NORTH MARIN WATER DISTRICT
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CITY OF SANTA ROSA
P.O. Box 1678
Santa Rosa, CA 95402

OCT 07 1996

DEPARTMENT OF
COMMUNITY DEVELOPMENT

September 27, 1996

Marie Merideth
City of Santa Rosa
Community Development Department
P.O. Box 1678
Santa Rosa, CA 95402-1678

Subj: North Marin Water District Comments on Santa Rosa Subregional Long-Term Wastewater Project Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS), July 1996

Dear Ms. Merideth :

The North Marin Water District (North Marin) has reviewed the subject draft EIR/EIS and appreciates the opportunity to comment. In November and December of 1995, North Marin participated in the roundtable meetings reviewing preliminary results of the environmental analysis. At that time North Marin expressed concern regards Alternative 5A involving construction of a 54-inch diameter pipeline to discharge treated wastewater upstream from the Sonoma County Water Agency's (SCWA) collector facilities. North Marin documented its concerns in a December 6, 1995 letter to the City of Santa Rosa Mayor and Council members, cautioning that Alternative 5A may trigger a Department of Health Services requirement for full filtration of water diverted by SCWA. Capital costs for such a facility is estimated to be greater than $107 million and the annual operating cost is estimated to be greater than $9 million per year. North Marin would argue that, if Alternative 5A is chosen and constructed, Santa Rosa and its subregional wastewater partners should foot that bill when and if this additional water treatment facility is required. A copy of that letter is enclosed for your ready reference (Attachment 1). 001 002 003

Our concerns regards discharge Alternative 5A are now echoed by the SCWA in their comments of October 3, 1996 (Attachment 2) in regard to the subject draft EIR/EIS. 004

North Marin notes that Page 1-3 of the draft EIR/EIS includes the overall project objectives reviewed by the Santa Rosa city council on December 28, 1993 and reaffirmed by the Board of Public Utilities on May 27, 1994 which states in part: "Develop and operate the wastewater treatment and disposal system in ways that protect public health and safety and promote wise use of water resources." The supporting objectives intended to further define the overall project objectives and to provide guidance in development and evaluation of project alternatives include:

- "Reclaimed water that is not reused will be recycled or disposed of in a manner that protects beneficial uses of receiving waters;" and

- "Satisfy applicable regulatory agency and institutional guidelines and requirements." 004 (cont.)

North Marin is of the opinion that Alternative 5A is not consistent with the above stated overall project objectives or supporting project objectives when considering that all the SCWA collectors, supplying drinking water to over 400,000 people in Sonoma and Marin counties, are downstream of the Alternative 5A discharge point. The Agency in their comments (Attachment 2) has ably pointed out the risks associated with this alternative and the potential for required further treatment.

North Marin does not believe that the draft EIR has adequately addressed our previously stated concerns. Section 4.7 of the draft EIR/EIS, Pubic Health and Safety, refers to risk assessments prepared to evaluate discharge to the Russian River found in Appendix J-3. Appendix J-3, Page 3-12 states: 005

> "A recent analysis of the affects of the proposed discharge to the Russian River has reaffirmed that the natural filtration provided by the river bed will effectively remove coliform bacteria, *Giardia, Cryptosporidium* and viruses (CH2M Hill 1996). The analysis also concludes that implementation of a Russian River discharge upstream of the SCWA collectors would not necessitate additional treatment by the SCWA to comply with the requirements of the Surface Water Treatment Rule, although further analysis of collectors and additional sampling for *Giardia and Cryptosporidium* in the effluent and river may be required by the California Department of Health Services."

There is no substantiation for this statement and the referenced CH2M Hill analysis is not included in the EIR/EIS. Additionally, in Appendix J-3, Page 3-16 the same consultant states: 006

> "The analysis of microbiological data collected for this study leads to the conclusion that it is unlikely that the treated the effluent discharge from the treatment system poses a significant human health risk. However, considering the uncertainty in estimating minimum infectious doses for some pathogens, it is not possible to accurately assess the risk from direct ingestion of treated effluent let alone the risk through pathways other than ingestion."

Further, in Appendix J-3, Page 3-16, it is identified that:

> "The concentration of *Cryptosporidium* which causes disease is not known. However, epidemiological data on an outbreak of *Cryptosporidosis* in Carrollton, Georgia in 1987 provided an indication that the ingestion of a very small number of viable oocysts, possibly as low as one, may be sufficient to cause disease symptoms in healthy individuals."

Thus Appendix J-3 has identified that the most likely pathway for contact with micro-organisms is through direct ingestion of drinking water by the SCWA collectors. SCWA has pointed out that sampling at the Laguna Treatment Plant has detected giardia and cryptosporidium in plant effluent and Appendix J-3 has identified that as few as one cryptosporidium oocysts may be sufficient to cause disease symptoms in healthy individuals and identified that it is not possible to accurately assess the risk from direct ingestion of treated effluent. The statement that: "Implementation of a Russian River discharge upstream of the SCWA collectors would not 007 necessitate additional treatment to comply with requirements of the Surface Water Treatment Rule," is not understood. 007 (cont.) It is requested that DHS make a conclusive determination and proclamation on any necessary treatment prior to any consideration of this alternative. 008

As the City of Santa Rosa progresses in preparing the final EIR and selecting the preferred alternative, the District strongly suggests that Alternative 5A, discharge above the SCWA collectors not be considered further.

Thank you for the opportunity to comment.

Sincerely,

John Baker, President
Board of Directors

cc:
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NORTH MARIN WATER DISTRICT

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December 6, 1995

Honorable Mayor and Council Members
City of Santa Rosa
P.O. Box 1678
Santa Rosa, CA 95403

Subj: Santa Rosa's Plan Involving Construction of a 54-Inch Pipeline to Discharge Treated Wastewater Upstream of All of the Sonoma County Water Agency's (SCWA) Collector Facilities

Ladies and Gentlemen:

The Project Description Report, dated October 27, 1995, includes five wastewater alternatives Santa Rosa has selected for EIR study. Alternative 5 involves direct discharge to the Russian River with two sub-alternatives to be studied:

Alt. A - Discharge to the Russian River *above all* of the SCWA's intakes via a 54-inch pipe.

Alt. B - Continued discharge to the Russian River via the Laguna (which enters the Russian River just above two of the collectors and, because of local streamline hydraulics, remains virtually isolated from the two downstream collectors).

Why in the world does Santa Rosa want to study an alternative that exposes the bulk of the urban population of Sonoma and Marin counties to increased risk? The November 27, 1995 Press Democrat estimates the SCWA supply serves 400,000 people and Santa Rosa's mayor is quoted as stating: "It would be a strictly political move to put it (the wastewater discharge) upstream of our intake." This is political nonsense, which could lead to serious implications if water quality is affected.

The water diverted from the Russian River by SCWA is naturally filtered through the sands and gravels overlying the Ranney collectors and produces drinking water of exceptional quality and clarity. By locating such massive wastewater disposal facilities above the SCWA Ranney collectors, the high quality SCWA supply may be compromised exposing SCWA customers, including Santa Rosa customers, to increased health risks which may trigger a Department of Health Services requirement for full filtration of water diverted by the SCWA collectors. Capital costs for such a facility in today's dollars is estimated to be $107,335,950 and North Marin would argue that Santa Rosa and its subregional wastewater partners should foot that bill and cost of operation of such a facility (estimated to be $9,159,900 per year)!

Attachment 1

Please review the arguments that the SCWA and North Marin Water District offered in objection to a similar alternative (rapid infiltration) proposed by Santa Rosa in 1986 (see Attachment A and B respectively). In response, Santa Rosa wisely dropped consideration of that alternative. We urge you to have the good conscience and political wisdom to do so again.

Sincerely,

Chris DeGabriele
General Manager/Chief Engineer

Enclosures:

Attachment A - Comments of the Sonoma County Water Agency on the DEIR for the Long Range Wastewater Management Plan of the City of Santa Rosa, dated January 12, 1987

Attachment B - Comments of North Marin Water District on DEIR for the Long Range Wastewater Management Plan of the City of Santa Rosa, dated February 5, 1987

cc: w/o enclosures (attached list)

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COMMENTS OF THE SONOMA COUNTY WATER AGENCY

ON THE

DRAFT ENVIRONMENTAL IMPACT REPORT

FOR THE

LONG-RANGE WASTEWATER MANAGEMENT PLAN

OF THE

CITY OF SANTA ROSA

JANUARY 12, 1987

Attachment A

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TABLES

COMMENTS OF THE SONOMA COUNTY WATER AGENCY
ON THE
DRAFT ENVIRONMENTAL IMPACT REPORT
FOR THE
LONG-RANGE WASTEWATER MANAGEMENT PLAN
OF THE
CITY OF SANTA ROSA

INTRODUCTION

The City of Santa Rosa has issued a Notice of Completion of the Draft Environmental Impact Report (DEIR) on the Santa Rosa Subregional Long-Term Wastewater Management Plan. The review period is specified as December 10, 1986 through January 23, 1987. The DEIR and the accompanying Phase 2 Report, Evaluation of Alternatives (1), analyses four alternative treatment and disposal methods for the Santa Rosa Subregional Wastewater System. Alternative 2, indirect disposal to the Russian River, would have a significant impact on the water supply of the Sonoma County Water Agency. These comments are directed at that alternative.

The Sonoma County Water Agency is a special district created by state legislation (Chapter 994, Statutes of 1949, as amended). The Agency's corporate boundaries coincide with those of Sonoma County and the Board of Supervisors of the County is the Board of Directors of the Agency. The Agency contracts with the federal government for the water supply storage space in Lake Mendocino and Lake Sonoma and regulates the flow of the Russian River for municipal, industrial, and agricultural water supply and for instream beneficial uses. Beneficiaries of the flow regulation for water supply include municipal and industrial users in Mendocino, Sonoma and Marin Counties and agricultural users in Mendocino and Sonoma Counties.

In addition to regulating the flow of the Russian River, the Agency operates a municipal water supply system serving approximately 400,000 persons in Sonoma and Marin Counties. The Agency's water supply system presently consists of five Ranney collectors located near Forestville along the Russian River, diversion works, infiltration ponds, chlorination facilities, pumping plants, transmission pipelines, steel reservoirs, control telemetry, and buildings. The water delivered by the Agency is untreated except for disinfection by chlorination. The Agency has 78.8 million gallons of storage and a pumping capacity of 92 million gallons per day. The book value of the Agency's water conservation and delivery assets after accumulated depreciation and amortization as of June 30, 1986 was $133,670,147. The Agency is contractually obligated to construct an additional 20 million gallons per day of pumping capacity and 42.4 million gallons of storage during the next decade.

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SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

An analysis of the concentration of wastewater that would be
present in the Russian River below the City of Santa Rosa's
discharge in 2010 under Alternative 2 has been made by the Agency
using one decade of historical hydrologic records. The 1
concentration ranges from 34.8 percent to zero. It was found to
exceed 20 percent for 7 out of 120 months and the mean
concentration during April, May, June, October, and November was
found to exceed 10 percent.

In comparison with the surface water sources of other California
metropolitan areas these concentrations would be exceedingly high.
Most of the surface water supplied to major metropolitan areas of 2
California is essentially free from wastewater. Several are
pristine. Even the Colorado River water served to most of Southern
California is relatively free from wastewater.

Many issues vital to the direct or indirect reuse of wastewater as
a potable water supply source and concomitant protection of public 3
health remain unresolved. Control of trace organics and viruses,
and the reliability of reclamation systems, are of particular
concern.

The Environmental Protection Agency (EPA) has greatly increased its
drinking water standards setting activities with regard to the
revision of present standards as well as the establishment of
standards for presently unregulated contaminants. A large part of 4
the impetus for this increased activity is pressure from Congress
in response to increasing public concerns about the safety of
drinking water. The 1986 Amendments to the Safe Drinking Water Act
bring additional pressure to bear on the EPA to produce further
drinking water standards in a timely fashion.

The 1986 Amendments to the Safe Drinking Water Act require that EPA
must promulgate regulations specifying criteria under which
filtration, coagulation and sedimentation is required for surface
water sources. In addition, the 1986 Amendments significantly
strengthen the enforcement action that the EPA may bring to bear to
secure conformance with regulations.

The people of this nation are concerned about the quality of their
drinking water. This concern has resulted in an avalanche of
legislative and regulatory activity. The results are just
beginning to be expressed as revised or new drinking water
standards. In the future, drinking water standards will exist for
many additional contaminants and existing standards will be
substantially more stringent.

The Sonoma County Water Agency and the other community water 5
systems must serve water that complies with all applicable
standards. The Agency has no current means to provide treatment
except disinfection by chlorination. If the high concentrations of

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wastewater in the Russian River that would be present due to the discharge under Alternative 2 resulted in contaminants exceeding present or future standards, the Agency would have to construct treatment facilities. It is not unreasonable to expect that this would occur, given the breadth of the regulatory effort already in progress and the difficulty of controlling the input of industrial waste discharges of organics and heavy metals to community sewerage systems. Even in the absence of a contaminant in excess of a present or future standard, Alternative 2 could result in the Agency being required to construct treatment facilities. It is a distinct possibility that the mere presence of wastewater in the Russian River in the concentrations anticipated would result in the Agency falling under the new surface water treatment rule.

The treatment facilities that the Agency would be required to construct are unknown, but under the 1986 Amendments they could include chemical coagulation, sedimentation, filtration and granular activated carbon adsorption (GAC). The costs of such facilities haven't been determined, but certainly would be several tens of millions of dollars.

The Agency, with its large and growing rate base and the economies that result from size, could finance the construction of such facilities. The smaller community water systems probably could not. If the high concentrations of wastewater in the Russian River 6
that would be present due to the discharge under Alternative 2 resulted in a contaminant exceeding a present or future standard in any community water system, the City could expect that its waste discharge standards would ultimately be modified to either require further treatment or prohibit the discharge. This could occur before or after the Agency had been compelled to construct treatment facilities.

Any of the eventualities cited above would make Alternative 2 uneconomic. But even if it wasn't uneconomic, it is not a prudent alternative. There is no factor unique to this area that would justify exposing the more than 400,000 people dependent on the Russian River for drinking water to the concentrations of wastewater which would result from Alternative 2. The Russian 7
River area is blessed with an ample high quality water supply. The existence of the Coyote Valley and Warm Springs Dam Projects insure an adequate supply for all projected municipal, industrial, and agricultural needs well into the next century. In addition, the area has substantial untapped ground water supplies. There is no need for the reuse wastewater as a source of potable water in this area which would justify the inherent risks associated with such use.

For these reasons it is recommended that Alternative 2 be excluded from further consideration as long-term treatment and disposal alternative for the Santa Rosa Subregional Wastewater System.

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WASTEWATER CONCENTRATION IN THE RUSSIAN RIVER

In order to evaluate the effects of Santa Rosa's proposed disposal of wastewater to the Russian River under Alternative 2 it is necessary to estimate the concentration of wastewater below the point of discharge which would result from the discharge. In Chapter 6 of the DEIR the dilution effect of the river is discussed. Table 6-7 lists seasonal variation in dilution with Russian River water based on historical flows during the period 1959-1983 and 1976-1977 and an assumed 25 million gallon per day constant wastewater discharge rate. Unfortunately this data is useless as a predictive tool since the flow regimen of the Russian River has been significantly changed as the result of the construction of Warm Springs Dam and the adoption of Decision 1610 by the State Water Resources Control Board on April 17, 1986. Also, the assumed 25 million gallon per day discharge rate is not consistent with the monthly rates of discharge set forth in Table 4-10 of the Phase 2 Report, Evaluation of Alternatives.

To estimate the concentration of wastewater that could be expected below the point of discharge the monthly rates of discharge were assumed to be those set forth in Table 4-10 of the Phase 2 Report, Evaluation of Alternatives. The model from which the assumed Russian River flows were derived is one of a series of model studies made by the California Department of Water Resources for the State Water Resources Control Board (2). The model study used is believed to be a reasonable representation of the flow conditions that can be expected in 2010 and is the same study upon which Decision 1610 is based.

The period selected for analysis was January, 1923 through December, 1932. It is a period having somewhat less rainfall than normal and it includes one critically dry year and two dry years as defined in Decision 1610. Since the introduction of additional inflow above the Agency's intakes modifies the required releases from Lake Sonoma, it was necessary to recalculate the flows at various points in the Russian River. Also, the published model study assumed that the flow rates at all control points were 15 cubic feet per second higher than the required minimums. While this is a conservative assumption for a water supply model, it is neither conservative or realistic for a model used to estimate minimum dilution values in the year 2010. Accordingly the Agency's estimates are based on the minimum flow rates required under Decision 1610. The Russian River streamflow requirements under Decision 1610 are summarized in Appendix A. A spread sheet was used to adjust the model values and calculate the wastewater concentration. The results are included as Appendix B.

The concentration of Santa Rosa wastewater below the point of discharge is listed in rank order by month in Table 1.

TABLE 1 - PERCENT CONCENTRATION OF WASTEWATER BY MONTH

Rank	1	2	3	4	5	6	7	8	9	10
Jan	11.7	8.1	4.8	4.6	3.0	2.3	2.2	1.9	1.5	1.1
Feb	9.8	3.8	2.9	2.9	2.8	1.8	1.5	0.7	0.5	0.4
Mar	18.7	6.5	6.1	5.5	5.4	4.2	2.9	1.8	1.7	0.9
Apr	34.8	25.0	17.3	8.6	6.3	3.3	2.8	2.1	1.5	1.4
May	28.4	23.0	20.1	12.6	12.5	12.2	11.0	10.3	7.3	4.3
Jun	17.9	14.2	13.4	13.4	13.2	13.0	13.0	13.0	9.5	3.0
Jul	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Aug	3.8	2.7	2.7	2.3	2.3	2.3	2.3	2.3	2.2	2.2
Sep	13.5	9.6	9.6	8.2	8.2	8.2	8.2	8.1	8.1	8.0
Oct	27.3	17.5	17.1	12.4	12.4	12.4	11.6	11.4	11.3	11.2
Nov	21.5	17.2	16.7	12.9	11.7	11.3	10.7	8.6	4.5	2.3
Dec	14.1	13.3	11.0	10.1	5.3	3.5	3.3	1.9	1.4	1.4

The concentration of wastewater varies from a high of 34.8 percent to zero. The mean concentration is 7.8 percent. It exceeds 20 percent for 7 out of 120 months. The highest concentration month is October with a mean concentration of 14.5 percent, followed by May with 14.2 percent, June with 12.4 percent, November with 11.7 percent and April with 10.3 percent.

WASTEWATER CONCENTRATION IN OTHER SURFACE WATERS

In order to understand the significance of the concentration of wastewater in the Russian River that would result from Alternative 2 it is helpful to have a standard for comparison. In a study prepared by the State Water Resources Control Board, the Department of Water Resources, and the Department of Health Services (3), it was reported that the surface waters of California contain, on the average 0.5 percent wastewater. The lower American River was reported to average 0.9 percent wastewater with maximum of 2.4 percent. The Sacramento River at Hood was reported to average 0.4 percent wastewater with a maximum of 0.7 percent. And these maximum values occur only during the lowest flows for short periods. While these concentrations may have increased since the study was published, the current values are certainly very low compared with those which would occur in the Russian River as the result of Alternative 2.

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The study concluded that most of the surface water supplied to major metropolitan areas in California is essentially free from wastewater. Some can be considered pristine, such as East Bay municipal Utility District's Mokelumne River Project, San Francisco's Tuolumne River Project, and Los Angeles' Owens Valley Project. In addition, the study found that the Colorado River water served to most of Southern California is relatively free from wastewater.

In a study published by the Environmental Protection Agency in 1980, the concentration of wastewater occuring in surface water supplies of U. S. cities having populations over 25,000 was determined (4). The study identified 1246 municipal water systems serving such cities. The concentrations were found to range from zero in the case of 142 systems to a number where wastewater constituted a major portion of the water supply. The higher concentration rivers were generally found to be the smaller streams, however, 20 cities with a total population over seven million were found to have surface water supplies containing from 3.5 to 16 percent wastewater during normal flow periods and from 8 percent to nearly total wastewater during low flow periods.

WASTEWATER REUSE AS A POTABLE WATER SUPPLY

The increasing water demand has resulted in wastewater reclamation and reuse being considered as an increasingly important part of a comprehensive water resources management plan. In response, numerous positions, policies, and guidelines on wastewater reuse have been developed. Of particular interest are those that bear on reuse as a potable water supply. The American Water Works Association adopted the following statement on the use of reclaimed wastewater as a public water supply source on January 26, 1986:

"The American Water Works Association opposes the direct use of reclaimed wastewater as a potable water supply source until research can develop adequate cost effective treatment technology and monitoring techniques to assure a production of a safe potable water from wastewater. The Association does support the use of reclaimed wastewater for non-potable uses. The American Water Works Association supports and urges continued research into the science and technology of treating raw water containing wastewater, and also plant effluent for direct reuse as a water supply source.

Wastewater is an important component of North America's total available water supply. With increasing amounts of treated wastewater being discharged to the waters of the world, wastewater effluent constitutes an increasing proportion of many public water supplies. To protect this water supply source it is imperative that pollutant discharges be controlled and that additional health effects research be conducted.

The use of wastewater for non-potable purposes can reduce the demands placed upon limited supplies for potable water. Therefore such use should be encouraged. Also the water industry and government should support research into the treatment, use, distribution and management of wastewater for non potable purposes.

The long term health effects of direct reuse of treated wastewater for potable use are not fully understood at this time. In addition fail-safe cost effective treatment technology for the removal of all possible contaminants is not currently available."

The concerns regarding the reuse of wastewater as a potable water supply were summarized in a 1982 article published in the Annual Review Public Health (5). In this article it was observed that challenging issues vital to successful direct or indirect reuse of wastewater as a potable water supply source and concomitant protection of public health remain unresolved. Control of trace organics and viruses, and the reliability of reclamation systems, were cited to be of particular importance.

The ability to remove specific trace organics compounds through full-scale advanced wastewater treatment (AWT) processes including chemical clarification, filtration, air stripping, granular activated carbon adsorption, and reverse osmosis has been demonstrated. Nevertheless, the majority of organic compounds in AWT effluents are unidentified and of generally unknown significance.

Control of viruses in reclaimed wastewater are also of substantial concern even though such products may meet current microbiological standards for potable water. These concerns arise from the high virus concentrations which are found in reclaimed water which are far higher than in even heavily polluted natural waters, and the difficulty in inactivating viruses which tend to clump together and form resistant aggregates.

Finally, the reliability of reclamation system performance is of concern. The poor operating results of many U. S. wastewater treatment plants is well documented. While plants designed as water production facilities with the ability to reject poor quality influent, to retreat or dispose of poor quality effluent, and to operate at a constant optimal flow rate can produce a consistently high quality product, such ideal conditions do not exist in most instances.

REGULATION OF DRINKING WATER QUALITY

In Chapter 7 of the DEIR it is acknowledged that a number of communities depend upon the Russian River for a water supply and that these communities water systems must meet drinking water standards. In Table 7-1 certain of the current standards are tabulated in comparison with the results of analysis of a single

24-hour composite sample of wastewater effluent. However, no reference is made to the fact that future drinking water standards will be much more stringent than those currently applicable. Also, no information is presented demonstrating that the proposed wastewater discharges will not impair the ability of the community water systems to meet future drinking water standards. The following sections, taken from a summary prepared by Camp Dresser & McKee Inc. (6), outlines the expected changes in drinking water standards.

Prior to 1970, protection of drinking water was the responsibility of the Public Health Services (PHS) which established standards for the quality of water used in interstate commerce. In 1970, this responsibility was inherited by the Environmental Protection Agency (EPA). A 1970 study indicated that a significant number of water supplies did not meet the PHS standards. As a result of these findings, the EPA and Congress began developing Federal legislation directed towards providing the EPA authority over all water supplies.

The Safe Drinking Water Act (SDWA) of 1974 required the EPA to set interim primary drinking water regulations (essentially requiring all water supplies to meet the 1962 PHS standards). Further requirements of the Act included the establishment of recommended maximum contaminant levels (RMCLs) for each contaminant which may have an adverse effect on public health. Each RMCL was required to be set at a level at which no known or anticipated adverse effects on health occur allowing an adequate margin of safety. The SDWA also required that revised National Primary Drinking Water Regulations (NPDWR), establishing a maximum contaminant level (MCL) or treatment technique, and secondary drinking water regulations be established by September 1976 and December 1977, respectively.

In spite of this legislative mandate, a number of contaminants have yet to be regulated. Furthermore, only a few revisions of existing regulations have been made, although the SDWA requires a review of the regulations at least every three years. Despite the complexity of setting MCLs for actual or suspected carcinogens, Congress has been placing greater pressure on EPA to regulate more completely.

The result of this is twofold. First, the EPA has increased its standard setting activities. Second, new amendments to the SDWA were signed into law by the president late last year.

REVISIONS TO DRINKING WATER REGULATIONS

In the March 4, 1982, Federal Register, the EPA announced an advance notice of proposed rulemaking (ANPRM) regarding revised National Primary Drinking Water Regulations (NPDWR) directed to regulation of volatile organic compounds (VOCs). In the announcement, the EPA stated its consideration of proposals for regulation of the VOCs listed in Table 2.

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TABLE 2 - VOLATILE ORGANIC COMPOUNDS

Trichloroethylene	Vinyl Chloride	Trichlorobenzene(s)
Tetracloroethylene	Methylene Chloride	1, 1-Dichloro-ethylene
Carbon Tetrachloride	Benzene	cis - 1, 2-Dichloro-ethylene
1, 1, 1-Trichloroethane	Chlorobenzene	trans - 1, 2-Dich-loroethylene
1, 2-Dichloroethane	Dichlorobenzene(s)	

Again in the October 5, 1983, Federal Register, the EPA announced another ANPRM. This announcement was directed toward revisions to Interim Primary Drinking Water Regulations (IPDWR) for all IPDWR contaminants previously regulated as well as toward the consideration of proposals for new regulations of certain synthetic organic chemicals (SOCs), inorganic chemicals (IOCs), microbiological contaminants and radionuclide contaminants. The contaminants noted in the ANPRM are listed in Tables 3-6.

TABLE 3 - SYNTHETIC ORGANIC COMPOUNDS

Endrin*	Carbofuran	Pentachlorophenol
Lindane*	1, 1, 2-Trichlorethane	Picloram
Methoxychlor*	Vydate	Dinoseb
Toxophene*	Simazine	Alachlor
2, 4, - D*	PAHs (Polynuclear Aromatic Hydrocarbons)	EDB (Ethylene Dibromide)
2, 4, 5-TP (Silvex)*		Epichlorohydrin
Total Trihalomethanes*	PCBs (Polychlorinated Biphenyls)	Dibromomethane
Aldicarb		Toluene
Chlordane	Atrazine	Xylene
Dalapon	Phthalates	Adipates
Diquat	Acrylamide	Hexachlorocyclo-pentadine
Endothall	DBCP (Dibromochloro-propane)	2, 3, 7, 8-TCDD (Dioxin)
Glyphosate	1, 2-Dichloropropane	*already regulated

TABLE 4 - INORGANIC CHEMICALS

Arsenic*	Silver*	Vanadium
Barium*	Fluoride*	Sodium
Cadmium*	Aluminum	Nickel
Chromium*	Antimony	Zinc
Lead*	Molybdenum	Thallium
Mercury*	Asbestos	Beryllium
Nitrate (as N)*	Sulfate	Cyanide
Selenium*	Copper	*already regulated

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TABLE 5 - MICROBIOLOGICAL CONTAMINANTS

Turbidity*	Viruses	Filtration of surface water
Total Coliforms*	Standard Plate Count	Disinfection of All Water
Giardia Lamblia		*already regulated

TABLE 6 - RADIONUCLIDE CONTAMINANTS

Radium 226 and 228*	Beta particle and Photon Radioactivity*	Uranium
Gross Alpha Particle Activity*		Radon
		*already regulated

In the October 5, 1983, issue of the Federal Register, the EPA outlined its approach to revising the National Primary Drinking Water Regulations. The EPA intends to develop these revised regulations in four phases as follows:

1. Establish volatile synthetic organic chemical (VOCs) regulations.

2. Establish revised regulations for other synthetic organic chemicals (SOCs), inorganic chemicals (IOCs), and microbiological contaminants.

3. Establish revised regulations for radionuclides.

4. Establish revised regulations for disinfectant by-products including trihalomethanes (THMs).

In the same issue of the Federal Register, it was stated that the revisions to the NPDWR will take two forms. First, RMCLs will be established, and second, MCLs will be set. In some cases, these may be established simultaneously. The MCLs are enforceable standards required to be set as near as "feasible" to the RMCLs (treatment goals), taking cost into consideration. The RMCLs are required to be set at levels that would result in no known or anticipated adverse health effects with an adequate margin of safety.

Volatile Organic Compounds

RMCLs and proposed MCLs were established and reported in the Federal Register on November 13, 1985, for eight volatile organic compounds. These are summarized in Table 7.

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TABLE 7 - VOLATILE ORGANIC COMPOUNDS - PROPOSED RMCLs

VOC	RMCL (mcgm/L)	Proposed MCL (mcgm/L)
Benzene	0	5
Vinyl Chloride	0	1
Carbon Tetrachloride	0	5
1,2-Dichloroethane	0	5
Trichloroethylene	0	5
1,1-Dichloroethylene	7	7
1,1,1-Trichloroethane	200	200
p-Dichlorobenzene	750	750

The VOCs for which the RMCLs are set at zero are considered to be probable human carcinogens. The RMCLs for the VOCs were effective December 13, 1985. Tetracholoroethylene was initially proposed to be regulated with a zero RMCL. Although additional comment has been requested regarding the carcinogenicity of this substance, it is anticipated that the RMCL will ultimately be established at zero and the MCL will be in the order of 1-5 mcgm/l.

Unregulated VOCs Monitoring

In addition to the regulations noted above, the November 13, 1985, Federal Register also contained a proposed requirement to monitor the additional VOCs in drinking water listed in Table 8.

TABLE 8 - ORGANICS TO BE MONITORED

Chloroform*	p-Xylene	bis-2-Chloroiso-propyl ether
Bromodichloromethane*	o-Xylene	2,2-Dichloropropane
Chlorodibromomethane*	m-Xylene	1,2,4-Trimethyl-benzene
Bromoform*	1,1-Dichloroethane	n-Butylbenzene
trans-1,2-Dichloro-ethylene	1,1,2,2-Tetrachloro-ethane	Napthalene
Chlorobenzene	Ethylbenzene	Hexachloro-butadiene
m-Dichlorobenzene	1,3-Dichloropropane	o-Chlorotoluene
Dichloromethane	Styrene	p-Chlorotoluene
cis-1,2-Dichloro-ethylene	Chloromethane	1,3,5-Trimethyl-benzene
o-Dichlorobenzene	Bromomethane	p-Isopropyltoluene
1,2,4-Trichlorobenzene	Bromochloromethane	1,1-Dichloropropene
Fluorotrichloromethane	1,2,3-Trichloropropane	iso-Propylbenzene
Dichlorodifluoromethane	1,2,3-Trichlorobenzene	tert-Butylbenzene
Dibromomethane	n-Propylbenzene	sec-Butylbenzene
1,2-Dibromoethane (EDB)	1,1,1,2-Tetrachloro-ethane	Bromobenzene
1,2-Dibromo-3-chloro-propane (DBCP)	Chloroethane	
	1,1,2-Trichloroethane	
Toluene	Pentachloroethane	

*already regulated

Synthetic Organic Chemicals Regulations

The interim primary drinking water regulations contain MCLs for seven synthetic organic chemicals (SOCs) noted in Table 3.

The November 1, 1985, Federal Register contains proposed revisions for SOCs including proposed RMCLs for additional SOCs. These are shown in Table 9.

TABLE 9 - SYNTHETIC ORGANIC CONTAMINANTS - PROPOSED RMCLs

SOC	Proposed RMCL (mg/L)
Acrylamide	0
Alachlor	0
Aldicarb, aldicarb sulfoxide and aldicarb sulfone	0.009
Carbofuran	0.036
Chlordane	0
cis-1,2-Dichloroethylene	0.07
DBCP	0
1,2-Dichloropropane	0.006
o-Dichlorobenzene	0.62
2,4-D	0.07
EDB	0
Epichlorohydrin	0
Ethylbenzene	0.68
Heptachlor	0
Heptachlor epoxide	0
Lindane	0.0002
Methoxychlor	0.34
Monochlorobenzene	0.06
Pentachlorophenol	0.22
Styrene	0.14
Toluene	2.0
2,4,5-TP	0.052
Toxaphene	0
trans-1,2-Dichloroethylene	0.07
Xylene	0.44

These RMCLs will likely be promulgated at these same values or close to these values. When promulgated, the MCLs are required to be promulgated as close as is feasible to the RMCLs.

Other SOCs have also been considered for regulation. Potential health effects for these have not yet been established and these will be considered in later phases of the revisions of regulations. These SOCs include: adipates, dalapon, dinoseb, dibromomethane, diquat, endothall glyphosate, hexachlorocycolpentadiene, PAHs, phthalates, picloram, 1,1,2-trichorethante, and vydate.

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Microbiological Parameters Regulations

The Interim Primary Drinking Water Regulations for microbiological parameters are based primarily on the total coliform count. In essence, the regulation calls for a limit of less than 1 coliform per 100 ml as a monthly average of all treated water samples. Related to this is a monthly average of turbidity of less than 1 NTU.

The new microbioligical parameters proposed in the November 13, 1985, Federal Register call for RMCLs for several parameters related to microbiological quality. These are listed in Table 10

TABLE 10 - MICROBIOLOGICAL PARAMETERS - PROPOSED RMCLs

Parameter	Proposed RMCL
Total coliforms	0
Turbidity	0.1 NTU
Giardia	0
Viruses	0

Inorganic Chemicals Regulations

The existing interim primary drinking water regulations contain MCLs for ten inorganic chemicals (IOCs) noted in Table 3. The new proposed RMCLs for IOCs are listed in Table 11.

TABLE 11 - INORGANIC CONTAMINANTS - PROPOSED RMCLs

IOC	Proposed RMCL (mg/L)
Arsenic	0.05
Asbestos (medium and long fibers)	7.1 million fibers/liter
Barium	1.5
Cadmium	0.005
Chromium	0.12
Copper	1.3
Lead	0.020
Mercury	0.003
Nitrate	10.0
Nitrite	1.0
Selenium	0.045

RMCLs have not yet been proposed for: aluminum, cyanide, molybdenum, nickel, silver, sulfate, sodium, antimony, beryllium, thallium, vanadium, and zinc. This is due to limited health effects data and/or limited occurrence in drinking water. Five of these IOCs (antimony, beryllium, thallium, vanadium, and aluminum) will be addressed in the future. Zinc is inappropriate for regulation on the basis of low toxicity even at elevated concentrations in water (up to 40 mg/L) and because it is not carcinogenic, mutagenic, or teratogenic.

Additional Drinking Water Regulations

Under the EPA's phased approach to revised regulations, MCLs and RMCLs will be proposed and then promulgated for those parameters addressed in the ANPRMs. One should next expect the promulgation of MCLs for VOCs for which RMCLs have already been promulgated.

Coincident with or following the establishment of RMCLs and MCLs for organic substances (VOCs and SOCs), IOCS and microbiological contaminants, the EPA will next concentrate on revisions to radionuclide regulations. This will be followed by revisions to the trihalomethane (THM) regulations.

The latter subject will likely create significant discussion. The current THM standard of 100 mcgm/L is based on a health risk which recognizes an excess lifetime (70 years) cancer risk of 1 in 10,000 to 1 in 100,000 on exposure to the 100 mcgm/L level. The new proposed regulations assume that any amount of carcinogen in water is unacceptable. It is from this philosophy that values of 0 have been established in RMCLs for certain VOCs. On this same basis, one might reasonably expect that the new RMCLs for each THM (or at least chloroform) will be set at 0. One can further argue that the MCLs for THMs which are required to be as close as feasible to the RMCLs might be in the order of 5 mcgm/L. In fact, current discussion does not preclude this possibility.

1986 SAFE DRINKING WATER ACT AMENDMENTS

The major aspects of the 1986 Amendments to the Safe Drinking Water Act include:

- Compulsory revisions to the Drinking Water Regulations in a timely fashion for new contaminants.
- Definition of a treatment technique for each contaminant regulated.
- Requirement of a treatment technique where it is infeasible to ascertain the level for those regulated contaminants in water.
- Filtration requirement for surface water supplies with certain exceptions.
- Disinfection of all water supplies.
- Prohibition of use of lead products in all conveyances for drinking water.
- Requirement for protection of ground water sources by states through well head protection regulations.

Maximum Contaminant Level Goals

The 1986 amendments to the SDWA have redefined Recommended Maximum Contaminant Levels so that they are now known as Maximum Contaminant Level Goals (MCGLs). In the future MCLs and MCLGs must be proposed simultaneously and promulgated simultaneously.

Contaminants To Be Regulated

The SDWA amendments recognize 83 contaminants for which regulations must be developed. Of these, 14 are VOCs addressed in the ANPR of March 4, 1982 (see Table 2). The remainder were addressed in the ANPR of October 5, 1983. Of the remainder, 29 are new SOCs (see Table 3), 13 are new IOCs (see Table 4), 4 are new microbiological contaminants (see Table 5), and 2 are new radiological contaminants (see Table 6). Those 21 contaminants contained in the Interim Primary Drinking Water Regulations are included in the total number of contaminants addressed by the amendments and were also addressed in the ANPRMs noted above. The 1986 Amendments have upgraded the previous IPDWR to National Primary Drinking Water Regulations.

In regard to the 83 listed contaminants, the Amendments require the Administrator of the EPA to publish MCLGs and promulgate NPDWR (including MCLs as appropriate) for not less than nine of the listed contaminants (as contained in the two ANPRs) within one year of enactment of the Amendments. The intent of the congress and the interpretation of the EPA is that these nine contaminants will include the VOCs Benzene, Vinyl Chloride, Carbon Tetrachloride, 1,2-Dichloroethane, Trichloroethylene, 1,1-Dichloroethylene, 1,1,1-Trichloroethane, p-Dichlorobenzene and Tetrachlorcethylene.

Another 40 more of the listed contaminants must be similarly regulated within two years of enactment. Of these 40 contaminants undoubtedly some of the 21 contaminants previously listed in the IPDWR will be included with revisions.

The remainder of the listed contaminants must be regulated as those above within three years of enactment of the Amendments. Up to seven different contaminants other than those listed may be substituted if the Administrator finds these may take precedence a public health concerns.

Each MCLG must be set by the EPA at a level at which no known or anticipated health effects occur allowing an adequate margin of safety. Each MCl promulgated simultaneously with the publishing of the MCLG must be set as close as feasible to the MCLG.

Treatment Techniques

In this regard, feasible means with the use of best technology, treatment techniques, and other means available taking cost into consideration. In setting the MCLs for synthetic organic chemicals the use of granular activated carbon for SOCs control is considered

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feasible according to the 1986 Amendments. Any other technology, treatment technique, or other means found to be the best available for the control of SOCs must be as effective as GAC for this purpose.

In addition to the determination that the use of GAC for SOCs control is considered a feasible treatment technique, the Amendments require that for each NPDWR that establishes an MCL, the Administrator of the EPA must list the technology, treatment technique, and other means that he determines are feasible for meeting the MCL. This does not mean that these means must be used for meeting the MCL.

In the event that it is not economically or technologically feasible to ascertain the level of a regulated contaminant, the Administrator is authorized to require the use of a treatment in lieu of an MCL. The Administrator must identify the treatment techniques that would prevent known or anticipated health effects. A variance may be granted from the use of the identified treatment techniques if it can be shown that an alternative technique is at least as efficient. In the event a variance is granted, the treatment technique must be implemented.

Filtration of Surface Water Supplies

The 1986 Amendments require that, within 18 months of enactment, the EPA must promulgate regulations specifying criteria under which filtration (including coagulation and sedimentation as appropriate) is required for surface water sources. The EPA must consider the quality of the source water, protection afforded by watershed management, treatment practices (such as disinfection and length of water storage), and other factors relevant to health. Specific procedures are required to be formulated by the EPA by which States determine which water systems shall adopt filtration. The State may require the water system to provide studies or other information to assist in this determination.

Enforcement

The 1986 Amendments have significantly strengthened the enforcement action that the EPA may use for water supplies in nonconformance with regulations. The EPA is allowed to enter into enforcement action sooner and the maximum civil penalties that may be applied have been increased from $5,000 to $25,000 per day regardless of the fact that failure to comply was willful or not.

REFERENCES

(1) Santa Rosa Subregional Wastewater System, Long-Term Study of Treatment and Disposal Alternatives, Phase 2 Report, Evaluation of Alternatives, CH2M-Hill, December, 1986

(2) Tab 15 of Attachment 3 to Staff Analysis for Application 19351 (Unapproved Portion) and Petitions on Permitted Applications 12919A, 15736, 15737, and 19351 of the Sonoma County Water Agency, Volume II, Background and Technical Data, State Water Resources Control Board, February, 1986

(3) A "State-of-the-Art" Review of Health Aspects of Wastewater Reclamation for Groundwater Recharge, State Water Resources Control Board, Department of Water Resources, Department of Health, November, 1975

(4) Wastewater in Receiving Water at the Water Supply Abstraction Points, Environmental Protection Agency, 1980

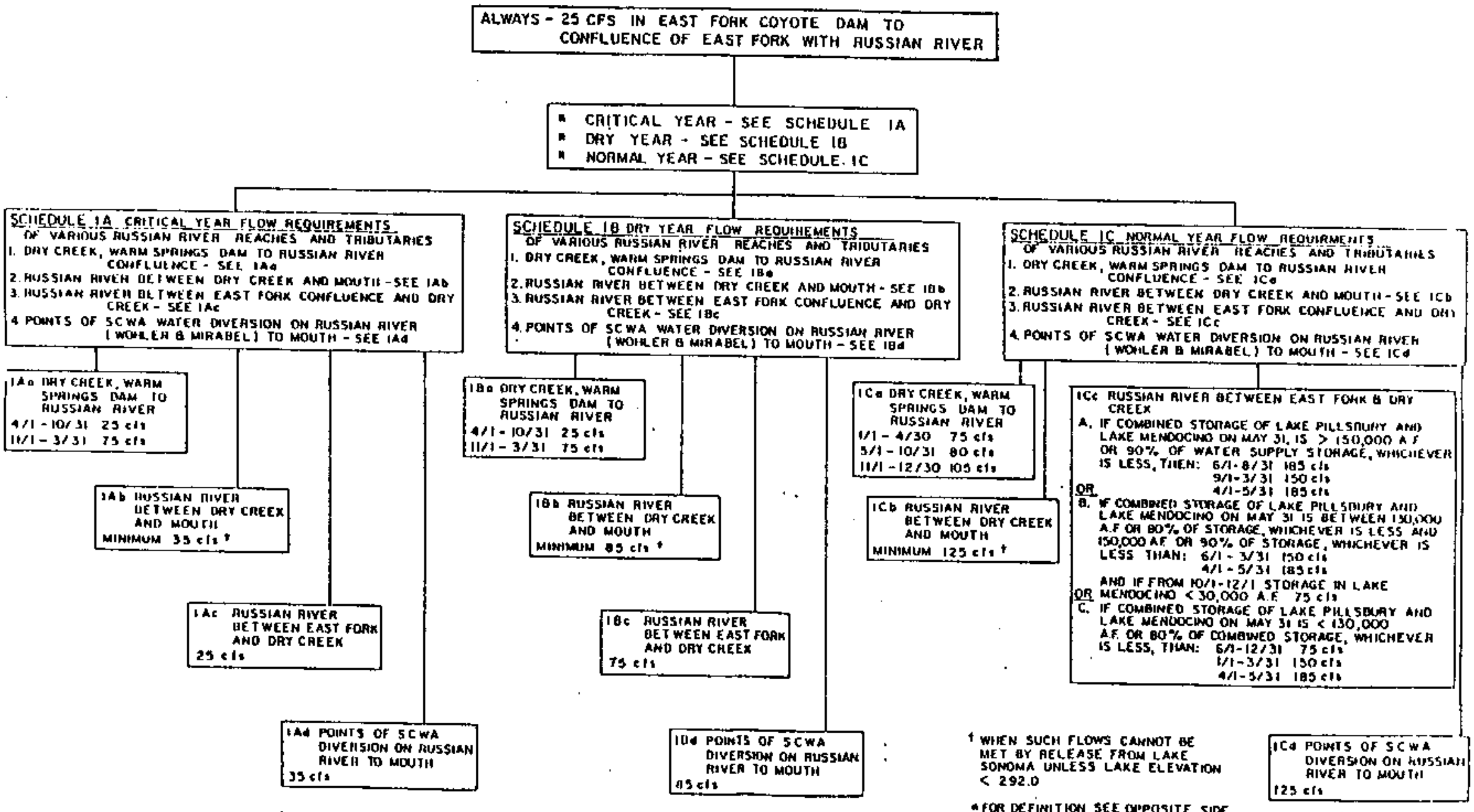
(5) Health Consequences of Wastewater Reuse, Henry J. Ongerth and Jerry E. Ongerth, Annual Review Public Health, 1982

(6) Summary of Revisions of the Drinking Water Regulations and Amendments to the Safe Drinking Water Act, John C. Thompson, Vice President, Camp Dresser & McKee Inc., June, 1986

APPENDIX A

RUSSIAN RIVER STREAMFLOW REQUIREMENTS UNDER DECISION 1610 OF THE STATE WATER RESOURCES CONTROL BOARD

RUSSIAN RIVER BASIN
STREAMFLOW REQUIREMENTS



RUSSIAN RIVER BASIN STREAMFLOW REQUIREMENTS

<u>Definitions of Critical, Dry, and Normal years</u>

1.Critical Year-Schedule 1A flow requirements:

Definition: Beginning October 1st of each year if cumulative inflow* to Lake Pillsbury is;

<4000 A.F. as of January 1st
<20,000 A.F. as of February 1st
<45,000 A.F. as of March 1st
<50,000 A.F. as of April 1st
<70,000 A.F. as of May 1st
<75,000 A.F. as of June 1st

2.Dry Year-Schedule 1B flow requirements:

Definition: Beginning October 1st of each year if cumulative inflow* to Lake Pillsbury is;

<8000 A.F. and >4000 A.F. as of January 1st
<39,200 A.F. and >20,000 A.F. as of February 1st
<65,700 A.F. and >45,000 A.F. as of March 1st
<114,500 A.F. and >50,000 A.F. as of April 1st
<145,600 A.F. and >70,000 A.F. as of May 1st
<160,000 A.F. and >75,000 A.F. as of June 1st

3.Normal Year-Schedule 1C flow requirements:

Definition: Beginning October 1st of each Normal Year water supply conditions exist in the absence of defined dry or critical water supply conditions, such as when cumulative inflow* to Lake Pillsbury is;

>8000 A.F. as of January 1st
>39,200 A.F. as of February 1st
>65,700 A.F. as of March 1st
>114,500 A.F. as of April 1st
>145,600 A.F. as of May 1st
>160,000 A.F. as of June 1st

*Cumulative inflow to Lake Pillsbury is the calculated algebraic sum of releases for Lake Pillsbury, increases in storage in Lake Pillsbury, and evaporation from Lake Pillsbury.

NOTE: 1.Storage, inflow, and evaporation figures for Lake Pillsbury may be obtained by calling P.G.&E.'s San Francisco office. (Dan Quail @ 415-972-1965)

2.The information presented in this document is based upon Decision 1610 of the State Water Resources Control Board, dated April, 1986.

June 1986
rtw:rrbas\.strmreq

YEAR	MONTH	WASTEWATER DISCHARGE (cfs)	HEALDSBURG (cfs) Model	Minimum	Revised	DRY CREEK (cfs) Model	Minimum	Revised
1923	JAN	46.4	2114	150	2114	358	75	343
	FEB	46.4	1329	150	1329	242	75	227
	MAR	46.4	583	150	583	148	75	133
	APR	46.4	1114	185	1114	264	75	250
	MAY	46.4	228	185	228	111	80	97
	JUN	39.6	200	185	185	109	80	81
	JUL	0.0	200	185	185	129	80	129
	AUG	6.9	200	185	185	125	80	118
	SEP	22.0	165	150	150	123	80	101
	OCT	32.7	169	150	169	94	80	80
	NOV	41.2	192	150	192	94	105	120
	DEC	46.4	190	150	190	127	105	112
	MEAN	35.1	557	165	552	160	83	149

GUERNEVILLE (cfs) Model	Minimum	Revised	TOTAL REV. (HL.+ DC) (cfs)	PERCENT WASTEWATER
3317	125	3348	2457	1.9%
1999	125	2030	1556	2.9%
877	125	908	716	6.1%
1884	125	1916	1364	3.3%
272	125	304	325	12.5%
140	125	137	266	13.0%
140	125	125	314	0.0%
140	125	125	303	2.2%
140	125	125	251	8.1%
163	125	182	249	11.6%
217	125	284	312	11.7%
260	125	291	302	13.3%
796	125	815	701	7.2%

APPENDIX B

YEAR 2010 FLOWS AND WASTEWATER CONCENTRATIONS
FOR HYDROLOGICAL CONDITIONS PREVAILING
DURING 1923-1932 PERIOD

YEAR	MONTH	WASTEWATER DISCHARGE (cfs)	HEALDSBURG (cfs) Model	Minimum	Revised	DRY CREEK (cfs) Model	Minimum	Revise
1924	JAN	46.4	244	75	244	122	75	107
	FEB	46.4	956	25	941	247	75	232
	MAR	46.4	127	25	111	106	75	91
	APR	46.4	40	25	25	108	25	62
	MAY	46.4	41	25	25	137	25	92
	JUN	39.6	40	25	25	197	25	157
	JUL	0.0	41	25	25	197	25	198
	AUG	6.9	41	25	25	156	25	149
	SEP	22.0	40	25	25	138	25	116
	OCT	32.7	73	25	57	49	25	30
	NOV	41.2	325	25	310	140	75	126
	DEC	46.4	1126	25	1110	275	75	260
	MEAN	35.1	258	29	244	156	46	135

GUERNEVILLE (cfs) Model	Minimum	Revised	TOTAL REV. (HL.+ DC) (cfs)	PERCENT WASTEWATER
400	85	431	351	11.7%
1647	35	1663	1173	3.8%
234	35	249	202	18.7%
50	35	35	87	34.8%
50	35	35	117	28.4%
50	35	35	182	17.9%
50	35	35	223	0.0%
50	35	35	174	3.8%
50	35	35	141	13.5%
54	35	52	87	27.3%
548	35	560	436	8.6%
1966	35	1981	1370	3.3%
429	39	429	379	14.3%

YEAR	MONTH	WASTEWATER DISCHARGE (cfs)	HEALDSBURG (cfs) Model	Minimum	Revised	DRY CREEK (cfs) Model	Minimum	Revis[illegible]
1925	JAN	46.4	755	150	755	189	75	17[illegible]
	FEB	46.4	7385	150	7385	1151	75	113[illegible]
	MAR	46.4	1338	150	1338	243	75	22[illegible]
	APR	46.4	1327	185	1327	296	75	28[illegible]
	MAY	46.4	866	185	866	192	80	17[illegible]
	JUN	39.6	294	185	294	111	80	8[illegible]
	JUL	0.0	200	185	185	122	80	12[illegible]
	AUG	6.9	200	185	185	117	80	11[illegible]
	SEP	22.0	165	150	150	118	80	9[illegible]
	OCT	32.7	176	150	176	96	80	8[illegible]
	NOV	41.2	210	150	210	98	105	11[illegible]
	DEC	46.4	283	150	283	145	105	13[illegible]
	MEAN	35.1	1100	165	1096	240	83	22[illegible]

GUERNEVILLE (cfs) Model	Minimum	Revised	TOTAL REV. (HL.+ DC) (cfs)	PERCENT WASTEWATER
1213	125	1244	929	4.8%
12024	125	12055	8521	0.5%
2041	125	2072	1566	2.9%
2239	125	2271	1609	2.8%
1261	125	1293	1044	4.3%
298	125	310	377	9.5%
140	125	125	307	0.0%
140	125	125	295	2.3%
140	125	125	246	8.2%
210	125	229	258	11.2%
224	125	281	324	11.3%
396	125	427	413	10.1%
1694	125	1713	1324	5.7%

YEAR	MONTH	WASTEWATER DISCHARGE (cfs)	HEALDSBURG Model	HEALDSBURG Minimum	HEALDSBURG Revised	DRY CREEK Model	DRY CREEK Minimum	DRY CREEK Revi
1926	JAN	46.4	1255	150	1255	243	75	2
	FEB	46.4	5375	75	5375	1006	75	10
	MAR	46.4	835	150	835	216	75	2
	APR	46.4	2167	185	2167	831	75	8
	MAY	46.4	239	185	239	112	80	
	JUN	39.6	200	185	185	121	80	
	JUL	0.0	200	185	185	122	80	1
	AUG	6.9	200	185	185	117	80	1
	SEP	22.0	165	150	150	126	80	1
	OCT	32.7	173	150	173	94	80	
	NOV	41.2	1398	150	1398	321	105	3
	DEC	46.4	2013	150	2013	384	105	3
	MEAN	35.1	1185	158	1180	308	83	2

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GUERNEVILLE Model	GUERNEVILLE Minimum	GUERNEVILLE Revised	TOTAL REV. (HL.+ DC) (cfs)	PERCENT WASTEWATER
2414	125	2445	1483	3.0%
14282	85	14328	6381	0.7%
1543	125	1589	1051	4.2%
6825	125	6871	2998	1.5%
397	125	415	323	12.6%
140	125	125	266	13.0%
140	125	125	307	0.0%
140	125	125	295	2.3%
140	125	125	254	8.0%
169	125	187	253	11.4%
2411	125	2468	1735	2.3%
3205	125	3236	2382	1.9%
2651	122	2670	1477	5.1%

YEAR	MONTH	WASTEWATER DISCHARGE (cfs)	HEALDSBURG (cfs) Model	Minimum	Revised	DRY CREEK (cfs) Model	Minimum	Revis
1927	JAN	46.4	3340	150	3340	947	75	94
	FEB	46.4	8882	150	8882	3211	75	321
	MAR	46.4	2028	150	2028	641	75	64
	APR	46.4	2455	185	2455	935	75	93
	MAY	46.4	470	185	470	133	80	11
	JUN	39.6	200	185	185	99	80	8
	JUL	0.0	200	185	185	127	80	12
	AUG	6.9	200	185	185	114	80	10
	SEP	22.0	165	150	150	118	80	9
	OCT	32.7	174	150	174	96	80	8
	NOV	41.2	691	150	691	175	105	19
	DEC	46.4	1053	150	1053	231	105	21
	MEAN	35.1	1655	165	1650	569	83	56

GUERNEVILLE (cfs) Model	Minimum	Revised	TOTAL REV. (HL.+ DC) (cfs)	PERCENT WASTEWATER
5736	125	5782	4287	1.1%
16340	125	16386	12093	0.4%
3477	125	3523	2669	1.7%
4576	125	4622	3390	1.4%
604	125	636	589	7.3%
143	125	149	265	13.0%
140	125	125	312	0.0%
140	125	125	292	2.3%
140	125	125	246	8.2%
176	125	195	256	11.3%
1068	125	1125	882	4.5%
1576	125	1607	1269	3.5%
2843	125	2867	2213	4.6%

YEAR	MONTH	WASTEWATER DISCHARGE (cfs)	HEALDSBURG (cfs) Model	Minimum	Revised	DRY CREEK (cfs) Model	Minimum	Revis
1929	JAN	46.4	402	150	402	138	75	12
	FEB	46.4	1310	75	1310	267	75	25
	MAR	46.4	535	75	535	145	75	13
	APR	46.4	183	75	183	69	25	3
	MAY	46.4	90	75	75	125	25	8
	JUN	39.6	89	75	75	204	25	16
	JUL	0.0	90	75	75	213	25	21
	AUG	6.9	90	75	75	176	25	17
	SEP	22.0	89	75	75	155	25	13
	OCT	32.7	90	75	75	111	25	7
	NOV	41.2	91	75	75	96	75	7
	DEC	46.4	2801	75	2801	527	75	51
	MEAN	35.1	488	81	480	186	46	16

GUERNEVILLE (cfs) Model	Minimum	Revised	TOTAL REV. (HL.+ DC) (cfs)	PERCENT WASTEWATER
623	125	654	525	8.1%
2074	85	2105	1562	2.9%
814	85	799	665	6.5%
247	85	263	222	17.3%
99	85	85	155	23.0%
99	85	85	239	14.2%
99	85	85	289	0.0%
99	85	85	245	2.7%
99	85	85	208	9.6%
99	85	85	154	17.5%
99	85	103	150	21.5%
4731	85	4762	3313	1.4%
765	88	766	644	10.4%

YEAR	MONTH	WASTEWATER DISCHARGE (cfs)	HEALDSBURG (cfs) Model	Minimum	Revised	DRY CREEK (cfs) Model	Minimum	Revis
1928	JAN	46.4	1702	150	1702	296	75	28
	FEB	46.4	2601	150	2601	518	75	51
	MAR	46.4	3970	150	3970	1374	75	137
	APR	46.4	1543	185	1543	597	75	59
	MAY	46.4	312	185	312	120	80	9
	JUN	39.6	200	185	185	114	80	8
	JUL	0.0	200	185	185	135	80	13
	AUG	6.9	200	185	185	120	80	11
	SEP	22.0	165	150	150	119	80	9
	OCT	32.7	164	150	150	94	80	8
	NOV	41.2	224	150	224	101	105	10
	DEC	46.4	636	150	636	203	105	18
	MEAN	35.1	993	165	987	316	83	30

GUERNEVILLE (cfs) Model	Minimum	Revised	TOTAL REV. (HL.+ DC) (cfs)	PERCENT WASTEWATER
2622	125	2653	1983	2.3%
4190	125	4236	3119	1.5%
7132	125	7178	5344	0.9%
2862	125	2908	2140	2.1%
391	125	409	404	10.3%
140	125	131	265	13.0%
140	125	125	320	0.0%
140	125	125	298	2.3%
140	125	125	247	8.2%
158	125	163	230	12.4%
294	125	323	345	10.7%
1040	125	1071	824	5.3%
1604	125	1621	1293	5.7%

YEAR	MONTH	WASTEWATER DISCHARGE (cfs)	HEALDSBURG (cfs) Model	Minimum	Revised	DRY CREEK (cfs) Model	Minimum	Revis
1930	JAN	46.4	2596	150	2596	431	75	41
	FEB	46.4	2165	150	2165	366	75	35
	MAR	46.4	2194	150	2194	371	75	35
	APR	46.4	543	185	543	163	75	14
	MAY	46.4	236	185	236	112	80	9
	JUN	39.6	165	150	150	151	80	11
	JUL	0.0	164	150	150	168	80	16
	AUG	6.9	164	150	150	160	80	15
	SEP	22.0	165	150	150	119	80	9
	OCT	32.7	164	150	150	94	80	8
	NOV	41.2	172	150	172	89	105	10
	DEC	46.4	174	150	174	124	105	10
	MEAN	35.1	742	156	736	196	83	18

GUERNEVILLE (cfs) Model	Minimum	Revised	TOTAL REV. (HL.+ DC) (cfs)	PERCENT WASTEWATER
4100	125	4131	3012	1.5%
3384	125	3415	2516	1.8%
3455	125	3486	2550	1.8%
877	125	909	692	6.3%
286	125	318	334	12.2%
140	125	125	261	13.2%
140	125	125	319	0.0%
140	125	125	303	2.2%
140	125	125	247	8.2%
153	125	158	230	12.4%
177	125	234	277	12.9%
229	125	260	283	14.1%
1102	125	1118	919	7.2%

YEAR	MONTH	WASTEWATER DISCHARGE (cfs)	HEALDSBURG (cfs) Model	Minimum	Revised	DRY CREEK (cfs) Model	Minimum	Revis
1931	JAN	46.4	768	25	752	215	75	20
	FEB	46.4	305	75	305	135	75	12
	MAR	46.4	641	75	641	177	75	16
	APR	46.4	104	75	104	72	25	3
	MAY	46.4	90	75	75	155	25	11
	JUN	39.6	89	75	75	222	25	18
	JUL	0.0	90	75	75	221	25	22
	AUG	6.9	90	75	75	176	25	17
	SEP	22.0	89	75	75	155	25	13
	OCT	32.7	90	75	75	116	25	8
	NOV	41.2	123	75	123	96	75	8
	DEC	46.4	2786	75	2786	560	75	54
	MEAN	35.1	439	71	430	192	46	17

GUERNEVILLE (cfs) Model	Minimum	Revised	TOTAL REV. (HL.+ DC) (cfs)	PERCENT WASTEWATER
1325	35	1340	952	4.6%
518	85	549	425	9.8%
1061	85	1092	803	5.5%
99	85	108	139	25.0%
99	85	85	185	20.1%
99	85	85	257	13.4%
99	85	85	297	0.0%
99	85	85	245	2.7%
99	85	85	208	9.6%
99	85	117	159	17.1%
151	85	178	205	16.7%
4857	85	4887	3330	1.4%
717	81	725	600	10.5%

YEAR	MONTH	WASTEWATER DISCHARGE (cfs)	HEALDSBURG (cfs) Model	Minimum	Revised	DRY CREEK (cfs) Model	Minimum	Revis[illegible]
1932	JAN	46.4	1759	150	1759	326	75	31[illegible]
	FEB	46.4	1358	150	1358	245	75	23[illegible]
	MAR	46.4	859	150	859	171	75	15[illegible]
	APR	46.4	380	185	380	130	75	11[illegible]
	MAY	46.4	270	185	270	120	80	10[illegible]
	JUN	39.6	165	150	150	146	80	10[illegible]
	JUL	0.0	164	150	150	174	80	17[illegible]
	AUG	6.9	164	150	150	156	80	14[illegible]
	SEP	22.0	165	150	150	123	80	10[illegible]
	OCT	32.7	164	150	150	94	80	8[illegible]
	NOV	41.2	94	75	94	133	105	10[illegible]
	DEC	46.4	251	150	251	138	105	12[illegible]
	MEAN	35.1	483	150	477	163	83	14[illegible]

GUERNEVILLE (cfs) Model	Minimum	Revised	TOTAL REV. (HL.+ DC) (cfs)	PERCENT WASTEWATER
2799	125	2830	2070	2.2%
2045	125	2076	1588	2.8%
1250	125	1281	1015	4.4%
562	125	594	496	8.6%
350	125	382	376	11.0%
140	125	125	256	13.4%
140	125	125	325	0.0%
140	125	125	298	2.3%
140	125	125	251	8.1%
150	125	155	230	12.4%
140	125	153	199	17.2%
378	125	409	374	11.0%
686	125	698	623	7.8%

NORTH MARIN WATER DISTRICT
999 RUSH CREEK PLACE • POST OFFICE BOX 146 • NOVATO, CALIFORNIA 94948 • (415) 897-4133

February 5, 1987

Honorable Mayor and Council Members
City of Santa Rosa
P. O. Box 1678
Santa Rosa, CA 95403

Subj: Comments of North Marin Water District on Draft Environmental Impact Report entitled "Long Range Wastewater Management Plan" dated December 1986

Ladies and Gentlemen:

As regards the rapid infiltration alternative, the subject report contains significant errors, omissions and deficiencies. Principal among these are:

1. The report significantly understates the potential impact of this proposed alternative on public health. As demonstrated by expert testimony before the North Coast Regional Water Quality Control Board and by the written position of the Department of Health Services (January 20, 1987 letter to Regional Water Quality Control Board from David Clark). It is clear that the agency whose responsibility is to safeguard public health will not tolerate this option.

2. Setting aside Item 1 for the moment, the report significantly understates the level of treatment required of the wastewater prior to infiltration pond disposal and the increased level of treatment required of water extracted at the Ranney collector system operated by the Sonoma County Water Agency which distributes potable water to a population of 400,359 people located in the urban areas of Sonoma and Marin Counties. The North Marin Water District has explored the potential cost of the additional treatment to the water supply (see Attachment A). This cost varies from a low of $50.9 million to a high of $98.9 million depending on the level of treatment that would be required by the Department of Health Services. The cost of additional treatment of the wastewater effluent has not been estimated but could easily run between $25 and $50 million. Clearly, consideration of these costs makes the RI option uneconomic compared to other available options.

Attachme

3. The DEIR ignores the issue of public acceptability but appears to embrace the comparison made by CH2M Hill in the Phase 2 report entitled "Evaluation of Alternatives" wherein the acceptability of the ocean project is rated equal to the acceptability of the RI option. This simply does not square with the many historic studies on this subject which show that the public does not prefer to have a significant amount of reclaimed sewerage in its public drinking supply. The public will not accept this option when there are other safer alternatives available from a public health perspective.

Enclosed for your study and consideration is the following reference material:

Attachment 1: Report by CWC-HDR, Inc., a renowed engineering company which has designed many water supply and wastewater treatment plants and has been selected often by the United States Environmental Protection Agency to perform special studies of water quality and water treatment plant costs. The attachment is a special report which identifies in detail the estimated cost of additional treatment that would be required at the Ranney collectors. The results are presented as a range of numbers because it is at this point not clear how far the Department of Public Health would require the Sonoma County Water Agency to go with additional treatment. The minimum requirement, however, has been determined to be $51 million (capital costs). The City of Santa Rosa, who is a signator to the Master Agreement for Water Supply from the Sonoma County Water Agency, would be responsible pursuant to that agreement for 55 percent of these costs. The first page of the CWC-HDR report contains the following significant statement:

> "Because of the proximity to the point of effluent disposal and the assessment that 90 percent of the water collected by the Ranney wells is underflow from the Russian River, there is justifiable concern that during low stream flows a high percentage of the water captured by the Ranney wells will be treated wastewater. Currently, water from the Ranney collector meets the Department of Health Services' drinking water standards and receives only chlorination prior to distribution. Addition of high concentrations of wastewater will increase the total dissolved solids content, increase background organic concentration levels, and potentially increase the level of toxic heavy metals in the supply. It is contemplated that additional treatment will be needed to remove heavy metals and organics if this in-stream effluent disposal alternative is adopted. Further, the Department of Health Service would probably mandate that complete treatment facilities with provisions to remove heavy metals and organics be installed."

Attachment 2: Statement (and qualifications) before the North Coast Regional Water Quality Control Board of Henry J. Ongerth, January 22, 1987. This statement concludes that the rapid infiltration alternative is extremely risky from a public health viewpoint and should not be considered further since other options are available to the City of Santa Rosa. It is particularly noteworthy that Henry J. Ongerth is the former Chief of the Bureau of Sanitation, Department of Health Services. During the many years that he held that post (1968-1978) Mr. Ongerth was a leader in establishing water quality standards not only in California but across the nation. Now retired, Mr. Ongerth lectures at the University of California at Berkeley in the Department of Sanitary Engineering and does occasional selective consultant work, principally for federal and state agencies.

Attachment 3: A paper entitled "Health Consequences of Wastewater Reuse" by Henry J. Ongerth and his son, Jerry E. Ongerth, Sanitary Engineers. The paper appeared in a 1982 issue of Annual Review Public Health and is an excellent update on the state of the art of health consequences of wastewater reuse.

Attachment 4: Questions raised on effluent chemistry, RI pond longevity and performance and dilution estimates by the geotechnical/engineering firm of Harding, Lawson and Associates, who were asked to review portions of the DEIR.

Attachment 5: Resolution No. 87-4 of the Board of Directors of North Marin Water District recommending that the Russian River sewage disposal pond alternative be dropped from further consideration and setting forth reasons therefor.

Attachment 6: Numerous other comments of North Marin Water District on the errors, omissions and deficiencies in the DEIR.

In closing, it is obvious to this District, based on expert advice and based on the combined 130+ years of professional experience in the field of water supply and wastewater engineering represented by our staff, that the proposed rapid infiltration alternative: 1) presents public health risks not worth taking and unnecessary to take given the fact there are other safer alternatives available; 2) is uneconomic compared to other alternatives available; and 3) is unacceptable to the public. We recommend the RI alternative be dropped from further consideration.

Sincerely yours,

John Olaf Nelson
General Manager

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