

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
NORTE COAST REGION  
Interoffice Communication**

TO: File - Russian River Monitoring

DATE: December 6, 1994

FROM: Theresa Wistrom

SUBJECT: **Russian River Bacterial Levels**

This memorandum serves to summarize the results of monitoring the Russian River for bacteria, from 1986 through 1994. It is an update to an Interoffice Communication of August 26, 1986 and to the discussion included in the "Interim Staff Report regarding Russian River Water Quality Monitoring" of January 27, 1993, pages 13 & 14, both of which are attached. In addition to summarizing the results of recent bacteriological monitoring on the Russian River, this memorandum will discuss two issues: 1) the determination of compliance to the Basin Plan bacterial objectives, and 2) impacts on the public health.

**Monitoring**

As in the past, Regional Board focus for monitoring has been during the summer months, the period of peak use for body contact recreation, and the period during which there is most interest regarding the impact of bacterial levels in the Russian River on the public health. Regional Board staff conducted limited monitoring to "spot-check" compliance to the numerical Basin Plan objective - the monitoring was not systematic, nor did it provide a thorough baseline for evaluation. The Sonoma County Health Department conducted more thorough monitoring of major bathing areas along the lower Russian River. The results of both Regional Board and Sonoma County Health Department bacteriological monitoring are included in files labelled "Bacteriological Data for Russian River, 1986- , " located in my cubicle.

**Basin Plan Objective**

The Basin Plan includes both narrative and numerical objectives for bacteria. The narrative objective is that the bacteriological quality of the Russian River not exceed natural background levels. The numerical objectives are: 1) that the median concentration of fecal coliform, based on a minimum of not less than five samples for any 30-day period, exceed 50/100 ml, and 2) that not more than ten percent of total samples taken during any 30-day period exceed 400/100 ml.

**Implementation of the Narrative Objective - Natural Background Levels**

The Basin Plan prohibits the discharge of waste, and thus the discharge of bacteria, to the Russian River and its tributaries during the period May 15 through September 30. The Regional Board and the health departments of Mendocino County and Sonoma County have enforced this prohibition to the extent possible through waste discharge orders and septic tank ordinances. Regional Board waste discharge orders prohibit the municipalities and industries located on the Russian River watershed from discharging during the period May 15 through September 30, and require the dischargers to report on compliance to the prohibition. Between 1986 and 1994, no incidences of non-authorized discharges of waste by dischargers under Regional Board waste discharge orders to the seasonal waste discharge prohibition were reported or known to occur. However, malfunctioning septic systems, which may result in discharge to the Russian River, probably continue to occur. Whenever such discharges are identified, the health departments can and do initiate proceedings requiring repair, then if necessary, abatement. To attempt to identify and control malfunctioning septic systems affecting water quality and public health, the Mendocino County and Sonoma County health departments have in the past and continue to conduct areawide pollution prevention studies along the Russian River watershed. One such study currently underway is in the Forestville-Mirabel Heights area in Sonoma County. In addition, the Regional Board is attempting to develop a monitoring effort utilizing EPA Region IX laboratory services, to assess the impacts of Spring runoff and infiltration to the Russian River from the Fitch Mountain area upstream of Healdsburg Memorial Beach.

Nonpoint sources of pollution which may introduce bacteria to the river, which include urban and agricultural runoff during storm events, are more difficult to assess and control. Regional Board efforts to minimize such impacts include: 1)

Implementation of storm water pollution prevention measures as required in the federal Clean Water Act for industries and major municipal dischargers; and 2) active administration of grant funds for nonpoint source management programs under Clean Water Act Section 319(h) in the Russian River watershed. Most recently, on September 22, 1994, the Regional Board assigned a high priority ranking to a combination of two projects by the Sotoyome-Santa Rosa Resource Conservation District and Rancho Cotate High School involving Laguna De Santa Rosa animal waste projects and other lower Russian River tributary nonpoint source issues, and requested a total grant funding of \$290,000 for the projects.

Compliance to the Numerical Objective - Median Fecal Coliform MPN of 50/100 ml

Measurements to assess compliance to the numerical objective taken along the Russian River are summarized below as well as in Tables 1-13 and Figures 1-3.

LOCATION	DESCRIPTION	YEARS SAMPLED	COMPLIANCE
Talmage Cloverdale Geyserville	Undisturbed areas. Not major swimming areas.	1992	"Spot check" sampling indicated compliance.
Del Rio Woods	Location of a summer dam. Receives moderate use for swimming.	1989	One of six sampling sets exceeded the objective. There was no difference in the results from above or below the summer dam.
Camp Rose	Water backs up when summer dam at Healdsburg Memorial Beach is in place. Not a major swimming area.	1994	"Spot-Check" sampling indicated compliance.
Healdsburg Memorial Beach	Location of a summer dam. Major swimming area.	1986-94	Exceedances of the objective occurred consistently at several locations; of 122 sampling sets, 88 (72%) exceeded the objective. Results of an intensive sampling of the "Kids' Area" in August and September 1994 indicated exceedance of the objective in 9 of 9 (100%) of the sampling sets. See Figure 1.
Burke's Beach Hilton Park Odd Fellows Midway Beach	No summer dams. Receive moderate use for swimming.	1992-94	Exceedance of the objective occurred in 1 of 19 (5.2%) sampling sets at Burke's Beach, 10 of 21 (47.6%) at Hilton Park, 0 of 3 sampling sets at Odd Fellows, and 7 of 21 (33.3%) sampling sets at Midway Beach.
Johnson's Beach	Location of a summer dam. Major swimming area.	1986-94	Exceedance of the objective occurred in 37 of 85 (44%) of the sampling sets. There were no observable differences in bacterial levels in the upstream, swim area, and downstream locations sampled. Levels observed in May and June appear generally higher than other months. See Figure 2.
Monte Rio Beach	Location of a summer dam. Receives moderate to heavy use for swimming.	1992-94	Exceedance of the objective occurred in 18 of 24 (75%) of the sampling sets. See Figure 3.
Casini Ranch	No summer dam. Water backs up when mouth of Russian River is blocked. Not a major swimming area.	1992-94	Exceedance of the objective occurred in 9 of 25 (35%) of the sampling sets, all of which occurred from July 1992 to July 1993. Sampling sets between August 1993 through August 1994 indicated compliance with the objective.

Compliance to the Numerical Objective - 10% of samples taken within a 30-day period not to exceed Fecal Coliform MPN of 400/100 ml

The monitoring did not specifically check for compliance to this objective. However, fecal coliform bacterial levels exceeding 400/100 ml. occurred at the following locations and frequencies.

LOCATION	OCCURRENCE OF SAMPLES WITH FECAL COLIFORM LEVELS GREATER THAN 400/100 ml.
Healdsburg Memorial Beach	6.6%
Hilton Park	One
Odd Fellows	One
Midway Beach	One
Johnson's Beach	1.6%
Casini Ranch	31% between July 1992 and July 1993 None from August 1993 to August 1994

### Public Health

The Statewide Conference of Directors of Environmental Health developed fecal coliform standards for freshwater recreation in 1973. The standards describe "recommended" and "action" levels of 50/100 ml and 200/100 ml respectively. The recommendations call for "investigations to commence into the causes" when the recommended level is exceeded, and the application of public warning or restrictions when the action level is exceeded. Federal criteria for full body contact are different than the statewide standards. Prior to 1986, they called for a log mean of not less than five samples over a 30-day period not to exceed a fecal coliform concentration of 200 per 100 ml, and not more than 10% of total samples over a 30-day period to exceed 400/100 ml. The EPA developed new criteria in 1986, which called for measurements of E. coli and enterococci rather than fecal coliform bacteria, based on findings nationwide of better correlation to swimming-associated gastroenteritis at both marine and freshwater bathing beaches. The State, however, has not adopted the new criteria for E. coli and enterococcus.

Based on recommendations from the State Department of Health Services, the Sonoma County Department of Public Health has chosen to continue sample bathing areas along the Russian River for fecal coliform bacteria and not for E. coli or enterococci. Results in the area of most concern, Healdsburg Memorial Beach, indicated the need for increased sampling, which was subsequently implemented by the Sonoma County Health Department, and no further action.

### Conclusions

Spot checks for background levels of fecal coliform bacteria indicated compliance with Basin Plan objectives in areas along the Russian River which are not heavily used or influenced by summer dams. However, the numerical objective of 50/100 ml fecal coliform bacteria was exceeded at times (ranging from 44% to 75% of sampling sets) in high-use bathing areas, and in areas with summer dams along the Russian River (Healdsburg Memorial Beach, Johnson's Beach, and Monte Rio Beach. These bathing areas received increased monitoring for public health purposes. Assessment of the results by Sonoma County Health Department, based on guidance provided by the State Department of Health Services, indicated that no action with respect to public warning or restriction was warranted.

Figure 1. Fecal Coliform MPN/100 ml at Healdsburg Memorial Beach

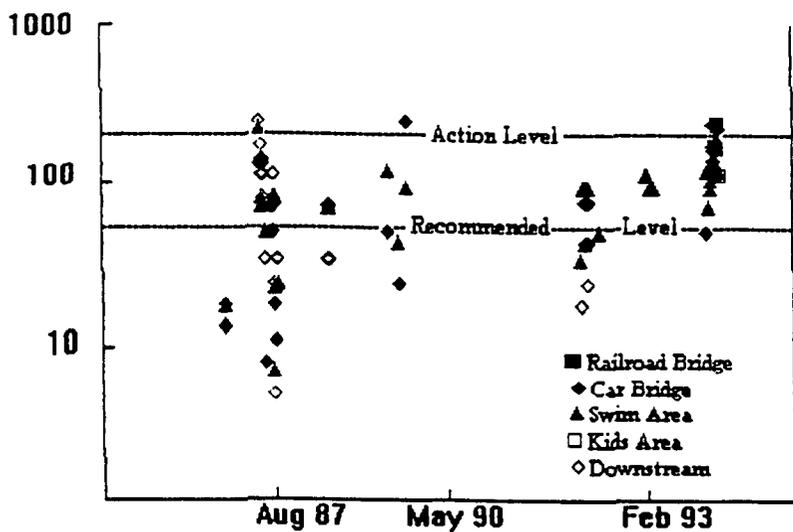


Figure 2. Median Fecal Coliform MPN/100 ml at Johnson's Beach

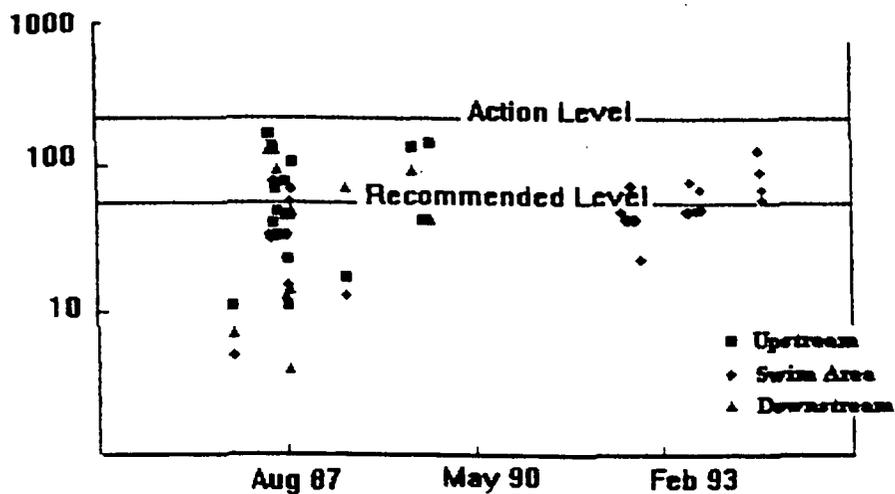


Figure 3. Median Fecal Coliform MPN/100 ml at Monte Rio Beach

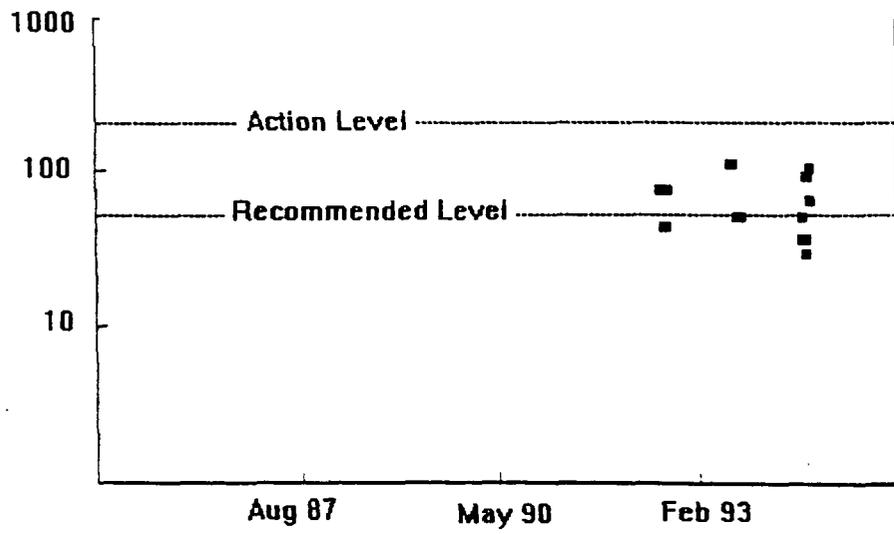


Table 1. Talmage

Date	Median Fecal Coliform MPN/100ml.
30-Jun-92	21.5
13-Oct-92	46

Table 2. Cloverdale

Date	Median Fecal Coliform MPN/100ml.
13-Oct-92	23

Table 3. Geyserville

Date	Median Fecal Coliform MPN/100ml.
13-Oct-92	5

Table 4. Del Rio Woods

Date	Median Fecal Coliform MPN/100ml.	
	Upstream	Downstream
12-Jun-89	170	33
07-Aug-89	9	23
18-Sep-89	23	9

Table 5. Camp Rose

Date	Median Fecal Coliform MPN/100 ml.
30-Jun-94	33

Table 6. Healdsburg Memorial Beach

Date	Median Fecal Coliform MPN/100 ml.				
	Upstream		Upstream		Downstream
	Railroad Bridge	Car Bridge	Swim Area	Kids' Area	
28-Oct-86		13		17	17
19-May-87		130		220	240
27-May-87		130		70	170
02-Jun-87		140		79	110
09-Jun-87		140		70	110
17-Jun-87		130		70	79
22-Jun-87		8		70	33
30-Jun-87		8		49	33
11-Aug-87		70		79	110
12-Aug-87		49		22	23
19-Aug-87		17		7	5
26-Aug-87		11		79	11
01-Sep-87		22		23	33
23-Jun-88		70		69	33
30-Jun-88		70		69	33
12-Jun-89		49		120	
07-Aug-89		23		43	
18-Sep-89		240		93	
30-Jun-92				33	17
20-Jul-92				93	
27-Jul-92		75		93	43
27-Jul-92				43	
03-Aug-92		43		93	23
10-Aug-92		75			23
17-Aug-92		75			
24-Aug-92		75			43
13-Oct-92				49	
13-Jul-93				110	
20-Jul-93				110	
27-Jul-93				<110	
03-Aug-93				92	
10-Aug-93				92	
17-Aug-93				92	
24-Aug-93				92	
31-Aug-93				92	
30-Jun-94		49		120	
05-Jul-94				71	
12-Jul-94				71	
19-Jul-94				92	
20-Jul-94				106	
26-Jul-94				120	
27-Jul-94				140	
29-Jul-94		230		120	
01-Aug-94		170		120	161
03-Aug-94		110		120	140
05-Aug-94		<110		120	161
08-Aug-94		110		140 >230	140
15-Aug-94	110	110		140 >225	161
17-Aug-94	170	110		120 >230	161
22-Aug-94	230	<110		190 >225	161
24-Aug-94		<110		>230	161
26-Aug-94		110		>225	<140
29-Aug-94				190 >220	<165
31-Aug-94		110			165 220
02-Sep-94		110			110 220

Table 7. Burkes Beach

Date	Median Fecal Coliform MPN/100 ml.
27-Jul-92	23
03-Aug-92	23
10-Aug-92	23
17-Aug-92	23
24-Aug-92	23
31-Aug-92	23
08-Sep-92	43
14-Sep-92	23
13-Jul-93	110
05-Jul-94	22
12-Jul-94	22
19-Jul-94	22
20-Jul-94	16
26-Jul-94	16
01-Aug-94	16
08-Aug-94	16
15-Aug-94	16
22-Aug-94	22
29-Aug-94	22

Table 8. Hilton Park

Date	Median Fecal Coliform MPN/100 ml.
27-Jul-92	75
03-Aug-92	75
10-Aug-92	75
17-Aug-92	75
24-Aug-92	43
31-Aug-92	43
08-Sep-92	93
14-Sep-92	93
13-Jul-93	100
20-Jul-93	100
27-Jul-93	<110
03-Aug-93	<110
10-Aug-93	38
17-Aug-93	38
24-Aug-93	38
31-Aug-93	22
20-Jul-94	51
28-Jul-94	51
01-Aug-94	31
08-Aug-94	11
15-Aug-94	11
22-Aug-94	11
29-Aug-94	22

Table 9. Odd Fellows

Date	Median Fecal Coliform MPN/100 ml.
30-Jun-92	13
13-Oct-92	23
30-Jun-94	33

Table 10. Midway Beach

Date	Median Fecal Coliform MPN/100 ml.
27-Jul-92	93
03-Aug-92	93
17-Aug-92	93
24-Aug-92	43
31-Aug-92	23
08-Sep-92	23
14-Sep-92	23
13-Jul-93	110
20-Jul-93	<110
27-Jul-93	<110
03-Aug-93	92
10-Aug-93	92
17-Aug-93	22
24-Aug-93	22
31-Aug-93	22
05-Jul-94	51
12-Jul-94	36
19-Jul-94	36
20-Jul-94	29
26-Jul-94	29
01-Aug-94	29
08-Aug-94	29
15-Aug-94	29

Table 11. Johnsons Beach

Date	Median Fecal Coliform MPN/100 ml.		
	Upstream	Swim Area	Downstream
28-Oct-86	11	5	7
19-May-87	170	33	130
27-May-87	170	31	130
02-Jun-87	40	79	130
09-Jun-87	140	79	130
17-Jun-87	70	79	130
22-Jun-87	49	32	95
30-Jun-87	33	32	49
11-Aug-87	46	33	13
12-Aug-87	79	23	
19-Aug-87	11	33	11
26-Aug-87	23	15	4
01-Sep-87	46	57	14
08-Sep-87	110	70	49
23-Jun-88	17	13	72
30-Jun-88	17	13	72
12-Jun-89	140		95
07-Aug-89	43		43
18-Sep-89	150		43
30-Jun-92		49	
27-Jul-92		43	
03-Aug-92		43	
10-Aug-92		43	
17-Aug-92		75	
24-Aug-92		75	
31-Aug-92		43	
08-Sep-92		43	
14-Sep-92		43	
13-Oct-92		23	
10-Jun-93		49	
15-Jun-93		49	
17-Jun-93		49	
23-Jun-93		49	
28-Jun-93		49	
29-Jun-93		80	
13-Jul-93		<110	
20-Jul-93		<110	
27-Jul-93		<73	
03-Aug-93		51	
10-Aug-93		51	
17-Aug-93		51	
24-Aug-93		69	
31-Aug-93		51	
30-Jun-94		130	
05-Jul-94		92	
12-Jul-94		92	
19-Jul-94		69	
20-Jul-94		60	
26-Jul-94		51	
01-Aug-94		51	
08-Aug-94		44	
15-Aug-94		44	
22-Aug-94		22	
29-Aug-94		22	

Table 12. Monte Rio Beach

Date	Median Fecal Coliform MPN/100 ml.
27-Jul-92	75
03-Aug-92	75
10-Aug-92	75
17-Aug-92	43
24-Aug-92	75
31-Aug-92	43
08-Sep-92	75
14-Sep-92	75
13-Jul-93	110
20-Jul-93	110
27-Jul-93	110
03-Aug-93	<110
10-Aug-93	51
17-Aug-93	51
24-Aug-93	51
31-Aug-93	51
30-Jun-94	51
05-Jul-94	36
12-Jul-94	36
19-Jul-94	36
20-Jul-94	29
26-Jul-94	92
01-Aug-94	92
08-Aug-94	106
15-Aug-94	64

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Table 13. Casini Ranch

Date	Median Fecal Coliform MPN/100 ml.
27-Jul-92	460
03-Aug-92	210
10-Aug-92	460
17-Aug-92	210
24-Aug-92	210
31-Aug-92	150
08-Sep-92	9
14-Sep-92	9
13-Jul-93	110
20-Jul-93	110
27-Jul-93	110
03-Aug-93	<110
10-Aug-93	36
17-Aug-93	36
24-Aug-93	36
31-Aug-93	22
05-Jul-94	22
12-Jul-94	11
19-Jul-94	11
20-Jul-94	16
26-Jul-94	16
01-Aug-94	28
08-Aug-94	28
15-Aug-94	<28
22-Aug-94	29
29-Aug-94	<11

# INTERIM STAFF REPORT

regarding

## RUSSIAN RIVER WATER QUALITY MONITORING

by

North Coast Regional Water Quality Control Board  
5550 Skylane Boulevard  
Santa Rosa, California 95403

January 27, 1993

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Pages 13 & 14:

### **B. BACTERIOLOGICAL**

Prior to and including 1976, fecal coliform levels in the Russian River, from Alexander Valley to Duncans Mills, consistently exceeded the Basin Plan's water quality objective for body contact recreation (fecal coliform MPN/100 ml of 50 or less for a median of five samples taken within a 30-day period). From 1985 to 1991, the objective was met in the Russian River with few exceptions. However, the results of more intensive monitoring of popular swimming areas in the lower Russian River by the Sonoma County Health Department during the peak of the recreational season in 1992 revealed exceedances of the Basin Plan objective for bacteria. The data suggests that the higher bacterial levels were localized to the most popular swimming areas, and are the result of high public use. These results raise concerns from both a water quality and public health perspective. This area of concern needs to be monitored closely early on in the next recreational season.

Increased levels of fecal coliform bacteria in surface waters can and do result from malfunctioning individual wastewater disposal systems.

Malfunctioning individual wastewater disposal systems are abated through the Sonoma County and Mendocino County Health Departments. In addition, the discharge of wastewater from existing or new individual systems utilizing subsurface disposal have been prohibited in areas of Sonoma and Mendocino Counties which have known problems with on-site wastewater disposal. Waiver prohibition areas have also been established by the local health departments in areas where geographical conditions may threaten or result in health hazards or water quality impairment.

Interoffice Communication

DATE: August 26, 1986

TO: Ben Kor  
Bob Tancretto  
Luis Rivera

FROM: Ron Church

SUBJECT: North Coastal Basin (1B) Water Quality Control Plan (Basin Plan)  
Bacteriological Objectives and Bacterial Concentrations in the Russian River

The Regional Board's public report of July 15, 1986 (which see) on amending the Basin Plan clearly identified "water contact recreation" and "intense recreational use" as being among the highest possible uses of the Russian River. Also, the report reflected the theme that it is imperative to protect those high uses through maintaining or enhancing water quality.

The Basin Plan, as presently written, includes bacteriological objectives to protect water contact recreation. There is one encompassing, narrative objective based on the nondegradation (of water quality) principle and a second specific, numerical one. The objectives are quoted below:

(1) The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels.

(11) In no case shall coliform concentrations in waters of the North Coast Region exceed the following:

In waters designated for contact recreation (Rec I), the median fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed 50/100 ml, nor shall more than ten percent of total samples during any 30-day period exceed 400/100 ml.

California Department of Public Health, Bureau of Sanitary Engineers, 1973. Memorandum report on fecal coliform standards for freshwater recreation. April 1973. 10 pp + attached tables.

"The recommended level is an attainable level of assured safe water quality based on all available data. Where the recommended level is exceeded, investigation should commence into the causes." (Italics added.)

"The action level is a level of water quality which approaches that which may be undesirable for water contact recreation. It is the level above which public warning or restrictions should be applied." (Italics added.)

August 26, 1986

The numerical fecal coliform objective is relatively stringent and specific as far as water contact recreation indicator levels are concerned. It probably can be attained in the Russian River (main stem) through continued good water quality control and waste management.

Between 1973 and 1978, the Regional Board either independently conducted or cooperated with other agencies in water quality studies<sup>3</sup> to support its regulatory functions in the Russian River system. Based on those studies, it appears that the fecal coliform objective was generally met beginning in the spring of 1975 and continued during successive low-flow seasons through the summer of 1978. These observations have since been repeated at some sampling stations in 1985. Table 1 illustrates this rather wide-spread attainment of the 50 MPN/100 ml objective in the watershed; approximately 88 river-miles are involved, ranging from Lake Mendocino near Ukiah to Duncan Mills near the Pacific Ocean. Figure 1 shows the sampling station network and some general geographic features of the Russian River basin.

Fecal coliform conditions in Mark West Creek near Mirable Heights (Xs all the way across in Table 1) warrant special notice; the objective was not met there. The Mark West Creek site is very near the creek's confluence with the Russian River. Mark West Creek carries the entire flow of Laguna de Santa Rosa, which meanders through a peneplain with many potential sources of fecal coliforms from urban and rural runoff. (Laguna de Santa Rosa is also the immediate receiving water for a regional wastewater treatment plant when surface water discharges are permitted.) Mark West Creek and Laguna de Santa Rosa are protected by the bacterial objectives, at least the narrative one about not exceeding natural background levels. However, lower Mark West Creek and Laguna de Santa Rosa waters may never meet either coliform objective in the summertime<sup>5</sup> (or anytime) unless land use practices change significantly — and perhaps not even then. Nevertheless, the Russian River downstream of its confluence with Mark West Creek evidently can meet the fecal coliform objective (probably mainly by dilution). (See Figure 2)

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These standards were developed by the Bureau for the Statewide Conference of Directors of Environmental Health; they were recommended by the Bureau for trial application. The numerical fecal coliform "recommended" and "action" levels of 50/100 ml and 200/100 ml, respectively, are not presently officially adopted criteria of the Bureau of the Department of Health [Services]. Nevertheless, the standards are considered valid and applicable to the Russian River because they were formulated by experts using the best available information.

2 The concentrations are in terms of MPN/100 ml of water.

3 That work is reported in Sylvester, M.A., and R. L. Church. 1984. A water quality study of the Russian River basin during the low-flow seasons, 1973-78, Sonoma and Mendocino Counties, California. U.S. Geological Survey, Water-Resources Investigations Report 83-4174. VIII + 106 pp.

4 Low-flow seasons here mean May 15-September 30, which are in the Russian River area generally recognized as the main water contact recreation season.