	0.0005 *	0.0005 *	17	0.011	0.005 *	0.005 *	0.005 *	0.007	0.005 *
Monte Rio storm	16-Mar-95										
Monte Rio	13-Apr-95										
Monte Rio	11-May-95										
Monte Rio	8-Jun-95										
Monte Rio	20-Jul-95										
Monte Rio	16-Aug-95	0.005 *	0.0005 *	0.0005 *	19	0.005 *	0.005 *			0.005 *	0.005 *
Oddfellows	19-May-94		0.0005 *			0.005 *				0.005 *	
Oddfellows	20-Sep-94		0.0005 *	0.0005 *	18	0.005 *	0.005 *			0.005 *	0.005 *
Oddfellows	16-Feb-95	0.005 *	0.0005 *	0.0005 *	16	0.01	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *
Oddfellows	13-Apr-95	0.005 *	0.0005 *	0.0005 *	20	0.01	0.005 *			0.005	0.005 *
Oddfellows	11-May-95	0.005 *	0.0005 *	0.0005 *	24	0.005 *	0.005 *			0.005 *	0.005 *
Oddfellows	8-Jun-95										
Oddfellows	20-Jul-95										
Oddfellows	16-Aug-95	0.005 *	0.0005 *	0.0005 *	19	0.005 *	0.005 *			0.005 *	0.005 *
Hacienda storm	16-Mar-95	0.005 *	0.0005 *	0.0005 *	15	0.026	0.005 *			0.013	0.005 *
Johnson's Beach	13-Jul-94										

Appendix 1

Russian River Water Quality - 1994-95 Data

* after a number indicates below reporting limit. Number shown is reporting limit

Station	Date	Total Pb mg/L	Dissolved Pb mg/L	Mg mg/L	Total Hg mg/L	Dissolved Hg mg/L	Total Ni mg/L	Dissolved Ni mg/L	Total Se mg/L	Dissolved Se mg/L	Total Ag mg/L
Healdsburg Beach	13-Jul-94										
Kaiser	20-Sep-94	0.002 *	0.002 *	12			0.005 *	0.005 *			0.001 *
Kaiser storm	16-Mar-95	0.007	0.002 *	17	0.0005 *	0.0005 *	0.051	0.005 *	0.005 *	0.005 *	0.001 *
Kaiser	13-Apr-95	0.002 *	0.002 *	12	0.0005 *	0.0005 *	0.022	0.005 *	0.005 *	0.005 *	0.001 *
Kaiser	11-May-95	0.002 *	0.002 *	16	0.0002 *	0.0002 *	0.005	0.005 *	0.005 *	0.005 *	0.001 *
Kaiser	8-Jun-95										
Kaiser	20-Jul-95										
Kaiser	16-Aug-95	0.002 *	0.002 *	11	0.0002 *	0.0002 *	0.005 *	0.005 *			0.003
Wohler Dam	19-May-94	0.005					0.005 *				0.001 *
Wohler Bridge	16-Feb-95	0.003	0.002 *	10	0.0005 *	0.0005 *	0.012	0.005 *	0.005 *	0.005 *	0.001 *
Monte Rio	19-May-94	0.002 *					0.005 *				0.001 *
Monte Rio	16-Feb-95	0.002	0.002 *	11	0.0005 *	0.0005 *	0.016	0.005	0.005 *	0.005 *	0.001 *
Monte Rio storm	16-Mar-95										
Monte Rio	13-Apr-95										
Monte Rio	11-May-95										
Monte Rio	8-Jun-95										
Monte Rio	20-Jul-95										
Monte Rio	16-Aug-95	0.003	0.002 *	12	0.0002 *	0.0002 *	0.005 *	0.005 *			0.001 *
Oddfellows	19-May-94	0.002 *					0.005 *				0.001 *
Oddfellows	20-Sep-94	0.002 *	0.002 *	12			0.005 *	0.005 *			0.001 *
Oddfellows	16-Feb-95	0.003	0.002 *	10	0.0005 *	0.0005 *	0.013	0.005 *	0.005 *	0.005 *	0.001 *
Oddfellows	13-Apr-95	0.002 *	0.002 *	13	0.0005 *	0.0005 *	0.015	0.005 *	0.005 *	0.005 *	0.001 *
Oddfellows	11-May-95	0.002 *	0.002 *	15	0.0002 *	0.0002 *	0.005 *	0.005 *	0.005 *	0.005 *	0.001
Oddfellows	8-Jun-95										
Oddfellows	20-Jul-95										
Oddfellows	16-Aug-95	0.002 *	0.002 *	12	0.0002 *	0.0002 *	0.005 *	0.005 *			0.001 *
Hacienda storm	16-Mar-95	0.009	0.002 *	14	0.0005 *	0.0005 *	0.049	0.005 *	0.005 *	0.005 *	0.001 *
Johnson's Beach	13-Jul-94										

Appendix 1
Russian River Water Quality - 1994-95 Data

5/13/96

* after a number indicates below reporting limit. Number shown is reporting limit

Station	Date	Dissolved Ag mg/L		Total Zn mg/L		Dissolved Zn mg/L	
Healdsburg Beach	13-Jul-94						
Kaiser	20-Sep-94	0.001 *		0.01 *		0.01 *	
Kaiser storm	16-Mar-95	0.001 *		0.05 *		0.06 *	
Kaiser	13-Apr-95	0.001 *		0.04		0.05 *	
Kaiser	11-May-95	0.001 *		0.03		0.05 *	
Kaiser	8-Jun-95						
Kaiser	20-Jul-95						
Kaiser	16-Aug-95	0.001		0.05 *		0.05 *	
Wohler Dam	19-May-94			0.01 *			
Wohler Bridge	16-Feb-95	0.001 *		0.05 *		0.05 *	
Monte Rio	19-May-94			0.01 *			
Monte Rio	16-Feb-95	0.001 *		0.02		0.09	
Monte Rio storm	16-Mar-95						
Monte Rio	13-Apr-95						
Monte Rio	11-May-95						
Monte Rio	8-Jun-95						
Monte Rio	20-Jul-95						
Monte Rio	16-Aug-95	0.001 *		0.05 *		0.05 *	
Oddfellows	19-May-94			0.01			
Oddfellows	20-Sep-94	0.001 *		0.01		0.01	
Oddfellows	16-Feb-95	0.001 *		0.01		0.07	
Oddfellows	13-Apr-95	0.001 *		0.13		0.05 *	
Oddfellows	11-May-95	0.001 *		0.02		0.05 *	
Oddfellows	8-Jun-95						
Oddfellows	20-Jul-95						
Oddfellows	16-Aug-95	0.001 *		0.05 *		0.05 *	
Hacienda storm	16-Mar-95	0.001 *		0.05 *		0.05 *	
Johnson's Beach	13-Jul-94						

Santa Rosa 1994 Effluent Study						
Organic and other constituents of concern in drinking water						
* after a constituent indicates the substance was below detection. Number shown is reporting limit.						
RR @ Kaiser						
		27-Oct-94	8-Nov-94	30-Nov-94	14-Dec-94	
Constituent	Units	Results	Results	Results	Results	
Inorganics						
Asbestos	(MFL)	34.2	27.1	198	5490	
Cyanide	mg/l	0.005 *	0.005 *	0.005 *	0.005 *	
Fluoride	mg/l	0.1 *	0.1 *	0.1 *	0.1 *	
Nitrate-N by IC	mg/l	0.1 *	0.1 *	0.2	0.5	
Nitrite, Nitrogen by IC	mg/l	0.1 *	0.1 *	0.1 *	0.1 *	
Silica	mg/l				16	
Total Dissolved Solids	mg/l		130			
Organics						
1,1,1,2-Tetrachloroethane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
1,1,1-Trichloroethane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
1,1,2,2-Tetrachloroethane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
1,1,2-Trichloroethane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
1,1-Dichloroethane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
1,1-Dichloroethylene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
1,1-Dichloropropene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
1,2,3-Trichlorobenzene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
1,2,3-Trichloropropane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
1,2,4-Trichlorobenzene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
1,2,4-Trimethylbenzene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
1,2-Dichloroethane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
1,2-Dichloropropane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
1,3,5-Trimethylbenzene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
1,3-Dichloropropane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
2,2-Dichloropropane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
2,3,7,8 - Dioxin	Picograms/	0.75 *	2.04 *	3.62 *	1.7 *	
2,4,5-T	ug/l	0.2 *	0.2 *	0.2 *	0.2 *	
2,4,5-TP (Silvex)	ug/l	0.2 *	0.2 *	0.2 *	0.2 *	
2,4-D	ug/l	0.1 *	0.1 *	0.1 *	0.1 *	
2,4-DB	ug/l	2 *	2 *	2 *	2 *	
2-Butanone (MEK)	ug/l	5 *	5 *	5 *	5 *	
2-Chloroethylvinylether	ug/l	1 *	1 *	1 *	1 *	
3,5-Dichlorobenzoic acid	ug/l	0.6 *	0.6 *	0.6 *	0.6 *	
3-Hydroxycarbofuran	ug/l	2 *	2 *	2 *	2 *	
4-Methyl-2-Pentanone (MIBK)	ug/l	5 *	5 *	5 *	5 *	
4-Nitrophenol (qualitative)	ug/l	5 *	5 *	5 *	5 *	
5-Hydroxydicamba	ug/l	0.2 *	0.2 *	0.2 *	0.2 *	
Acenaphthylene	ug/l	0.1 *	0.1 *	0.1 *	0.1 *	
Acifluorfen (qualitative)	ug/l	0.2 *	0.2 *	0.2 *	0.2 *	
Alachlor	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	
Alachlor (Alanex)	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	
Aldicarb (Temik)	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Aldicarb sulfone	ug/l	0.8 *	0.8 *	0.8 *	0.5 *	
Aldicarb sulfoxide	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Aldrin	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	

Appendix 2. Russian River at Kaiser (Special Effluent Study Data)

5/13/96

* after a constituent indicates the substance was below detection. Number shown is reporting limit.						
RR @ Kaiser						
Constituent	Units	27-Oct-94 Results	8-Nov-94 Results	30-Nov-94 Results	14-Dec-94 Results	
Aldrin	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	*
Alpha-BHC	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	*
alpha-Chlordane	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	*
Anthracene	ug/l	0.02 *	0.02 *	0.02 *	0.02 *	*
Atrazine	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	*
Baygon	ug/l	2 *	2 *	2 *	2 *	*
Bentazon	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Benz(a)Anthracene	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	*
Benzene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Benzo(a)pyrene	ug/l	0.02 *	0.02 *	0.02 *	0.02 *	*
Benzo(b)Fluoranthene	ug/l	0.02 *	0.02 *	0.02 *	0.02 *	*
Benzo(g,h,i)Perylene	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	*
Benzo(k)Fluoranthene	ug/l	0.02 *	0.02 *	0.02 *	0.02 *	*
Beta-BHC	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	*
Bromacil	ug/l	2 *	2 *	2 *	2 *	*
Bromobenzene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Bromochloromethane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Bromodichloromethane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Bromoform	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Bromomethane (Methyl Bromid	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Butachlor	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	*
Butylbenzylphthalate	ug/l	0.5 *	0.5 *	0.5 *	0.05 *	*
Carbaryl	ug/l	2 *	2 *	2 *	2 *	*
Carbofuran (Furadan)	ug/l	0.9 *	0.9 *	0.9 *	0.9 *	*
Carbon Tetrachloride	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Chloramben (qualitative)	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Chlordane	ug/l	0.1 *	0.1 *	0.1 *	0.1 *	*
Chlorobenzene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Chlorodibromomethane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Chloroethane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Chloroform (Trichloromethane)	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Chloromethane(Methyl Chlorid	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Chlorthalonil (Drconil, Bravo)	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	*
Chrysene	ug/l	0.02 *	0.02 *	0.02 *	0.02 *	*
cis-1,2-Dichloroethylene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
cis-1,3-Dichloropropene	ug/l	0.2 *	0.2 *	0.5 *	0.5 *	*
Dalapon (qualitative)	ug/l	1 *	1 *	1 *	1 *	*
DCPA	ug/l	0.2 *	0.2 *	0.2 *	0.2 *	*
Delta-BHC	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	*
Di(2-Ethylhexyl)phthalate	ug/l	0.6 *	0.6 *	0.6 *	0.7 *	*
Di-(2-Ethylhexyl)adipate	ug/l	0.6 *	0.6 *	0.6 *	0.6 *	*
Di-n-Butylphthalate	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Diazinon	ug/l	0.1 *	0.1 *	0.1 *	0.1 *	*
Dibenz(a,h)Anthracene	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	*
Dibromochloropropane (DBCP)	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	*
Dibromomethane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Dicamba	ug/l	0.2 *	0.2 *	0.2 *	0.2 *	*
Dichlorodifluoromethane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Dichloromethane	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*
Dichloroprop	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	*

Appendix 2. Russian River at Kaiser (Special Effluent Study Data)

5/13/96

* after a constituent indicates the substance was below detection. Number shown is reporting limit.						
RR @ Kaiser						
		27-Oct-94	8-Nov-94	30-Nov-94	14-Dec-94	
Constituent	Units	Results	Results	Results	Results	
Dieldrin	ug/l	0.2 *	0.2 *	0.2 *	0.2 *	
Dieldrin	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	
Diethylphthalate	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Dimethoate	ug/l	10 *	10 *	10 *	10 *	
Dimethylphthalate	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Dinoseb	ug/l	0.2 *	0.2 *	0.2 *	0.2 *	
Diquat	ug/l	0.4 *	0.4 *	0.4 *	0.4 *	
Endosulfan I (alpha)	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	
Endosulfan II (beta)	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	
Endosulfan sulfate	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	
Endothall	ug/l	5 *	5 *	5 *	5 *	
Endrin	ug/l	0.1 *	0.1 *	0.1 *	0.1 *	
Endrin	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	
Endrin Aldehyde	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	
Ethyl benzene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Ethylene Dibromide (EDB)	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	
Fluorene	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	
Fluorotrichloromethane(Freon1	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
gamma-Chlordane	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	
Glyphosate	ug/l	6 *	6 *	6 *	6 *	
Heptachlor	ug/l	0.04 *	0.04 *	0.04 *	0.04 *	
Heptachlor	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	
Heptachlor Epoxide	ug/l	0.02 *	0.02 *	0.02 *	0.02 *	
Heptachlor Epoxide	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	
Hexachlorobenzene	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	
Hexachlorobutadiene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Hexachlorocyclopentadiene	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	
Indeno(1,2,3,c,d)Pyrene	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	
Isophorone	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Isopropylbenzene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Lindane	ug/l	0.02 *	0.02 *	0.02 *	0.02 *	
Lindane (gamma-BHC)	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	
m,p-Xylenes	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
m-Dichlorobenzene (1,3-DCB)	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Methiocarb	ug/l	2 *	2 *	2 *	2 *	
Methomyl	ug/l	2 *	2 *	2 *	2 *	
Methoxychlor	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	
Methoxychlor	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	
Metolachlor	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	
Metribuzin	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	
Molinate	ug/l	0.2 *	0.2 *	0.2 *	0.2 *	
n-Butylbenzene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
n-Propylbenzene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Naphthalene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
o-Chlorotoluene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
o-Dichlorobenzene (1,2-DCB)	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
o-Xylene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Oxamyl (Vydate)	ug/l	2 *	2 *	2 *	2 *	
p,p' DDD	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	
p,p' DDE	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	

Appendix 2. Russian River at Kaiser (Special Effluent Study Data)

5/13/96

* after a constituent indicates the substance was below detection. Number shown is reporting limit.						
RR @ Kaiser						
		27-Oct-94	8-Nov-94	30-Nov-94	14-Dec-94	
Constituent	Units	Results	Results	Results	Results	
p,p' DDT	ug/l	0.01 *	0.01 *	0.01 *	0.01 *	
p-Chlorotoluene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
p-Dichlorobenzene (1,4-DCB)	ug/l	0.5 *	0.5 *	0.5 *	0.05 *	
p-Isopropyltoluene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Paraquat	ug/l	2 *	2 *	2 *	2 *	
PCB 1016 Aroclor	ug/l	0.1 *	0.1 *	0.1 *	0.1 *	
PCB 1221 Aroclor	ug/l	0.1 *	0.1 *	0.1 *	0.1 *	
PCB 1232 Aroclor	ug/l	0.1 *	0.1 *	0.1 *	0.1 *	
PCB 1242 Aroclor	ug/l	0.1 *	0.1 *	0.1 *	0.1 *	
PCB 1248 Aroclor	ug/l	0.1 *	0.1 *	0.1 *	0.1 *	
PCB 1254 Aroclor	ug/l	0.1 *	0.1 *	0.1 *	0.1 *	
PCB 1260 Aroclor	ug/l	0.1 *	0.1 *	0.1 *	0.1 *	
Pentachlorophenol	ug/l	1 *	1 *	1 *	1 *	
Pentachlorophenol	ug/l	0.04 *	0.04 *	0.04 *	0.04 *	
Phenanthrene	ug/l	0.02 *	0.02 *	0.02 *	0.02 *	
Picloram	ug/l	0.1 *	0.1 *	0.1 *	0.1 *	
Prometryn	mg/l	0.5 *	0.5 *	0.5 *	0.5 *	
Propachlor	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	
Pyrene	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	
sec-Butylbenzene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Simazine	ug/l	0.05 *	0.05 *	0.05 *	0.08	
Styrene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
tert-Butylbenzene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Tetrachloroethylene (PCE)	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Thiobencarb	ug/l	0.2 *	0.2 *	0.2 *	0.2 *	
Toluene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Toxaphene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
trans-1,2-Dichloroethylene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
trans-1,3-Dichloropropene	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
trans-Nonachlor	ug/l	0.05 *	0.05 *	0.05 *	0.05 *	
Trichloroethylene (TCE)	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Trichlorotrifluoroethane(Freon	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Trifluralin	ug/l	0.1 *	0.1 *	0.1 *	0.1 *	
Vinyl chloride (VC)	ug/l	0.5 *	0.5 *	0.5 *	0.5 *	
Radionuclides						
Alpha, Gross	pCi/l	-0.2	-0.2	-1.7	0.6	
Alpha, Two Sigma Error	pCi/l	1.4	1.3	1.6	1.4	
Beta, Gross	pCi/l	0.9	0.2	0.3	1.8	
Beta, Two Sigma Error	pCi/l	0.9	0.8	1.2	0.9	
Metals						
Aluminum (ICP)	mg/L	0.2 *	0.2 *	0.2 *	0.3	
Antimony (GFAA)	mg/L	0.005 *	0.005 *	0.005 *	0.005 *	
Arsenic (GFAA)	mg/L	0.005 *	0.005 *	0.005 *	0.005 *	
Arsenic (GFAA,Dissolved)	mg/L	0.005 *	0.005 *	0.005 *	0.005 *	
Barium (ICP)	mg/L	0.06	0.08	0.08	0.07	
Beryllium	mg/L					
Beryllium (ICP)	mg/L	0.004 *	0.004 *	0.004 *	0.004 *	
Cadmium (GFAA)	mg/L	0.0005 *	0.005 *	0.0005 *	0.0005 *	
Cadmium (GFAA,Dissolved)	mg/L	0.01 *	0.0005 *	0.0005 *	0.0005 *	

Appendix 2. Russian River at Kaiser (Special Effluent Study Data)

5/13/96

* after a constituent indicates the substance was below detection. Number shown is reporting limit.					
RR @ Kaiser					
		27-Oct-94	8-Nov-94	30-Nov-94	14-Dec-94
Constituent	Units	Results	Results	Results	Results
Calcium (ICP)	mg/L	18	25	24	20
Chromium (GFAA,Dissolved)	mg/L		0.005 *	0.005 *	0.005 *
Chromium (ICP)	mg/L	0.02 *	0.02 *	0.02 *	0.02 *
Chromium+6 (Color,Dissolved)	mg/L	0.005 *	0.005 *	0.005 *	0.005 *
Copper (GFAA,Dissolved)	mg/L	0.005 *	0.005 *	0.005 *	0.005 *
Copper (ICP)	mg/L	0.02 *	0.02 *	0.02 *	0.02 *
Lead (GFAA)	mg/L	0.002 *	0.002 *	0.002 *	0.002 *
Lead (GFAA,Dissolved)	mg/L	0.002 *	0.002 *	0.002 *	0.002 *
Magnesium (ICP)	mg/L	11	14	14	13
Mercury (CVAA)	mg/L	0.0005 *	0.0005 *	0.0005 *	0.0005 *
Mercury (CVAA,Dissolved)	mg/L	0.0005 *	0.0005 *	0.0005 *	0.0005 *
Nickel (GFAA,Dissolved)	mg/L	0.005 *	0.005 *	0.005 *	0.005 *
Nickel (ICP)	mg/L	0.05 *	0.05 *	0.05 *	0.05 *
Selenium (GFAA)	mg/L	0.005 *	0.005 *	0.005 *	0.005 *
Selenium (GFAA,Dissolved)	mg/L	0.005 *	0.005 *	0.005 *	0.005 *
Silver (GFAA,Dissolved)	mg/L	0.001 *	0.001 *	0.001 *	0.001 *
Silver (ICP)	mg/L	0.02 *	0.02 *	0.02 *	0.02 *
Thallium (GFAA)	mg/L	0.002 *	0.002 *	0.002 *	0.002 *
Thallium, Total, ICAP/MS	mg/L				
Zinc (FLAA,Dissolved)	mg/L	0.05 *	0.05 *	0.05 *	0.05 *
Other					
Tot. Dissolved Solids (TFR)	mg/L	150		170	170
Tot. Suspended Solids (NFR)	mg/L	4 *		4 *	6.4
Total Organic Carbon	mg/L	2		2.3	2.3
Hardness (Total, as CaCO3)	mg/L	90	120	120	100
pH	mg/L	8.2		7.8	8
Biology					
Giardia lamblia Cyst	#Cysts/# L	0/386	0/111	0/80	0/258
Cryptosporidium Oocyst	#Oocysts/# L	0/386	3/111	0/80	1/258
Legionella Species	MPN/100 mL	7840 *	7840 *	7840 *	7840 *
Salmonella Species	MPN/100 mL	2.2 *	2.2 *	2.2 *	2.2 *
Shigella	MPN/100 mL	2.2 *	2.2 *	2.2 *	2.2 *
Heterotrophic Plate Count	CFU/ mL	166	31	110	610
Total Coliform	MPN/100 mL	23	240	30	220
Enteric Virus	PFU/# L	1/45 *	sample lost	0/153	sample lost
TIC Search (Method 8270)					
				No Unknowns	No Unknowns
Organics analyzed as part of alkylphenol study					
Acenaphthene	µg/L			10 *	10 *
Acenaphthylene	µg/L			10 *	10 *
Aldrin	µg/L			50 *	50 *
Anthracene	µg/L			10 *	10 *
Benzidine	µg/L			44 *	44 *
Benzo(a)anthracene	µg/L			10 *	10 *
Benzo(b)fluoranthene	µg/L			10 *	10 *

* after a constituent indicates the substance was below detection. Number shown is reporting limit.					
RR @ Kaiser					
		27-Oct-94	8-Nov-94	30-Nov-94	14-Dec-94
Constituent	Units	Results	Results	Results	Results
Benzo(k)fluoranthene	µg/L			10 *	10 *
Benzo(a)pyrene	µg/L			10 *	10 *
Benzo(g,h,i)perylene	µg/L			10 *	10 *
Benzoic acid	µg/L			50 *	50 *
Benzyl alcohol	µg/L			10 *	10 *
Butyl benzyl phthalate	µg/L			10 *	10 *
delta-BHC	µg/L			50 *	50 *
gamma-BHC	µg/L			50 *	50 *
bis(2-Chloroethyl)ether	µg/L			10 *	10 *
bis(2-Chloroethoxy)methane	µg/L			10 *	10 *
bis(2-Chloroisopropyl)ether	µg/L			10 *	10 *
bis(2-Ethylhexyl)phthalate	µg/L			10 *	10 *
4-Bromophenyl phenyl ether	µg/L			10 *	10 *
4-Chloroaniline	µg/L			10 *	10 *
2-Chloronaphthalene	µg/L			10 *	10 *
4-Chlorophenyl phenyl ether	µg/L			10 *	10 *
Chrysene	µg/L			10 *	10 *
4,4'-DDD	µg/L			50 *	50 *
4,4'-DDE	µg/L			50 *	50 *
4,4'-DDT	µg/L			50 *	50 *
Dibenzo(a,h)anthracene	µg/L			10 *	10 *
Dibenzofuran	µg/L			10 *	10 *
Di-n-butylphthalate	µg/L			10 *	10 *
1,2-Dichlorobenzene	µg/L			10 *	10 *
1,3-Dichlorobenzene	µg/L			10 *	10 *
1,4-Dichlorobenzene	µg/L			10 *	10 *
3,3'-Dichlorobenzidine	µg/L			20 *	20 *
Dieldrin	µg/L			50 *	50 *
Diethylphthalate	µg/L			10 *	10 *
Dimethyl phthalate	µg/L			10 *	10 *
2,4-Dinitrotoluene	µg/L			10 *	10 *
2,6-Dinitrotoluene	µg/L			10 *	10 *
Di-n-octyl phthalate	µg/L			10 *	10 *
Endrin aldehyde	µg/L			50 *	50 *
Fluoranthene	µg/L			10 *	10 *
Fluorene	µg/L			10 *	10 *
Heptachlor	µg/L			50 *	50 *
Heptachlor epoxide	µg/L			50 *	50 *
Hexachlorobenzene	µg/L			10 *	10 *
Hexachlorobutadiene	µg/L			10 *	10 *
Hexachlorocyclopentadiene	µg/L			10 *	10 *
Hexachloroethane	µg/L			10 *	10 *
Indeno(1,2,3-cd)pyrene	µg/L			10 *	10 *
Isophorone	µg/L			10 *	10 *
2-Methylnaphthalene	µg/L			10 *	10 *
Naphthalene	µg/L			10 *	10 *
2-Nitroaniline	µg/L			50 *	50 *
3-Nitroaniline	µg/L			50 *	50 *
4-Nitroaniline	µg/L			50 *	50 *
Nitrobenzene	µg/L			10 *	10 *

Appendix 2. Russian River at Kaiser (Special Effluent Study Data)

5/13/96

* after a constituent indicates the substance was below detection. Number shown is reporting limit.						
RR @ Kaiser						
		27-Oct-94	8-Nov-94	30-Nov-94	14-Dec-94	
Constituent	Units	Results	Results	Results	Results	
N-Nitroso-Di-N-propylamine	µg/L			10 *	10 *	
N-Nitrosodiphenylamine	µg/L			10 *	10 *	
Phenanthrene	µg/L			10 *	10 *	
Pyrene	µg/L			10 *	10 *	
1,2,4-Trichlorobenzene	µg/L			10 *	10 *	
ACID EXTRACTABLES	µg/L					
4-Chloro-3-methylphenol	µg/L			10 *	10 *	
2-Chlorophenol	µg/L			10 *	10 *	
2,4-Dichlorophenol	µg/L			10 *	10 *	
2,4-Dimethylphenol	µg/L			10 *	10 *	
2,4-Dinitrophenol	µg/L			50 *	50 *	
4,6-Dinitro-2-methylphenol	µg/L			50 *	50 *	
2-Nitrophenol	µg/L			10 *	10 *	
4-Nitrophenol	µg/L			50 *	50 *	
Pentachlorophenol	µg/L			50 *	50 *	
Phenol	µg/L			10 *	10 *	
2,4,6-Trichlorophenol	µg/L			10 *	10 *	
2-Methylphenol	µg/L			10 *	10 *	
4-Methylphenol	µg/L			10 *	10 *	
2,4,5-Trichlorophenol	µg/L			50 *	50 *	

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	STIME	WEATHER	AIR Temp	H2O Temp	DO2	PH	Condo	TFR	TURB	ALK	TOC	DOC	NO3	NO2
				Deg C	Deg C	ppm		umhos			mg/L	mg/L	mg/L	mg-N/L	mg-N/L
All data below the detection limit entered as 1/2 the detection limit.															
CB	1/26/88	1050		12.0	11.0	10.0	8.0	260	170	20.00	100			0.760	0.0150
CB	3/4/88	1615		19.0	15.5	10.2	8.2					3.60		0.320	0.0150
CB	3/14/88	1400		25.0	14.5	10.0	7.6					2.50		0.520	0.0150
CB	3/24/88	1030		25.0	16.0	8.4			180			2.20	2.10	0.390	
CB	4/5/88	1630			19.0									0.210	
CB	4/8/88	1130	WARM/WIND	20.7	17.4	10.1	8.2	290	160	2.50		2.40	1.60	0.340	0.0150
CB	4/12/88	1200			19.2	8.9	8.1							0.410	
CB	5/19/88	1010		23.6	19.1	8.6	7.9	280	290	2.40		1.70	2.00	0.110	0.0150
CB	6/16/88	1210	SOLID CLOU	18.0	20.2	7.8	8.2	260	160	2.40		2.20	2.00	0.015	0.0150
CB	7/21/88	1130	CLEAR	26.6	21.5	8.7	8.1	220	100	3.00		1.50	0.50	0.015	0.0150
CB	8/26/88	1050	CLEAR - HOT	29.6	21.5	8.8	8.1	230	130	1.60		3.30	1.80	0.015	0.0150
CB	9/29/88	1600	CLEAR	32.4	20.3	9.3	8.0	230	96	0.80		1.00	0.50	0.030	0.0150
CB	10/26/88	1040	FOG/OVERCA	13.9	15.7	8.6	7.8	240	140	0.65		0.50	0.50	0.015	0.0150
CB	12/6/88	1600	CLEAR		12.7	10.3	7.6	279	150	0.20		2.90	2.40	0.250	0.0150
CB	12/21/88	1150	CLEARING		9.5	10.5	7.5	242	140	20.00		7.20	6.60	0.490	0.0150
CB	1/18/89	1015	FOG		8.7	12.0	7.2	261	130	4.30		4.60	3.50	0.680	0.0150
CB	2/23/89	1530	PART OC		14.4	10.2	7.8	328	200	2.70		6.20	4.00	1.100	0.0300
CB	3/16/89	1120	STORMY		13.0	9.2	7.8	237	130	26.00		4.70	4.80	0.840	0.0300
CB	4/4/89	1045	SUNNY		15.0	9.5	7.3	239	150	14.00		3.10	4.00	0.550	0.0150
CB	5/5/89	840	SUNNY		19.2	8.3	8.0	264	140	3.20		2.50	2.60	0.150	0.0150
CB	9/25/89	1500			21.2	10.3	8.2	249	160			1.80	2.20	0.040	0.0020
CB	8/29/89	1200			21.0	10.1	7.7	226	120			2.10	1.60	0.020	0.0025
CB	10/16/89	1215			18.2	12.0	8.3	242	140			3.30	2.20	0.030	0.0010
CB	6/21/89	1030			23.0	8.5	8.1	257	150	2.60		3.00	0.05	0.015	0.0150
CB	11/13/89	1315	WARM		15.6	12.2	8.2	262	150			1.80	1.30	0.200	0.0060
CB	12/12/89	1240							180			2.00	2.20	0.260	0.0300
CB	5/23/90	1135							210	3.00		3.60	11.90	0.150	0.0350
CB	5/3/90	1130							190	25.00		5.90	5.30	0.390	0.0470
CB	6/6/90	1050			20.1	9.4	7.7	385	130	6.00		2.80	3.40	0.200	0.0080
CB	6/20/90	1100			23.6	8.9	7.7	277	160	3.40		1.70	1.90	0.050	0.0010
CB	6/13/90	1100			19.8	9.4	7.8	260	170	2.00		1.60	1.90	0.020	0.0010
CB	12/4/90	1345			10.1	16.8	8.6	254				2.40	1.20	0.005	0.0010
CB	12/6/90	1315			11.0	13.8	8.2	263				1.70	2.80	0.005	0.0010
CB	12/11/90	1310			11.8	11.4	8.1	258				2.60	3.20	0.005	0.0010

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE		STIME	WEATHER	AIR Temp Deg C	H2O Temp Deg C	DO2 ppm	PH	Condo umhos	TFR	TURB	ALK mg/L	TOC mg/L	DOC mg/L	NO3 mg-N/L	NO2 mg-N/L
CB	12/13/90		1250			10.3	11.2	8.2	278				3.00	3.90	0.070	0.0110
CB	12/18/90		1455			9.7	11.4	8.2	326				3.70	3.40	0.500	0.0350
CB	12/20/90		1225			7.0	11.8	8.3	328				3.40	3.50	0.620	0.0470
CB	12/27/90		1230			6.4	12.6	8.4	326				3.90	2.70	0.730	0.0380
CB	1/3/91		1235			7.1	12.8	8.4	328				3.20	2.60	0.880	0.0350
CB	1/23/91		1320			9.6	12.2	8.1	378				4.00	3.70	0.680	0.1000
CB	1/30/91		1330			9.1	13.1	8.2	340				3.10	2.80	0.720	0.0200
CB	2/8/91		1355			12.1	11.4	7.6	375				7.70	7.40	2.400	0.1900
CB	1/10/91		1210			9.4	11.4	8.2	342				2.80	6.80	1.000	0.0600
CB	1/15/91		1220			12.4	11.2	8.1	344				3.60	3.40	0.920	0.0500
CB	4/10/91		1112			13.9	9.6	8.0	230						0.980	0.0100
CB	5/30/90		1130	RAINING		17.3	8.6	7.4	208	190	25.00		5.90	5.30	0.390	0.0470
CB	1/16/90		1515													
CB	9/24/85	NCRWQCB	1150					8.0	200	140	0.80	120			0.015	0.0015
CB	10/3/85	NCRWQCB	1410				6.0	8.2	210	220	1.00	130			0.015	0.0015
CB	10/11/85	NCRWQCB	1225				10.0	8.2	200		0.83	130			0.015	0.0015
CB	10/25/85	NCRWQCB	1245				5.0	8.0	250	140	0.70	120			0.150	0.0030
CB	11/8/85	NCRWQCB	1045				10.0	8.0	230	130	0.10	110			0.040	0.0015
CB	12/11/85	NCRWQCB	1235				12.0	7.7	250	130	11.00	100			0.300	0.0100
CB	1/7/86	NCRWQCB	1445				10.0	7.6	250	160	14.00	110			0.500	0.0110
CB	1/14/86	NCRWQCB	1250				7.0	7.7	280	180	2.90	120			0.390	0.0050
CB	4/3/86	NCRWQCB	1505					7.8	290	170	5.30	130			0.620	0.0120
CB	5/14/86	NCRWQCB	1045				10.0	7.9	240	180	2.90	140			0.110	0.0050
CB	6/17/86	NCRWQCB	1015				10.0	8.1	270	160	2.70	120			0.030	0.0015
CB	6/26/86	NCRWQCB	1015				9.0	8.2	240	140	3.00	110			0.015	0.0015
CB	12/31/86	NCRWQCB	1115					7.9	270	180	2.70	120			0.300	0.0120
CB	12/9/86	NCRWQCB	1400					8.0	260	110	1.00	110			0.060	0.0015
CB	12/17/86	NCRWQCB	1220					7.9	260	160	3.00	110			0.260	0.0060
CB	12/24/86	NCRWQCB	1030					8.0	250	170	4.40	110			0.260	0.0150
CB	4/10/87	NCRWQCB	1240	SUN/CLEAR		19.0	10.1	7.7	250	170	2.80	130			0.170	0.0015
CB	4/13/87	NCRWQCB	1230	SUN/BREEZE		16.1	10.0	7.2	280	160	2.10	130			0.150	0.0015
CB	4/15/87	NCRWQCB	1100					7.9	280	170	2.50	130			0.140	0.0150
CB	4/20/87	NCRWQCB	1230			16.2	10.4	7.8	280	160	1.90	120			0.130	0.0150
CB	4/22/87	NCRWQCB	1510			20.1	12.1	8.2	260	150	3.80	120			0.110	0.0150
CB	4/24/87	NCRWQCB	1000			15.2	5.7	8.0	250	160	3.50	110			0.140	0.0150
CB	5/26/87	NCRWQCB	1325			20.4	8.6	8.8	220	140	1.40	120			0.090	0.0150

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE		STIME	WEATHER	AIR Temp	H2O Temp	DO2	PH	Condo	TFR	TURB	ALK	TOC	DOC	NO3	NO2
					Deg C	Deg C	ppm		umhos			mg/L	mg/L	mg/L	mg-N/L	mg-N/L
CB	9/10/87	NCRWQCB	1100			20.0	10.0	8.2	460	130	1.50	110			0.015	0.0150
CB	4/16/92		920	cloudy	16.5	16.2	9.2	7.7	291	170					0.510	0.0150
CB	6/23/92		1440	SUNNY	35.0	23.6	9.6	8.4	252	160					0.015	
CB	9/8/92		1420	SUNNY	35.0	22.2	9.2	8.3	235	130					0.015	0.0150
CB		mean					10.1	8.0	271	157	5.36	118	3	3	0.316	0.019
CB		max					16.8	8.8	460.0	290.0	26.0	140.0	7.7	11.9	2.400	0.190
CB		min					5.0	7.2	200.0	96.0	0.1	100.0	0.5	0.1	0.005	0.001
DM	1/26/88		940		12.0		10.2	8.1	240	160	18.00	100			0.560	0.0150
DM	4/8/88		930	WARM/WIND	12.9	15.5	9.3	8.0	290	130	2.00		2.70	2.30	0.070	0.0150
DM	5/19/88		1400		28.3	21.5	9.3	7.8	300	290	3.10		2.40	2.10	0.120	0.0150
DM	6/16/88		1410	SOLID CLOU	21.8	21.0	7.7	8.1	250	150	2.10		2.20	2.10	0.015	0.0150
DM	7/21/88		945	CLEAR	19.3	22.0	7.1	7.7	220	120	1.00		1.00	1.20	0.015	0.0150
DM	8/26/88		1320	8CLEAR	22.0	22.6	8.7	8.0	240	140	3.00		5.40	2.20	0.015	0.0150
DM	9/29/88		1445	CLEAR	31.2	19.8	8.8	7.9	235	110	2.00		1.70	0.50	0.030	0.0150
DM	10/26/88		920	FOG/OVERCA	13.4	15.5	8.9	7.6	250	140	1.10		0.50	0.50	0.015	0.0150
DM	12/7/88		1505	CLEAR		12.5	12.1	7.6	281	170	1.30		2.90	3.70	0.280	0.0150
DM	12/21/88		1030	CLEARING		8.5	11.6	7.7	233	130	12.00		4.30	4.80	0.150	0.0150
DM	1/18/89		830	FOG		8.4	11.5	7.6	260	160	3.80		3.90	3.50	0.620	0.0150
DM	2/24/89		915	FOG/OC		12.2	9.5	7.6	328	200	1.50		4.20	4.50	1.100	0.0150
DM	3/16/89		1400	PART OC		13.6	9.7	7.8	218	120	23.00		4.00	3.90	0.600	0.0300
DM	4/4/89		1315	SUNNY		16.2	9.7	7.4	244	140	13.00		2.50	2.40	0.580	0.0150
DM	5/5/89		1030	SUNNY		20.1	9.8	8.2	266	160	1.60		1.80	1.40	0.060	0.0150
DM	9/26/89		1010			19.0	8.4	7.6	251	160			4.90	1.90	0.030	0.0020
DM	8/29/89		1400			21.2	9.4	7.7	231	91			1.40	1.70	0.020	0.0025
DM	10/16/89		1345			18.7	11.2	8.2	250	150			5.30	2.30	0.040	0.0010
DM	6/21/89		1230			25.0	7.6	7.6	267	160	2.40		2.40	2.30	0.015	0.0150
DM	11/13/89		1445	WARM		15.6	14.7	7.1	262	150			1.60	2.10	0.040	0.0040
DM	12/12/89		1415							160			2.40	2.90	0.090	0.0100
DM	1/17/90		1100							170			4.60	5.00	1.000	0.0500
DM	5/23/90		920							140	13.00		4.70	10.10	0.050	0.0060
DM	5/3/90		920							170	34.00		5.40	5.00	0.440	0.0220
DM	6/6/90		830			19.2	10.0	7.7		120	6.00		3.00	3.00	0.200	0.0130
DM	6/13/90		925			21.9	8.2	7.4	270	160	2.00		1.70	1.80	0.050	0.0010
DM	6/13/90		905			20.3	10.0		258	160	2.00		1.70	1.80	0.050	0.0010
DM	5/30/91		1115	SUN,WIND,MIL		20.0	9.8	7.9	308						0.070	0.0150

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE		STIME	WEATHER	AIR Temp	H2O Temp	DO2	PH	Condo	TFR	TURB	ALK	TOC	DOC	NO3	NO2
					Deg C	Deg C	ppm		umhos			mg/L	mg/L	mg/L	mg-N/L	mg-N/L
DM	6/4/91			FOG,WIND,COO		18.2	9.3	8.5	319							
DM	6/18/91		1130	SUN,WIND,COO		20.2	8.9	7.3	319	180						0.0060
DM	6/27/91		1205	CLOUDY	69	20.2	8.6	7.8	253							0.0040
DM	6/27/91		1400	CLOUDY	72	21.5	9.6	7.7	259							0.0050
DM	6/27/91		1740	OVERCAST	66	20.5	9.6	7.8	278				0.03			0.0050
DM	6/28/91		144	CLOUD,DRIZZ	59	19.3	8.6	7.6	277							0.0060
DM	6/28/91		522	HEAVY RAIN	59.5	19.2	8.4	7.4	277							0.0060
DM	6/28/91		1001		15.6	19.7	8.1	7.3	273	130						0.0060
DM	6/28/91		1321		15.6	20.3	8.2	7.4	274							0.0060
DM	5/30/90		920	RAINING		16.4	9.2	7.4	200	170	34.00		5.40	5.00	0.440	0.0220
DM	9/24/85	NCRWQCB	1015					7.9	170	150	1.40	120			0.030	0.0015
DM	10/3/85	NCRWQCB	1425				10.0	8.2	210	180	0.90	130			0.015	0.0015
DM	10/11/85	NCRWQCB	945				8.0	8.0	220	150	0.62	130			0.015	0.0015
DM	10/25/85	NCRWQCB	1510				10.0	8.1	220	150	0.90	110			0.130	0.0030
DM	11/8/85	NCRWQCB	1300				11.0	8.1	190	130	0.20	120			0.015	0.0015
DM	12/11/85	NCRWQCB	1540				11.0	7.8	240	140	12.00	98			0.340	0.0110
DM	1/8/86	NCRWQCB	1100				10.0	7.6	250	150	8.40	110			0.400	0.0180
DM	4/3/86	NCRWQCB	1645				10.0	7.9	290	210	4.50	130			0.460	0.0100
DM	5/14/86	NCRWQCB	1220				11.0	7.7	250	160	2.10	120			0.030	0.0050
DM	6/17/86	NCRWQCB	1150				9.0	7.8	270	160	1.60	120			0.015	0.0015
DM	6/26/86	NCRWQCB	1245				8.0	7.9	260	150	1.20	120			0.015	0.0015
DM	12/9/86	NCRWQCB	1600					8.0	260	130	1.20	110			0.080	0.0015
DM	4/15/87	NCRWQCB	1315					8.2	280	170	2.20	130			0.050	0.0150
DM	5/26/87	NCRWQCB	1055			19.2	6.4	7.3	240	150	1.90	120			0.050	0.0150
DM	9/10/87	NCRWQCB	920			20.0	8.5	8.2	240	110	0.60	110			0.015	0.0150
DM	6/23/92		1200	foggy	21.0	22.2	8.4	7.9	280	170					0.015	
DM		mean					9.4	7.8	256.1	153.3	6.0	117.4	3.0	3.0	0.2	0.0
DM		max					14.7	8.5	328.0	290.0	34.0	130.0	5.4	10.1	1.1	0.1
DM		min					6.4	7.1	170.0	91.0	0.2	98.0	0.03	0.5	0.015	0.001
HMB	1/25/88		830		19.0	10.0	10.2	8.3	250	160	13.00	100			0.560	0.0150
HMB	4/7/88		1130	WARM/WIND	20.4	17.5	8.6	8.0	290	180	0.75		1.90	1.70	0.220	0.0150
HMB	5/18/88		1610		28.1	22.0	10.0	8.2	250	330	2.80		1.20	1.90	0.090	0.0150
HMB	6/15/88		1615	SUN & HAZE	23.3	24.0	8.0	8.5	290	170	1.70		2.10	1.50	0.015	0.0150
HMB	7/20/88		1530	OVERCAST	30.5	27.3	7.9	8.3	280	140	4.00		1.90	0.50	0.015	0.0150
HMB	8/25/88		1545	CLEAR - HOT	42.8	26.4	8.8	8.0	320	160	3.90		1.80	0.50	0.015	0.0150

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE		STIME	WEATHER	AIR Temp	H2O Temp	DO2	PH	Condo	TFR	TURB	ALK	TOC	DOC	NO3	NO2
					Deg C	Deg C	ppm		umhos			mg/L	mg/L	mg/L	mg-N/L	mg-N/L
HMB	9/29/88		900	CLEAR	20.9	18.7	7.5	7.6	275	160	1.60		1.20	1.00	0.040	0.0150
HMB	10/26/88		1315	FOG/OVERCA	16.1	16.4	9.0	7.9	275	150	0.50		0.50	0.50	0.015	0.0150
HMB	12/5/88		1415	HI OVERCAST		13.2	11.7	7.9	285	170	0.70		0.50	0.50	0.310	0.0150
HMB	12/21/88		1440	CLEARING		10.4	11.8	7.6	295	150	1.40		0.50	2.00	0.100	0.0150
HMB	1/19/89		1530	CLEAR		10.8	13.5	7.7	239	140	1.40		2.70	1.80	0.330	0.0150
HMB	2/23/89		1500	PART OC		15.4	10.3	8.1	275	170	0.59		2.10	2.10	0.180	0.0150
HMB	3/17/89		920	CLEAR		11.3	10.4	8.0	169	180	75.00		5.50	2.40	0.420	0.0150
HMB	4/3/89		1430	SUNNY/WINDY		15.7	10.4	7.7	223	140	11.00		1.40	1.90	0.400	0.0150
HMB	5/4/89		1400	SUNNY		23.3	11.5	8.7	251	130	2.80		2.90	2.20	0.150	0.0150
HMB	9/25/89		1000			19.2	8.0	7.4	251	160			1.20	1.30	0.040	0.0010
HMB	8/29/89		915			20.8	8.0	7.4	234	130			2.00	1.60	0.130	0.0025
HMB	10/16/89		945			16.2	10.1	7.8	257	150			1.40	1.40	0.040	0.0010
HMB	6/20/89		1345			24.1	9.7	8.3	267	140	1.60		2.90	0.05	0.015	0.0150
HMB	11/13/89		1000	WARM		15.1	10.9	7.9	274	150			1.60	1.30	0.010	0.0010
HMB	12/12/89		1025							160			1.70	2.10	0.005	0.0040
HMB	1/16/90		1325							140			3.00	2.80	0.320	0.0010
HMB	5/23/90		1430							170	4.00		1.60	9.40	0.050	0.0050
HMB	5/24/90												2.30			
HMB	5/3/90		1250							180	17.00		2.80	4.30	0.200	0.0010
HMB	6/6/90		1310			22.1	9.9	7.8	412	170	11.00		5.80	4.40	0.180	0.0120
HMB	6/20/90		1315			29.5	8.7	7.9	298	150	5.40		1.40	1.60	0.050	0.0010
HMB	6/13/90		1330			21.3	6.2	7.8	249	48	2.00		1.60	1.60	0.010	0.0010
HMB	4/8/91		1425	CLEAR;WINDY		16.3	11.4	7.6	270						0.700	0.0110
HMB	4/15/91		1350	CLOUDY,WINDY		17.2	11.7	8.1	278						0.570	0.0080
HMB	6/4/91		1345	SUN, WARM		23.1	9.0	8.2	309						0.350	0.0100
HMB	6/18/91		1440	SUNNY, WARM		23.8	10.8	7.9	313	180						0.0010
HMB	5/30/90		1250	RAINING		16.6	9.2	7.7	105	180	17.00		2.80	4.30	0.200	0.0010
HMB	9/24/85	NCRWQCB	1545					8.2	170	120	1.40	120			0.015	0.0015
HMB	10/3/85	NCRWQCB	1240				9.0	8.1	210	210	0.70	130			0.015	0.0015
HMB	10/11/85	NCRWQCB	1430				11.0	8.3	180	140	0.32	120			0.015	0.0015
HMB	10/25/85	NCRWQCB	915				9.0	8.0	250	150	0.40	130			0.130	0.0015
HMB	11/8/85	NCRWQCB	900				10.0	8.1	210	130	0.10	130			0.015	0.0015
HMB	12/11/85	NCRWQCB	915				12.0	7.5	220	120	9.90	98			0.300	0.0080
HMB	1/8/86	NCRWQCB	810				11.0	7.9	230	130	5.90	110			0.180	0.0050
HMB	4/3/86	NCRWQCB	740				11.0	8.0	280	200	4.00	130			0.560	0.0030
HMB	5/14/86	NCRWQCB	815				9.0	7.7	260	170	2.20	140			0.110	0.0040

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE		STIME	WEATHER	AIR Temp	H2O Temp	DO2	PH	Condo	TFR	TURB	ALK	TOC	DOC	NO3	NO2
					Deg C	Deg C	ppm		umhos			mg/L	mg/L	mg/L	mg-N/L	mg-N/L
HMB	6/17/88	NCRWQCB	750				9.0	8.2	280	180	0.45	130			0.040	0.0015
HMB	6/26/88	NCRWQCB	905				10.0	8.2	240	150	0.33	120			0.015	0.0015
HMB	4/15/87	NCRWQCB	800					7.8	290	190	3.40	130			0.120	0.0150
HMB	5/26/87	NCRWQCB	1520			20.9	7.4	8.2	300	160	1.00	130			0.110	0.0150
HMB	9/11/87	NCRWQCB	800			19.5	8.2	8.1	250	130	1.40	120			0.015	0.0150
HMB	4/15/92		1210	COOL CLOUD	17.0	16.8	10.1	7.8	269	160					0.360	0.0150
HMB	5/21/92		1025	sunny	28.8	22.2	8.8	8.2	293	170					0.250	0.0150
HMB	6/25/92		1045	OVERCAST	21.0	22.4	8.9	8.2	268	160					0.040	
HMB	9/8/92		1015	SUNNY	21.0	22.1	8.4	8.1	251	140					0.015	0.0150
HMB	9/17/92		1030	OVERCAST	17.5	19.2	8.4	8.1	249							
HMB	9/22/92		1400	SUNNY	26.0	23.3	9.3	8.2	253							
HMB	9/24/92		945	CLEAR, WIND	21.0	20.3	7.9	7.9	259							
HMB	9/29/92		1345	PTLY CLOUD	26.5	21.5	8.3	8.3	251							
HMB	5/17/93		1315												0.310	
HMB	6/22/93														0.180	
HMB	10/12/93														0.100	
HMBDD	6/25/92		1055	OVERCAST	21.0	22.3	9.4	8.2	267							
HMB		mean					9.6	8.0	259.1	158.4	5.9	122.4	2.1	2.1	0.166	0.009
HMB		max					13.5	8.7	412.0	330.0	75.0	140.0	5.8	9.4	0.700	0.015
HMB		min					6.2	7.4	105.0	46.0	0.1	96.0	0.5	0.1	0.005	0.001
JB	1/26/88		1015		10.5	10.5	10.2	8.1	240	150	21.00	100			0.620	0.0150
JB	4/8/88		1030	WARM/WIND	18.7	17.9	10.7	8.3	300	160	1.80		2.50	2.20	0.340	0.0150
JB	5/19/88		1125		27.0	21.0	9.2	7.9	290	250	1.80		1.90	1.80	0.100	0.0150
JB	6/16/88		1510	SOLID CLOU	19.0	21.8	7.7	8.0	260	160	4.40		2.80	1.80	0.015	0.0150
JB	7/21/88		1030	CLEAR	25.6	23.9	7.8	7.9	220	110	6.50		1.80	0.50	0.015	0.0150
JB	8/26/88		1400	CLEAR - HOT	34.0	24.6	8.6	8.0	235	130	2.60		0.50	0.50	0.015	0.0150
JB	9/29/88		1530	CLEAR	29.4	21.1	8.4	7.7	240	96	3.40		2.00	0.50	0.050	0.0150
JB	10/26/88		950	FOG/OVERCA	13.2	15.6	9.2	7.8	240	140	1.10		0.50	0.50	0.015	0.0150
JB	12/7/88		1435	CLEAR		12.1	10.9	7.6	281	160	18.00		3.00	3.90	0.250	0.0150
JB	12/21/88		1110	CLEARING		9.2	11.4	7.7	293	160	13.00		5.40	4.90	0.430	0.0150
JB	1/18/89		915	FOG		8.3	12.0	7.3	260	150	4.60		5.30	2.90	0.710	0.0150
JB	2/24/89		830	FOG/OC		12.1	9.7	7.6	337	210	2.40		4.10	5.10	1.200	0.0300
JB	3/16/89		1245	PART OC		13.4	10.3	7.8	232	140	27.00		4.30	4.60	0.760	0.0300
JB	4/4/89		1230	SUNNY		16.6	9.7	7.4	239	150	14.00		3.30	2.60	0.540	0.0150
JB	5/5/89		940	SUNNY		21.1	9.7	8.2	265	160	2.60		2.10	2.20	0.120	0.0150

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE		STIME	WEATHER	AIR Temp	H2O Temp	DO2	PH	Condo	TFR	TURB	ALK	TOC	DOC	NO3	NO2
					Deg C	Deg C	ppm		umhos			mg/L	mg/L	mg/L	mg-N/L	mg-N/L
JB	9/26/89		940			18.9	8.6	7.6	254	160			1.90	2.40	0.050	0.0020
JB	8/29/89		1330			21.9	8.1	8.0	225	110			1.80	2.00	0.030	0.0025
JB	10/16/89		1315			18.2	12.1	8.2	248	140			2.10	1.80	0.030	0.0010
JB	6/21/89		1130			24.9	7.4	7.1	268	160	5.70		3.00	0.05	0.015	0.0150
JB	11/13/89		1415	WARM		15.6	14.0	8.5	264	140			6.70	1.20	0.130	0.0060
JB	12/12/89		1350							140			2.40	2.20	0.230	0.0200
JB	1/17/90		1030							160			5.70	4.70	0.950	0.0400
JB	5/23/90		1030							170	2.00		6.20	8.60	0.100	0.0190
JB	5/3/90		1033							180	33.00		5.60	6.60	0.360	0.0260
JB	6/6/90		945			20.1	9.4	7.7	389	140	7.00		3.20	2.90	0.200	0.0140
JB	6/20/90		1015			23	8.2	7.6	269	150	3.30		1.80	1.80	0.050	0.0010
JB	6/13/90		1005			20.1	8.7	7.9	256	150	8.00		1.80	1.90	0.050	0.0010
JB	12/4/90		1430			11.0	6.5	8.6	280				2.00	1.10	0.005	0.0010
JB	12/6/90		1400			10.8	13.8	8.3	264				1.10	3.30	0.005	0.0010
JB	12/11/90		1350			10.4	12.6	8.2	271				1.70	7.10	0.005	0.0010
JB	12/13/90		1325			11.5	11.4	8.2	271				4.20	3.90	0.005	0.0060
JB	12/18/90		1430			9.7	12.5	8.3	300				2.90	3.50	0.300	0.0210
JB	12/20/90		1320			6.6	12.4	8.5	330				3.30	4.30	0.630	0.0370
JB	12/27/90		1310			6.3	12.9	8.5	323				3.20	2.50	0.520	0.0340
JB	1/3/91		1305			6.9	15.0	8.8	150				4.30	2.40	0.780	0.0370
JB	1/23/91		1350			9.8	12.8	8.3	369				3.80	2.80	0.700	0.0600
JB	1/30/91		1430			9.3	13.8	8.3	348				3.80	2.80	0.420	0.0200
JB	2/8/91		1500			13.6	10.7	7.7	364				7.10	6.30	2.100	0.1900
JB	1/10/91		1255			10.1	13.4	8.5	348				3.40	12.00	1.300	0.0700
JB	1/15/91		1310			12.7	11.1	8.3	358				49.00	3.20	1.100	0.0500
JB	4/10/91		940			14.8	9.6	8.0	295						1.000	0.0200
JB	4/17/91		902	NOT RECORDED		14.8	10.6	8.4	238						0.760	0.0200
JB	5/30/91		1250	SUN,WIND,MIL		20.6	8.8	8.1	321						0.280	0.0250
JB	6/4/91		1100	SUNNY, WARM		20.3	8.9	8.2	298							
JB	6/18/91		1255	SUN,WARM		22.	10.1	7.2	310	180						0.0010
JB	5/30/90		1033	RAINING		16.9	8.2	7.4	196	180	33.00		5.60	6.60	0.360	0.0260
JB	9/24/85	NCRWQCB	1110					8.0	190	150	1.10	120			0.015	0.0015
JB	10/3/85	NCRWQCB	1315					9.0	200	240	1.50	130			0.015	0.0015
JB	10/11/85	NCRWQCB	1130					10.0	200	150	0.95	140			0.015	0.0050
JB	10/25/85	NCRWQCB	1400					9.0	230	130	0.80	120			0.130	0.0040
JB	11/8/85	NCRWQCB	1135					10.0	180	130	0.20	110			0.040	0.0015

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE		STIME	WEATHER	AIR Temp	H2O Temp	DO2	PH	Condo	TFR	TURB	ALK	TOC	DOC	NO3	NO2
					Deg C	Deg C	ppm		umhos			mg/L	mg/L	mg/L	mg-N/L	mg-N/L
JB	12/11/85	NCRWQCB	1430				9.0	7.3	230	130	11.00	100			0.290	0.0120
JB	1/7/86	NCRWQCB	1550					7.7	250	110	12.00	100			0.520	0.0210
JB	4/3/86	NCRWQCB	1555				11.0	7.8	300	220	5.60	130			0.360	0.0130
JB	5/14/86	NCRWQCB	1140				10.0	8.0	250	180	1.90	130			0.090	0.0050
JB	6/17/86	NCRWQCB	1100				10.0	8.0	260	160	4.00	120			0.015	0.0015
JB	6/26/86	NCRWQCB	1130				9.0	8.1	240	140	1.30	110			0.015	0.0015
JB	12/31/86	NCRWQCB	1330					8.0	280	180	2.90	120			0.350	0.0170
JB	12/9/86	NCRWQCB	1500					8.0	260	100	0.95	120			0.050	0.0015
JB	12/17/86	NCRWQCB	1255					8.0	270	180	1.50	110			0.300	0.0110
JB	12/24/86	NCRWQCB	1050					8.0	220	160	6.50	100			0.240	0.0070
JB	4/10/87	NCRWQCB	1300	SUN/CLEAR		19.0	10.6	7.9	240	170	2.40	130			0.110	0.0015
JB	4/13/87	NCRWQCB	1300	SUN/BREEZE		17.6	10.4	7.6	280	150	1.90	130			0.110	0.0015
JB	4/15/87	NCRWQCB	1200					8.1	280	170	1.60	130			0.100	0.0150
JB	4/20/87	NCRWQCB	1300			17.8	10.6	8.0	280	160	1.60	130			0.090	0.0150
JB	4/22/87	NCRWQCB	1600			19.8	11.7	8.4	250	150	4.10	120			0.060	0.0150
JB	4/24/87	NCRWQCB	930			16.7	7.2	8.0	250	160	3.30	120			0.090	0.0150
JB	5/26/87	NCRWQCB	1215			20.0	8.7	8.1	200	150	1.80	120			0.040	0.0150
JB	9/10/87	NCRWQCB	1015			20.5	9.2	8.1	240	120	2.00	110			0.015	0.0150
JB	3/31/92		1330	SUNNY BREE	26.0	19.3	11.0	8.2	274							
JB	4/16/92		1105	lt rain	17.0	16.4	9.4	7.7	288	170					0.510	0.0150
JB	6/23/92		1330	OVERCAST	27.0	23.0	8.6	7.9	258							
JB	9/8/92		1315	SUNNY, WIN	29.0	21.6	8.8	8.0	243	150					0.015	0.0150
JB	9/17/92		1145	SUNNY	20.0	19.8	8.8	8.1	240							
JB	9/22/92		1530	SUNNY, WIN	23.0	21.9	9.1	8.1	248							
JB	9/24/92		1050	SUNNY	27.0	20.4	8.4	8.0								
JB	9/29/92		1445	SUNNY WIND	27.5	20.8	8.2	8.2	249							
JB	5/17/93	RWQCB	1020												0.290	
JB	6/23/93														0.160	
JB	10/12/93														0.005	
JBUD	6/23/92		1315	OVERCAST	27.0	23.0	8.4	7.9	258	160					0.015	
JB		mean					10.0	8.0	265.4	155.6	6.4	118.8	4.4	3.3	0.297	0.018
JB		max					15.0	8.8	389.0	250.0	33.0	140.0	49.0	12.0	2.100	0.190
JB		min					6.5	7.1	150.0	96.0	0.2	100.0	0.5	0.1	0.005	0.001
JEN	9/26/89		1030			17.8	8.8	7.6		6200			6.10	2.30	0.070	0.0030
JEN	8/29/89		1430			18.8	8.7	8.1	3908	460			1.80	0.30	0.070	0.0025

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE		STIME	WEATHER	AIR Temp	H2O Temp	DO2	PH	Condo	TFR	TURB	ALK	TOC	DOC	NO3	NO2
					Deg C	Deg C	ppm		umhos			mg/L	mg/L	mg/L	mg-N/L	mg-N/L
JEN	10/16/89		1415			16.8	11.8	8.4		1100			2.50	2.20	0.040	0.0010
JEN	11/13/89		1515	FOGGY		15.1	11.8	7.7		13000			1.90	0.50	0.120	0.0070
JEN	12/12/89		1445							920			3.50	2.90	0.090	0.0140
JEN	1/17/90		1120						394	210			4.80	4.90	1.000	0.0600
JEN	6/23/92		1130	foggy	21.0	20.2	9.0	7.9	1000	2800					0.040	
JEN		mean					10.0	7.9	1767.3	3527.1			3.4	2.2	0.204	0.015
JEN		max					11.8	8.4	3908.0	13000.0			6.1	4.9	1.000	0.060
JEN		min					8.7	7.6	394.0	210.0			1.8	0.3	0.040	0.001
OF	1/26/88		1030		12.0	10.5	10.3	8.1	240	150	19.00	100			0.680	0.0150
OF	3/14/88		1425		23.0	15.0	10.4	7.8					2.80		0.510	0.0150
OF	3/24/88		1100		26.0	16.5	8.8			180			2.70	2.40	0.430	
OF	4/8/88		1050	WARM/WIND	25.4	17.2	9.4	8.0	290	150	2.00		2.60	2.60	0.370	0.0300
OF	5/19/88		1100		26.1	19.6	8.7	7.8	280	240	1.80		1.70	2.00	0.110	0.0150
OF	6/16/88		1245	2SOLID CLOU	18.8	21.0	7.3	8.0	260	160	3.20		2.00	2.00	0.015	0.0150
OF	7/21/88		1100	CLEAR	28.8	23.2	8.1	8.0	220	100	3.80		1.50	0.50	0.015	0.0150
OF	8/26/88		1115	CLEAR - HOT	33.5	22.8	8.5	8.0	230	140	2.40		2.20	1.90	0.015	0.0150
OF	9/29/88		1545	CLEAR	34.1	20.8	8.7	7.8	235	90	1.30		2.00	0.50	0.040	0.0150
OF	10/26/88		1015	FOG/OVERCA	14.7	15.6	8.9	7.9	240	140	0.80		1.80	0.50	0.015	0.0150
OF	12/7/88		1415	CLEAR		12.1	10.1	7.5	280	170	1.50		3.50	3.10	0.230	0.0150
OF	12/21/88		1130	CLEARING		9.5	10.3	7.5	277	170	35.00		8.70	6.90	0.740	0.0150
OF	1/18/89		1945	FOG		8.3	12.1	7.3	262	150	4.50		4.40	3.30	0.690	0.0150
OF	2/24/89		800	FOG/OC		12.1	9.7	7.8	315	200	2.50		4.80	5.00	1.000	0.0150
OF	3/16/89		1230	PART OC		13.1	9.3	7.7	233	150	27.00		5.70	5.00	0.810	0.0300
OF	4/4/89		1200	SUNNY		16.1	9.6	7.4	238	150	15.00		3.60	2.80	0.530	0.0150
OF	5/5/89		915	SUNNY		20.5	8.4	8.1	263	150	3.00		1.90	1.90	0.140	0.0150
OF	9/26/89		910			18.6	8.5	7.2	251	160			2.20	2.60	0.050	0.0030
OF	8/29/89		1230			21.3	8.7	7.6	228	93			2.00	1.80	0.030	0.0025
OF	10/16/89		1245			18.0	11.4	8.0	247	140			1.70	2.10	0.030	0.0010
OF	6/21/89		1100			23.5	8.0	7.8	257	150	3.20		3.20	1.00	0.015	0.0150
OF	11/13/89		1345	WARM		15.5	12.5	8.2	263	140			2.30	1.60	0.160	0.0060
OF	12/12/89		1330							170			2.10	2.00	0.250	0.0300
OF	1/17/90		1000							170			4.80	5.20	0.960	0.0500
OF	5/23/90		1100							170	2.00		2.60	8.40	0.100	0.0220
OF	5/3/90		1130							190	30.00		5.40	7.80	0.460	0.0340
OF	6/6/90		1015			20.2	9.3	7.8	398	130	8.00		4.40	5.30	0.210	0.0010

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	STIME	WEATHER	AIR Temp Deg C	H2O Temp Deg C	DO2 ppm	PH	Condo umhos	TFR	TURB	ALK mg/L	TOC mg/L	DOC mg/L	NO3 mg-N/L	NO2 mg-N/L
OF	6/13/90	1035			22.4	8.2	7.5	283	160	1.80		1.70	1.80	0.050	0.0010
OF	6/13/90	1030			20.2	9.0	7.8	254	160	3.00		1.90	2.00	0.020	0.0010
OF	12/4/90	1400			11.0	17.4	8.5	256				2.10	1.20	0.005	0.0010
OF	12/6/90	1345			10.7	13.8	8.2	266				1.50	3.40	0.005	0.0010
OF	12/11/90	1330			10.9	11.6	8.2	269				2.00	2.80	0.005	0.0010
OF	12/13/90	1305			10.8	11.5	8.2	274				2.70	4.30	0.070	0.0090
OF	12/18/90	1350			9.8	12.5	8.4	310				3.80	3.50	0.380	0.0270
OF	12/20/90	1245			7.2	12.3	8.4	330				3.10	2.90	0.670	0.0430
OF	12/27/90	1250			6.3	12.9	8.5	323				3.20	2.70	0.630	0.0340
OF	1/3/91	1250			7.5	13.2	8.4	326				2.50	3.00	0.810	0.0330
OF	1/23/91	1335			10.2	13.8	8.2	356				2.80	2.50	0.680	0.0600
OF	1/30/91	1410			9.3	14.7	8.3	341				2.90	2.70	0.540	0.0200
OF	2/8/91	1430			13.1	10.6	7.7	370				7.30	7.00	2.300	0.1900
OF	1/10/91	1235			9.6	12.4	8.3	367				4.70	4.50	1.300	0.0800
OF	1/15/91	1250			12.7	12.0	8.3	346				3.60	3.70	1.000	0.0500
OF	4/10/91	1020			14.4	9.4	8.1	295						0.980	0.0100
OF	4/17/91	948	NOT RECORDED		14.2	10.6	8.4	234						0.730	0.0200
OF	5/30/91	1315	SUN,WIND,MIL		20.8	9.6	8.1	314						0.310	0.0180
OF	6/4/91	1115	SUNNY, WARM		20.6	8.9	8.1	296							
OF	6/18/91	1315	SUNNY, WARM		23.1	9.8	7.4	283	170						0.0060
OF	6/27/91	1050	CLOUDY		19.9	8.8	8.0	247							0.0050
OF	6/27/91	1245	CLOUDY	67	20.7	9.8	8.0	253							0.0070
OF	6/27/91	1440	CLOUDY	71	20.6	9.9	7.9	254							0.0050
OF	6/27/91	1600	OVERCAST	69	20.3	8.5	7.9	225							0.0060
OF	6/27/91	1705	OVERCAST	70	20.1	9.7	7.9	276							0.0060
OF	6/27/91	1925	OVERCAST	66	20.0	9.8	7.7	275				0.02			0.0060
OF	6/27/91	2200	OVERCAST	62	19.6	9.1	7.7	275							0.0040
OF	6/28/91	100	CLOUDS,MIS	63	19.4	9.3	7.7	273							0.0070
OF	6/28/91	320	LIGHT RAIN	58	19.1	9.4	7.5	271							0.0080
OF	6/28/91	450	HEAVY RAIN	59.5	18.7	9.2	7.6	271							0.0080
OF	6/28/91	645	HEAVY RAIN	56.5	18.8	9.2	7.5	269							0.0080
OF	9/11/91	620		12.5	19.9	8.3	8.2	265						0.005	
OF	9/11/91	720		12.4	19.8	8.3	8.1	266							
OF	9/11/91	1030		16.5	20.1	8.6	8.2	240						0.005	
OF	9/11/91	20		11.0	19.9	8.4	8.1	267						0.005	
OF	9/11/91	1230		23.5	21.6	9.2	8.3	247						0.005	

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE		STIME	WEATHER	AIR Temp Deg C	H2O Temp Deg C	DO2 ppm	PH	Condo umhos	TFR	TURB	ALK mg/L	TOC mg/L	DOC mg/L	NO3 mg-N/L	NO2 mg-N/L
OF	9/11/91		1130		20.0	21.0	8.9	8.2	245							
OF	9/11/91		930		14.5	19.8	8.5	8.2	239							
OF	9/11/91		820		13.3	19.8	8.5	8.2	264						0.005	
OF	9/11/91		520		12.4	20.1	8.3	8.1	267							
OF	9/11/91		420		12.7	20.1	8.2	8.1	267						0.005	
OF	9/11/91		220		12.4	20.1	8.4	8.1	266						0.005	
OF	9/11/91		320		12.4	20.1	8.2	8.1	266							
OF	9/11/91		120		11.5	19.8	8.4	8.1	267							
OF	9/10/91		1520		22.3	22.9	9.4		269							
OF	9/10/91		2220		11.0	20.2	8.5	8.1	266						0.005	
OF	9/10/91		2320		10.5	19.9	8.4	8.1	267							
OF	9/10/91		1920		16.1	21.6	9.1	8.2	268							
OF	9/10/91		1325		31.6	23.5	9.2	8.1	264							
OF	9/10/91		1820		18.3	22.1	9.2	8.2	268						0.005	
OF	9/10/91		1230		29.6	22.1	9.3	8.1	266						0.005	
OF	9/10/91		1040	CLOUDY	24.2	20.2	8.7	8.0	266						0.005	
OF	9/10/91		1425		30.4	22.5	9.4	8.1	263						0.005	
OF	9/10/91		2020		14.5	20.9	9.0	8.2	267						0.005	
OF	9/10/91		2120		12.9	20.5	8.6	8.1	267							
OF	9/10/91		1720		20.8	22.4	9.5	8.1	267							
OF	9/10/91		1625		22.2	23.1	9.3	8.0	264						0.005	
OF	9/10/91		1130	CLEAR	27.5	21.4	9.1	8.0	266							
OF	6/28/91		1		17.5	19.5	9.1	7.7	274							
OF	6/28/91		822		15.0	19.1	8.7	7.4	270	130						0.0100
OF	6/28/91		1051		16.1	19.0	8.7	7.4	268							0.0110
OF	6/28/91		1527		18.3	19.2	8.4		267							0.0110
OF	6/28/91		1159		16.7	19.0	8.7	7.7	268							0.0190
OF	6/28/91		1427		17.2	19.0	8.8	7.5	267							0.0170
OF	5/30/90		1100	RAINING		17.2	8.9	7.4	207	190	30.00		5.40	7.80	0.460	0.0340
OF	9/24/85	NCRWQCB	1125					7.9	200	140	1.20	130			0.015	0.0015
OF	10/3/85	NCRWQCB	1445				9.0	8.1	190	170	0.60	130			0.015	0.0015
OF	10/11/85	NCRWQCB	1200				10.0	8.1	200	150	0.80	130			0.015	0.0015
OF	10/25/85	NCRWQCB	1315				9.0	8.0	240	130	0.60	120			0.140	0.0030
OF	11/8/85	NCRWQCB	1105				10.0	8.1	190	130	0.30	110			0.030	0.0015
OF	12/11/85	NCRWQCB	1315				10.0	7.7	240	130	11.00	100			0.270	0.0110
OF	1/7/86	NCRWQCB	1520				10.0	7.6	240	160	11.00	100			0.510	0.0200

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE		STIME	WEATHER	AIR Temp Deg C	H2O Temp Deg C	DO2 ppm	PH	Condo umhos	TFR	TURB	ALK mg/L	TOC mg/L	DOC mg/L	NO3 mg-N/L	NO2 mg-N/L
OF	1/14/86	NCRWQCB	1410				10.0	7.7	300	180	3.20	120			0.540	0.0060
OF	4/3/86	NCRWQCB	1525				11.0	7.8	300	210	7.30	130			0.680	0.0120
OF	5/14/86	NCRWQCB	1110				9.0	7.8	250	180	2.90	140			0.060	0.0050
OF	6/17/86	NCRWQCB	1045				10.0	8.0	280	160	2.20	120			0.030	0.0015
OF	6/26/86	NCRWQCB	1105				9.0	7.9	240	150	1.90	120			0.015	0.0015
OF	12/9/86	NCRWQCB						7.9	260	110	1.60	120			0.080	0.0015
OF	4/15/87	NCRWQCB	1125					8.0	280	170	1.90	130			0.120	0.0150
OF	5/26/87	NCRWQCB	1255			19.9	8.6	8.0	220	150	2.20	120			0.070	0.0150
OF	9/10/87	NCRWQCB	1030			20.0	8.6	8.1	250	140	1.50	110			0.015	0.0150
OF	4/16/92		1040	cloudy	17.0	16.2	9.2	7.7	288	180					0.510	0.0150
OF	6/23/92		1355	OVERCAST	30.0	23.0	8.6	8.0	258	170					0.015	
OF	9/8/92		1345	SUNNY	33.0	21.7	8.6	7.9	243	140					0.015	0.0150
OF	9/17/92		1120	MOSTLY SUN	20.0	18.8	8.6	8.0	248							
OF	9/22/92		1510	SUNNY, WIN	27.0	21.4	9.1	8.0	245							
OF	9/24/92		1030	SUNNY	27.5	20.3	8.2	8.0	252							
OF	9/29/92		1430	SUNNY	28.5	20.8	8.4	8.2	244							
OF				mean			9.6	8.0	266.4	155.3	6.6	119.4	3.1	3.3	0.288	0.017
OF				max			17.4	8.5	398.0	210.0	30.0	140.0	7.3	7.8	2.300	0.190
OF				min			7.3	7.2	190.0	90.0	0.3	100.0	0.0	0.5	0.005	0.001
RRSP	4/8/88		1330	WARM/WIND	27.4	16.6	9.7	8.0	260	150	2.00		2.50	1.60	0.210	0.0150
RRSP	5/19/88		840		19.7	17.1	8.8	7.8	260	300	1.80		1.80	1.90	0.100	0.0150
RRSP	6/16/88		1050	SOLID CLOU	16.4	17.7	8.5	8.1	230	140	2.50		1.70	1.70	0.040	0.0150
RRSP	7/21/88		1345	CLEAR	32.0	21.6	10.8	8.5	210	100	3.00		1.60	1.60	0.015	0.0150
RRSP	8/26/88		840	CLEAR	19.7	17.6	8.6	7.7	220	130	2.00		3.70	1.90	0.030	0.0150
RRSP	9/29/88		1015	CLEAR	22.2	16.4	7.8	7.6	225	120	0.95		1.50	0.50	0.080	0.0150
RRSP	10/26/88		1200	FOG/OVERCA	13.5	15.3	8.7	7.8	230	140	0.60		0.50	0.50	0.015	0.0150
RRSP	12/5/88		1455	PART CLOUDY		12.9	10.8	7.8	252	160	1.00		1.10	1.80	0.240	0.0150
RRSP	1/18/89		1435	SUNNY		10.7	13.2	7.8	229	130	2.50		3.10	3.90	0.300	0.0150
RRSP	2/23/89		1420	PART OC		17.1	11.5	8.0	241	160	0.55		2.50	1.60	0.150	0.0150
RRSP	3/17/89		845	SHOWERS		NA										
RRSP	4/3/89		1515	SUNNY/WINDY		16.2	10.0	8.0	225	140	12.00		1.80	1.90	0.410	0.0150
RRSP	5/4/89		1430	SUNNY		22.4	10.7	8.6	244	130	1.70		2.60	2.50	0.150	0.0150
RRSP	9/25/89		1230			20.4	10.2	7.9	227	160			1.00	1.60	0.040	0.0010
RRSP	8/29/89		1030			19.3	8.9	7.4	223	110			1.70	1.90	0.060	0.0025
RRSP	10/16/89		1100			16.7	11.8	8.0	230	270			4.50	1.40	0.050	0.0010

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE		STIME	WEATHER	AIR Temp	H2O Temp	DO2	PH	Condo	TFR	TURB	ALK	TOC	DOC	NO3	NO2
					Deg C	Deg C	ppm		umhos			mg/L	mg/L	mg/L	mg-N/L	mg-N/L
RRSP	6/20/89		1440			24.0	9.7	8.4	243	110	1.40		2.30	0.05	0.030	0.0150
RRSP	11/13/89		1145	WARM		15.7	12.5	8.1	242	140			1.60	1.50	0.020	0.0020
RRSP	12/12/89		1115							170			2.10	1.90	0.005	0.0050
RRSP	1/16/90		1345							150			3.20	2.80	0.330	0.0010
RRSP	5/24/90									170	3.00		2.70	2.30	0.170	0.0090
RRSP	5/3/90		1340							160	16.00		3.20	3.40	0.220	0.0090
RRSP	6/6/90		1350			21.9	10.2	7.9	392	150	4.00		1.70	2.10	0.140	0.0090
RRSP	6/20/90		1355			25.2	10.0	7.9	268	140	0.50		1.30	1.60	0.025	0.0010
RRSP	6/13/90		1400			20.2	10.2	7.9	243	46	1.00		1.70	1.70	0.020	0.0010
RRSP	4/8/91		1454	CLEAR, WINDY		16.8	10.8	7.6	272						0.720	0.0110
RRSP	4/15/91		1415	CLOUDY, WINDY		17.0	11.5	7.6	275						0.590	0.0070
RRSP	6/4/91		1410	SUNNY, WARM		22.2	9.6	8.2	269						0.340	0.0090
RRSP	6/18/91		1505	SUNNY, WARM		22.5	11.2	7.8	245	160						0.0040
RRSP	5/30/90		1340	RAINING		16.6	9.4	7.7	205	160	16.00		3.20	3.40	0.220	0.0090
RRSP	4/15/92		1310	CLOUDY	19.5	16.5	10.0	8.0	263	160					0.360	0.0150
RRSP	5/21/92		1125	sunny	32.7	22.4	8.6	8.3	283	160					0.290	0.0150
RRSP	6/25/92		1200	OVERCAST	23.5	20.0	10.0	8.2	239	150					0.040	
RRSP	9/8/92		1100	SUNNY	27.5	21.2	8.9	8.0	244	150					0.015	0.0150
RRSP	9/22/92		1440	SUNNY	28.0	21.0	10.1	8.2	232							
RRSP		mean					10.1	8.0	247.4	150.5	3.8		2.2	1.9	0.170	0.010
RRSP		max					13.2	8.6	392.0	300.0	16.0		4.5	3.9	0.720	0.015
RRSP		min					7.8	7.4	205.0	46.0	0.5		0.5	0.1	0.005	0.001
SHB	4/17/91		1020	NOT RECORDED		13.9	10.4	8.2	228						0.700	0.0200
SHB	5/30/91		1405	SUN, WIND, MIL		21.0	10.1	8.2	310						0.330	0.0190
SHB	6/4/91		1150	SUNNY, WARM		21.0	9.7	8.3	290							
SHB	6/18/91		1355	SUNNY, WARM		22.4	10.4	7.5	269	160						0.0060
SHB		mean					10.2	8.1	274.3	160.0						0.015
SHB		max					10.4	8.3	310.0	160.0						0.020
SHB		min					9.7	8.2	228.0	160.0						0.019
VB	1/26/88		1000		10.0	11.0	10.1	8.1	240	160	24.00	100			0.610	0.0150
VB	9/24/85	NCRWQCB	1045					7.9	200	160	1.50	130			0.015	0.0015
VB	10/3/85	NCRWQCB	1350				10.0	8.1	220	180	0.80	130			0.015	0.0015
VB	10/11/85	NCRWQCB	1045				11.0	8.1	220	160	0.56	120			0.015	0.0015
VB	10/25/85	NCRWQCB	1430				7.0	8.0	240	160	1.00	120			0.140	0.0030

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE		STIME	WEATHER	AIR Temp	H2O Temp	DO2	PH	Condo	TFR	TURB	ALK	TOC	DOC	NO3	NO2
					Deg C	Deg C	ppm		umhos			mg/L	mg/L	mg/L	mg-N/L	mg-N/L
VB	11/8/85	NCRWQCB	1210				10.0	8.0	180	130	0.30	110			0.030	0.0015
VB	12/11/85	NCRWQCB	1500				11.0	7.8	250	130	11.00	100			0.300	0.0120
VB	1/8/86	NCRWQCB	1140				10.0	7.6	260	160	11.00	110			0.420	0.0180
VB	4/3/86	NCRWQCB	1610				10.0	7.8	300	210	4.70	130			0.660	0.0120
VB	5/14/86	NCRWQCB	1200				10.0	7.6	250	180	2.80	130			0.015	0.0050
VB	6/17/86	NCRWQCB	1130				9.0	8.0	260	160	4.60	120			0.015	0.0015
VB	6/26/86	NCRWQCB	1200				8.0	7.9	240	140	1.40	110			0.015	0.0015
VB	12/9/86	NCRWQCB	1525					7.9	260	100	1.10	120			0.060	0.0015
VB	4/15/87	NCRWQCB	1225					8.1	280	170	1.40	130			0.090	0.0150
VB	5/26/87	NCRWQCB	1145			19.8	8.4	8.0	240	140	2.40	120			0.040	0.0150
VB	9/10/87	NCRWQCB	1000			19.5	9.6	8.2	240	120	0.60	110			0.015	0.0150
VB	6/23/92		1245	OVERCAST	25.0	23.6	8.8	8.0	263	170					0.015	
VB		mean					9.5	7.9	243.7	154.7	4.3	118.1			0.145	0.008
VB		max					11.0	8.2	300.0	210.0	24.0	130.0			0.660	0.018
VB		min					7.0	7.6	180.0	100.0	0.3	100.0			0.015	0.002
WB	1/26/88		1125		14.0	11.0	10.0	8.1	230	140	19.00	98			0.490	0.0150
WB	3/4/88		1545		19.0	16.0	11.3	8.4					0.50		0.130	0.0150
WB	3/14/88		1340		25.0	15.0	10.6	7.8					1.00		0.250	0.0150
WB	3/24/88		1130		27.0	16.3	10.2			150			1.70	1.50	0.240	
WB	4/7/88		1400	WARM/WIND	23.8	18.2	8.8	8.0	260	170	1.70		1.90	1.90	0.190	0.0150
WB	4/12/88		1145			18.8		7.9							0.280	
WB	5/19/88		940		22.9	19.0	9.0	8.0	260	300	1.80		1.50	1.90	0.080	0.0150
WB	6/16/88		1140	SOLID CLOU	17.7	20.0	8.4	8.2	240	140	2.60		1.70	1.50	0.015	0.0150
WB	7/21/88		1200	8CLEAR	29.3	21.7	9.1	8.2	210	100	2.90		1.00	0.50	0.015	0.0150
WB	8/26/88		945	CLEAR - HOT	25.0	21.1	9.4	8.1	225	130	2.00		3.20	3.00	0.015	0.0150
WB	9/29/88		1115	CLEAR	28.4	19.4	8.4	7.7	225	110	1.60		1.50	0.50	0.050	0.0150
WB	10/26/88		1100	FOG/OVERCA	13.5	15.9	8.8	8.0	230	130	1.10		0.50	0.50	0.015	0.0150
WB	12/6/88		1500	CLEAR		13.4	10.6	7.7	255	140	4.60		1.60	1.40	0.260	0.0150
WB	12/21/88		1230	CLEARING		10.2	12.0	7.9	248	130	3.00		1.90	1.90	0.130	0.0150
WB	1/18/89		1040	FOG		8.9	12.6	7.3	230	120	3.30		3.90	3.40	0.290	0.0150
WB	2/22/89		1130	RAIN		13.6	9.2	7.9	263	150	0.60		2.40	1.60	0.140	0.0150
WB	3/16/89		1100	STORMY		13.7	10.1	7.9	211	150	26.00		4.20	3.70	0.620	0.0150
WB	4/4/89		1030	SUNNY		15.4	10.3	7.8	220	130	14.00		2.10	2.30	0.380	0.0150
WB	5/4/89		1520	SUNNY		22.9	10.8	8.6	247	130	2.30		2.70	2.30	0.160	0.0150
WB	9/25/89		1410			20.8	8.8	8.0	230	150			1.10	3.50	0.040	0.0010

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE		STIME	WEATHER	AIR Temp	H2O Temp	DO2	PH	Condo	TFR	TURB	ALK	TOC	DOC	NO3	NO2
					Deg C	Deg C	ppm		umhos			mg/L	mg/L	mg/L	mg-N/L	mg-N/L
WB	8/29/89		1120			19.9	8.3	7.4	219	110			1.50	1.90	0.030	0.0025
WB	10/16/89		1145			16.7	10.6	8.0	233	140			15.00	1.40	0.040	0.0010
WB	6/21/89		1000			21.7	7.7	7.9	246	140	2.30		2.20	0.05	0.015	0.0150
WB	11/13/89		1230	WARM		16.0	12.9	8.2	243	140			1.80	1.70	0.020	0.0010
WB	12/12/89		1145							140			1.90	2.00	0.005	0.0050
WB	1/16/90		1450							150			3.10	2.80	0.400	0.0010
WB	5/23/90		1235							170	1.00		1.20	6.80	0.020	0.0080
WB	5/3/90		1210							170	23.00		3.00	3.20	0.260	0.0010
WB	6/6/90		1130			20.9	10.6	7.9	370	260	3.00		1.50	2.10	0.120	0.0070
WB	6/20/90		1145			23.9	7.0	7.6	272	150	7.40		1.30	1.40	0.050	0.0010
WB	6/13/90		1140			19.2	9.0	7.8	241	160	2.00		2.60	1.50	0.020	0.0010
WB	12/4/90		1315			10.3	17.0	8.6	249				2.30	1.40	0.030	0.0010
WB	12/6/90		1250			12.0	12.4	8.2	254				2.30	3.00	0.005	0.0010
WB	12/11/90		1240			12.1	11.0	8.1	250				1.40	3.30	0.050	0.0010
WB	12/13/90		1225			10.7	11.2	8.2	256				1.80	3.10	0.005	0.0010
WB	12/18/90		1325			10.8	12.2	8.3	258				3.70	2.30	0.005	0.0010
WB	12/20/90		1155			7.1	11.8	8.3	260				1.80	2.00	0.005	0.0010
WB	12/27/90		1135			7.1	12.1	8.4	261				2.20	1.50	0.005	0.0010
WB	1/3/91		1200			7.7	11.8	8.2	258				19.00	1.20	0.050	0.0010
WB	1/23/91		1300			11.0	11.2	8.1	264				1.30		0.030	0.0010
WB	1/30/91		1310			9.5	12.3	8.0	262				1.80	1.20	0.030	0.0010
WB	2/8/91		1335			12.3	11.8	7.8	274				2.90	2.90	5.200	0.0200
WB	1/10/91		1150			10.1	11.3	8.2	261				1.50	2.10	0.005	0.0010
WB	1/15/91		1150			13.3	11.8	8.3	260				2.20	2.00	0.005	0.0010
WB	4/10/91		1132			13.6	9.8	8.0	214						0.820	0.0080
WB	4/17/91		1040	NOT RECORDED		14.1	11.0	8.2	219						0.630	0.0080
WB	5/30/91		1440	SUN, WIND, MIL		20.1	9.2	7.5	296						0.350	0.0180
WB	6/4/91		1220	SUNNY, WARM		22.1	8.8	8.1	280							
WB	6/18/91		1045	SUNNY, WARM		20.0	9.8	7.5	253	140						0.0060
WB	5/30/90		1210	RAINING		17.4	9.4	7.7	205	170	23.00		3.00	3.20	0.260	0.0010
WB	9/24/85	NCRWQCB	1540					8.0	190	130	0.90	120			0.015	0.0015
WB	10/3/85	NCRWQCB	1340				11.0	8.3	200	200	0.80	120			0.015	0.0015
WB	10/11/85	NCRWQCB	1300				10.0	8.1	180	140	1.20	120			0.040	0.0015
WB	10/25/85	NCRWQCB	1215				12.0	8.1	240	150	0.40	130			0.150	0.0015
WB	11/8/85	NCRWQCB	1020				11.0	8.5	220	140	0.20	110			0.060	0.0015
WB	12/11/85	NCRWQCB	1200				11.0	7.4	210	110	10.00	95			0.290	0.0090

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE		STIME	WEATHER	AIR Temp	H2O Temp	DO2	PH	Condo	TFR	TURB	ALK	TOC	DOC	NO3	NO2
					Deg C	Deg C	ppm		umhos			mg/L	mg/L	mg/L	mg-N/L	mg-N/L
WB	1/8/86	NCRWQCB	1230				12.0	7.9	240	130	4.90	110			0.160	0.0050
WB	1/14/86	NCRWQCB	1340				11.0	7.8	250	160	0.90	130			0.280	0.0030
WB	4/3/86	NCRWQCB	1440				10.0	7.8	270	180	5.30	130			0.580	0.0030
WB	5/14/86	NCRWQCB	1020				9.0	7.9	250	160	2.50	130			0.040	0.0040
WB	6/17/86	NCRWQCB	950				8.0	7.9	240	150	4.50	110			0.030	0.0015
WB	6/26/86	NCRWQCB	905				8.0	7.9	240	140	2.00	110			0.015	0.0015
WB	12/31/86	NCRWQCB	1055					8.0	240	150	2.20	110			0.140	0.0040
WB	12/9/86	NCRWQCB	1325					7.8	240	100	0.80	110			0.060	0.0015
WB	12/17/86	NCRWQCB	1200					8.0	220	150	1.00	110			0.080	0.0015
WB	12/24/86	NCRWQCB	1015					8.0	240	140	1.40	110			0.160	0.0030
WB	4/10/87	NCRWQCB	1200	SUN/CLEAR		17.0	10.0	7.8	240	160	1.90	120			0.100	0.0015
WB	4/13/87	NCRWQCB	1155	SUN/BREEZE		15.6	10.8	7.1	270	140	1.30	120			0.130	0.0015
WB	4/15/87	NCRWQCB	1015					7.9	270	180	1.40	130			0.130	0.0150
WB	4/20/87	NCRWQCB	1200			16.1	10.3	7.9	270	160	1.40	120			0.130	0.0150
WB	4/22/87	NCRWQCB	1435			18.6	9.2	8.2	240	150	5.40	110			0.100	0.0150
WB	4/24/87	NCRWQCB	1030			14.8	8.4	8.0	240	140	3.20	110			0.110	0.0150
WB	5/26/87	NCRWQCB	1415			19.8	9.1	7.9	220	150	0.90	120			0.130	0.0150
WB	9/11/87	NCRWQCB	1000			20.0	8.5	8.1	240	140	2.00	100			0.015	0.0150
WB	3/30/92		1520	CLOUDY	18.0	14.9	11.2	8.2	268							
WB	4/15/92		1355	LT RAIN	19.5	16.6	9.9	8.0	263	160					0.360	0.0150
WB	5/21/92		1205	sunny	33.3	23.3	9.0	8.2	291	170					0.240	0.0150
WB	6/25/92		1000	OVERCAST	20.0	20.4	8.2	7.9	244	160					0.015	
WB	9/8/92		1215	SUNNY	34.5	21.3	8.2	7.9	234	140					0.015	0.0150
WB		mean					10.2	8.0	245.1	149.8	4.5	115.3	2.7	2.1	0.208	0.008
WB		max					17.0	8.6	370.0	300.0	26.0	130.0	19.0	6.8	5.200	0.020
WB		min					7.0	7.1	180.0	100.0	0.2	95.0	0.5	0.1	0.005	0.001
WBD	6/27/91		1025	CLOUDY		20.1	9.4	8.0	230							0.0040
WBD	6/27/91		1310	CLOUDY	73	20.1	10.1	8.0	233							0.0050
WBD	6/27/91		1505	CLOUDY	70	19.6	10.0	8.0	232							0.0050
WBD	6/27/91		1625	OVERCAST	70	19.2	9.8	8.0	258							
WBD	6/27/91		1900	OVERCAST	67	19.1	9.8	7.8	257							
WBD	6/27/91		2130	OVERCAST	62	18.8	9.9	7.8	258							0.0050
WBD	6/27/91		2315	OVERCAST	60	18.8	9.8	7.8	256							0.0050
WBD	6/28/91		23	CLOUD, DRIZZ	62	18.4	10.0	7.8	256							0.0060
WBD	6/28/91		244	CLOUD, DRIZZ	61	18.4	10.2	7.8	257							0.0080

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE		STIME	WEATHER	AIR Temp	H2O Temp	DO2	PH	Condo	TFR	TURB	ALK	TOC	DOC	NO3	NO2
					Deg C	Deg C	ppm		umhos			mg/L	mg/L	mg/L	mg-N/L	mg-N/L
WBD	6/28/91		415	LIGHT RAIN	60	18.3	10.2	7.7	254							0.0080
WBD	6/28/91		611	HEAVY RAIN	58.5	18.3	10.2	7.7	254							0.0090
WBD	6/28/91		715	HEAVY RAIN	58	18	9.6	7.7	256							0.0090
WBD	9/11/91		1200		21.5	20.9	9.4	8.3	232						0.020	
WBD	9/11/91		800		13	19.2	9.6		219						0.005	
WBD	9/11/91		1100		21	20.5	9.4	8.3	230							
WBD	9/11/91		405		12	19.0	9.1		201						0.005	
WBD	9/11/91		200		11.5	20.3	9.0		218						0.005	
WBD	9/11/91		900		14.5	19.4	9.2	8.2	227							
WBD	9/11/91		505		12	19.6	9.2		215							
WBD	9/11/91		700		12.5	19.0	8.5		201							
WBD	9/11/91		100		10	20.1	8.6		218							
WBD	9/11/91		305		12	19.7	9.1		219							
WBD	9/11/91		600		12	19.1	9.2		204						0.005	
WBD	9/11/91		1000		17.5	19.8	9.4	8.3	227						0.005	
WBD	9/10/91		1005	CLOUDY	21.3	19.9	9.1	7.9	261						0.040	
WBD	9/10/91		1110	CLEARING	20.0	19.8	9.4	8.1	253							
WBD	9/10/91		1205	CLEAR	20.9	21.3	9.6	8.0	253						0.030	
WBD	9/10/91		1300		29.1	22.2	9.7	8.1	252							
WBD	9/10/91		2000		15.5	21.1	8.3		228						0.005	
WBD	9/10/91		1820		19.5	21.9	9.1		228						0.005	
WBD	9/10/91		2100		13.5	21.0	8.3		225							
WBD	9/10/91		2200		13	20.9	8.6		223						0.005	
WBD	9/10/91		2400		11	20.2	8.6		219						0.005	
WBD	9/10/91		1800		23	22.6	9.6		233						0.010	
WBD	9/10/91		1700		23	22.0	8.8		235							
WBD	9/10/91		2300		12	20.5	8.4		221							
WBD	9/10/91		1355		26.9	23.4	9.6	8.1	252						0.020	
WBD	9/10/91		1900		17	21.9	8.7		230							
WBD	6/28/91		1125		16.7	18.4	9.5	7.7	253							0.0130
WBD	6/28/91		1452		17.2	18.5	9.5	7.6	253							0.0200
WBD	6/28/91		900		15.6	18.3	9.6	7.7	251	140						0.0140
WBD	6/28/91		1237		17.2	18.4	9.6	7.7	257							0.0140
WBD	6/27/91		1120		22.0	19.4	9.5	8.0	230							
WBD		mean					9.4	7.9	236.5	140.0					0.012	0.009
WBD		max					10.2	8.3	261.0	140.0					0.040	0.020

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	TIME	WEATHER	AIR Temp	H2O Temp	DO2	PH	Condo	TFR	TURB	ALK	TOC	DOC	NO3	NO2
				Deg C	Deg C	ppm		umhos			mg/L	mg/L	mg/L	mg-N/L	mg-N/L
WBD		min				8.3	7.6	201.0	140.0					0.005	0.004

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
CB	1/26/88	0.180		0.26	0.150	0.220	0.6600	14.3	85.7						1600	280
CB	3/4/88	0.170		0.37	0.110	0.120									23	13
CB	3/14/88	0.700			0.250	0.300									64	64
CB	3/24/88					0.170										
CB	4/5/88					0.100						0.00400				
CB	4/8/88	0.100	0.0060	0.25	0.090	0.090	0.2130	100.0							22	8
CB	4/12/88					0.120	0.1380	44.0	44.0		12.0	0.00600	0.00400	0.00800		
CB	5/19/88	0.080		0.16	0.070	0.100	0.5000	96.0		1.0	1.0	0.00120	0.00025	0.00025	46	46
CB	6/16/88	0.025		0.34	0.070	0.090	1.1190	49.0	45.0	2.0	4.0	0.00680	0.00080	0.00025	2401	26
CB	7/21/88	0.025		0.30	0.020	0.070	0.3380	71.0	29.0			0.00100	0.00025	0.00025		
CB	8/26/88	0.025		0.02	0.010	0.030	0.1780	50.0	50.0			0.00080	0.00025	0.00025		
CB	9/29/88	0.025		0.16	0.010	0.030	0.0300	100.0				0.00080	0.00025	0.00025		
CB	10/26/88	0.025		0.05	0.020	0.020	0.0510	100.0				0.00080	0.00025	0.00025		
CB	12/6/88	0.025		0.19	0.130	0.130	0.4600	29.0	68.0	3.0		0.00290	0.00025	0.00025		
CB	12/21/88	0.400		0.88	0.200	0.260	0.4500	75.0	22.0	3.0		0.00150	0.00025	0.00025		
CB	1/18/89	0.140		0.26	0.160	0.190	0.4700	41.0	53.0	6.0		0.00190	0.00025	0.00070		
CB	2/23/89	0.220		0.75	0.390	0.420	0.8000	53.0	47.0			0.00080	0.00025	0.00025		
CB	3/16/89	0.120		0.54	0.300	0.280	0.6100	32.0	65.0	3.0		0.00210	0.00110	0.00160		
CB	4/4/89	0.050		0.30	0.130	0.150	0.1400	24.0	76.0			0.00100	0.00025	0.00050		
CB	5/5/89	0.100		0.10	0.050	0.150	0.8400	67.0	27.0	4.0	1.0	0.00670	0.00190	0.00280		
CB	9/25/89	0.025		0.52	0.040	0.060	0.1900	100.0								
CB	8/29/89	0.050		0.05	0.040	0.020	0.0160	99.0	1.0							
CB	10/16/89	0.025		0.41	0.030	0.005	0.0690	96.0	1.0	1.0	1.0					
CB	6/21/89	0.025		0.40	0.010	0.050	0.8700	55.0	42.0	3.0		0.00140	0.00025	0.00025		
CB	11/13/89	0.025		0.05	0.080	0.080	0.2200	93.0	2.0		4.0					
CB	12/12/89	0.025		0.35	0.120	0.100	1.6000	99.0	0.3	0.3	0.3					
CB	5/23/90	0.025		0.05	0.300	0.320	0.4700	66.0	34.0			0.02000	0.02500	0.03000		
CB	5/3/90	0.025		0.05	0.170	0.230	0.1800	88.0	6.0	6.0		0.02000	0.02500	0.03000		
CB	6/6/90	0.025		0.50	0.200	0.160	0.1900	93.0	4.0	3.0		0.11000	0.08000	0.12000		
CB	6/20/90	0.025		0.05	0.040	0.050	0.0240	73.0	27.0			0.10000	0.08000	0.08000		
CB	6/13/90	0.025		0.30	0.040	0.040	0.0420	100.0				0.10000	0.08000	0.08000		
CB	12/4/90	0.025		0.05	0.010	0.005										
CB	12/6/90	0.025		0.05	0.005	0.005										
CB	12/11/90	0.025		0.05	0.005	0.020										

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
CB	12/13/90	0.025		0.13	0.050	0.050										
CB	12/18/90	0.025		0.22	0.210	0.200										
CB	12/20/90	0.025		0.16	0.220	0.250										
CB	12/27/90	0.025		0.05	0.230	0.730										
CB	1/3/91	0.025		0.05	0.260	0.260										
CB	1/23/91	0.025		0.45	0.300	0.340										
CB	1/30/91	0.025		0.05	0.200	0.210										
CB	2/8/91	0.160		0.41	1.000	1.100										
CB	1/10/91	0.025		0.17	0.400	0.400										
CB	1/15/91	0.025			0.320	0.340										
CB	4/10/91	0.025		0.18	0.130	0.140										
CB	5/30/90	0.025		0.05	0.170	0.230	0.1800	88.0	6.0	6.0		0.02000	0.02500	0.03000		
CB	1/16/90															
CB	9/24/85	0.270		0.50	0.030	0.030	1.2000	36.0	36.0	28.0					2401	380
CB	10/3/85	0.025		0.05	0.010	0.030	0.7600	33.0	33.0	34.0					1600	1
CB	10/11/85	0.025		0.20	0.010	0.020	0.1800		14.0	86.0					2401	11
CB	10/25/85	0.025		0.10	0.060	0.070	0.8600	3.0	65.0	32.0					1600	17
CB	11/8/85	0.025		0.10	0.020	0.030	0.0250			100.0					17	13
CB	12/11/85	0.170		0.80	0.240	0.220	0.9400	5.0	8.0	86.0					2401	130
CB	1/7/86	0.260		1.10	0.260	0.360	2.9300	1.0	3.0	96.0					2401	1600
CB	1/14/86	0.750		1.00	0.200	0.200	0.3300	15.0	38.0	47.0					2401	920
CB	4/3/86	0.100		0.10	0.010	0.080	0.2000	38.0	63.0						79	79
CB	5/14/86	0.050		0.20	0.060	0.060	0.1300	100.0							2401	43
CB	6/17/86	0.025		0.30	0.010	0.050	10.2210	13.0	87.0						350	17
CB	6/26/86	0.060		0.20	0.040	0.060	3.5230	80.0	20.0						110	13
CB	12/31/86	0.330		0.34	0.160	0.200										
CB	12/9/86	0.025		0.05	0.030	0.040	0.0005								49	31
CB	12/17/86	0.300		0.94	0.080	0.320									540	17
CB	12/24/86	0.220		0.36	0.140	0.140										
CB	4/10/87	0.025		0.32	0.050	0.040									110	110
CB	4/13/87	0.025		0.22	0.040	0.060									220	22
CB	4/15/87	0.025		0.19	0.030	0.060	0.3200	100.0							70	70
CB	4/20/87	0.070		0.18	0.030	0.050									350	13
CB	4/22/87	0.025		0.16	0.020	0.060									240	23
CB	4/24/87	0.025		0.27	0.040	0.060									130	79
CB	5/26/87	0.025		0.18	0.010	0.010									140	37

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
CB	9/10/87	0.025		0.20	0.010	0.040	0.0430	100.0							46	8
CB	4/16/92	0.080		0.49	0.150	0.200						0.01000				
CB	6/23/92	0.025				0.030										
CB	9/8/92	0.025		0.30	0.020	0.060						0.00500				
CB		0.089	0.006	0.277	0.123	0.151	1	63	34	28	3	0.018	0.016	0.399	865	145
CB		0.750	0.006	1.100	1.000	1.100	10.221	100	87	100	12	0.110	0.080	8.000	2401	1600
CB		0.025	0.006	0.020	0.005	0.005	0.001	1.000	0.300	0.300	0.300	0.001	0.0003	0.0003	17	1
DM	1/26/88	0.070		0.19	0.080	0.130	0.3900	33.3	66.7						2401	110
DM	4/8/88	0.080	0.0030	0.28	0.040	0.060	0.0710	100.0							79	17
DM	5/19/88	0.025		0.29	0.120	0.150	1.5040	64.0	33.0	3.0	0.5	0.00320	0.00025	0.00025	95	95
DM	6/16/88	0.025		0.12	0.050	0.070	1.0950	14.0	14.0	72.0		0.00660	0.00025	0.00060	1600	49
DM	7/21/88	0.050		0.24	0.040	0.060	0.0930	86.0	14.0			0.00025	0.00025	0.00025		
DM	8/26/88	0.025		0.13	0.030	0.060	0.2370	7.0	86.0	7.0		0.00100	0.00025	0.00025		
DM	9/29/88	0.025		0.24	0.020	0.040						0.00025	0.00025	0.00025		
DM	10/26/88	0.025		0.11	0.020	0.030	0.0950	100.0				0.00060	0.00025	0.00025		
DM	12/7/88	0.025		0.26	0.120	0.130	0.1800	65.0	35.0			0.00150	0.00025	0.00025		
DM	12/21/88	0.060		0.39	0.100	0.110	0.4800	25.0	55.0	20.0		0.00110	0.00025	0.00025		
DM	1/18/89	0.110		0.26	0.140	0.150	0.2500	38.0	46.0	16.0		0.00170	0.00060	0.00070		
DM	2/24/89	0.080		0.50	0.320	0.360	6.0000	60.0	39.0	1.0		0.00460	0.00025	0.00050		
DM	3/16/89	0.060		0.41	0.240	0.200	0.4100	36.0	54.0	10.0		0.00110	0.00025	0.00025		
DM	4/4/89	0.060		0.26	0.140	0.140	0.1200	49.0	51.0			0.00100	0.00025	0.00025		
DM	5/5/89	0.025		0.40	0.050	0.090	0.8200	68.0	25.0	6.0	1.0	0.00590	0.00110	0.00150		
DM	9/26/89	0.025		0.31	0.030	0.030	0.0540	97.0	1.0	1.0	1.0					
DM	8/29/89	0.100		0.05	0.030	0.010	0.0070	98.0	1.0	1.0						
DM	10/16/89	0.025		0.29	0.070	0.060	0.0380	96.0	1.0	1.0	1.0					
DM	6/21/89	0.025		0.19	0.010	0.060	0.0780	38.0	63.0			0.00120	0.00025	0.00025		
DM	11/13/89	0.025		0.05	0.060	0.070	0.0560	98.0	1.0		1.0					
DM	12/12/89	0.025		13.00	0.070	0.060	0.0120	88.0	3.0		9.0					
DM	1/17/90	0.430		0.42	0.310	0.370	0.5500	99.0	0.3	0.3	0.3					
DM	5/23/90	0.025		0.05	0.020	0.060	0.1400	100.0				0.02000	0.02500	0.03000		
DM	5/3/90	0.025		0.05	0.090	0.190	0.0640	100.0				0.06000	0.02500	0.03000		
DM	6/6/90	0.025		0.40	0.160	0.320	0.0550	100.0				0.07000	0.07000	0.09000		
DM	6/13/90	0.025		0.30	0.040	0.050	0.0066	100.0				0.02000	0.02500	0.03000		
DM	6/13/90	0.025		0.30	0.040	0.050	0.0066	100.0				0.02000	0.02500	0.03000		
DM	5/30/91			0.35												

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
DM	6/4/91															
DM	6/18/91	0.025		0.36	0.030	0.050										
DM	6/27/91			0.16	0.040	0.050										
DM	6/27/91			0.20	0.040	0.070										
DM	6/27/91			0.40	0.040	0.050										
DM	6/28/91			0.20	0.040	0.050										
DM	6/28/91			0.20	0.040	0.050										
DM	6/28/91	0.025		0.38	0.040	0.050						0.02000	0.02500	0.03000		
DM	6/28/91	0.025		0.45	0.040	0.090										
DM	5/30/90	0.025		0.05	0.090	0.190	0.0640	100.0								
DM	9/24/85	0.090		0.55	0.030	0.050	2.4000		21.0	79.0					220	5
DM	10/3/85	0.080		0.05	0.010	0.400	0.2300			100.0					1500	13
DM	10/11/85	0.025		0.20	0.020	0.030	0.2500		30.0	70.0					220	95
DM	10/25/85	0.025		0.10	0.040	0.040	0.1000			100.0					540	7
DM	11/8/85	0.025		0.10	0.020	0.020	0.4800			100.0					49	49
DM	12/11/85	0.140		0.50	0.220	0.190	0.8300	12.0	30.0	58.0					2401	540
DM	1/8/86	0.180		0.70	0.230	0.300	0.4800		79.0	21.0					46	23
DM	4/3/86	0.050		0.10	0.060	0.070	0.1800	43.0	57.0						220	5
DM	5/14/86	0.025		0.40	0.040	0.060	0.1000		100.0						31	5
DM	6/17/86	0.025		0.40	0.030	0.050	14.3430	35.5	64.5						130	33
DM	6/26/86	0.025		0.20	0.040	0.040									360	34
DM	12/9/86	0.025		0.05	0.020	0.040	0.0005								130	18
DM	4/15/87	0.025		0.23	0.030	0.060	0.4100	25.0	75.0						110	46
DM	5/26/87	0.025		0.19	0.020	0.040									79	22
DM	9/10/87	0.025		0.25	0.020	0.030	0.0540	85.0	15.0						280	120
DM	6/23/92	0.025				0.060										
DM		0.1	0.003	0.5	0.1	0.1	0.8	67.5	37.9	35.1	2.0	0.012	0.010	0.012	552.2	67.7
DM		0.4	0.003	13.0	0.3	0.4	14.3	100.0	100.0	100.0	9.0	0.070	0.070	0.090	2401.0	540.0
DM		0.025	0.003	0.1	0.0	0.0	0.0	7.0	0.3	0.3	0.3	0.0003	0.0003	0.0003	31.0	5.0
HMB	1/25/88	0.025		0.05	0.060	0.090									130	49
HMB	4/7/88	0.025		0.10	0.010	0.020	0.0530	100.0							220	64
HMB	5/18/88	0.025		0.26	0.020	0.030	0.4550	88.5	11.5			0.00050	0.00025	0.00025	2401	2401
HMB	6/15/88	0.025		0.18	0.010	0.020	0.6290	64.0	33.0	3.0		0.00210	0.00025	0.00025	920	69
HMB	7/20/88	0.080		0.40	0.020	0.040	0.3540	63.0	37.0			0.00180	0.00025	0.00025	2401	2401
HMB	8/25/88	0.025		0.11	0.010	0.010	0.2460	29.0	71.0			0.00071	0.00025	0.00025	940	245

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
HMB	9/29/88	0.025		0.13	0.010	0.020	0.0400	94.0	6.0			0.00340	0.00330	0.00420		
HMB	10/26/88	0.025		0.12	0.010	0.010	0.0250	100.0				0.00025	0.00025	0.00025		
HMB	12/5/88	0.025		0.10	0.020	0.030	0.0900	88.0	12.0			0.00025	0.00025	0.00025		
HMB	12/21/88	0.025		0.22	0.010	0.010	0.1070	83.0	17.0			0.00060	0.00025	0.00025		
HMB	1/19/89	0.025		0.19	0.020	0.060	0.2600	58.0	42.0			0.00025	0.00025	0.00025		
HMB	2/23/89	0.025		0.27	0.010	0.040	0.6200	70.0	27.0	3.0		0.00380	0.00060	0.00060		
HMB	3/17/89	0.025		0.46	0.050	0.260	0.3200	39.0	54.0	7.0		0.00025	0.00025	0.00025		
HMB	4/3/89	0.025		0.24	0.010	0.060	0.0800	55.0	45.0			0.00025	0.00025	0.00025		
HMB	5/4/89	0.060		0.19	0.010	0.040	1.0000	79.0	21.0			0.00210	0.00025	0.00060		
HMB	9/25/89	0.025		0.38	0.020	0.020	0.2800	100.0								
HMB	8/29/89	0.050		0.10	0.010	0.010	0.0270	99.0			1.0					
HMB	10/16/89	0.090		0.25	0.005	0.005	0.2500	97.0	1.0	1.0	1.0					
HMB	6/20/89	0.025		0.24	0.010	0.010	0.1700	64.0	27.0	9.0		0.00150	0.00025	0.00025		
HMB	11/13/89	0.250		0.05	0.005	0.010	0.0280	91.0			9.0					
HMB	12/12/89	0.025		0.96	0.010	0.005	0.0880	98.0			2.0					
HMB	1/16/90	0.130		0.30	0.005	0.100	0.2700	99.0	0.3	0.3	0.3					
HMB	5/23/90	0.025		0.05	0.010	0.020	0.0670	95.0	5.0			0.02000	0.02500	0.03000		
HMB	5/24/90															
HMB	5/3/90	0.025		0.05	0.005	0.080	0.1300	100.0				0.02000	0.02500	0.03000		
HMB	6/6/90	0.025		0.20	0.040	0.040	0.1100	100.0				0.09000	0.05000	0.10000		
HMB	6/20/90	0.025		0.05	0.005	0.020	0.0465	95.0	5.0			0.09000	0.07000	0.09000		
HMB	6/13/90	0.025		0.20	0.005	0.005						0.09000	0.07000	0.09000		
HMB	4/8/91	0.025		0.11	0.005	0.020										
HMB	4/15/91	0.025		0.30	0.005	0.230										
HMB	6/4/91			0.24		0.090										
HMB	6/18/91	0.025		1.00		0.090										
HMB	5/30/90	0.025		0.05	0.010	0.080	0.1300	100.0				0.02000	0.02500	0.03000		
HMB	9/24/85	0.025		0.53	0.010	0.010	1.6000	5.0	26.0	69.0					180	4
HMB	10/3/85	0.070		0.05	0.010	0.010	0.0500			100.0					540	13
HMB	10/11/85	0.025		0.40	0.010	0.010	0.2500		20.0	80.0					23	23
HMB	10/25/85	0.060		0.10	0.010	0.020	0.1000	25.0		75.0					540	11
HMB	11/8/85	0.025		0.20	0.010	0.010									21	14
HMB	12/11/85	0.050		0.30	0.050	0.050	0.8100	6.0	41.0	53.0					430	95
HMB	1/8/86	0.050		0.12	0.020	0.080	0.7800			100.0					920	27
HMB	4/3/86	0.050		0.05	0.010	0.020	0.0200	100.0							1600	1600
HMB	5/14/86	0.100		0.40	0.030	0.030	0.0500	100.0							280	8

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
HMB	6/17/86	0.025		0.10	0.010	0.020	0.9350	11.0	89.0						33	13
HMB	6/26/86	0.060		0.10	0.010	0.080	2.2650	33.0	67.0						120	23
HMB	4/15/87	0.025		0.22	0.010	0.020	0.2000	100.0							540	170
HMB	5/26/87	0.025		0.08	0.010	0.020									170	70
HMB	9/11/87	0.025		0.10	0.015	0.050	0.0500	100.0							170	240
HMB	4/15/92	0.025		0.26	0.010	0.050						0.00500				
HMB	5/21/92	0.025		0.15	0.010	0.030						0.00500				
HMB	6/25/92	0.025			0.010	0.010						0.00500				
HMB	9/8/92	0.025		0.22	0.010	0.010						0.00500			170	14
HMB	9/17/92														350	70
HMB	9/22/92														240	240
HMB	9/24/92														170	49
HMB	9/29/92														70	31
HMB	5/17/93					0.030										
HMB	6/22/93					0.060										
HMB	10/12/93					0.081										
HMBDD	6/25/92															
HMB		0.041		0.223	0.014	0.043	0.3	75.1	29.9	41.7	2.7	0.015	0.014	0.019	543.2	317.8
HMB		0.250		1.000	0.060	0.260	2.3	100.0	89.0	100.0	9.0	0.090	0.070	0.100	2401.0	2401.0
HMB		0.025		0.050	0.005	0.005	0.020	5.0	0.3	0.3	0.3	0.000	0.000	0.000	21.0	4.0
JB	1/26/88	0.080		0.05	0.080	0.120	0.5200	75.0	25.0						2401	70
JB	4/8/88	0.060	0.0050	0.25	0.090	0.110	1.4090	88.0	12.0						13	13
JB	5/19/88	0.025		0.31	0.100	0.140	1.5020	85.0	15.0			0.00280	0.00025	0.00025	2401	2401
JB	6/16/88	0.025		0.02	0.060	0.080	1.6230	45.0	44.0	11.0		0.00990	0.00080	0.00080	1600	13
JB	7/21/88	0.025		0.27	0.040	0.080	0.6580	75.0	25.0			0.00320	0.00025	0.00025	2401	1600
JB	8/26/88	0.025		0.12	0.020	0.030	0.1200	55.0	45.0			0.00090	0.00025	0.00025	2000	190
JB	9/29/88	0.025		0.16	0.020	0.040	0.1500	79.0	18.0	3.0		0.00070	0.00025	0.00025		
JB	10/26/88	0.070		0.05	0.020	0.010	0.0790	79.0	21.0			0.00050	0.00025	0.00025		
JB	12/7/88	0.080		0.23	0.100	0.130	0.4200	24.0	76.0			0.00280	0.00025	0.00025		
JB	12/21/88	0.410		0.62	0.210	0.210	1.0100	62.0	36.0	2.0		0.00830	0.00070	0.00080		
JB	1/18/89	0.160		0.29	0.160	0.190	0.5100	42.0	52.0	6.0		0.00190	0.00070	0.00130		
JB	2/24/89	0.190		0.68	0.380	0.450	1.1000	42.0	57.0	1.0		0.00570	0.00070	0.00025		
JB	3/16/89	0.150		0.55	0.290	0.230	0.2900	80.0	13.0	7.0		0.00140	0.00025	0.00025		
JB	4/4/89	0.025		0.28	0.140	0.160	0.2400	36.0	64.0			0.00140	0.00025	0.00050		
JB	5/5/89	0.025		0.30	0.070	0.090	1.2000	78.0	14.0		7.0	0.00740	0.00140	0.00230		

Appendix 3.

Water Quality In the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3 mg-N/L	UN-NH3 mg-N/L	TKN mg-N/L	OPO4 mg-P/L	TPO4 mg-P/L	PHYTODEN	DIA	GRN	BLU	DINO	CHLA mg/L	CHLB mg/L	CHLC mg/L	TC	FC
JB	9/26/89	0.025		0.37	0.040	0.030	0.2800	94.0	1.0	1.0	3.0					
JB	8/29/89	0.050		0.05	0.020	0.020	0.0050	97.0			2.8					
JB	10/16/89	0.025		0.28	0.040	0.030	0.0980	96.0	1.0	1.0						
JB	6/21/89	0.025		0.48	0.010	0.100	1.1000	59.0	49.0	2.0		0.00650	0.00200	0.00180		
JB	11/13/89	0.025		0.05	0.070	0.080	0.1200	94.0	1.0	1.0	4.0					
JB	12/12/89	0.025		0.05	0.110	0.140	0.1000	99.0	0.5		0.5					
JB	1/17/90	0.400		0.59	0.300	0.250	0.0740	98.0	1.0	0.5	0.5					
JB	5/23/90	0.025		0.05	0.080	0.090	0.1600	100.0				0.04000	0.06000	0.03000		
JB	5/3/90	0.025		0.05	0.150	0.190	0.0480	96.0		4.0		0.02000	0.02500	0.03000		
JB	6/6/90	0.025		0.30	0.180	0.150	0.0066	66.0	33.0	0.5	0.5	0.10000	0.08000	0.10000		
JB	6/20/90	0.025		0.40	0.040	0.040	0.0940	10.0				0.02000	0.25000	0.03000		
JB	6/13/90	0.025		0.20	0.050	0.080	0.0180	100.0				0.02000	0.02500	0.03000		
JB	12/4/90	0.025		0.05	0.020	0.025										
JB	12/6/90	0.025		0.05	0.005	0.005										
JB	12/11/90	0.025		0.05	0.005	0.005										
JB	12/13/90	0.025		0.05	0.020	0.030										
JB	12/18/90	0.025		0.11	0.130	0.130										
JB	12/20/90	0.025		0.05	0.220	0.250										
JB	12/27/90	0.025		0.05	0.170	0.180										
JB	1/3/91	0.025		0.05	0.250	0.260										
JB	1/23/91	0.025		0.36	0.220	0.290										
JB	1/30/91	0.025		0.05	0.170	0.180										
JB	2/8/91	0.110		0.31	0.850	0.890										
JB	1/10/91	0.025		0.05	0.420	0.420										
JB	1/15/91	0.025		0.05	0.320	0.340										
JB	4/10/91	0.025		0.24	0.110	0.140										
JB	4/17/91	0.025		0.30	0.060	0.070										
JB	5/30/91			0.22	0.040	0.040										
JB	6/4/91															
JB	6/18/91	0.025		1.00	0.020	0.080										
JB	5/30/90	0.025		0.05	0.150	0.190	0.0480	96.0		4.0						
JB	9/24/85	0.460		0.55	0.030	0.030	3.3000	28.0	41.0	31.0					2401	4
JB	10/3/85	0.120		0.20	0.010	0.400	0.2500			100.0					350	2
JB	10/11/85	0.025		0.40	0.020	0.250	0.1500		67.0	33.0					920	27
JB	10/25/85	0.025		0.40	0.040	0.060	0.1300	60.0	20.0	20.0					1600	43
JB	11/8/85	0.025		0.10	0.020	0.020	0.0760			100.0					280	39

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
JB	12/11/85	0.160		0.50	0.220	0.260	0.5300	5.0	14.0	81.0					2401	350
JB	1/7/86	0.200		0.90	0.240	0.670	3.0100	4.0	39.0	57.0					2401	2401
JB	4/3/86	0.050		0.30	0.060	0.080	0.3500	21.0	57.0	21.0					170	49
JB	5/14/86	0.025		0.10	0.050	0.060	0.2800	55.0	45.0						64	1
JB	6/17/86	0.025		0.30	0.020	0.050	9.6800	27.5	72.5						110	5
JB	6/26/86	0.025		0.10	0.040	0.060	7.5500	100.0							920	14
JB	12/31/86	0.370		0.47	0.170	0.180										
JB	12/9/86	0.025		0.05	0.030	0.040	0.0005								46	11
JB	12/17/86	0.390		0.52	0.280	0.030									64	11
JB	12/24/86	0.080		0.20	0.080	0.080										
JB	4/10/87	0.025		0.28	0.040	0.040									540	23
JB	4/13/87	0.025		0.32	0.030	0.060									2401	70
JB	4/15/87	0.025		0.28	0.030	0.050	1.6000	62.0	38.0						540	130
JB	4/20/87	0.025		0.14	0.030	0.040									140	8
JB	4/22/87	0.025		0.22	0.090	0.050									350	110
JB	4/24/87	0.025		0.21	0.050	0.040									110	70
JB	5/26/87	0.025		0.22	0.010	0.020									540	130
JB	9/10/87	0.025		0.20	0.010	0.040	0.0670	89.0	11.0						45	32
JB	3/31/92															
JB	4/16/92	0.025		0.62	0.140	0.210						0.01000				
JB	6/23/92															
JB	9/8/92	0.025		0.24	0.010	0.050						0.00500			920	33
JB	9/17/92														540	46
JB	9/22/92														220	23
JB	9/24/92														540	13
JB	9/29/92														240	2
JB	5/17/93					0.050										
JB	6/23/93					0.040										
JB	10/12/93					0.051	0.4440									
JBUD	6/23/92	0.025				0.040										
JB		0.070	0.005	0.257	0.111	0.133	0.9	65.8	31.5	22.1	2.6	0.013	0.024	0.012	927.2	247.9
JB		0.460	0.005	1.000	0.850	0.890	9.7	100.0	76.0	100.0	7.0	0.100	0.250	0.100	2401.0	2401.0
JB		0.025	0.005	0.020	0.005	0.005	0.0	4.0	0.5	0.5	0.5	0.001	0.0003	0.0003	13.0	1.0
JEN	9/26/89	0.025		0.27	0.030	0.030	0.0190	96.0	1.0	1.0	1.0					
JEN	8/29/89	0.050		0.10	0.040	0.620	0.1800	99.0	1.0							

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
JEN	10/16/89	0.025		0.31	0.040	0.050	0.0050	96.0	1.0	1.0	1.0					
JEN	11/13/89	0.025		0.05	0.060	0.060	0.0940	94.0	1.0	1.0	4.0					
JEN	12/12/89	0.025		0.05	0.080	0.120	0.0070	62.0	14.0		24.0					
JEN	1/17/90	0.310		0.47	0.250	0.360	0.0900	97.0	1.0	1.0	1.0					
JEN	6/23/92	0.060				0.060										
JEN		0.074		0.208	0.083	0.186	0.066	90.7	3.2	1.0	6.2					
JEN		0.310		0.470	0.250	0.620	0.180	99.0	14.0	1.0	24.0					
JEN		0.025		0.050	0.030	0.030	0.005	62.0	1.0	1.0	1.0					
OF	1/26/88	0.100		0.10	0.080	0.130	0.7000	28.6	71.4						2401	350
OF	3/14/88	0.450			0.180	0.250	2.0000								23	13
OF	3/24/88					0.170										
OF	4/8/88	0.110	0.0040	0.37	0.110	0.120	0.1890	50.0	50.0						79	22
OF	5/19/88	0.025		0.20	0.080	0.100	0.7140	80.0	17.0	3.0		0.00220	0.00025	0.00025	110	110
OF	6/16/88	0.025		0.25	0.060	0.080	1.1290	58.0	36.0	5.0	1.0	0.00820	0.00070	0.00025	2401	33
OF	7/21/88	0.025		0.28	0.030	0.050	0.2690	67.0	33.0			0.00140	0.00025	0.00025		
OF	8/26/88	0.025		0.02	0.010	0.250	0.0700	50.0	50.0			0.00060	0.00025	0.00025		
OF	9/29/88	0.025		0.14	0.010	0.030	0.0600	84.0	16.0			0.00060	0.00025	0.00025		
OF	10/26/88	0.025		0.11	0.020	0.020	0.1290	58.0	42.0			0.00025	0.00025	0.00025		
OF	12/7/88	0.025		0.27	0.110	0.110	0.2800	44.0	56.0			0.00270	0.00025	0.00025		
OF	12/21/88	0.370		0.95	0.250	0.410	0.9600	73.0	26.0	1.0		0.01000	0.00140	0.00150		
OF	1/18/89	0.140		0.24	0.160	0.180	0.6100	73.0	23.0	4.0		0.00200	0.00060	0.00080		
OF	2/24/89	0.130		0.53	0.330	0.420	0.7700	59.0	39.0	2.0		0.00350	0.00025	0.00025		
OF	3/16/89	0.160		0.55	0.300	0.260	0.3700	21.0	63.0	16.0		0.00300	0.00260	0.00280		
OF	4/4/89	0.025		0.35	0.140	0.160	0.1900	46.0	46.0	8.0		0.00160	0.00025	0.00025		
OF	5/5/89	0.050		0.30	0.050	0.120	1.9000	66.0	26.0	5.0	3.0	0.00700	0.00140	0.00230		
OF	9/26/89	0.025		0.38	0.050	0.040	0.2700	96.0		1.0	3.0					
OF	8/29/89	0.050		0.05	0.050	0.010	0.0190	99.0	1.0							
OF	10/16/89	0.025		0.27	0.040	0.030	0.0620	93.0	1.0	1.0	6.0					
OF	6/21/89	0.025		0.42	0.010	0.050	0.5700	70.0	27.0	3.0		0.00025	0.00370	0.00025		
OF	11/13/89	0.025		0.10	0.080	0.080	0.2100	95.0	1.0	1.0	3.0					
OF	12/12/89	0.025		0.36	0.120	0.120	0.3400	99.0	0.3	0.3	0.3					
OF	1/17/90	0.360		0.71	0.290	0.420	0.2900	99.0	0.3	0.3	0.3					
OF	5/23/90	0.025		38.00	0.130	0.140	0.3400	60.0	40.0			0.06000	0.02500	0.25000		
OF	5/3/90	0.025		0.05	0.160	0.210	0.1700	85.0		15.0		0.02000	0.02500	0.03000		
OF	6/6/90	0.025		0.40	0.200	0.170	0.0350	59.0	9.0	31.0	1.0	0.10000	0.08000	0.10000		

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
OF	6/13/90	0.025		0.30	0.030	0.030	0.0150	86.0	14.0			0.10000	0.08000	0.13000		
OF	6/13/90	0.025		0.20	0.040	0.050	0.0180	100.0				0.10000	0.08000	0.13000		
OF	12/4/90	0.025		0.05	0.005	0.010										
OF	12/6/90	0.250		0.05	0.005	0.005										
OF	12/11/90	0.025		0.05	0.020	0.030										
OF	12/13/90	0.025		0.05	0.060	0.070										
OF	12/18/90	0.025		0.38	0.170	0.170										
OF	12/20/90	0.025		0.17	0.230	0.250										
OF	12/27/90	0.025		0.11	0.200	0.210										
OF	1/3/91	0.025		0.05	0.260	0.260										
OF	1/23/91	0.025		0.18	0.220	0.260										
OF	1/30/91	0.025		0.05	0.180	0.200										
OF	2/8/91	0.120		0.27	0.950	1.000										
OF	1/10/91	0.025		0.11	0.540	0.540										
OF	1/15/91	0.025		0.05	0.310	0.330										
OF	4/10/91	0.025		0.15	0.120	0.290										
OF	4/17/91	0.025		0.30	0.050	0.100										
OF	5/30/91			0.15	0.050	0.050										
OF	6/4/91															
OF	6/18/91	0.025		0.36	0.030	0.080										
OF	6/27/91			0.33		0.070										
OF	6/27/91			0.17	0.030	0.030										
OF	6/27/91			0.27		0.030										
OF	6/27/91			0.40	0.030	0.040										
OF	6/27/91			0.40	0.030	0.040										
OF	6/27/91			0.45	0.030	0.040										
OF	6/27/91			0.29	0.030	0.040										
OF	6/28/91			0.30	0.030	0.050										
OF	6/28/91			0.25	0.030	0.040										
OF	6/28/91			0.29	0.030	0.040										
OF	6/28/91			0.30	0.030	0.040										
OF	9/11/91			0.25												
OF	9/11/91															
OF	9/11/91															
OF	9/11/91															
OF	9/11/91															

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
OF	9/11/91															
OF	9/11/91															
OF	9/11/91															
OF	9/11/91															
OF	9/11/91															
OF	9/11/91			0.13												
OF	9/11/91															
OF	9/11/91															
OF	9/10/91															
OF	9/10/91															
OF	9/10/91															
OF	9/10/91															
OF	9/10/91															
OF	9/10/91			0.12												
OF	9/10/91															
OF	9/10/91			0.24												
OF	9/10/91			0.15												
OF	9/10/91															
OF	9/10/91															
OF	9/10/91															
OF	9/10/91															
OF	9/10/91															
OF	6/28/91															
OF	6/28/91	0.025		0.38	0.005	0.050						0.02000	0.02500	0.03000		
OF	6/28/91	0.025		0.30	0.005	0.050										
OF	6/28/91	0.025		0.35	0.020	0.050										
OF	6/28/91	0.025		0.37	0.005	0.050										
OF	6/28/91	0.025		0.27	0.030	0.050										
OF	5/30/90	0.025		0.05	0.180	0.210	0.1700	85.0	15.0			0.02000	0.02500	0.03000		
OF	9/24/85	0.290		0.48	0.030	0.040	1.5000	17.0	56.0	27.0					1600	140
OF	10/3/85	0.260		0.34	0.010	0.300	0.2500		40.0	60.0					920	1
OF	10/11/85	0.025		0.05	0.020	0.200	0.1800		43.0	57.0					430	31
OF	10/25/85	0.025		0.10	0.050	0.050	0.1800	14.0		86.0					350	33
OF	11/8/85	0.025		0.10	0.030	0.030	0.0760			100.0					70	33
OF	12/11/85	0.160		0.60	0.220	0.350	0.6600	4.0	4.0	92.0					1600	240
OF	1/7/86	0.280		1.10	0.260	0.340	1.3100	4.0	2.0	94.0					1600	1600

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
OF	1/14/86	0.750		1.20	0.190	0.210	0.1800	29.0	42.0	29.0					2401	920
OF	4/3/86	0.060		0.40	0.070	0.090	0.2300	78.0	22.0						33	23
OF	5/14/86	0.025		0.10	0.060	0.070									2401	2
OF	6/17/86	0.025		0.20	0.020	0.050	9.6190	23.5	76.5						350	17
OF	6/26/86	0.060		0.10	0.040	0.040	2.2150	33.0	67.0						240	17
OF	12/9/86	0.025		0.05	0.020	0.040		9.0	91.0						79	22
OF	4/15/87	0.025		0.22	0.030	0.060	1.9000	100.0								
OF	5/26/87	0.025		0.20	0.010	0.020									140	95
OF	9/10/87	0.025		0.20	0.010	0.040	0.0530	100.0							280	23
OF	4/18/92	0.025		0.55	0.140	0.210						0.01000				
OF	6/23/92	0.025				0.030										
OF	9/8/92	0.025		0.25	0.010	0.020						0.00500			130	11
OF	9/17/92														79	23
OF	9/22/92														79	79
OF	9/24/92														79	33
OF	9/29/92														26	1
OF		0.078	0.0040	0.723	0.106	0.136	0.7	61.4	32.8	26.7	2.2	0.021	0.017	0.034	716.0	154.9
OF		0.750	0.0040	1.200	0.950	1.000	9.6	100.0	91.0	100.0	1.0	0.100	0.080	0.130	2401.0	1600.0
OF		0.025	0.0040	0.020	0.005	0.005	0.015	4.0	0.3	0.3	0.3	0.0003	0.0003	0.0003	23.0	1.0
RRSP	4/8/88	0.025		0.15	0.020	0.030	0.5730	82.0	18.0						13	8
RRSP	5/19/88	0.025		0.10	0.010	0.030	0.3120	100.0				0.00100	0.00025	0.00025	350	350
RRSP	6/16/88	0.025		0.20	0.010	0.020	1.1720	77.0	16.0	7.0		0.00160	0.00025	0.00025	2401	33
RRSP	7/21/88	0.025		0.21	0.010	0.010	0.2990	85.0	15.0			0.00110	0.00025	0.00025		
RRSP	8/26/88	0.025		0.10	0.010	0.010	0.4250	92.0	8.0			0.00180	0.00025	0.00025		
RRSP	9/29/88	0.025		0.17	0.010	0.030	0.1700	93.0	7.0			0.00120	0.00060	0.00060		
RRSP	10/26/88	0.025		0.05	0.020	0.020	0.2290	81.0	19.0			0.00050	0.00025	0.00025		
RRSP	12/5/88	0.025		0.10	0.020	0.050	0.1700	73.0	9.0	9.0	9.0	0.00060	0.00025	0.00025		
RRSP	1/18/89	0.025		0.12	0.030	0.060	0.4500	64.0	35.0	1.0		0.00140	0.00070	0.00160		
RRSP	2/23/89	0.025		0.23	0.030	0.040	0.5000	71.0	24.0	5.0		0.00150	0.00025	0.00025		
RRSP	3/17/89															
RRSP	4/3/89	0.025		0.18	0.010	0.060	0.1500	54.0	46.0			0.00025	0.00025	0.00025		
RRSP	5/4/89	0.025		0.22	0.010	0.020	0.5200	79.0	21.0			0.00230	0.00025	0.00025		
RRSP	9/25/89	0.025		0.44	0.005	0.005	0.1200	100.0								
RRSP	8/29/89	0.050		0.10	0.010	0.010	0.0780	99.0	1.0							
RRSP	10/16/89	0.120		0.31	0.020	0.005	0.1300	98.0	1.0		1.0					

Appendix 3.

Water Quality In the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
RRSP	6/20/89	0.025		0.26	0.010	0.010	0.3500	79.0	16.0	5.0		0.00170	0.00025	0.00025		
RRSP	11/13/89	0.060		0.02	0.010	0.010	0.0910	98.0	1.0		1.0					
RRSP	12/12/89	0.025		0.15	0.005	0.020	0.2200	99.0	0.3	0.3	0.3					
RRSP	1/16/90	0.110		0.36	0.005	0.080	0.1000	95.0	0.5	0.5	4.0					
RRSP	5/24/90	0.025		0.05	0.005	0.020	0.1900	100.0				0.02000	0.02500	0.03000		
RRSP	5/3/90	0.025		0.05	0.005	0.080	0.0810	98.0	2.0			0.02000	0.02500	0.03000		
RRSP	6/6/90	0.025		0.30	0.020	0.030	0.0420	100.0				0.07000	0.07000	0.09000		
RRSP	6/20/90	0.025		0.05	0.005	0.010	0.1200	100.0				0.09000	0.05000	0.10000		
RRSP	6/13/90	0.025		0.50	0.005	0.005						0.09000	0.05000	0.10000		
RRSP	4/8/91	0.025		0.35	0.005	0.020										
RRSP	4/15/91	0.025		0.20	0.005	0.005										
RRSP	6/4/91			0.33		0.050										
RRSP	6/18/91	0.025		1.00		0.040										
RRSP	5/30/90	0.025		0.05	0.005	0.080	0.0810	98.0	2.0			0.02000	0.02500	0.03000		
RRSP	4/15/92	0.025		0.32	0.010	0.050						0.00500				
RRSP	5/21/92	0.025		0.18	0.010	0.040						0.00500				
RRSP	6/25/92	0.025			0.010	0.010						0.00500				
RRSP	9/8/92	0.025		0.20	0.010	0.050						0.00500				
RRSP	9/22/92				0.010	0.020										
RRSP		0.033		0.220	0.011	0.030	0.274	88.1	12.7	4.0	3.1	0.016	0.014	0.021	921.3	130.3
RRSP		0.120		1.000	0.030	0.080	1.172	100.0	46.0	9.0	9.0	0.090	0.070	0.100	2401.0	350.0
RRSP		0.025		0.020	0.005	0.005	0.042	54.0	0.3	0.3	0.3	0.0003	0.0003	0.0003	13.0	8.0
SHB	4/17/91	0.025		0.30	0.050	0.240										
SHB	5/30/91			0.26	0.060	0.050										
SHB	6/4/91															
SHB	6/18/91	0.025		0.21	0.020	0.370										
SHB		0.025		0.257	0.043	0.220										
SHB		0.025		0.300	0.060	0.370										
SHB		0.025		0.260	0.050	0.050										
VB	1/26/88	0.070		0.15	0.080	0.130	0.5300	55.6	44.4						1600	110
VB	9/24/85	0.070		0.65	0.030	0.160	1.4000	24.0	41.0	35.0					2401	2
VB	10/3/85	0.090		0.05	0.010	0.400	0.1500	17.0		83.0					2401	9
VB	10/11/85	0.025		0.20	0.020	0.020	0.0760		25.0	75.0					920	14
VB	10/25/85	0.025		0.20	0.040	0.050	0.1000	50.0		50.0					2401	23

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
VB	11/8/85	0.025		0.10	0.020	0.020	0.1000			100.0					180	49
VB	12/11/85	0.140		0.62	0.210	0.200	0.2500	20.0		80.0					1600	920
VB	1/8/86	0.200		1.30	0.230	0.310	0.3500			100.0					1600	40
VB	4/3/86	0.050		0.10	0.080	0.080	0.1000	50.0	50.0						350	31
VB	5/14/86	0.025		0.10	0.050	0.060	0.2000		100.0						64	11
VB	6/17/86	0.025		0.40	0.020	0.050	4.9290	60.0	40.0						79	11
VB	6/26/86	0.060		0.10	0.050	0.080	1.5100	40.0	60.0						170	13
VB	12/9/86	0.025		0.05	0.020	0.040	0.0005								33	8
VB	4/15/87	0.025		0.24	0.030	0.060	0.7800	33.0	67.0						350	49
VB	5/26/87	0.025		0.24	0.010	0.020									140	49
VB	9/10/87	0.025		0.20	0.010	0.050	0.0520	67.0	33.0						23	14
VB	6/23/92	0.025				0.050										
VB		0.055		0.294	0.057	0.105	0.702	41.7	51.2	74.7					894.5	84.8
VB		0.200		1.300	0.230	0.400	4.929	67.0	100.0	100.0					2401.0	920.0
VB		0.025		0.050	0.010	0.020	0.0005	17.0	25.0	35.0					23.0	2.0
WB	1/26/88	0.025		0.13	0.010	0.050	0.1700		100.0							
WB	3/4/88	0.025		0.08	0.010	0.010									11	7
WB	3/14/88	0.025			0.010	0.030									33	5
WB	3/24/88					0.010										
WB	4/7/88	0.025		0.20		0.020	0.1010	50.0	50.0						220	23
WB	4/12/88					0.020	0.0460	100.0				0.00500		0.00300		
WB	5/19/88	0.060		0.14	0.010	0.030	1.4390	96.0	3.0	1.0		0.00080	0.00025	0.00025	280	280
WB	6/16/88	0.025		0.22	0.010	0.020	0.9900	69.0	24.0	7.0		0.00430	0.00025	0.00025	540	11
WB	7/21/88	0.025		0.23	0.010	0.010	0.1620	50.0	44.0	6.0		0.00090	0.00025	0.00025		
WB	8/26/88	0.025		0.10	0.010	0.020	0.0960	57.0	43.0			0.00060	0.00025	0.00025		
WB	9/29/88	0.025		0.24	0.010	0.030	0.0300	100.0				0.00025	0.00025	0.00025		
WB	10/26/88	0.025		0.26	0.020	0.020	0.0490	91.0		9.0		0.00060	0.00025	0.00025		
WB	12/6/88	0.025		0.17	0.050	0.040	0.1900	68.0	21.0	11.0		0.00130	0.00025	0.00025		
WB	12/21/88	0.050		0.21	0.020	0.010	0.7200	67.0	33.0			0.00320	0.00025	0.00050		
WB	1/18/89	0.025		0.27	0.030	0.060	0.3700	42.0	42.0	16.0		0.00170		0.00110		
WB	2/22/89	0.025		0.27	0.010	0.020	0.2700	94.0	6.0			0.00160	0.00025	0.00025		
WB	3/16/89	0.050		0.34	0.170	0.120	0.3900	36.0	60.0	4.0		0.00130	0.00060	0.00090		
WB	4/4/89	0.025		0.20	0.040	0.070	0.0670	18.0	82.0			0.00100	0.00025	0.00025		
WB	5/4/89	0.025		0.16	0.010	0.120	0.8200	86.0	12.0		2.0	0.00360	0.00050	0.00025		
WB	9/25/89	0.025		0.42	0.005	0.005	0.2700	100.0								

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
WB	8/29/89	0.050		0.05	0.010	0.060	0.1600	100.0								
WB	10/16/89	0.025		0.24	0.010	0.005	0.0570	99.0			1.0					
WB	6/21/89	0.025		0.05	0.010	0.040	0.2100	76.0	24.0			0.00090	0.00025	0.00025		
WB	11/13/89	0.025			0.010	0.005	0.0920	96.0	1.0		3.0					
WB	12/12/89	0.025		3.00	0.010	0.040	0.1600	97.0	1.0	1.0	1.0					
WB	1/16/90	0.080		0.26	0.005	0.130	0.3000	99.0	0.3	0.3	0.3					
WB	5/23/90	0.025		0.05	0.005	0.030	0.0630	100.0				0.02000	0.02500	0.03000		
WB	5/3/90	0.025		0.05	0.020	0.090	0.1800	100.0				0.02000	0.02500	0.03000		
WB	6/6/90	0.025		0.20	0.005	0.020	0.0150	100.0				0.06000	0.08000	0.07000		
WB	6/20/90	0.025		0.05	0.005	0.030	0.1100	100.0				0.09000	0.07000	0.06000		
WB	6/13/90	0.025		0.20	0.005	0.005						0.09000	0.07000	0.09000		
WB	12/4/90	0.050		0.05	0.025	0.025										
WB	12/6/90	0.025		0.05	0.005	0.005										
WB	12/11/90	0.025		0.05	0.005	0.005										
WB	12/13/90	0.025		0.05	0.005	0.005										
WB	12/18/90	0.025		0.05	0.005	0.005										
WB	12/20/90	0.025		0.05	0.005	0.020									542	33
WB	12/27/90	0.025		0.05	0.005	0.005										
WB	1/3/91	0.025		0.10	0.005	0.005										
WB	1/23/91	0.025		0.05	0.005	0.080										
WB	1/30/91	0.025		0.05	0.005	0.030										
WB	2/8/91	0.025		0.05	0.020	0.030										
WB	1/10/91	0.025		0.05	0.005	0.005										
WB	1/15/91	0.025		0.05	0.005	0.005										
WB	4/10/91	0.025		0.14	0.040	0.050										
WB	4/17/91	0.025		0.30	0.005	0.050										
WB	5/30/91			0.14		0.030										
WB	6/4/91															
WB	6/18/91	0.025		1.00		0.050										
WB	5/30/90	0.025		0.05	0.020	0.090	0.1800	100.0				0.02000	0.02500	0.03000		
WB	9/24/85	0.050		0.47	0.010	0.020	1.5000	6.0	44.0	50.0					220	2
WB	10/3/85	0.090		0.05	0.010	0.010	0.1500	17.0	50.0	33.0					430	2
WB	10/11/85	0.025		0.40	0.010	0.020	2.1000	5.0	1.0	94.0					23	8
WB	10/25/85	0.025		0.10	0.010	0.020	0.2300		67.0	33.0					130	5
WB	11/8/85	0.025		0.70	0.010	0.030	0.1500			100.0					11	8
WB	12/11/85	0.090		0.40	0.060	0.060	0.8300		24.0	76.0					2401	240

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
WB	1/8/86	0.025		0.21	0.020	0.100	0.1000	25.0		75.0					920	49
WB	1/14/86	0.080		0.35	0.020	0.020	0.2000	75.0	25.0							
WB	4/3/86	0.025		0.20	0.030	0.040	0.1500	67.0	33.0						240	49
WB	5/14/86	0.050		0.20	0.030	0.030	0.1500	83.0	17.0						2401	12
WB	6/17/86	0.025		0.40	0.010	0.030	1.8240	4.5	95.5						220	33
WB	6/26/86	0.060		0.20	0.030	0.060	0.7550	100.0							49	11
WB	12/31/86	0.025		0.21	0.010	0.030										
WB	12/9/86	0.025		0.05	0.010	0.010	0.0005								23	23
WB	12/17/86	0.025		0.10	0.010	0.020									49	33
WB	12/24/86	0.025		0.18	0.010	0.020										
WB	4/10/87	0.025		0.12	0.010	0.010									23	8
WB	4/13/87	0.025		0.11	0.010	0.010									170	13
WB	4/15/87	0.025		0.14	0.010	0.020	0.0150								220	70
WB	4/20/87	0.070		0.09	0.010	0.010									46	13
WB	4/22/87	0.025		0.15	0.020	0.020									49	33
WB	4/24/87	0.025		0.20	0.010	0.020									110	27
WB	5/26/87	0.025		0.15	0.010	0.010									17	14
WB	9/11/87	0.025		0.10	0.010	0.080	0.3600	90.0	10.0						240	22
WB	3/30/92															
WB	4/15/92	0.025		0.35	0.020	0.060						0.00500				
WB	5/21/92	0.025		0.22	0.010	0.060						0.00500				
WB	6/25/92	0.090			0.010	0.020						0.00500				
WB	9/8/92	0.025		0.32	0.010	0.060						0.00500				
WB		0.033		0.226	0.016	0.033	0.377	72.0	33.8	32.3	1.5	0.014	0.016	0.015	349.1	38.5
WB		0.090		3.000	0.170	0.130	2.100	100.0	100.0	100.0	3.0	0.090	0.080	0.090	2401.0	280.0
WB		0.025		0.050	0.005	0.005	0.0005	4.5	0.3	0.3	0.3	0.0003	0.0003	0.0003	11.0	2.0
WBD	6/27/91			0.24		0.010										
WBD	6/27/91			0.24		0.020										
WBD	6/27/91					0.030										
WBD	6/27/91			0.16		0.020										
WBD	6/27/91			0.25		0.020										
WBD	6/27/91			0.39												
WBD	6/27/91			0.32		0.020										
WBD	6/28/91			0.30												
WBD	6/28/91			0.20		0.400										

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

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STN	SAMDATE	NH3	UN-NH3	TKN	OPO4	TPO4	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
WBD	6/28/91			0.20		0.020										
WBD	6/28/91			0.20												
WBD	6/28/91			0.20		0.020										
WBD	9/11/91															
WBD	9/11/91															
WBD	9/11/91															
WBD	9/11/91															
WBD	9/11/91			0.13												
WBD	9/11/91															
WBD	9/11/91															
WBD	9/11/91															
WBD	9/11/91															
WBD	9/11/91															
WBD	9/11/91															
WBD	9/10/91			0.25												
WBD	9/10/91															
WBD	9/10/91															
WBD	9/10/91															
WBD	9/10/91			0.19												
WBD	9/10/91															
WBD	9/10/91															
WBD	9/10/91															
WBD	9/10/91															
WBD	9/10/91			0.25												
WBD	9/10/91															
WBD	6/28/91	0.025		0.40	0.005	0.030										
WBD	6/28/91	0.025		0.28	0.005	0.020										
WBD	6/28/91	0.025		0.34	0.005	0.020						0.02000	0.02500	0.03000		
WBD	6/28/91	0.025		0.17	0.005	0.030										
WBD	6/27/91															
WBD		0.025		0.248	0.005	0.051						0.020	0.025	0.030		
WBD		0.025		0.400	0.005	0.400						0.020	0.025	0.030		

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	NH3	UN-NH3	TKN	OP04	TP04	PHYTODEN	DIA	GRN	BLU	DINO	CHLA	CHLB	CHLC	TC	FC
		mg-N/L	mg-N/L	mg-N/L	mg-P/L	mg-P/L						mg/L	mg/L	mg/L		
WBD		0.025		0.130	0.005	0.010						0.020	0.025	0.030		

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia #/100gal	Cryptos #/100gal	DNO3	DOPO4 mg-P/L	DPO4 mg-P/L	DRAT	SMILE
CB	1/26/88	920						1.0	37.2
CB	3/4/88	13						2.5	37.2
CB	3/14/88	1600						4.5	37.2
CB	3/24/88				0.390		0.16	4.5	37.2
CB	4/5/88				0.210		0.08	1.6	37.2
CB	4/8/88	17			0.340		0.08	1.6	37.2
CB	4/12/88				0.380		0.11	0.9	37.2
CB	5/19/88	170			0.110		0.06		37.2
CB	6/16/88	220			0.015		0.05		37.2
CB	7/21/88								37.2
CB	8/26/88								37.2
CB	9/29/88								37.2
CB	10/26/88								37.2
CB	12/6/88							1.0	37.2
CB	12/21/88							4.2	37.2
CB	1/18/89							2.3	37.2
CB	2/23/89							5.0	37.2
CB	3/16/89							0.6	37.2
CB	4/4/89								37.2
CB	5/5/89							0.7	37.2
CB	9/25/89								37.2
CB	8/29/89								37.2
CB	10/16/89								37.2
CB	6/21/89								37.2
CB	11/13/89							1.3	37.2
CB	12/12/89								37.2
CB	5/23/90								37.2
CB	5/3/90								37.2
CB	6/6/90								37.2
CB	6/20/90								37.2
CB	6/13/90								37.2
CB	12/4/90								37.2
CB	12/6/90								37.2
CB	12/11/90								37.2

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia #/100gal	Cryptos #/100gal	DNO3	DOPO4 mg-P/L	DPO4 mg-P/L	DRAT	SMILE
CB	12/13/90								37.2
CB	12/18/90								37.2
CB	12/20/90								37.2
CB	12/27/90								37.2
CB	1/3/91							0.9	37.2
CB	1/23/91							0.1	37.2
CB	1/30/91							0.1	37.2
CB	2/8/91							4.4	37.2
CB	1/10/91							0.9	37.2
CB	1/15/91							0.5	37.2
CB	4/10/91							1.0	37.2
CB	5/30/90								37.2
CB	1/16/90								37.2
CB	9/24/85	2000							37.2
CB	10/3/85	13							37.2
CB	10/11/85	17							37.2
CB	10/25/85	23							37.2
CB	11/8/85	26							37.2
CB	12/11/85	210						1.1	37.2
CB	1/7/86	2401						2.7	37.2
CB	1/14/86	2401						3.9	37.2
CB	4/3/86	48						0.9	37.2
CB	5/14/86	34							37.2
CB	6/17/86	920							37.2
CB	6/26/86	920							37.2
CB	12/31/86								37.2
CB	12/9/86	140							37.2
CB	12/17/86	220							37.2
CB	12/24/86								37.2
CB	4/10/87	130						0.9	37.2
CB	4/13/87	17						0.8	37.2
CB	4/15/87	14						0.8	37.2
CB	4/20/87	26						0.5	37.2
CB	4/22/87	40						0.6	37.2
CB	4/24/87	17						0.6	37.2
CB	5/26/87	49							37.2

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia #/100gal	Cryptos #/100gal	DNO3	DOPO4 mg-P/L	DPO4 mg-P/L	DRAT	SMILE
CB	9/10/87	2							37.2
CB	4/16/92					0.12	0.16	1.0	37.2
CB	6/23/92								37.2
CB	9/8/92						0.02		37.2
CB		450			0.241	0.120	0.090	2	37
CB		2401			0.390	0.120	0.160	5.0	37.2
CB		2			0.015	0.120	0.020	0.1	37.2
DM	1/26/88	48						1.0	10.5
DM	4/8/88	170			0.070		0.03	1.6	10.5
DM	5/19/88	5			0.120		0.13		10.5
DM	6/16/88	49			0.015		0.03		10.5
DM	7/21/88								10.5
DM	8/26/88								10.5
DM	9/29/88								10.5
DM	10/26/88								10.5
DM	12/7/88							1.0	10.5
DM	12/21/88							4.2	10.5
DM	1/18/89							2.3	10.5
DM	2/24/89							5.0	10.5
DM	3/16/89							0.6	10.5
DM	4/4/89								10.5
DM	5/5/89								10.5
DM	9/26/89								10.5
DM	8/29/89								10.5
DM	10/16/89								10.5
DM	6/21/89								10.5
DM	11/13/89								10.5
DM	12/12/89								10.5
DM	1/17/90								10.5
DM	5/23/90								10.5
DM	5/3/90								10.5
DM	6/6/90								10.5
DM	6/13/90								10.5
DM	6/13/90								10.5
DM	5/30/91								10.5

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia #/100gal	Cryptos #/100gal	DNO3	DOPO4 mg-P/L	DPO4 mg-P/L	DRAT	SMILE
DM	6/4/91								10.5
DM	6/18/91								10.5
DM	6/27/91					0.03			10.5
DM	6/27/91					0.02			10.5
DM	6/27/91					0.03			10.5
DM	6/28/91					0.03			10.5
DM	6/28/91					0.03			10.5
DM	6/28/91								10.5
DM	6/28/91								10.5
DM	5/30/90								10.5
DM	9/24/85	23							10.5
DM	10/3/85	9							10.5
DM	10/11/85	170							10.5
DM	10/25/85	33							10.5
DM	11/8/85	4							10.5
DM	12/11/85	2401						1.1	10.5
DM	1/8/86	240						2.7	10.5
DM	4/3/86	17						0.9	10.5
DM	5/14/86	26							10.5
DM	6/17/86	140							10.5
DM	6/26/86	300							10.5
DM	12/9/86	9							10.5
DM	4/15/87	46						0.8	10.5
DM	5/26/87	33							10.5
DM	9/10/87	1600							10.5
DM	6/23/92								10.5
DM		280.1			0.068	0.028	0.063	1.9	10.5
DM		2401.0			0.120	0.030	0.130	5.0	10.5
DM		4.0			0.015	0.020	0.030	0.6	10.5
HMB	1/25/88	540							56.8
HMB	4/7/88	280			0.220		0.01		56.8
HMB	5/18/88	540			0.100		0.01		56.8
HMB	6/15/88	280			0.015		0.01		56.8
HMB	7/20/88	2401							56.8
HMB	8/25/88								56.8

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Water Quality In the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia #/100gal	Cryptos #/100gal	DNO3	DOPO4 mg-P/L	DPO4 mg-P/L	DRAT	SMILE
HMB	9/29/88								56.8
HMB	10/26/88								56.8
HMB	12/5/88								56.8
HMB	12/21/88								56.8
HMB	1/19/89								56.8
HMB	2/23/89								56.8
HMB	3/17/89							0.6	56.8
HMB	4/3/89							1.4	56.8
HMB	5/4/89							0.6	56.8
HMB	9/25/89								56.8
HMB	8/29/89								56.8
HMB	10/16/89								56.8
HMB	6/20/89								56.8
HMB	11/13/89								56.8
HMB	12/12/89								56.8
HMB	1/16/90								56.8
HMB	5/23/90								56.8
HMB	5/24/90								56.8
HMB	5/3/90								56.8
HMB	6/6/90								56.8
HMB	6/20/90								56.8
HMB	6/13/90								56.8
HMB	4/8/91								56.8
HMB	4/15/91								56.8
HMB	6/4/91								56.8
HMB	6/18/91								56.8
HMB	5/30/90								56.8
HMB	9/24/85	4							56.8
HMB	10/3/85	17							56.8
HMB	10/11/85	95							56.8
HMB	10/25/85	26							56.8
HMB	11/8/85	20							56.8
HMB	12/11/85	1600							56.8
HMB	1/8/86	980						2.7	56.8
HMB	4/3/86	170							56.8
HMB	5/14/86	17							56.8

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Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia #/100gal	Cryptos #/100gal	DNO3	DOPO4 mg-P/L	DPO4 mg-P/L	DRAT	SMILE
HMB	6/17/86	26							56.8
HMB	6/26/86	50							56.8
HMB	4/15/87	17							56.8
HMB	5/26/87	170							56.8
HMB	9/11/87	170							56.8
HMB	4/15/92					0.01	0.03		56.8
HMB	5/21/92					0.01	0.03		56.8
HMB	6/25/92								56.8
HMB	9/8/92						0.01		56.8
HMB	9/17/92								56.8
HMB	9/22/92								56.8
HMB	9/24/92								56.8
HMB	9/29/92								56.8
HMB	5/17/93								
HMB	6/22/93								
HMB	10/12/93								
HMBDD	6/25/92								56.8
HMB		389.6			0.11	0.010	0.017	1.3	56.8
HMB		2401.0			0.22	0.010	0.030	2.7	56.8
HMB		4.0			0.02	0.010	0.010	0.6	56.8
JB	1/26/88	170						1.0	25.4
JB	4/8/88				0.310		0.09	1.6	25.4
JB	5/19/88	2401			0.110		0.10		25.4
JB	6/16/88	49			0.015		0.03		25.4
JB	7/21/88	49							25.4
JB	8/26/88								25.4
JB	9/29/88								25.4
JB	10/26/88								25.4
JB	12/7/88							1.0	25.4
JB	12/21/88							4.2	25.4
JB	1/18/89							2.3	25.4
JB	2/24/89							5.0	25.4
JB	3/16/89							0.6	25.4
JB	4/4/89								25.4
JB	5/5/89							0.7	25.4

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Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia #/100gal	Cryptos #/100gal	DNO3	DOPO4 mg-P/L	DPO4 mg-P/L	DRAT	SMILE
JB	9/26/89								25.4
JB	8/29/89								25.4
JB	10/16/89								25.4
JB	6/21/89								25.4
JB	11/13/89							1.3	25.4
JB	12/12/89								25.4
JB	1/17/90							1.2	25.4
JB	5/23/90								25.4
JB	5/3/90								25.4
JB	6/6/90								25.4
JB	6/20/90								25.4
JB	6/13/90								25.4
JB	12/4/90								25.4
JB	12/6/90								25.4
JB	12/11/90								25.4
JB	12/13/90								25.4
JB	12/18/90								25.4
JB	12/20/90								25.4
JB	12/27/90								25.4
JB	1/3/91							0.9	25.4
JB	1/23/91							0.1	25.4
JB	1/30/91							0.1	25.4
JB	2/8/91							4.4	25.4
JB	1/10/91							0.9	25.4
JB	1/15/91							0.5	25.4
JB	4/10/91							1.0	25.4
JB	4/17/91							0.8	25.4
JB	5/30/91								25.4
JB	6/4/91								25.4
JB	6/18/91								25.4
JB	5/30/90								25.4
JB	9/24/85	22							25.4
JB	10/3/85	7							25.4
JB	10/11/85	8							25.4
JB	10/25/85	26							25.4
JB	11/8/85	14							25.4

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Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia #/100gal	Cryptos #/100gal	DNO3		DOPO4 mg-P/L	DPO4 mg-P/L	DRAT	SMILE
JB	12/11/85	72							1.1	25.4
JB	1/7/86	920							2.7	25.4
JB	4/3/86	17							0.9	25.4
JB	5/14/86	17								25.4
JB	6/17/86	17								25.4
JB	6/26/86	170								25.4
JB	12/31/86									25.4
JB	12/9/86	24								25.4
JB	12/17/86	46								25.4
JB	12/24/86									25.4
JB	4/10/87	27							0.9	25.4
JB	4/13/87	7							0.8	25.4
JB	4/15/87	7							0.8	25.4
JB	4/20/87	2							0.5	25.4
JB	4/22/87	9							0.6	25.4
JB	4/24/87	13							0.6	25.4
JB	5/26/87	17								25.4
JB	9/10/87	2401								25.4
JB	3/31/92									25.4
JB	4/16/92						0.12	0.16	1.0	25.4
JB	6/23/92									25.4
JB	9/8/92							0.02		25.4
JB	9/17/92									25.4
JB	9/22/92									25.4
JB	9/24/92									25.4
JB	9/29/92									25.4
JB	5/17/93									
JB	6/23/93									
JB	10/12/93									
JBUD	6/23/92									25.4
JB		260.5			0.145		0.120	0.080	1.3	25.4
JB		2401.0			0.310		0.120	0.160	5.0	25.4
JB		2.0			0.015		0.120	0.020	0.1	25.4
JEN	9/26/89									
JEN	8/29/89									

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Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia #/100gal	Cryptos #/100gal	DNO3	DOPO4 mg-P/L	DPO4 mg-P/L	DRAT	SMILE
JEN	10/16/89								
JEN	11/13/89								
JEN	12/12/89								
JEN	1/17/90								
JEN	6/23/92								
JEN									
JEN									
JEN									
OF	1/26/88	540						1.0	34.0
OF	3/14/88	2						4.5	34.0
OF	3/24/88				0.430		0.17	4.5	34.0
OF	4/8/88	9			0.360		0.11	1.6	34.0
OF	5/19/88	170			0.110		0.09		34.0
OF	6/16/88	95			0.015		0.04		34.0
OF	7/21/88								34.0
OF	8/26/88								34.0
OF	9/29/88								34.0
OF	10/26/88								34.0
OF	12/7/88							1.0	34.0
OF	12/21/88							4.2	34.0
OF	1/18/89							2.3	34.0
OF	2/24/89							5.0	34.0
OF	3/16/89							0.6	34.0
OF	4/4/89								34.0
OF	5/5/89							0.7	34.0
OF	9/26/89								34.0
OF	8/29/89								34.0
OF	10/16/89								34.0
OF	6/21/89								34.0
OF	11/13/89							1.3	34.0
OF	12/12/89								34.0
OF	1/17/90							1.2	34.0
OF	5/23/90								34.0
OF	5/3/90								34.0
OF	6/6/90								34.0

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Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia #/100gal	Cryptos #/100gal	DNO3	DOPO4 mg-P/L	DPO4 mg-P/L	DRAT	SMILE
OF	6/13/90								34.0
OF	6/13/90								34.0
OF	12/4/90								34.0
OF	12/6/90								34.0
OF	12/11/90								34.0
OF	12/13/90								34.0
OF	12/18/90								34.0
OF	12/20/90								34.0
OF	12/27/90								34.0
OF	1/3/91							0.9	34.0
OF	1/23/91							0.1	34.0
OF	1/30/91							0.1	34.0
OF	2/8/91							4.4	34.0
OF	1/10/91							0.9	34.0
OF	1/15/91							0.5	34.0
OF	4/10/91							1.0	34.0
OF	4/17/91							0.8	34.0
OF	5/30/91								34.0
OF	6/4/91								34.0
OF	6/18/91				0.02				34.0
OF	6/27/91				0.02				34.0
OF	6/27/91				0.02	0.02			34.0
OF	6/27/91				0.02				34.0
OF	6/27/91					0.02			34.0
OF	6/27/91					0.02			34.0
OF	6/27/91					0.02			34.0
OF	6/27/91					0.02			34.0
OF	6/27/91					0.02			34.0
OF	6/28/91					0.02			34.0
OF	6/28/91					0.02			34.0
OF	6/28/91					0.02			34.0
OF	6/28/91					0.02			34.0
OF	9/11/91								34.0
OF	9/11/91								34.0
OF	9/11/91								34.0
OF	9/11/91								34.0

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

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Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia #/100gal	Cryptos #/100gal	DNO3	DOPO4 mg-P/L	DPO4 mg-P/L	DRAT	SMILE
OF	1/14/86	54						3.9	34.0
OF	4/3/86	79						0.9	34.0
OF	5/14/86	6							34.0
OF	6/17/86	240							34.0
OF	6/26/86	920							34.0
OF	12/9/86	21							
OF	4/15/87							0.8	34.0
OF	5/26/87	49							34.0
OF	9/10/87	14							34.0
OF	4/16/92					0.12	0.16	1.0	34.0
OF	6/23/92								34.0
OF	9/8/92						0.01		34.0
OF	9/17/92								34.0
OF	9/22/92								34.0
OF	9/24/92								34.0
OF	9/29/92								34.0
OF		244.5			0.229	0.03	0.10	1.8	34.0
OF		2401.0			0.4300	0.12	0.16	4.4	34.0
OF		2.0			0.015	0.0	0.0	0.1	34.0
RRSP	4/8/88	41			0.230		0.01		53.0
RRSP	5/19/88	2401			0.100		0.01		53.0
RRSP	6/16/88	1600			0.040		0.01		53.0
RRSP	7/21/88								53.0
RRSP	8/26/88								53.0
RRSP	9/29/88								53.0
RRSP	10/26/88								53.0
RRSP	12/5/88								53.0
RRSP	1/18/89								53.0
RRSP	2/23/89								53.0
RRSP	3/17/89								53.0
RRSP	4/3/89							1.4	53.0
RRSP	5/4/89							0.6	53.0
RRSP	9/25/89								53.0
RRSP	8/29/89								53.0
RRSP	10/16/89								53.0

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Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia #/100gal	Cryptos #/100gal	DNO3	DOPO4 mg-P/L	DPO4 mg-P/L	DRAT	SMILE
RRSP	6/20/89								53.0
RRSP	11/13/89								53.0
RRSP	12/12/89								53.0
RRSP	1/16/90								53.0
RRSP	5/24/90								53.0
RRSP	5/3/90								53.0
RRSP	6/6/90								53.0
RRSP	6/20/90								53.0
RRSP	6/13/90								53.0
RRSP	4/8/91								53.0
RRSP	4/15/91								53.0
RRSP	6/4/91								53.0
RRSP	6/18/91								53.0
RRSP	5/30/90								53.0
RRSP	4/15/92					0.01	0.04		53.0
RRSP	5/21/92					0.01	0.02		53.0
RRSP	6/25/92								53.0
RRSP	9/8/92						0.01		53.0
RRSP	9/22/92								53.0
RRSP		1347.3			0.1	0.010	0.017	1.0	53.0
RRSP		2401.0			0.2	0.010	0.040	1.4	53.0
RRSP		41.0			0.0	0.010	0.010	0.6	53.0
SHB	4/17/91							0.8	37.2
SHB	5/30/91								37.2
SHB	6/4/91								37.2
SHB	6/18/91								37.2
SHB								0.8	
SHB								0.8	
SHB								0.8	
VB	1/26/88	280						1.0	23.6
VB	9/24/85	22							23.6
VB	10/3/85	4							23.6
VB	10/11/85	22							23.6
VB	10/25/85	49							23.6

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia #/100gal	Cryptos #/100gal	DNO3		DOPO4 mg-P/L	DPO4 mg-P/L	DRAT	SMILE
VB	11/8/85	79								23.6
VB	12/11/85	31							1.1	23.6
VB	1/8/86	920							2.7	23.6
VB	4/3/86	22							0.9	23.6
VB	5/14/86	31								23.6
VB	6/17/86	540								23.6
VB	6/26/86	2401								23.6
VB	12/9/86	33								23.6
VB	4/15/87	5							0.8	23.6
VB	5/26/87	11								23.6
VB	9/10/87	350								23.6
VB	6/23/92									23.6
VB		300.0							1.3	23.6
VB		2401.0							2.7	23.6
VB		4.0							0.8	23.6
WB	1/26/88								1.0	43.0
WB	3/4/88	3							2.5	43.0
WB	3/14/88	1							4.5	43.0
WB	3/24/88				0.240		0.01		4.5	43.0
WB	4/7/88	240			0.200		0.01		1.6	43.0
WB	4/12/88				0.280		0.02		0.9	43.0
WB	5/19/88	130			0.080		0.01			43.0
WB	6/16/88	95			0.015		0.02			43.0
WB	7/21/88									43.0
WB	8/26/88									43.0
WB	9/29/88									43.0
WB	10/26/88									43.0
WB	12/6/88								1.0	43.0
WB	12/21/88								4.2	43.0
WB	1/18/89								2.3	43.0
WB	2/22/89								5.0	43.0
WB	3/16/89								0.6	43.0
WB	4/4/89									43.0
WB	5/4/89								0.6	43.0
WB	9/25/89									43.0

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia #/100gal	Cryptos #/100gal	DNO3	DOPO4 mg-P/L	DPO4 mg-P/L	DRAT	SMILE
WB	8/29/89								43.0
WB	10/16/89								43.0
WB	6/21/89								43.0
WB	11/13/89							1.3	43.0
WB	12/12/89								43.0
WB	1/16/90							1.2	43.0
WB	5/23/90								43.0
WB	5/3/90								43.0
WB	6/6/90								43.0
WB	6/20/90								43.0
WB	6/13/90								43.0
WB	12/4/90								43.0
WB	12/6/90								43.0
WB	12/11/90								43.0
WB	12/13/90								43.0
WB	12/18/90								43.0
WB	12/20/90								43.0
WB	12/27/90								43.0
WB	1/3/91							0.9	43.0
WB	1/23/91							0.1	43.0
WB	1/30/91							0.1	43.0
WB	2/8/91							4.4	43.0
WB	1/10/91							0.9	43.0
WB	1/15/91							0.5	43.0
WB	4/10/91							1.0	43.0
WB	4/17/91							0.8	43.0
WB	5/30/91								43.0
WB	6/4/91								43.0
WB	6/18/91								43.0
WB	5/30/90								43.0
WB	9/24/85	2							43.0
WB	10/3/85	6							43.0
WB	10/11/85	10							43.0
WB	10/25/85	7							43.0
WB	11/8/85	33							43.0
WB	12/11/85	140						1.1	43.0

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia #/100gal	Cryptos #/100gal	DNO3		DOPO4 mg-P/L	DPO4 mg-P/L	DRAT	SMILE
WB	1/8/86	130							2.7	43.0
WB	1/14/86								3.9	43.0
WB	4/3/86	350							0.9	43.0
WB	5/14/86	54								43.0
WB	6/17/86	920								43.0
WB	6/26/86	2401								43.0
WB	12/31/86									43.0
WB	12/9/86	46								43.0
WB	12/17/86	36								43.0
WB	12/24/86									43.0
WB	4/10/87	49							0.9	43.0
WB	4/13/87	27							0.8	43.0
WB	4/15/87	23							0.8	43.0
WB	4/20/87	2							0.5	43.0
WB	4/22/87	170							0.6	43.0
WB	4/24/87	33							0.6	43.0
WB	5/28/87	11								43.0
WB	9/11/87	27								43.0
WB	3/30/92									43.0
WB	4/15/92						0.01	0.03	1.0	43.0
WB	5/21/92						0.01	0.01		43.0
WB	6/25/92									43.0
WB	9/8/92							0.02		43.0
WB		190.2			0.163		0.01	0.02	1.6	43.0
WB		2401.0			0.280		0.01	0.03	5.0	43.0
WB		1.0			0.015		0.01	0.01	0.1	43.0
WBD	6/27/91									43.0
WBD	6/27/91									43.0
WBD	6/27/91									43.0
WBD	6/27/91									43.0
WBD	6/27/91									43.0
WBD	6/27/91									43.0
WBD	6/27/91									43.0
WBD	6/27/91									43.0
WBD	6/28/91									43.0
WBD	6/28/91									43.0

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

[illegible]

Appendix 3.

Water Quality in the Russian River (Data Collected by the North Coast Regional Water Quality Control Board)

All data below the detection limit entered as 1/2 the detection limit.

STN	SAMDATE	FS	Giardia	Cryptos	DNO3		DOPO4	DPO4	DRAT	SMILE
			#/100gal	#/100gal			mg-P/L	mg-P/L		
WBD										

Appendix 3. Russian River Water Quality (North Coast Regional Water Quality Control Board 1995 Data)

Bacteriology and phytoplankton also collected. See lab sheets									
*indicates number to left is below detection. Number shown is detection limit.									
Station	Date	Chlor a mg/L	Total nitrate+nitrite mg-N/L	Total ortho P mg-P/L	Dissolved nitrate+nitrite mg-N/L	Dissolved ortho P mg-P/L	Total coliforms mpn/100ml	Fecal coliforms mpn/100ml	
Hacienda	31-May-95	0.01 *	1 *	1 *					
Midway	31-May-95	0.01 *	1 *	1 *	1 *	1 *			
Johnson's	31-May-95	0.01 *	1 *	1 *	1 *	1 *			
Hacienda	6-Jun-95	0.01 *	1 *	1 *					
Midway	6-Jun-95	0.01 *	1 *	1 *			110	70	
Johnson's	6-Jun-95	0.01 *	1 *	1 *			240	33	
Midway	13-Jun-95	0.01 *	1 *	1 *			540	17	
Johnson's above dam	13-Jun-95	0.01 *	1 *	1 *					
Johnson's below dam	13-Jun-95	0.01 *	1 *	1 *			140	33	
Oddfellows	13-Jun-95	0.01 *	1 *	1 *					
above samples re-run for lower dl in excess of holding times							bacteria not re-done		
Hacienda	31-May-95		0.318	0.5 *					
Midway	31-May-95		0.315	0.5 *	0.316	0.5			
Johnson's	31-May-95		0.285	0.5 *	0.293	0.5			
Hacienda	6-Jun-95		0.308	0.5 *					
Midway	6-Jun-95		0.275	0.5 *			110	70	
Johnson's	6-Jun-95		0.27	0.5 *			240	33	
Midway	13-Jun-95		0.258	0.5 *			540	17	
Johnson's above dam	13-Jun-95		0.228	0.5 *					
Johnson's below dam	13-Jun-95		0.224	0.5 *			140	33	
Oddfellows	13-Jun-95		0.266	0.5 *					
Midway - Down	20-Jun-95						>=1600	110	
Johnson's above dam	20-Jun-95						350	23	
Johnson's below dam	20-Jun-95						350	33	
Midway - Up	20-Jun-95						240	23	

**Appendix 3. Russian River Water Quality
(North Coast Regional Water Quality Control Board 1995 Data)**

5/13/96

Bacteriology and phytoplankton also collected. See lab sheets									
*Indicates number to left is below detection. Number shown is detection limit.									
Station	Date	Chlor a mg/L	Total nitrate+nitrite mg-N/L	Total ortho P mg-P/L	Dissolved nitrate+nitrite mg-N/L	Dissolved ortho P mg-P/L	Total coliforms mpn/100ml	Fecal coliforms mpn/100ml	
Hacienda	27-Jun-95	0.01	0.217	0.5 *			240	79	
Midway	27-Jun-95	0.02	0.165	0.5 *			1600	1600	
Johnson's above dam	27-Jun-95	0.02	0.158	0.5 *			>=1600	540	
Johnson's below dam	27-Jun-95	0.02	0.152	0.5 *			540	130	
Oddfellows	27-Jun-95	0.01	0.192	0.5 *					
Rio Nido	27-Jun-95	0.02	0.179	0.5 *					
Wohler Bridge	28-Jun-95	0.01 *	0.286	0.5 *					
Laguna at TH	28-Jun-95	0.02	0.121	0.664					
MWC	28-Jun-95	0.01 *	0.1 *	0.5 *					
Johnson's	6-Jun-95	240	33						
Johnson's above dam	13-Jun-95								
Johnson's below dam	13-Jun-95	140	33						
Oddfellows	13-Jun-95								
Johnson's above dam	20-Jun-95	350	23						
Johnson's below dam	20-Jun-95	350	33						
Johnson's above dam	27-Jun-95	>=1600	540						
Johnson's below dam	27-Jun-95	540	130						

**Appendix 4. Russian River Water Quality Data
(County of Sonoma Environmental Health Data)**

5/13/96

County of Sonoma Environmental Health Department Services				
Russian River Water Testing				
		Total		Fecal
Location	Date	Coliform		Coliform
		mpn/100mL		mpn/100mL
Burkes Beach	6/8/94	161		22
Burkes Beach	6/14/94	161		51
Burkes Beach	6/21/94	51		11
Burkes Beach	6/28/94	51		22
Burkes Beach	7/5/94	120		36
Burkes Beach	7/12/94	161		22
Burkes Beach	7/19/94	230		11 <
Burkes Beach	7/20/94	92		11
Burkes Beach	7/26/94	36		11
Burkes Beach	8/1/94	230 >		22
Burkes Beach	8/8/94	92		51
Burkes Beach	8/15/94	230 >		36
Burkes Beach	8/22/94	161		22
Burkes Beach	8/29/94	230 >		11
Casini Ranch	6/8/94	230 >		69
Casini Ranch	6/14/94	69		11 <
Casini Ranch	6/21/94	230		230 >
Casini Ranch	6/28/94	92		22
Casini Ranch	7/5/94	69		11 <
Casini Ranch	7/12/94	92		11
Casini Ranch	7/19/94	69		11 <
Casini Ranch	7/20/94	230		69
Casini Ranch	7/26/94	161		36
Casini Ranch	8/1/94	230 >		120
Casini Ranch	8/8/94	51		11 <
Casini Ranch	8/15/94	36		11 <
Casini Ranch	8/22/94	51		22
Casini Ranch	8/29/94	36		11 <
Hilton Park	6/8/94	161		120
Hilton Park	6/14/94	120		69
Hilton Park	6/21/94	230		69
Hilton Park	7/5/94	230 >		92
Hilton Park	7/12/94	230		51
Hilton Park	7/19/94	120		11 <
Hilton Park	7/20/94	161		51
Hilton Park	7/26/94	161		11
Hilton Park	8/1/94	230 >		11
Hilton Park	8/8/94	120		11
Hilton Park	8/15/94	161		51
Hilton Park	8/22/94	161		22
Hilton Park	8/29/94	230 >		22
Johnsons Beach	6/8/94	230		51
Johnsons Beach	6/14/94	230 >		120

**Appendix 4. Russian River Water Quality Data
(County of Sonoma Environmental Health Data)**

5/13/96

County of Sonoma Environmental Health Department Services				
Russian River Water Testing				
Location	Date	Total Coliform		Fecal Coliform
Johnsons Beach	6/21/94	120		92
Johnsons Beach	6/28/94	161		120
Johnsons Beach	7/5/94	92		51
Johnsons Beach	7/12/94	230 >		51
Johnsons Beach	7/19/94	161		69
Johnsons Beach	7/20/94	36		11
Johnsons Beach	7/26/94	161		11
Johnsons Beach	8/1/94	230 >		92
Johnsons Beach	8/8/94	230 >		36
Johnsons Beach	8/15/94	120		11
Johnsons Beach	8/22/94	230		22
Johnsons Beach	8/29/94	92		22
Memorial Beach (Car Bridge)	7/19/94	230 >		230
Memorial Beach (Car Bridge)	7/20/94	230 >		230
Memorial Beach (Car Bridge)	7/26/94	69		69
Memorial Beach (Car Bridge)	7/27/94	230 >		230
Memorial Beach (Car Bridge)	7/29/94	510		110 <
Memorial Beach (Car Bridge)	8/1/94	2300 >		110
Memorial Beach (Car Bridge)	8/3/94	1610		110 <
Memorial Beach (Car Bridge)	8/5/94	110 <		110 <
Memorial Beach (Car Bridge)	8/8/94	110		110
Memorial Beach (Car Bridge)	8/15/94	110		110
Memorial Beach (Car Bridge)	8/17/94	220		110 <
Memorial Beach (Car Bridge)	8/22/94	51		51
Memorial Beach (Car Bridge)	8/24/94	690		510
Memorial Beach (Car Bridge)	8/26/94	360		110
Memorial Beach (Car Bridge)	8/31/94	360		220
Memorial Beach (Car Bridge)	9/2/94	690		690
Memorial Beach (Center)	6/8/94	230 >		230 >
Memorial Beach (Center)	6/14/94	230 >		69
Memorial Beach (Center)	6/21/94	230		51
Memorial Beach (Center)	6/28/94	36		71
Memorial Beach (Center)	7/5/94	120		92
Memorial Beach (Center)	7/12/94	230 >		230 >
Memorial Beach (Center)	7/19/94	230		120
Memorial Beach (Center)	7/20/94	230		120
Memorial Beach (Center)	7/26/94	161		161
Memorial Beach (Center)	7/27/94	230 >		230
Memorial Beach (Center)	7/29/94	220		110
Memorial Beach (Center)	8/1/94	2300 >		110 <
Memorial Beach (Center)	8/3/94	1610		110 <
Memorial Beach (Center)	8/5/94	510		510
Memorial Beach (Center)	8/8/94	220		220
Memorial Beach (Center)	8/15/94	360		360
Memorial Beach (Center)	8/17/94	220		110

**Appendix 4. Russian River Water Quality Data
(County of Sonoma Environmental Health Data)**

5/13/96

County of Sonoma Environmental Health Department Services				
Russian River Water Testing				
Location	Date	Total Coliform		Fecal Coliform
Memorial Beach (Center)	8/22/94	690		510
Memorial Beach (Center)	8/29/94	510		360
Memorial Beach (Kids Area)	7/27/94	230	>	230
Memorial Beach (Kids Area)	7/29/94	920		360
Memorial Beach (Kids Area)	8/3/94	2300		110
Memorial Beach (Kids Area)	8/5/94	220		220
Memorial Beach (Kids Area)	8/8/94	360		360
Memorial Beach (Kids Area)	8/15/94	110		110
Memorial Beach (Kids Area)	8/17/94	920		510
Memorial Beach (Kids Area)	8/22/94	51		36
Memorial Beach (Kids Area)	8/24/94	920		360
Memorial Beach (Kids Area)	8/28/94	220		110
Memorial Beach (Kids Area)	8/29/94	360		220
Memorial Beach (Kids Area)	8/31/94	110		110
Memorial Beach (Kids Area)	9/2/94	220		110
Memorial Beach (Railroad Bridge)	7/28/94	230	>	230
Memorial Beach (Railroad Bridge)	8/3/94	1610		110
Memorial Beach (Railroad Bridge)	8/5/94	110	<	110
Memorial Beach (Railroad Bridge)	8/8/94	110		110
Memorial Beach (Railroad Bridge)	8/15/94	360		360
Memorial Beach (Railroad Bridge)	8/17/94	1200		920
Memorial Beach (Railroad Bridge)	8/22/94	230	>	230
Memorial Beach (South)	7/19/94	230	>	120
Memorial Beach (South)	7/20/94	230		161
Memorial Beach (South)	7/26/94	230	>	230
Memorial Beach (South)	7/27/94	230		161
Memorial Beach (South)	7/29/94	690		
Memorial Beach (South)	8/1/94	2300	>	110
Memorial Beach (South)	8/3/94	1610		110
Memorial Beach (South)	8/5/94	360		360
Memorial Beach (South)	8/8/94	110	<	110
Memorial Beach (South)	8/15/94	510		220
Memorial Beach (South)	8/17/94	360		360
Memorial Beach (South)	8/22/94	11		11
Memorial Beach (South)	8/24/94	1200		510
Memorial Beach (South)	8/26/94	220		110
Memorial Beach (South)	8/29/94	360		220
Memorial Beach (South)	8/31/94	220		220
Memorial Beach (South)	9/2/94	360		220
Midway Beach	6/8/94	230	>	120
Midway Beach	6/14/94	230	>	69
Midway Beach	6/21/94	161		22
Midway Beach	6/28/94	92		51

**Appendix 4. Russian River Water Quality Data
(County of Sonoma Environmental Health Data)**

5/13/96

County of Sonoma Environmental Health Department Services				
Russian River Water Testing				
Location	Date	Total Coliform	Fecal Coliform	
Midway Beach	7/5/94	36	22	
Midway Beach	7/12/94	230 >	36	
Midway Beach	7/19/94	230 >	36	
Midway Beach	7/20/94	120	22	
Midway Beach	7/26/94	120	11	
Midway Beach	8/1/94	230 >	51	
Midway Beach	8/8/94	92	11	
Midway Beach	8/15/94	230 >	69	
Midway Beach	8/29/94	120	11	
Monte Rio	6/8/94	230 >	51	
Monte Rio	6/14/94	230	36	
Monte Rio	6/21/94	51	36	
Monte Rio	6/28/94	230 >	120	
Monte Rio	7/5/94	92	11	
Monte Rio	7/12/94	230 >	120	
Monte Rio	7/19/94	230	22	
Monte Rio	7/20/94	120	22	
Monte Rio	7/26/94	230 >	161	
Monte Rio	8/1/94	230 >	230 >	
Monte Rio	8/8/94	230 >	92	
Monte Rio	8/15/94	69	36	
Monte Rio	8/29/94	120	36	

**Appendix 5. Russian River Water Quality
(Sonoma County Water Agency Data)**

5/13/96

Sonoma County Water Agency					
River/Caisson Sampling--1992					
River station at the RR diversion structure (near Wohler Bridge)					
	Temp	Turb NTU	Conduct.	pH	Total Coliforms mpn/100 mL
03/04/92	13.5	8.20	198	7.75	
03/10/92	14.5		192	7.65	1100
03/17/92	15.0	67.00		7.66	
03/18/92	14.0	38.00		7.66	460
03/24/92	13.5	17.00	181	7.59	2400
03/26/92	16.5	16.00			
03/31/92	15.0	4.20	185	7.67	2400
04/06/92	15.5	4.86	185	7.76	1100
04/07/92	15.5	2.50	182	7.76	75
04/15/92	16.5	5.50	167	7.81	75
04/16/92	16.5	3.60	163	7.62	93
04/20/92			181		
04/21/92	15.5	2.70	177	8.03	
04/22/92			181		
04/27/92			181		
04/28/92			181		
04/29/92	19.0	1.80	162	7.78	
04/30/92			181		
05/05/92	20.5	1.30	181	7.78	460
05/06/92			181		
05/11/92			181		
05/12/92	19	0.95	162	7.84	
05/13/92			181		
05/18/92	22	1.20	196	7.67	93
05/19/92			181		240
05/26/92			181		23
05/27/92		0.79	181	7.67	240
06/01/92			181		
06/02/92	22	1.50	181	7.84	93
06/03/92			181		
06/10/92	22	0.90	178	8.47	460
06/15/92			181		
06/16/92	19.5	1.60	169	8.63	16
06/17/92			181		
06/22/92	21	1.50	186	7.90	
06/23/92			181		43
06/24/92			181		93
06/26/92			181		
06/30/92			181		
07/01/92	19.5	1.5	173	8.07	460
07/07/92	23	1.9	185	8.22	
07/08/92			181		240
07/14/92	22.5	1.5	141	8.18	93
07/15/92			181		
07/21/92			181		

**Appendix 5. Russian River Water Quality
(Sonoma County Water Agency Data)**

5/13/96

Sonoma County Water Agency					
River/Caisson Sampling--1992					
River station at the RR diversion structure (near Wohler Bridge)					
	Temp	Turb	Conduct.	pH	Total
		NTU			Coliforms
					mpn/100 mL
07/22/92	23.5	6.9	198	8.29	93
07/28/92	23	2	144	8.13	93
07/29/92					
08/03/92	22.5	2	153	8.13	43
08/04/92					
08/10/92	23.5	1.5	154	7.86	43
08/12/92					
08/17/92	23	4	159	8.12	23
08/18/92					
08/24/92	23	2	154	7.92	23
08/26/92					
08/31/92	21	2.4	165	7.87	460
09/07/92	21	1.9	157	7.65	240
09/16/92	19.5	0.75	164	7.75	23
09/22/92	20	1	168	7.47	80
09/28/92	19	1.6	163	7.45	80
10/05/92	18	2.6	171	7.77	50
10/12/92	18	5.6	165	7.48	240
10/19/92	17.6	2.6	167	7.79	500
10/26/92	17	8.4	169	8.03	500
11/02/92	16.7	0.7	173	7.99	130
11/09/92	11.9	0.81	164	7.96	30
11/16/92	13.7	0.71	160	7.72	30
11/23/92	11.1	0.4	165	7.8	70
11/30/92	10.5	0.36	156	7.88	80
12/07/92	10.2	67	192	7.14	
12/14/92	10	24	198	7.18	
12/21/92	9	9.5	162	7.22	800
12/28/92	9	55	138	7.54	80
01/03/93	9.2	66	117	7.64	1300
01/11/93	8.1	45	142	7.62	1600
01/18/93	10	190	79	7.59	11000
01/25/93	11	100	126	7.44	1400
02/01/93	10.5	66	163	7.56	1700
02/09/93	12.2	65	161	7.46	16000
02/16/93	10.1	16	160	7.52	500
02/23/93	9.6	61	160	7.5	2400
03/01/93	13.3	19	176	7.61	260
03/08/93	14	7.9	181	7.49	170
03/15/93	13.8	42	130	7.46	16000
03/22/93	15.1	8.1	147	7.6	800
03/29/93	12.8	7.1	157	7.65	
04/05/93	13.7	5.9	166	7.74	900
04/12/93	14.8	5.3	163	7.77	800
04/19/93	13.7	13	136	7.48	1600

**Appendix 5. Russian River Water Quality
(Sonoma County Water Agency Data)**

5/13/96

Sonoma County Water Agency					
River/Caisson Sampling--1992					
River station at the RR diversion structure (near Wohler Bridge)					
	Temp	Turb NTU	Conduct.	pH	Total Coliforms mpn/100 mL
04/26/93	16.6	6	156	7.79	170
05/03/93	15.8	4.2	179	7.76	900
05/10/93	16	3.5	165	7.67	900
05/17/93		2	167	7.71	800
05/26/93	17.6	2	167	7.58	

Appendix 6.

5/13/96

Russian River Metals Data Collected by the North Coast Regional Water Quality Control Board.

* after a value indicates the value was below detection. The value shown is half the detection limit													
Acronyms and station descriptions appear in Appendix 9.													
		AV	HMB	WB	CB	OB	JB	VB	DM	DM	VB	JB	
Parameter	Units	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/11/85	10/11/85	10/11/85	
Arsenic	(mg/L)	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	
Cadmium	(mg/L)	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	
Chromium (VI)	(mg/L)	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	
Chromium (Total)	(mg/L)	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	
Copper	(mg/L)	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	
Lead	(mg/L)												
Mercury	(mg/L)	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	
Nickel	(mg/L)												
Selenium	(mg/L)												
Silver	(mg/L)												
Zinc	(mg/L)	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	
Ca	(mg/L)												
Mg	(mg/L)												
Hardness	(mg/L)												

Appendix 6.

Russian River Metals Data Collected by the North Coast Regional Water Quality Control Board.

	* after a value indicates the value was below detection. The value shown is half the detection limit												
	Acronyms and station descriptions appear in Appendix 9.												
	OB	CB	WB	AV	HMB	CB	OB	JB	HMB	AV	DM	VB	
Parameter	10/11/85	10/11/85	10/11/85	10/11/85	10/11/85	1/8/86	1/8/86	1/8/86	1/8/86	1/8/86	1/8/86	1/8/86	
Arsenic	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	
Cadmium	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	
Chromium (VI)	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	
Chromium (Total)	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.01 <=	0.005 *	
Copper	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	
Lead													
Mercury	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	
Nickel													
Selenium													
Silver													
Zinc	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	
Ca													
Mg													
Hardness													

Appendix 6.

Russian River Metals Data Collected by the North Coast Regional Water Quality Control Board.

* after a value indicates the value was below detection. The value shown is half the detection limit												
Acronyms and station descriptions appear in Appendix 9.												
	WB	AV	HMB	WB	CB	OB	JB	VB	DM	WB	WC	JB
Parameter	1/8/86	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	3/30/92	3/31/92	3/31/92
Arsenic	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *
Cadmium	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *	0.0025 *
Chromium (VI)	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.0025 *	0.0025 *	0.0025 *
Chromium (Total)	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *			
Copper	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *	0.01 *
Lead										0.001 *	0.001 *	0.001 *
Mercury	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0005 *	0.0001 *	0.0001 *	0.0001 *
Nickel										0.0025 *	0.0025 *	0.0025 *
Selenium										0.0025 *	0.0025 *	0.0025 *
Silver										0.005 *	0.005 *	0.005 *
Zinc	0.005 *	0.005 *	0.005 *	0.03	0.005 *	0.005 *	0.005 *	0.005 *	0.005 *	0.02	0.02	0.005 *
Ca										24	19	
Mg										14	13	
Hardness										120	100	

Appendix 7.

5/13/96

Russian River Organics Data (Collected by the North Coast Regional Water Quality Control Board)

* indicates value to left is below detection. Number entered is one half the detection limit												
Acronyms for stations and station descriptions appear in Appendix 9.												
		AV	HMB	WB	CB	OB	JB	VB	DM	DM	VB	JB
Parameter	Units	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/11/85	10/11/85	10/11/85
Pesticides												
Aldrin	(ug/L)	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
alpha-BHC	(ug/L)	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
beta-BHC	(ug/L)	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
delta-BHC	(ug/L)	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Chlordane	(ug/L)	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *
1,4'-DDD	(ug/L)	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
4,4'-DDD	(ug/L)	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
1,4'-DDE	(ug/L)	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
4,4'-DDE	(ug/L)											
1,4'-DDT	(ug/L)	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
4,4'-DDT	(ug/L)	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
Dieldrin	(ug/L)	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Endosulfan I	(ug/L)	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Endosulfan II	(ug/L)	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Endosulfan Sulfate	(ug/L)	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Endrin	(ug/L)	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Heptachlor	(ug/L)	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Heptachlor epoxide	(ug/L)	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Hexachlorobenzene	(ug/L)											
Lindane	(ug/L)											
Methoxychlor	(ug/L)	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
Mirex	(ug/L)	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *
Toxaphene	(ug/L)	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *
PCBs												
PCB-1016	(ug/L)	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *
PCB-1221	(ug/L)	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *
PCB-1232	(ug/L)	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *
PCB-1242	(ug/L)	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *
PCB-1248	(ug/L)	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *
PCB-1254	(ug/L)	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *
PCB-1260	(ug/L)	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *

Russian River Organics Data (Collected by the North Coast Regional Water Quality Control Board)

* indicates value to left is below detection. Number entered is one half the detection limit														
Acronyms for stations and station descriptions appear in Appendix 9.														
	OB	CB	WB	AV	HMB	CB	OB	JB	HMB	AV	DM	VB	WB	
Parameter	10/11/85	10/11/85	10/11/85	10/11/85	10/11/85	1/8/86	1/8/86	1/8/86	1/8/86	1/8/86	1/8/86	1/8/86	1/8/86	
Pesticides														
Aldrin	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
alpha-BHC	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
beta-BHC	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
delta-BHC	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Chlordane	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *
1,4'-DDD	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
4,4'-DDD	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
1,4'-DDE	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
4,4'-DDE						0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
1,4'-DDT	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
4,4'-DDT	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
Dieldrin	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Endosulfan I	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Endosulfan II	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Endosulfan Sulfate	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Endrin	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Heptachlor	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Heptachlor epoxide	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *
Hexachlorobenzene														
Lindane														
Methoxychlor	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *
Mirex	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *
Toxaphene	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *
PCB,s														
PCB-1016	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *
PCB-1221	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *
PCB-1232	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *
PCB-1242	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *
PCB-1248	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *
PCB-1254	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *
PCB-1260	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *

Appendix 7.

Russian River Organics Data (Collected by the North Coast Regional Water Quality Control Board)

* indicates value to left is below detection. Number entered is one half the detection limit												
Acronyms for stations and station descriptions appear in Appendix 9.												
	AV	HMB	WB	CB	OB	JB	VB	DM	WB	WC	JB	
Parameter	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	3/30/92	3/31/92	3/31/92	
Pesticides												
Aldrin	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.01 *	0.01 *	0.01 *	
alpha-BHC	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.0025 *	0.0025 *	0.0025 *	
beta-BHC	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.0025 *	0.0025 *	0.0025 *	
delta-BHC	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.0025 *	0.0025 *	0.0025 *	
Chlordane	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.2 *	0.2 *	0.2 *	
1,4'-DDD	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *				
4,4'-DDD	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.025 *	0.025 *	0.025 *	
1,4'-DDE	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *				
4,4'-DDE	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.025 *	0.025 *	0.025 *	
1,4'-DDT	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *				
4,4'-DDT	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.025 *	0.025 *	0.025 *	
Dieldrin	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.025 *	0.025 *	0.025 *	
Endosulfan I	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.025 *	0.025 *	0.025 *	
Endosulfan II	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.025 *	0.025 *	0.025 *	
Endosulfan Sulfate	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.025 *	0.025 *	0.025 *	
Endrin	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.025 *	0.025 *	0.025 *	
Heptachlor	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.025 *	0.025 *	0.025 *	
Heptachlor epoxide	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.015 *	0.025 *	0.025 *	0.025 *	
Hexachlorobenzene									0.025 *	0.025 *	0.025 *	
Lindane									0.01 *	0.01 *	0.01 *	
Methoxychlor	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	0.04 *	
Mirex	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	0.025 *	1 *	1 *	1 *	
Toxaphene	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	0.5 *	
PCB.s												
PCB-1016	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	1 *	1 *	1 *	
PCB-1221	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	4 *	4 *	4 *	
PCB-1232	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	1.5 *	1.5 *	1.5 *	
PCB-1242	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	1 *	1 *	1 *	
PCB-1248	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	1 *	1 *	1 *	
PCB-1254	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	
PCB-1260	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	0.25 *	

Appendix 7.

Russian River Organics Data (Collected by the North Coast Regional Water Quality Control Board)

		* indicates value to left is below detection. Number entered is one half the detection limit											
		Acronyms for stations and station descriptions appear in Appendix 9.											
		AV	HMB	WB	CB	QB	JB	VB	DM	DM	VB	JB	
Parameter	Units	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/11/85	10/11/85	10/11/85	
Bromodichloromethane	(ug/L)												
Bromoform	(ug/L)												
Bromomethane	(ug/L)												
Carbon Tetrachloride	(ug/L)												
Chlorobenzene	(ug/L)												
Chloroethane	(ug/L)												
2-Chloroethylvinyl ether	(ug/L)												
Chloroform	(ug/L)												
Chloromethane	(ug/L)												
Dibromochloromethane	(ug/L)												
1,2-Dichlorobenzene	(ug/L)												
1,3-Dichlorobenzene	(ug/L)												
1,4-Dichlorobenzene	(ug/L)												
Dichlorodifluoromethane	(ug/L)												
1,1-Dichloroethane	(ug/L)												
1,2-Dichloroethane	(ug/L)												
1,1-Dichloroethene	(ug/L)												
trans-3-Dichloroethene	(ug/L)												
1,2-Dichloropropane	(ug/L)												
cis-1,3-Dichloropropene	(ug/L)												
trans-1,3-Dichloropropene	(ug/L)												
Methelene chloride	(ug/L)												
1,1,2,2-Tetrachloroethan	(ug/L)												
Tetrachloroethene	(ug/L)												
1,1,1-Trichloroethane	(ug/L)												
1,1,2-Trichloroethane	(ug/L)												
Trichloroethene	(ug/L)												
Trichlorofluoromethane	(ug/L)												
Vinyl chloride	(ug/L)												
Benzene	(ug/L)												
Ethylbenzene	(ug/L)												
Toluene	(ug/L)												

Appendix 7.

5/13/96

Russian River Organics Data (Collected by the North Coast Regional Water Quality Control Board)

* indicates value to left is below detection. Number entered is one half the detection limit															
Acronyms for stations and station descriptions appear in Appendix 9.															
	OB	CB	WB	AV	HMB	CB	OB	JB	HMB	AV	DM	VB	WB		
Parameter	10/11/85	10/11/85	10/11/85	10/11/85	10/11/85	1/8/86	1/8/86	1/8/86	1/8/86	1/8/86	1/8/86	1/8/86	1/8/86		
Bromodichloromethane															
Bromoform															
Bromomethane															
Carbon Tetrachloride															
Chlorobenzene															
Chloroethane															
2-Chloroethylvinyl ether															
Chloroform															
Chloromethane															
Dibromochloromethane															
1,2-Dichlorobenzene															
1,3-Dichlorobenzene															
1,4-Dichlorobenzene															
Dichlorodifluoromethane															
1,1-Dichloroethane															
1,2-Dichloroethane															
1,1-Dichloroethene															
trans-3-Dichloroethene															
1,2-Dichloropropane															
cis-1,3-Dichloropropene															
trans-1,3-Dichloropropene															
Methelene chloride															
1,1,2,2-Tetrachloroethane															
Tetrachloroethene															
1,1,1-Trichloroethane															
1,1,2-Trichloroethane															
Trichloroethene															
Trichlorofluoromethane															
Vinyl chloride															
Benzene															
Ethylbenzene															
Toluene															

Appendix 7.

Russian River Organics Data (Collected by the North Coast Regional Water Quality Control Board)

* indicates value to left is below detection. Number entered is one half the detection limit												
Acronyms for stations and station descriptions appear in Appendix 9.												
	AV	HMB	WB	CB	OB	JB	VB	DM	WB	WC	JB	
Parameter	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	3/30/92	3/31/92	3/31/92	
Bromodichloromethane									0.2 *			
Bromoform									0.2 *			
Bromomethane									0.2 *			
Carbon Tetrachloride									0.2 *			
Chlorobenzene									0.2 *			
Chloroethane									0.2 *			
2-Chloroethylvinyl ether									0.5 *			
Chloroform									0.2 *			
Chloromethane									0.2 *			
Dibromochloromethane									0.2 *			
1,2-Dichlorobenzene									0.2 *			
1,3-Dichlorobenzene									0.2 *			
1,4-Dichlorobenzene									0.2 *			
Dichlorodifluoromethane									0.2 *			
1,1-Dichloroethane									0.2 *			
1,2-Dichloroethane									0.2 *			
1,1-Dichloroethene									0.2 *			
trans-3-Dichloroethene									0.2 *			
1,2-Dichloropropane									0.2 *			
cis-1,3-Dichloropropene									0.2 *			
trans-1,3-Dichloropropene									0.2 *			
Methelene chloride									5 *			
1,1,2,2-Tetrachloroethane									0.2 *			
Tetrachloroethene									0.2 *			
1,1,1-Trichloroethane									0.2 *			
1,1,2-Trichloroethane									0.2 *			
Trichloroethene									0.2 *			
Trichlorofluoromethane									0.2 *			
Vinyl chloride									0.2 *			
Benzene									0.25 *			
Ethylbenzene									0.3 *			
Toluene									0.25 *			

Appendix 7.

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Russian River Organics Data (Collected by the North Coast Regional Water Quality Control Board)

* indicates value to left is below detection. Number entered is one half the detection limit												
Acronyms for stations and station descriptions appear in Appendix 9.												
		AV	HMB	WB	CB	OB	JB	VB	DM	DM	VB	JB
Parameter	Units	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/25/85	10/11/85	10/11/85	10/11/85
Xylenes (total)	(ug/L)											
4-Chloro-3-methylphenyl	(ug/L)											
2-Chlorophenol	(ug/L)											
2,4-Dichlorophenol	(ug/L)											
2,4-Dimethylphenol	(ug/L)											
2,4-Dinitrophenol	(ug/L)											
2-Methyl-4,6-dinitrophenol	(ug/L)											
2-Nitrophenol	(ug/L)											
4-Nitrophenol	(ug/L)											
Pentachlorophenol	(ug/L)											
Phenol	(ug/L)											
2,4,6-Trichlorophenol	(ug/L)											
Acenaphthene	(ug/L)											
Acenaphthylene	(ug/L)											
Anthracene	(ug/L)											
Benzo(a)anthracene	(ug/L)											
Benzo(b)fluoranthene	(ug/L)											
Benzo(k)fluoranthene	(ug/L)											
Benzo(a)pyrene	(ug/L)											
Benzo(g,h,i)perylene	(ug/L)											
Chrysene	(ug/L)											
Dibenzo(a,h)anthracene	(ug/L)											
Fluoranthene	(ug/L)											
Fluorene	(ug/L)											
Indeno(1,2,3-cd)pyrene	(ug/L)											
Naphthene	(ug/L)											
Phenanthrene	(ug/L)											
Pyrene	(ug/L)											

Appendix 7.

5/13/96

Russian River Organics Data (Collected by the North Coast Regional Water Quality Control Board)

* indicates value to left is below detection. Number entered is one half the detection limit															
Acronyms for stations and station descriptions appear in Appendix 9.															
	OB	CB	WB	AV	HMB	CB	OB	JB	HMB	AV	DM	VB	WB		
Parameter	10/11/85	10/11/85	10/11/85	10/11/85	10/11/85	1/8/86	1/8/86	1/8/86	1/8/86	1/8/86	1/8/86	1/8/86	1/8/86		
Xylenes (total)															
4-Chloro-3-methylphenyl															
2-Chlorophenol															
2,4-Dichlorophenol															
2,4-Dimethylphenol															
2,4-Dinitrophenol															
2-Methyl-4,6-dinitrophenol															
2-Nitrophenol															
4-Nitrophenol															
Pentachlorophenol															
Phenol															
2,4,6-Trichlorophenol															
Acenaphthene															
Acenaphthylene															
Anthracene															
Benzo(a)anthracene															
Benzo(b)fluoranthene															
Benzo(k)fluoranthene															
Benzo(a)pyrene															
Benzo(g,h,i)perylene															
Chrysene															
Dibenzo(a,h)anthracene															
Fluoranthene															
Fluorene															
Indeno(1,2,3-cd)pyrene															
Naphthene															
Phenanthrene															
Pyrene															

Appendix 7.

5/13/96

Russian River Organics Data (Collected by the North Coast Regional Water Quality Control Board)

* indicates value to left is below detection. Number entered is one half the detection limit											
Acronyms for stations and station descriptions appear in Appendix 9.											
	AV	HMB	WB	CB	OB	JB	VB	DM	WB	WC	JB
Parameter	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	11/8/85	3/30/92	3/31/92	3/31/92
Xylenes (total)									0.3 *		
4-Chloro-3-methylphenyl									1.5 *	1.5 *	1.5 *
2-Chlorophenol									1.5 *	1.5 *	1.5 *
2,4-Dichlorophenol									1.5 *	1.5 *	1.5 *
2,4-Dimethylphenol									1.5 *	1.5 *	1.5 *
2,4-Dinitrophenol									5 *	5 *	5 *
2-Methyl-4,6-dinitrophen									5 *	5 *	5 *
2-Nitrophenol									2 *	2 *	2 *
4-Nitrophenol									2 *	2 *	2 *
Pentachlorophenol									5 *	5 *	5 *
Phenol									0.5 *	0.5 *	0.5 *
2,4,6-Trichlorophenol									2.5 *	2.5 *	2.5 *
Acenaphthene									0.5 *		0.5 *
Acenaphthylene									0.5 *		0.5 *
Anthracene									0.5 *		0.5 *
Benzo(a)anthracene									1 *		1 *
Benzo(b)fluoranthene									1 *		1 *
Benzo(k)fluoranthene									1 *		1 *
Benzo(a)pyrene									1 *		1 *
Benzo(g,h,i)perylene									2.5 *		2.5 *
Chrysene									1 *		1 *
Dibenzo(a,h)anthracene									2.5 *		2.5 *
Fluorathene									0.5 *		0.5 *
Fluorene									0.5 *		0.5 *
Indeno(1,2,3-cd)pyrene									2.5 *		2.5 *
Naphthene									0.5 *		0.5 *
Phenanthrene									0.5 *		0.5 *
Pyrene									0.5 *		0.5 *

Appendix 8.
California EPA Department of Pesticide Regulation
Russian River Monitoring Results

California Environmental Protection Agency

James M. Strock, *Secretary for Environmental Protection*

State of California

Pete Wilson, *Governor*

DEPARTMENT OF PESTICIDE REGULATION

James W. Wells, *Director*



1020 N Street, Room 161
Sacramento, California 95814-5624

June 7, 1995

To: Interested Parties

Subject: Four River Monitoring Study, Russian River Semiannual Report

Enclosed, for your information, is the semiannual report on the preliminary results of the Four River Monitoring Study, Russian River portion, of the period of August 8, 1994 through February 6, 1995. This report was prepared by the Department of Pesticide Regulation to detail the preliminary results of the weekly pesticide analyses of Russian River water. This report also discusses the background of the study, the selection of the sampling site and the sampling methods.

If you have any questions regarding this report, please contact Carissa Ganapathy, Environmental Research Scientist, at (916) 324-4201.

Sincerely,

A handwritten signature in cursive script that reads "John S. Sanders".

John S. Sanders, Ph. D., Branch Chief
Environmental Monitoring and Pest Management
(916) 324-4100

Attachment

cc: Carissa Ganapathy

Memorandum

To : Roger Sava
Sr. Env. Research Scientist (Supervisor)
Environmental Hazards Assessment Program

Date : June 7, 1995

Place : Sacramento

From : Department of Pesticide Regulation
Carissa Ganapathy, Env. Research Scientist
Environmental Hazards Assessment Program

Subject : Preliminary Results of the Four River Monitoring Study, Russian River; First and Second Quarters, August through February, 1994-1995.

SCOPE OF THIS MEMORANDUM

The purpose of this memorandum is to provide results from the Russian River portion of the Four River Monitoring Study. Data included here were from a six month period between August 1994 through February 1995. This memorandum does not include an interpretation of the data, which will be provided in the final report. The final report will contain data from all four rivers and will be available in February, 1996.

BACKGROUND

This study is a cooperative effort between the Department of Pesticide Regulation (DPR) and the California Department of Fish and Game (CDFG). The portion conducted by DPR is an investigation of pesticide residues in surface waters of four rivers in California: the Merced, Russian, Sacramento, and Salinas Rivers. In addition to pesticide residue quantification by DPR, samples will be tested for toxicity and ammonia concentration by CDFG. This memorandum only summarizes DPR's results from the Russian River.

Pesticide residues in surface water are of concern to DPR due to their potential to contaminate drinking water and their possible effects on California's fish and wildlife. Studies conducted on the San Joaquin and Sacramento Rivers (Ross 1991, 1992a and 1992b, 1993a and 1993b; Foe and Sheplaine, 1993; Lee et al., 1993), as well as regional studies (Shelton and Miller, 1988), indicate certain pesticides have been found in California rivers at levels which may be harmful to aquatic life. In these studies, however, samples were collected once per month, or more frequently during certain seasons. A more intensive sampling approach is required in order to identify potential problems caused by pesticides throughout the year. Year-round pesticide concentration data is lacking for many California rivers having significant amounts of agricultural runoff. Therefore, in this study, water was collected weekly from one sampling site along each of four rivers for a one-year period and analyzed for a number of pesticides.



DPR will use the data collected in this study to determine the temporal distribution of pesticide residues in the Russian River. Although this is not a comprehensive investigation, potential pesticide problems in surface waters can be identified and the timing of contamination may indicate possible sources. If a problem exists and sources can be identified, then mitigation measures can be developed and implemented.

MATERIALS AND METHODS

Sampling Plan

The sampling site is located at a private residence on the Russian River about one mile upstream of the Highway 116 Bridge, in Guerneville. The site is five miles downstream of Green Valley Creek and about 17 miles upstream of the mouth of the river. Green Valley Creek is the last tributary that introduces agricultural run-off into the Russian River.

Water was collected weekly from August 8, 1994 to January 3, 1995 using an ISCO® model 2700 refrigerated automatic sampler. The Teflon® intake line of the automatic sampler was placed in a fixed position about five feet from the bank and at least two feet below the river's surface. The sampling period spanned three consecutive days per week, generally occurring over a weekend. During the three day period, a total of 20 liters of water were collected by programming the automatic sampler to collect one subsample per hour, for a total of 72 hours. The sample water was refrigerated at 4°C in the automatic sampler until retrieved by DPR staff.

Due to heavy rains which resulted in regional flooding in the sampling area, the automatic sampler was removed from its location on January 5. Consequently, the scheduled January 9 sample was not collected. From January 17 through February 6, samples were collected weekly from the Hacienda Bridge (four miles upstream of the sampling site) using the depth-integration method (Guy and Norman, 1970).

Within one day of sample collection, water samples were split with a ten-port splitter (Geotech® dekaport) into discrete samples. CDFG received 14.5 L of water for their testing. DPR retained three 1-L samples for pesticide analyses, performed by the California Department of Food and Agriculture (CDFA) Chemistry Laboratory. Water samples were kept at 4°C until analyzed.

Environmental Measurements

Water quality and environmental parameters measured include pH, dissolved oxygen (DO), EC, water and air temperature. Weekly in situ pH and DO measurements were made in the river on sample-collection days. A Sentron pH meter (model 1001) was used for pH measurements and DO was measured with a Yellow Springs Instruments (model 57) dissolved oxygen meter. DO

and EC of the split sample was measured by ATL for toxicity testing purposes. Water and Air temperatures were measured in situ with a Whatman Lo-Temp μ -Sensor meter.

In addition to parameters measured by DPR, discharge data were obtained from the Department of Water Resources' (DWR) gauging station at Hacienda Bridge. Daily rainfall measurements during the sampling period were obtained from DWR weather stations at Venado (6 miles north of the sampling site) and Windsor (10 miles Northwest of the sampling site).

Pesticide Analysis

DPR retained three 1-liter samples for chemical analysis, one liter for each of the following: organophosphates (OPs), carbamates (CBs), and endosulfan (I, II, and sulfate forms) (Table 1). To preserve samples prior to analysis, the OP and CB samples were acidified to a pH of 3.0 to 3.5. In most cases, the pesticides listed in Table 1 were adequately preserved under acidic conditions for at least two weeks in storage at 4°C. However, in past studies, diazinon was found to degrade rapidly under acidic conditions. Therefore, diazinon was analyzed in the endosulfan sample, which was not acidified. All samples were extracted and analyzed within four days of collection. Chemical analytical procedures are available upon request and will also be included in the final report.

As a quality control procedure, rinse blanks were prepared after approximately every 10 sample periods. Rinse blank procedures involved pouring deionized water sequentially into or through each piece of equipment used in the splitting procedure. Sufficient deionized water was used to obtain three 1-liter, samples which were handled and analyzed for pesticide residues as normal water samples.

RESULTS AND DISCUSSION

Environmental Measurements

Water samples collected during the six-month period had pH values ranging from 7.1 to 7.6 and DO ranging from 7.3 to 10.6 mg/L (68% to 97% saturation, respectively). Both pH and DO met the water quality criteria set by the the U.S. Environmental Protection Agency (US EPA). The Fresh Water Chronic Criteria Lowest Observed Effect Level for pH is between 6.5 and 9.0 and DO is 4.0 mg/L (US EPA 1986). Water temperature on sample pick up days varied from 8 to 30°C and the air temperatures ranged from 7 to 37 °C.

During the first three months there was 1.6 inches of rain recorded at the Venado weather station and the Russian River discharge rate fluctuated between 91 to 285 cubic feet per second (cfs). However, during the second three-month period rainfall totaled 59.8 inches at Venado and the

discharge ranged from 107 to approximately 100,000 cfs (Figure 1). August through December discharges were similar to past years (Shelton, et. al., 1991 and Markham, et. al., 1993). In mid-January, however, there was heavy rain and flooding in the basin. The stage height during January reached 48.0 feet, close to the record stage height of 48.56 feet during the 1986 flood. The calculated discharge for the 1986 flood was 102,000 cfs (Markham et. al., 1993).

Pesticide Concentrations

During the six-month sampling period, only one of the 26 samples had a concentration above the reporting limit. Diazinon was detected in the sample collected November 5-8 at a concentration of 0.076 ppb. There were no detections reported from the three quality control rinse blanks of the splitting equipment.

The US EPA has established a Lifetime Health Advisory (HA) of 0.6 ppb for diazinon for toxicity to humans other than cancer risk (EPA 1988). US EPA has not yet determined a water quality criterion for the protection of freshwater aquatic organisms. However, CDFG recently developed acute and chronic freshwater criteria for diazinon (Menconi and Cox, 1994). According to CDFG, freshwater organisms should not be affected unacceptably if the average concentration of diazinon does not exceed 0.04 ppb in a 4-day period more than once every three years and if the one-hour average concentration does not exceed 0.08 ppb more than one time in three years on the average (Menconi and Cox, 1994 and Stephan, et. al., 1985). The above values are presented in this memorandum for reference only. Full interpretation of all data will be presented in the final report.

A memorandum summarizing the results of the second six-month sampling period for the Russian River will be available in October, 1995. The final report will be available in February, 1996, and will include data from all four rivers.

RESULTS AND DISCUSSION

Roger Sava
June 7, 1995
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June 7, 1995
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Table 1. List of active ingredients and their breakdown products analyzed by the California Department of Food and Agriculture, Laboratory Services Branch, for the Four-River Monitoring Study.

**Organophosphate (OP)
Screen^a**

Method: Gas chromatography/
Flame photometric detector

Compound	RL ^b
Azinphos-methyl	0.05
Azinphos-methyl OA ^c	0.05
Chlorpyrifos	0.05
Chlorpyrifos OA	0.05
DDVP	0.05
Diazinon	0.05
Diazinon OA	0.05
Dimethoate	0.05
Ethoprop	0.05
Ethyl Parathion	0.05
Ethyl Parathion OA	0.05
Fonofos	0.05
Malathion	0.05
Malathion OA	0.05
Methidathion	0.05
Methidathion OA	0.05
Methyl Parathion	0.05
Methyl Parathion OA	0.05
Phosalone	0.05
Phosalone OA	0.05
Phosmet	0.05
Phosmet OA	0.05

**N-methyl Carbamate (CB)
Screen^a**

Method: High performance
liquid chromatography/ Post
Column derivitization with
fluorescence detector

Compound	RL
Aldicarb	0.05
Aldicarb Sulfone	0.05
Aldicarb Sulfoxide	0.05
Carbaryl	0.05
Carbofuran	0.05
3-Hydroxycarbofuran	0.05
Methiocarb	0.05
Methiocarb Sulfone	0.05
Methiocarb Sulfoxide	0.05
Methomyl	0.05
Oxamyl	0.05

Endosulfan

Method: Gas chromatography/
Electron capture detector

Compound	RL
Endosulfan I	0.005
Endosulfan II	0.005
Endosulfan Sulfate	0.01

Diazinon^d

Method: Gas chromatography/
Nitrogen phosphorus detector

Compound	RL
Diazinon	0.05
Diazinon OA	0.05

a) Preserved by acidification. b) Reporting limit in ppb. c) Oxygen analog d) Diazinon and diazinon OA were extracted from the same water sample as endosulfan I, endosulfan II and endosulfan sulfate.

SECOND QUARTER DAILY PRECIPITATION AND DISCHARGE RATES: NOVEMBER-FEBRUARY

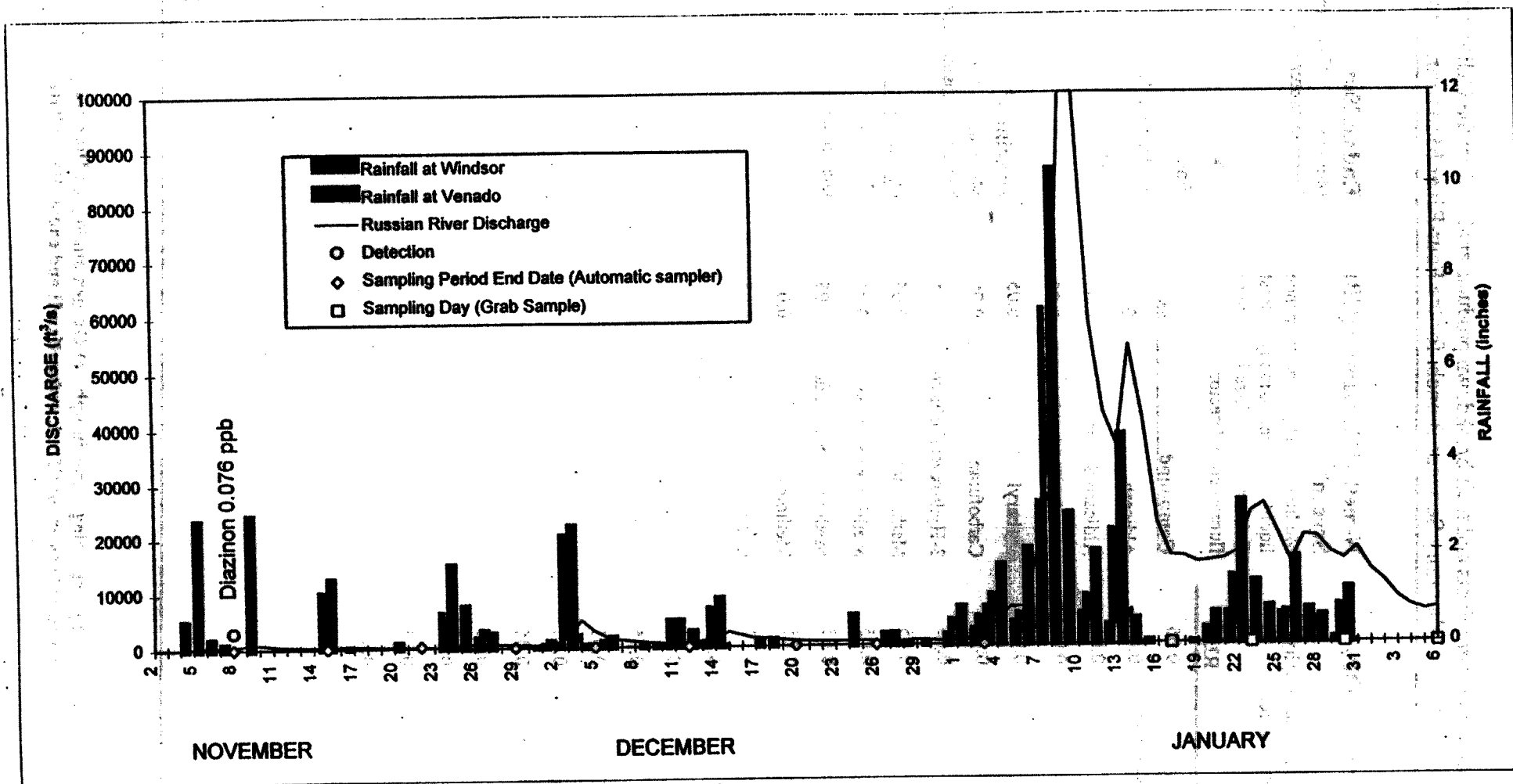


Figure 1. Daily rainfall and Russian River discharge for November 2 through February 6, 1995. Rainfall data are from the Department of Water Resource's weather stations at Windsor and Venado. River discharge data are from the USGS Hacienda Bridge gauging station.

California Environmental Protection Agency

James M. Strock, *Secretary for Environmental Protection*

State of California

Pete Wilson, *Governor*

DEPARTMENT OF PESTICIDE REGULATION

James W. Wells, *Director*



1020 N Street, Room 161
Sacramento, California 95814-5624

October 3, 1995

To: Interested Parties

Subject: Four River Monitoring Study, Russian River Semiannual Report

Enclosed, for your information, is the semiannual report on the preliminary results of the Four River Monitoring Study, Russian River portion, of the period of February 14 through August 8, 1995. This report was prepared by the Department of Pesticide Regulation to detail the preliminary results of the weekly pesticide analyses of Russian River water. This report also discusses the background of the study, the selection of the sampling site and the sampling methods.

If you have any questions regarding this report, please contact Carissa Ganapathy, Environmental Research Scientist, at (916) 324-4201.

Sincerely,

A handwritten signature in cursive script that reads "John S. Sanders".

John S. Sanders, Ph. D., Branch Chief
Environmental Monitoring and Pest Management
(916) 324-4100

Attachment

cc: Carissa Ganapathy



Memorandum

To : Roger Sava
Sr. Env. Research Scientist (Supervisor)
Environmental Hazards Assessment Program

Date : October 3, 1995

Place : Sacramento

From : Department of Pesticide Regulation
Carissa Ganapathy, Env. Research Scientist
Environmental Hazards Assessment Program

Subject : Preliminary Results of the Four River Monitoring Study, Russian River; Third and Fourth Quarters, February through August, 1995.

SCOPE OF THIS MEMORANDUM

The purpose of this memorandum is to provide results from the Russian River portion of the Four River Monitoring Study. Data included are from a six month period between February and August 1995. This memorandum does not include an interpretation of the data, which will be provided in the final report. The final report will contain data from all four rivers and will be available in February, 1996.

BACKGROUND

This study is a cooperative effort between the Department of Pesticide Regulation (DPR) and the California Department of Fish and Game (CDFG). The portion conducted by DPR is an investigation of pesticide residues in surface waters of four rivers in California: the Merced, Russian, Sacramento, and Salinas Rivers. In addition to pesticide residue quantification by DPR, samples were tested for toxicity and ammonia concentration by CDFG. This memorandum only summarizes DPR's results from the Russian River.

Pesticide residues in surface water are of concern to DPR due to their potential to contaminate drinking water and their possible effects on California's fish and wildlife. Studies conducted on the San Joaquin and Sacramento Rivers (Ross 1991, 1992a and 1992b, 1993a and 1993b; Foe and Sheipline, 1993; Lee et al., 1993), as well as regional studies (Shelton and Miller, 1988), indicate certain pesticides have been found in California rivers at levels which may be harmful to aquatic life. In these studies, however, samples were collected once per month, or more frequently during certain seasons. A more intensive sampling approach is required in order to identify potential problems caused by pesticides throughout the year. Year-round pesticide concentration data is lacking for many California rivers having significant amounts of agricultural runoff. Therefore, in this study, water was collected weekly from one sampling site along each of four rivers for a one-year period and analyzed for a number of pesticides.



DPR will use the data collected in this study to determine the temporal distribution of pesticide residues in the Russian River. Although this is not a comprehensive investigation, potential pesticide problems in surface waters can be identified and the timing of contamination may indicate possible sources. If a problem exists and sources can be identified, then mitigation measures can be developed and implemented.

MATERIALS AND METHODS

Sampling Plan

The sampling site is located at a private residence on the Russian River about one mile upstream of the Highway 116 Bridge, in Guerneville. The site is five miles downstream of Green Valley Creek and about 17 miles upstream of the mouth of the river. Green Valley Creek is the last tributary that introduces agricultural run-off into the Russian River.

Water was collected weekly during most of the first and second quarters using an ISCO® model 2700 refrigerated automatic sampler. The Teflon® intake line of the automatic sampler was placed in a fixed position about five feet from the bank and at least two feet below the river's surface. The sampling period spanned three consecutive days per week, generally occurring over a weekend. During the three day period, a total of 20 liters of water were collected by programming the automatic sampler to collect one subsample per hour, for a total of 72 hours. The sample water was refrigerated at 4°C in the automatic sampler until retrieved by DPR staff. Due to heavy rains which resulted in regional flooding in the sampling area, the automatic sampler was removed from its location on January 5. Consequently, samples were collected weekly from the Hacienda Bridge (four miles upstream of the original sampling site) using the depth-integration method (Guy and Norman, 1970) from January 17 through May 1.

From May 8th to August 8th, samples were again collected using the automatic sampler which was returned to the site near Guerneville. Due to technical difficulties the autosampler was not used for the May 8th and June 26th samples. Instead, a grab sample was collected from the river edge near the site by submerging a capped bottle, uncapping, filling and then capping under water.

Within one day of sample collection, water samples were split with a ten-port splitter (Geotech® dekport) into discrete samples. CDFG received 14.5 L of water for their testing. DPR retained three 1-L samples for pesticide analyses, performed by the California Department of Food and Agriculture (CDFA) Chemistry Laboratory. Water samples were kept at 4°C until analyzed.

Environmental Measurements

Water quality and environmental parameters measured include pH, dissolved oxygen (DO), electrical conductivity (EC), water and air temperature. Weekly in situ pH and DO measurements were made in the river on sample-collection days. A Sentron pH meter (model 1001) was used for pH measurements and DO was measured with a Yellow Springs Instruments (model 57) dissolved oxygen meter. DO and electrical conductivity of the split sample was measured by ATL (Aquatic Toxicology Laboratory, Department of Fish and Game) for toxicity testing purposes. Water and Air temperatures were measured in situ with a Cole-Palmer temperature meter (model 90201-10).

In addition to parameters measured by DPR, discharge data were obtained from the Department of Water Resources' (DWR) gauging station at Hacienda Bridge. Daily rainfall measurements during the sampling period were obtained from the DWR weather station at Venado (6 miles north of the sampling site) and from the Russian River Fire Protection District in Guerneville.

Pesticide Analysis

DPR retained three 1-liter samples for chemical analysis, one liter for each of the following: organophosphates (OPs), carbamates (CBs), and endosulfan (I, II, and sulfate forms) (Table 1). To preserve samples prior to analysis, the OP and CB samples were acidified to a pH of 3.0 to 3.5. In most cases, the pesticides listed in Table 1 were adequately preserved under acidic conditions for at least two weeks in storage at 4°C. However, in past studies, diazinon was found to degrade rapidly under acidic conditions. Therefore, diazinon was analyzed in the endosulfan sample, which was not acidified. All samples were extracted and analyzed within four days of collection. Chemical analytical procedures are available upon request and will also be included in the final report.

As a quality control procedure, rinse blanks were prepared after approximately every 10 sample periods. Rinse blank procedures involved pouring deionized water sequentially into or through each piece of equipment used in the splitting procedure. Sufficient deionized water was used to obtain three 1-liter samples which were handled and analyzed for pesticide residues as normal water samples.

RESULTS AND DISCUSSION

Environmental Measurements

Water quality measurements taken during the six month period had pH values ranging from 7.3 to 7.9 and DO ranging from 6.0 to 12.6 mg/L (72% to 109% saturation, respectively). Both pH

and DO met the water quality criteria set by the U.S. Environmental Protection Agency (U.S. EPA) and the pH met the objectives set by the North Coast Regional Water Quality Control Board (NCRWQCB) in the Water Quality Control Plan for the North Coast Region (1994). The U.S. EPA recommended fresh water criteria for pH for aquatic organisms is expressed as a range of values from 6.5 to 9.0. The Water Quality Control Plan for the North Coast Region lists the pH objectives as a minimum of 6.5 and a maximum of 8.5. The U.S. EPA lists two 1-day minimum criteria for DO based on whether a stream is considered a cold or a warmwater stream. Since the Russian River supports both coldwater and warmwater species (personal communication with NCRWQCB's R. Klamt and C. Goodwin) the U.S. EPA 1-day minimum criteria for DO that is most protective is the coldwater criteria of 4.0 mg/L (US EPA 1986). The DO values met the specific water quality minimum objective of 7.0 mg/L listed in the Water Quality Control Plan for the downstream portion of the Russian River, with the exception of one time. Water temperature on sample pick up days varied from 9 to 30°C and the air temperatures ranged from 8 to 31°C.

During the third quarter 38.08 inches of rain were recorded at the Venado weather station and the Russian River discharge rate fluctuated between 1,241 to 61,274 cubic feet per second (cfs)(Figure 1). The highest discharge occurred in March, coinciding with heavy rain and flooding in the basin. The stage height during the March flood reached 42.0 feet, six feet less than the flood in January. During the fourth quarter, however, rainfall totaled 2.08 inches at Venado and the discharge ranged from 188 to approximately 9,000 cfs.

Pesticide Concentrations

During the six month sampling period, only one of the 26 samples had a concentration above the reporting limit (see Table 1 for reporting limits). Dimethoate was detected at a concentration of 0.11 ppb (part per billion) in the grab sample collected March 20. The California Department of Health Services has set an action level of 140 ppb for dimethoate in drinking water (Department of Water Resources, 1993) and there is no current U.S. EPA water quality criterion for the protection of freshwater aquatic organisms. There were no detections reported from the three quality control rinse blanks of the splitting equipment.

The final report will be available in February, 1996, and will include data from all four rivers.

References

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Roger Sava
October 3, 1995
Page 6

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Table 1. List of active ingredients and their breakdown products analyzed by the California Department of Food and Agriculture, Laboratory Services Branch, for the Four-River Monitoring Study.

Organophosphate (OP)

Screen^a

Method: Gas chromatography/
Flame photometric detector

Compound	RL ^b
Azinphos-methyl	0.05
Chlorpyrifos	0.05
DDVP	0.05
Diazinon	0.05
Dimethoate	0.05
Ethoprop	0.05
Ethyl Parathion	0.05
Fonofos	0.05
Malathion	0.05
Methidathion	0.05
Methyl Parathion	0.05
Phosalone	0.05
Phosmet	0.05

N-methyl Carbamate (CB)

Screen^a

Method: High performance
liquid chromatography/ Post
Column derivatization with
fluorescence detector

Compound	RL
Aldicarb	0.05
Aldicarb Sulfone	0.05
Aldicarb Sulfoxide	0.05
Carbaryl	0.05
Carbofuran	0.05
3-Hydroxycarbofuran	0.05
Methiocarb	0.05
Methiocarb Sulfone	0.05
Methiocarb Sulfoxide	0.05
Methomyl	0.05
Oxamyl	0.05

Endosulfan

Method: Gas chromatography/
Electron capture detector

Compound	RL
Endosulfan I	0.005
Endosulfan II	0.005
Endosulfan Sulfate	0.01

Diazinon^c

Method: Gas chromatography/
Nitrogen phosphorus detector

Compound	RL
Diazinon	0.05

a) Preserved by acidification. b) Reporting limit in ppb. c) Diazinon was extracted from the same water sample as endosulfan I, endosulfan II and endosulfan sulfate.

THIRD QUARTER DAILY RAINFALL AND DISCHARGE RATES: FEBRUARY-APRIL

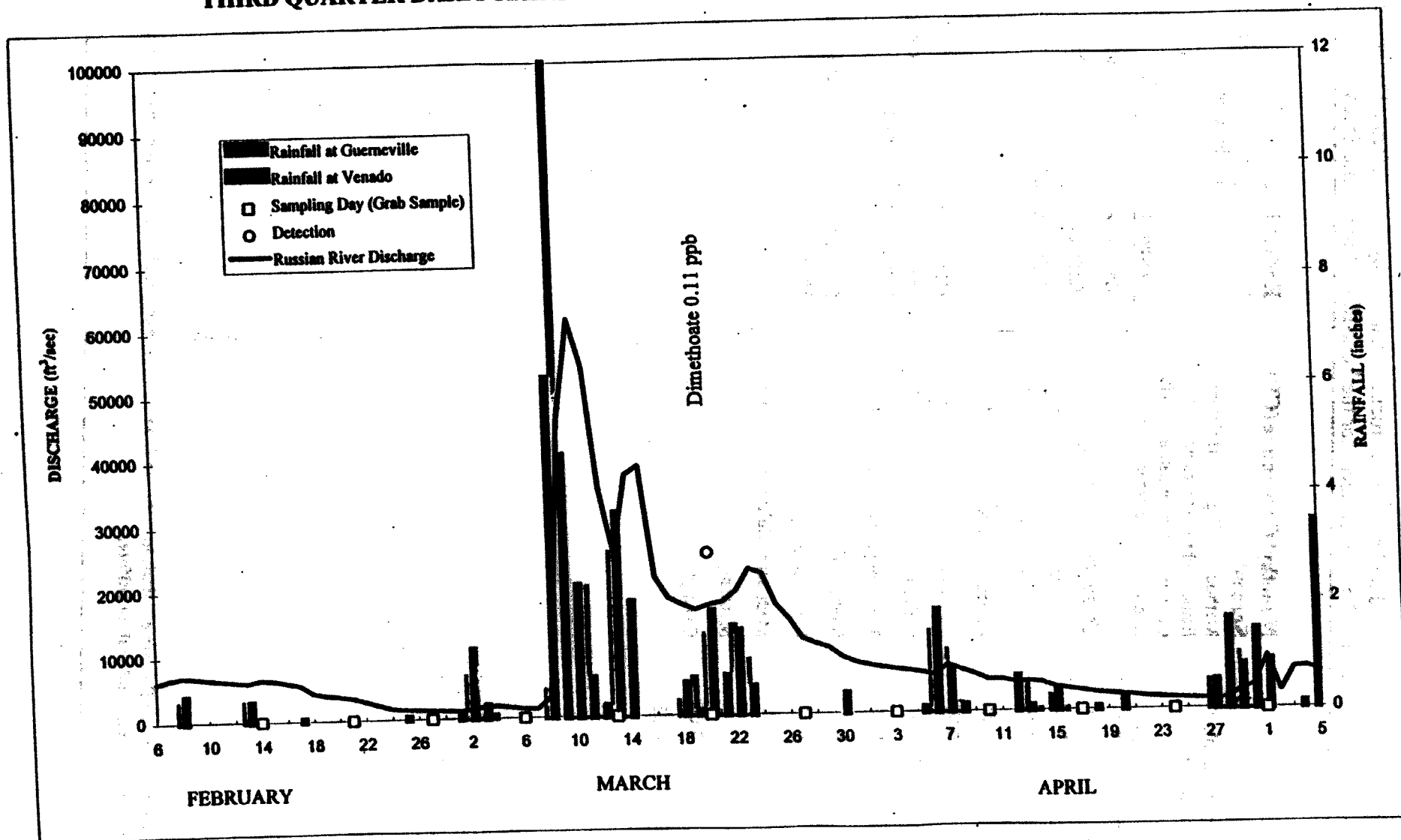


Figure 1. Daily rainfall and Russian River discharge for February 6 through May 1, 1995. Rainfall data are from the Department of Water Resource's weather station at Venado and the Russian River Fire Protection District in Guerneville. River discharge data are from the USGS Hacienda Bridge gauging station.

Appendix 9.
North Coast Regional Water Quality Control Board
Russian River Sampling Locations

Acronym	Station Description
AC	Austin Creek at 1st bridge on Old Cazadero Hwy
ASTI	Russian River at Asti
AV	Russian River at Alexander Valley Bridge
BP	Brown Pond
BSC	Big Sulfur Creek near mouth
BSCS	Big Sulfur Cr downstream confluence with Squaw Creek
CAL	West Fork Russian River near Calpella
CB	Russian River at Cook's Beach (9500 River Road)
CCDHB	Copeland Creek downstream of Hinebaugh Creek
CCDRP	Copeland Creek downstream of Rohnert Park
CCUHB	Copeland Creek upstream of Hinebaugh Creek
CCURP	Copeland Creek upstream of Rohnert Park
CLO	Russian River at Cloverdale 1st Street Bridge
COL	Colgan Creek at Todd Road
CUMM	Russian River at Cumiskey Station
DBC	Dutch Bill Creek at Monte Rio
DC1	Dry Creek arm
DC2B	Dry Creek arm bottom sample
DC3	Dry Creek arm
DC3B	Dry Creek arm bottom sample
DCRR	Dry Creek at mouth
DM	Russian River at Duncan's Mills
DP	Delta Pond
EFRR	East Fork Russian River at USGS gaging station at dam

Acronym Station Description
 ~~~~~

|          |                                                                               |
|----------|-------------------------------------------------------------------------------|
| GEY      | Russian River at Geyserville                                                  |
| GOS      | Gossage Creek at Stony Point Road                                             |
| GVC      | Green Valley Creek at River Road                                              |
| HBDRP    | Hinebaugh Creek downstream of Rohnert Park STP                                |
| HBURP    | Hinebaugh Creek upstream of Rohnert Park STP                                  |
| HMB      | Russian River at Healdsburg Memorial Beach                                    |
| HOP      | Russian River at Hopland at road 175                                          |
| JB       | Russian River at Johnson's Beach                                              |
| JEN      | Russian River at Jenner                                                       |
| L12      | Laguna de Santa Rosa at Highway 12                                            |
| LGR      | Laguna de Santa Rosa at Guerneville Road                                      |
| LLR      | Laguna de Santa Rosa at Llano Road                                            |
| LOR      | Laguna de Santa Rosa at Occidental Road                                       |
| LRR      | Mark West Creek at River Road                                                 |
| LSP      | Laguna de Santa Rosa at Stony Point Road                                      |
| LSTP-EFF | Laguna WTP                                                                    |
| LTR      | Laguna de Santa Rosa at Todd Road                                             |
| LUSR     | Laguna de Santa Rosa immediately upstream of confluence with Santa Rosa Creek |
| MAA      | Maacama Creek downstream of Franz Creek                                       |
| MLP      | Meadow Lane Pond                                                              |
| MP       | Russian River at Mirabel Park                                                 |
| MWC      | Mark West Creek at Slusser Road                                               |
| OF       | Russian River at Oddfellows Bridge                                            |
| PB       | Russian River at Preston Bridge                                               |
| PV       | Russian River at Potter Valley                                                |

Acronym      Station Description

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RC-A	Roseland Creek at Alpha Pond
RCLL	Roseland Creek at Llano Road
RCSP	Roseland Creek at Stony Pt. Road
RRE	Russian River Estates
RRPC	Russian River at Pieta Creek
RRSP	Russian River downstream of Syar gravel pond
SGPP	Syar gravel pit pond below Healdsburg STP
SHB	Russian River at Steelhead Beach
SOC	Big Sulfur Creek at Socrates Mine Road Crossing
SRC	Santa Rosa Creek upstream of Delta Pond
SRCFR	Santa Rosa Creek at Fulton Road
SRCMR	Santa Rosa Creek at Melita Road
SRCSP	Santa Rosa Creek at Stoney Point Road
SRCWS	Santa Rosa Creek at Willowside Road
TAL	Russian River at Talmage Road; Ukiah
TH	Mark West Creek at Trenton-Healdsburg Road
TUR	Russian River at Turula Vineyard
UK EFF	Ukiah STP Effluent
UKSTP	Russian River downstream of Ukiah STP
VB	Russian River at Vacation Beach
WB	Russian River at Wohler Bridge
WBD	Russian River at Rubber Dam
WFRR	West Fork Russian River at bridge on road to dam
WS1	Warm Springs Creek arm, Lake Sonoma
WS2B	Warm Springs Creek arm bottom sample, Lake Sonoma

Acronym	Station Description
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WS25	Warm Springs Creek arm surface sample, Lake Sonoma
WSD	Dry Creek at Warm Springs Dam, Lake Sonoma
YB	Dry Creek at Yoakim Bridge
SSP	Five's Creek at Stony Point Road
SW	Five's Creek at Wilford Avenue

Additional Sampling stations:

- Rincon Creek tributary at Acacia Ln.
- Rincon Creek tributary at Boas Drive
- Rincon Creek tributary at St. Francis Rd.
- Rincon Creek tributary at San Ramon Way