CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
NORTH 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 agricultrual 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 intenstive 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	1.8%
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 gasteroenteritis 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

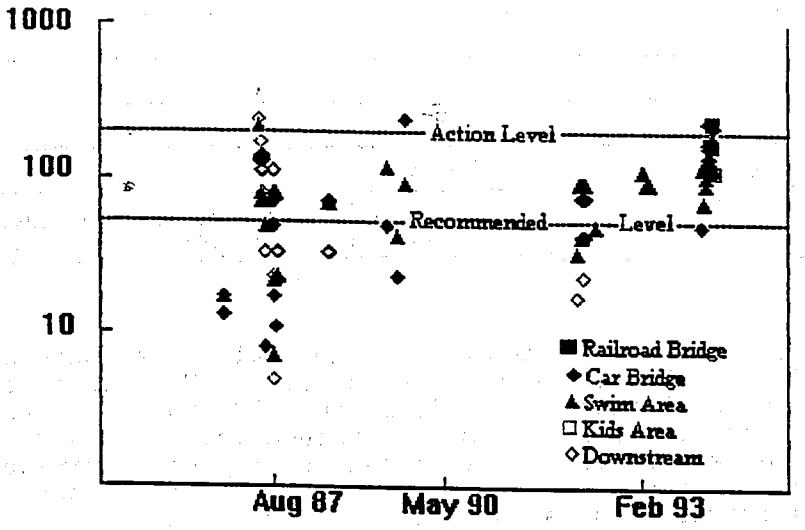

Figure 2. Median Fecal Coliform MPN/100 ml at Johnson's Beach

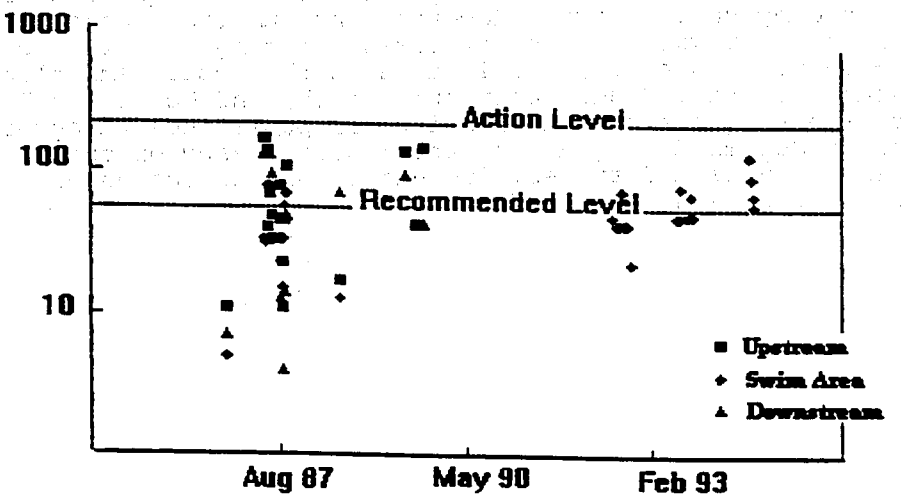

Figure 3. Median Fecal Coliform MPN/100 ml at Monte Rio Beach

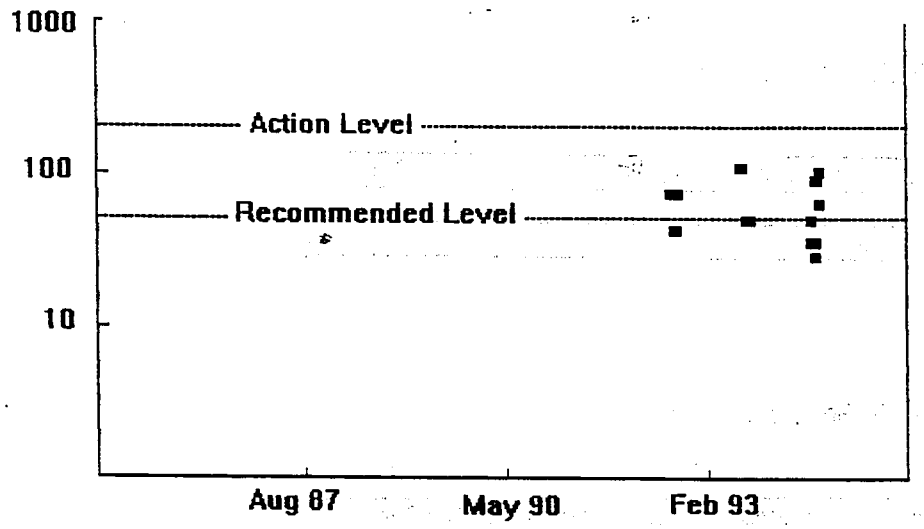

Table 1. Talmage

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

Table 2. Cloverdale (Guy)

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

Table 3. Geyserville (Guy)

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

Table 4. Del Rio Woods (Guy)

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 (Guy)

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

Table 6. Healdsburg Memorial Beach

Date	Median Fecal Coliform MPN/100 ml.				
	Upstream Railroad Bridge	Upstream Car Bridge	Swim Area	Kids' Area	Downstream
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-92			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	36
17-Aug-93	36
24-Aug-93	36
31-Aug-93	22
20-Jul-94	51
26-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

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