WATER QUALITY CONTROL PLAN
FOR THE
NORTH COAST REGION

Adopted by the
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FOREWORD

The need for comprehensive water quality planning is set forth in both California and federal law. California's Porter-Cologne Water Quality Control Act, which is contained in California Water Code, Division 7, Chapters 1 through 17, and the Federal Water Pollution Control Act as amended by the Clean Water Act of 1977 require water quality control plans for the waters of the State as well as public review of the plans. The basic purpose of the state's planning effort is to determine the future direction of water quality control for protection of California's waters.

The Water Quality Control Plan for the North Coast Region (Basin Plan) is comprehensive in scope. It contains a brief description of the North Coast Region, and describes its water quality and quantity problems and the present and potential beneficial uses of the surface and ground waters within the Region. The water quality objectives contained in the Basin Plan are prescribed for the purposes of protecting the beneficial uses. The implementation plans section describes the measures, which include specific prohibitions, action plans, and policies which form the basis for the control of water quality.

Statewide plans and policies are included as well as a description of Regional Water Board surveillance and monitoring activities. The plan contains provision for public participation, complies with the requirements of the California Environmental Quality Act, and establishes a setting and the framework for the development of discharger regulation.

Integral to the basin planning process is the provision for change. In that respect, the water quality control plans are reviewed triennially to determine the needed changes and to keep pace with technologies, policies, changes in the law, and physical changes within the Region. The Regional Water Board conducted its most recent triennial review of its Basin Plan in 1992 and on February 25, 1993 adopted a prioritized list of issues which the Regional Water Board has determined necessary for further evaluation and potential development into a basin plan revision. The Regional Water Board placed high priority on updating the Basin Plan to provide updated descriptions of the Region, laws, and regulations and to correct inaccuracies in the Basin Plan. This Basin Plan has been updated and revised accordingly.

Cover Photo: Trinity River at Big Bar, 1987
(A. Wellman)

1. INTRODUCTION

The primary responsibility for the protection and enhancement of water quality in California has been assigned by the California legislature to the State Water Resources Control Board (State Water Board) and the nine regional water quality control boards (regional water boards). The State Water Board provides state-level coordination of the water quality control program by establishing statewide policies and plans for the implementation of state and federal laws and regulations. The regional water boards adopt and implement water quality control plans (basin plans) which recognize the unique characteristics of each region with regard to natural water quality, actual and potential beneficial uses, and water quality problems.

HISTORY OF BASIN PLANNING IN THE NORTH COAST REGION

The nine regional water boards were established as "regional water pollution control boards" by the Dickey Act of 1949. The names of the regional water boards were changed, and their authority broadened, by the Porter-Cologne Water Quality Control Act of 1969. The development of comprehensive basin plans was initiated in response to both federal and state directives.

The North Coast Regional Water Quality Control Board (Regional Water Board) first adopted an interim Basin Plan in 1971. This was a brief, basic document which was used until comprehensive basin plans for its two natural hydrologic basins, the Klamath River Basin 1A and the North Coastal Basin 1B, were developed, adopted by the Regional Water Board, and approved by the State Water Board in 1975. Also in 1975, the comprehensive plans were condensed into two abstracts which were adopted by the Regional Water Board and approved by the State Water Board.

In the development of the 1975 comprehensive plans, the California Department of Water Resources was the major contractor for planning in Basin 1A. A three-member consortium (basin contractor) consisting of Brown and Caldwell, Water Resources Engineers, Inc. and Yoder-Trotter-Orlob and Associates conducted the planning for Basin 1B. The basin contractors were aided by several subcontractors for specialized studies outside the contractors' expertise. The State Water Board contracted with agencies to organize and supply their respective data for each subbasin. The Regional Water Board and staff participated throughout the planning process and were responsible for organizing and conducting the public meetings and workshops. An Office of Technical Coordination (OTC) was established by contract with the State Water Board to provide technical criteria, coordination and standardization to the Basin Planning Program. OTC reviewed the plans for technical content and coordination on a statewide level.

In 1975, the State Water Board's Office of Planning and Research in conjunction with the regional water boards organized and directed the statewide basin planning program. Planning areas were defined in accordance with natural hydrologic boundaries. At that time, a total of 16 study basins were defined within the nine administrative regional water boards and two of these basins, the Klamath River Basin 1A and the North Coastal Basin 1B comprised the boundaries of the North Coast Regional Water Quality Control Board.

In 1980, the State Water Board, the Department of Water Resources, and the U.S. Geological Survey entered into an agreement which redefined the hydrologic basin planning areas within the State of California. The North Coast Region is Hydrologic Unit Number 1. This hydrologic unit is divided into hydrologic areas and subareas as shown on Figure 1-1 (located in the map pocket). The names and areas shown on Figure 1-1 are the same as used by the Department of Water Resources in its Bulletin 94 series.

Since 1975, the Regional Water Board and Regional Water Board staff have had the primary responsibility for basin planning. The Regional Water Board observes the formal public hearing process while considering basin planning issues, and before submitting its decision to the State Water Board for approval. The Basin Planning Unit of the State Water Board's Division of Water Quality serves to coordinate planning efforts among the nine regional water boards as well as the Office of Administrative Law and the U.S. Environmental Protection Agency.

The comprehensive plans and abstracts have been amended several times to serve the needs of the

Regional Water Board, its staff, and the public. On April 28, 1988, the Regional Water Board combined and updated the two comprehensive plans and their abstracts into a single Water Quality Control Plan for the North Coast Region (Basin Plan). The Appendix Section of this Plan contains a summary of Basin Plan amendments since 1975.

Planning Relationships

This Basin Plan is only one of a number of plans which deal directly or indirectly with the water resources of the North Coast Region.

At the federal level, overall guidance on the course of future development of water and related land resources is provided by the Comprehensive Framework Study, California Region. This study was completed in 1971 by the Water Resources Council, pursuant to the Water Resources Planning Act of 1965.

At the state level, the California Water Plan calls for the orderly and coordinated control, protection, conservation, development, and use of the state's water resources. Basin plans became part of the California Water Plan after the basin plans were adopted by the regional water boards and approved by the State Water Board.

In addition, several state agencies are involved in planning for resources whose protection and development are dependent on high water quality. Completed plans related to water quality include the California Fish and Wildlife Plan (1966), the California Comprehensive Ocean Area Plan (1967), the California Protected Waterways Plan (1971) and the California Coastal Plan (1975). Senate Bill 1285, an outgrowth of the Protected Waterways Plan, mandated that detailed waterway management plans be prepared for the major North Coast rivers. These plans were prepared by the Protected Waterways Program. Other related plans are the California Outdoor Recreation Resources Plan, the California Coastal Zone Conservation Plan, and the California Wild and Scenic Rivers Management Plan.

All of the counties in the North Coast Region have prepared general plans which include water and sewage disposal elements. These plans are used by the counties for establishing priorities for meeting current and future water and sewerage needs. The counties have prepared solid waste management plans in response to the Nejedly-Z'berg-Dills Solid Waste Management and Resource Recovery Act of 1972, and these are reviewed triennially. In addition, Assembly Bill 2948 of 1986 (the Tanner Bill), requires all counties to adopt plans for the management and disposal of the hazardous and toxic wastes generated within their boundaries.

The protection and orderly development of the Region's water resources make it essential that all planning efforts be coordinated.

FUNCTION AND OBJECTIVES OF THE BASIN PLAN

The basic purpose of the state's basin planning effort is to determine the future direction of water quality control for protection of California's waters.

The goal of this Basin Plan is to provide a definitive program of actions designed to preserve and enhance water quality and to protect beneficial uses of water in the North Coast Region. The plan is concerned with all factors and activities which might affect water quality. It emphasizes, however, actions to be taken by the State Water Board and the Regional Water Board since they have primary responsibility for maintenance of water quality in the North Coast Region.

This Basin Plan is comprehensive in scope. It contains a brief description of the North Coast Region, and describes its water quality and quantity problems and the present and potential beneficial uses of the surface and ground waters within the Region. The water quality objectives contained in the plan are prescribed for the purposes of protecting the beneficial uses. The Implementation Plans section describes the measures, which include specific prohibitions, action plans, and policies which form the basis for the control of water quality. Statewide plans and policies are included as well as a description of Regional Water Board surveillance and monitoring activities. The plan contains provisions for public participation, complies with the requirements of the California Environmental Quality Act, and establishes

a setting and the framework for the development of discharger regulation.

Basin plans complement and may be more stringent than water quality control plans and policies adopted by the State Water Board, such as the "Water Quality Control Plan for Ocean Waters of California" and the "Water Quality Control Policy for the Enclosed Bays and Estuaries of California". Provisions of State Water Board plans supersede basin plans; however, the same state plans may allow for site-specific objectives and exceptions in order to meet localized needs and circumstances.

This Basin Plan is used as a regulatory tool by the Regional Water Board's technical staff. Regional Water Board orders cite the Basin Plan's water quality standards and prohibitions applicable to a particular discharge. The Basin Plan also is used by other agencies in their permitting and resource management activities. It also serves as an educational and reference document for staff, dischargers and members of the public.

LEGAL BASIS AND AUTHORITY

Comprehensive water quality planning is mandated by California and federal law. The federal Clean Water Act contains the law protecting navigable waters, and the California Water Code is the state body of law protecting groundwaters and fresh and marine surface waters.

The federal Clean Water Act (Section 303, 33 U.S.C. § 1313) requires states to adopt water quality standards (water quality objectives and beneficial uses) for navigable waters of the United States and to review and update those standards on a triennial basis. Other provisions of the Clean Water Act related to basin planning include Section 208, which authorizes the preparation of areawide wastewater management plans, and Section 319 (added by 1987 amendments) which provides for more specific planning related to control of nonpoint source problems. The 1987 amendments to the federal Clean Water Act also mandated adoption by the states of numerical standards for 126 "priority pollutant" toxic chemicals.

The State Water Board and regional water boards implement the federal Clean Water Act in California under the oversight of the U.S. Environmental Protection Agency (EPA), Region IX. Direction for implementation of the Clean Water Act is provided by the Code of Federal Regulations (40 CFR) and by a variety of EPA guidance documents on specific subjects.

The Porter-Cologne Water Quality Control Act (Porter-Cologne) is codified in the California Water Code (CWC) and establishes the State Water Board and the nine regional water boards in their current form. It authorizes the State Water Board to adopt, review and revise state water policy, which may include water quality objectives, principles, and guidelines (CWC Sections 13142-13143). It directs the State Water Board to formulate, adopt and revise general procedures for the basin planning process by regional water boards (CWC Section 13164). Porter-Cologne also authorizes the State Water Board to adopt water quality control plans on its own initiative (CWC Section 13170); such plans supersede regional basin plans to the extent of any conflict.

Article 3 of Chapter 4 of Porter-Cologne directs regional water boards to adopt, review, and revise basin plans, and provides specific guidance on factors which must be considered in adoption of water quality objectives and implementation measures. The format for basin plans as described in Sections 13241-13247 of Porter-Cologne follows a logical progression towards water quality protection by:

1) describing the resources and beneficial uses to be protected;

2) stating water quality objectives for the protection of those uses;

3) providing implementation plans (which include specific prohibitions, action plans and policies) to achieve the water quality objectives;

4) describing the statewide plans and policies which apply to the waters of the region; and

5) describing the region's surveillance and monitoring activities.

TRIENNIAL REVIEW AND BASIN PLAN AMENDMENT PROCESS

Both Porter-Cologne (CWC Section 13240) and the Clean Water Act (Section 303(c)(1)) require review of basin plans at least once each three-year period to keep pace with changes in regulations, new technologies and policies, and physical changes within the Region. The Regional Water Board is responsible for this triennial review, and is required to: 1) identify those portions of the Basin Plan which are in need of modification or new additions; 2) adopt standards as appropriate; and 3) recognize the portions of the Basin Plan which are appropriate as written. The review includes a public hearing process, thus providing a forum for the public to raise issues for the Regional Water Board to consider for incorporation into its Basin Plan.

At the conclusion of the triennial review the Regional Water Board adopts a resolution by the Regional Water Board which: 1) summarizes those sections of the Basin Plan which the Regional Water Board has determined to be appropriate and up to date, and 2) sets forth a prioritized list of issues (priority list) which the Regional Water Board has determined are necessary for further evaluation and potential development into a basin plan revision.

The triennial review priority list directs the planning efforts of the Regional Water Board for a period of three years following its adoption. As staffing and budget allows, and starting at the top of the list, the Regional Water Board considers each of the issues identified on the priority list for potential basin plan revisions. The Regional Water Board may also initiate Basin Plan revisions apart from the triennial review process in response to urgent needs which arise after completion of the triennial review.

Once an issue has been evaluated, a proposed amendment is noticed for public hearing. The hearing considers testimony specific to each proposed amendment. This process allows the Regional Water Board to consider each potential amendment on its own merits, to thoroughly identify the problem, to consider alternatives for action, and to assess the expected environmental impact of the proposed action.

Following their adoption by the Regional Water Board, basin plan amendments and supporting documents are submitted to the State Water Board for review and approval. The State Water Board may approve the amendments or remand them to the Regional Water Board with directions for change. Certain basin plan amendments approved by the State Water Board after June 1, 1992, must be reviewed and approved by the Office of Administrative Law (OAL). For purposes of state law, all amendments take effect upon approval by the OAL. Adoption or revision of surface water standards are subject to the approval of the U.S. Environmental Protection Agency.

Public Participation

Public participation is a key element in both state and federal planning requirements. California Code of Regulations, Title 23, Division 3, Chapter 1.5, Section 647.2 describes the Notice and Agenda requirements for all meetings of the Regional Water Board. Water Code Section 13244 requires advance public notice of basin plan amendments and periodic reviews. Federal public participation requirements of 40 CFR Part 25 also apply.

The public participation requirements are intended to foster public awareness and the open processes of governmental decision-making. The Regional Water Board seeks to implement public participation requirements by requesting the public's input, assimilating its viewpoints and preferences, and demonstrating that those viewpoints have been considered.

In the basin planning process, a notice of the proposed action is published in area newspapers and distributed to a list of interested persons or organizations. All basin plan amendments must observe as a minimum the publication procedures which are described in Section 6061 of the Government Code. This requires notification in a newspaper of general circulation once, and three consecutive times when a prohibition of waste discharge is being considered.

All basin plan and statewide plan amendments are subject to the California Environmental Quality Act (CEQA); however, the basin planning process has been certified by the Secretary of Resources as being

exempt from CEQA's requirement for preparation of an environmental impact report (EIR) or negative declaration and initial study (California Code of Regulations (CCR) Title 14, Section 15251). Under the basin planning process, the plan amendment, as well as the staff report and backup materials, serve as a "functional equivalent" to an EIR or negative declaration and initial study. A CEQA "notice of filing" as well as a hearing notice must be published. Under normal circumstances, these notices are published concurrently and at least 45 days prior to the hearing. The notice for noncontroversial matters may be reduced to 30 days. Additionally, under limited emergency situations, further reduction of the advance notice may be possible. The notice sets out dates for public meetings and requests comments from the public. The notice must describe the availability of related reports, include a discussion of possible alternative actions, and an environmental impact analysis of the proposed action(s). All materials related to the proposed action must be available at least thirty days in advance of the public hearing.

Input from interested persons may be either through written correspondence, through public workshop sessions, or at the hearing. At the hearing all interested persons are given the opportunity to speak and respond to the material being considered, within reasonable limitations as determined by the Regional Water Board.

California Code of Regulations, Title 23, Division 4, Chapter 1.5, Section 3781 requires that Regional Water Board approval of basin plan amendments be followed by a Notice of Decision which is filed with the Secretary of the Resources Agency. The Resources Agency is to post this notice for public inspection for at least 30 days.

REGIONAL SETTING OF THE NORTH COAST REGION

This section provides an overview of the environmental and socioeconomic setting of the North Coast Region.

The North Coast Region is defined in Section 13200(a) of Porter-Cologne as follows:

> North Coast region, which comprises all basins including Lower Klamath Lake and Lost River Basins draining into the Pacific Ocean from the California-Oregon state line southerly to the southerly boundary of the watershed of the Estero de San Antonio and Stemple Creek in Marin and Sonoma Counties.

The North Coast Region is divided into two natural drainage basins, the Klamath River Basin and the North Coastal Basin. The North Coast Region covers all of Del Norte, Humboldt, Trinity, and Mendocino Counties, major portions of Siskiyou and Sonoma Counties, and small portions of Glenn, Lake, and Marin Counties.

The North Coast Region encompasses a total area of approximately 19,390 square miles, including 340 miles of scenic coastline and remote wilderness areas, as well as urbanized and agricultural areas.

The North Coast Region is characterized by distinct temperature zones. Along the coast, the climate is moderate and foggy and the temperature variation is not great. For example, at Eureka, the seasonal variation in temperature has not exceeded 63°F for the period of record. Inland, however, seasonal temperature ranges in excess of 100°F have been recorded.

Precipitation over the North Coast Region is greater than for any other part of California, and damaging floods are a fairly frequent hazard. Particularly devastating floods occurred in the North Coast area in December of 1955, in December of 1964, and in February of 1986.

Ample precipitation in combination with the mild climate found over most of the North Coast Region has provided a wealth of fish, wildlife, and scenic resources. The mountainous nature of the Region, with its dense coniferous forests interspersed with grassy or chaparral covered slopes, provides shelter and food for deer, elk, bear, mountain lion, furbearers and many upland bird and mammal species. The numerous streams and rivers of the Region contain anadromous fish, and the reservoirs, although few in number, support both coldwater and warmwater fish.

Tidelands, and marshes too, are extremely important to many species of waterfowl and shore birds, both for feeding and nesting. Cultivated land and pasture lands also provide supplemental food for many birds, including small pheasant populations. Tideland areas along the north coast provide important habitat for marine invertebrates and nursery areas for forage fish, game fish, and crustaceans. Offshore coastal rocks are used by many species of seabirds as nesting areas.

Major components of the economy are tourism and recreation, logging and timber milling, aggregate mining, commercial and sport fisheries, sheep, beef and dairy production, and vineyards and some wineries.

In all, the North Coast Region offers a beautiful natural environment with opportunities for scientific study and research, recreation, sport and commerce. To ensure their perpetuation, the resources must be used wisely.

The Klamath River Basin

The Klamath River Basin covers an area of approximately 10,830 square miles within northern California tributary to the Klamath, Smith, Applegate, Illinois, and Winchuck Rivers, as well as the closed Lost River and Butte Valley hydrologic drainage areas. The Basin is bounded by the Oregon state border on the north, the Pacific Ocean on the west, Redwood Creek and Mad River hydrologic units on the south, and by the Sacramento Valley to the east. The Basin covers all of Del Norte County, and major portions of Humboldt, Trinity, Siskiyou and Modoc counties.

The western portion of the Basin is within the Klamath Mountains and Coast Range provinces, characterized by steep, rugged peaks ranging to elevations of 6,000 to 8,000 feet with relatively little valley area. The mountain soils are shallow and often unstable. Precipitation ranges from 60 to 125 inches per year. The 45-mile coastline is dominated by a narrow coastal plain where heavy fog is common.

The eastern portion of the Basin receives low to moderate rainfall and includes predominantly high, broad valleys such as the Butte, Shasta, and Scott Valleys.

The Lost River and Butte Valley hydrologic areas are located in the Modoc-Oregon Lava Plateau. The area is characterized by broad valleys ranging from 4,000 to 6,000 feet in elevation. Typical annual precipitation is 15 to 25 inches.

The Shasta Valley hydrologic area lies principally within the Cascade Range province. The valley floor elevation is about 2,500 to 3,000 feet, and surrounding mountains range up to 14,162 feet (Mt. Shasta). Annual precipitation ranges from below 15 inches in the valley to over 60 inches in the mountains.

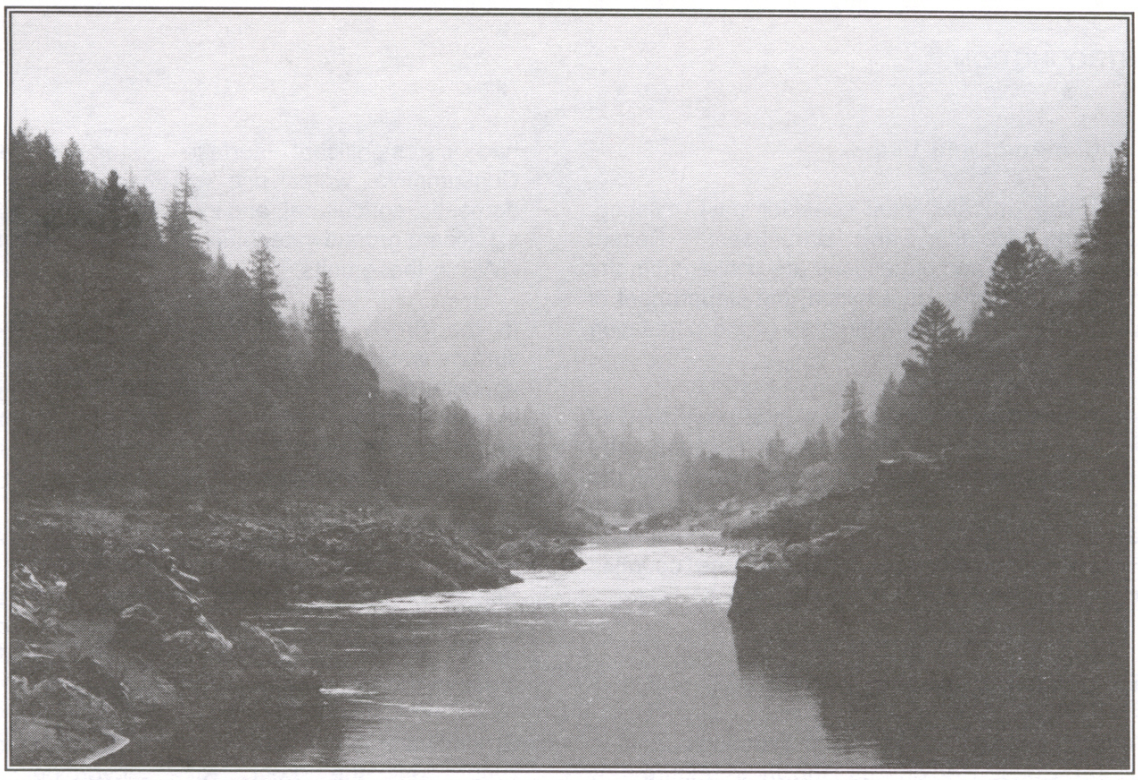
The Scott River hydrologic area is in the Klamath Mountains province. The valley floor elevation is also about 2,500 to 3,000 feet, and surrounding mountains range up to approximately 8,500 feet. Annual precipitation ranges from below 20 inches in the valley to over 70 inches in the western mountains.

The North Coastal Basin

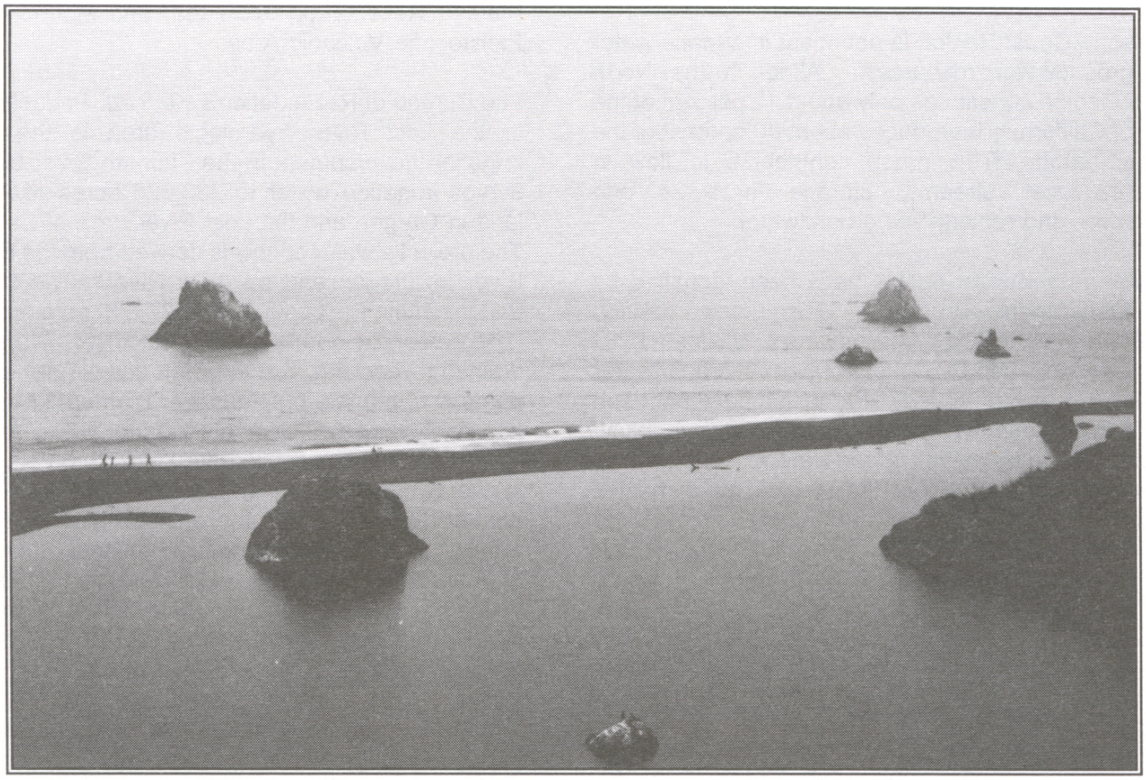
The North Coastal Basin covers an area of approximately 8,560 square miles located along the north-central California Coast. The Basin is bounded by the Pacific Ocean on the west, by the Klamath River and Trinity River Basins on the north, by the Sacramento Valley, Clear Lake, Putah and Cache Creeks and the Napa River Basin on the east, and by the Marin-Sonoma area on the south. The Basin covers all of Mendocino County, major portions of Humboldt and Sonoma counties, about one-fifth of Trinity County, and small portions of Glenn, Lake and Marin counties.

Most of the Basin consists of rugged, forested coastal mountains dissected by six major river systems: Eel, Russian, Mad, Navarro, Gualala, and Noyo rivers and numerous smaller river systems. Soils are generally unstable and erodible, and rainfall is high. The area along the eastern boundary of the Basin is mostly National Forest land administered by the United States Forest Service. Major population areas are centered around Humboldt Bay in the northern portion of the Basin and around Santa Rosa in the southern portion. The Santa Rosa area is on the northern

fringe of the greater San Francisco Bay urban area and has experienced rapid population growth in the period following the Second World War. The economy of the remainder of the Basin has developed much more slowly than other areas in California.



Trinity River at Big Bar, 1987 (A. Wellman)



Mouth of the Russian River at Jenner, 1988 (B. Bacon)

Population and Land Use

The planning process must consider past, existing, and future population and land uses. Recent population trends and projections are contained in the county general plans. In addition, the Department of Finance provides annual estimates of the population by county.

Approximately two percent of the total population of California reside in the North Coast Region. The largest urban centers continue to be located in the Eureka area of Humboldt County and in the Santa Rosa area of Sonoma County, which has experienced the highest population change of all the counties within the Region.

WATER RESOURCES AND WATER USE

There are 14 major surface water hydrologic units in the North Coast Region, as shown in Figure 1-1. Each of these hydrologic units is divided into smaller units called hydrologic areas and hydrologic subareas.

The North Coast Region is abundant in surface water and groundwater resources. Although the North Coast Region constitutes only about 12 percent of the area of California, it produces about 40 percent of the annual runoff. This runoff contributes to flow in surface water streams, storage in lakes and reservoirs, and replenishes groundwater.

Several groundwater basins have been identified by the Department of Water Resources (DWR). Additional unnamed groundwater basins exist throughout the North Coast Region. Groundwater exists even where groundwater basins have not been identified. Groundwater basins do not always follow the same boundaries as surface waters. Groundwater is used widely throughout the Region for domestic, agricultural, and industrial water supply.

The Klamath River Basin

The Klamath River Basin includes five hydrologic units: Winchuck River, Rogue River, Smith River, Klamath River and Trinity River.

The Winchuck River and Rogue River hydrologic units, located near the California-Oregon border, have had no significant surface water development. Consumptive water use in these units include domestic, agricultural, and industrial water supply. No significant groundwater basins have been identified by DWR in these units.

In the Smith River hydrologic unit no significant surface water development has occurred. Domestic, agricultural, and industrial water needs are supplied through surface water diversions and groundwater pumping. DWR has identified one groundwater basin, the Smith River Plain basin, in this hydrologic unit.

The Klamath River hydrologic unit is divided into seven hydrologic areas: Lost River, Butte Valley, Shasta Valley, Scott River, Middle Klamath, Salmon River and Lower Klamath River. Water resources and water use are described for each of these hydrologic areas in the following paragraphs.

Groundwater is the primary source of domestic water supply in the Lost River hydrologic area. Groundwater basins identified by DWR are the Klamath River Valley, Fairchild Swamp Valley, Modoc Plateau Recent Volcanic Area, and Modoc Plateau Pleistocene Volcanic Area.

The Bureau of Reclamation's Klamath Project located in the Lost River hydrologic area is the largest irrigation development in the Klamath River Basin. It serves irrigation water to 233,625 acres of irrigable land in Oregon and the Lost River area of California. The project's water supply is derived from the Klamath River in Oregon and the Lost River. The principal feature within the basin is the 527,000 acre-foot Clear Lake Reservoir on the Upper Lost River. Runoff and drainage reaching the 13,200 acre Tule Lake is pumped to the 9,000 acre Lower Klamath Lake Sump for irrigation and wildlife refuge use. Water not used for irrigation in Lower Klamath Lake Sump is pumped to the Oregon portion of the Klamath River via the Klamath Straits Drain to regulate the water table within the Tule Lake Irrigation District area. The Klamath Project serves a majority of the irrigable land in the Lost River subunit. The Tulelake Irrigation District, the basin's largest, serves 60,600 acres in California with Klamath Project water.

Water use in the Butte Valley hydrologic area comes mostly from groundwater pumping. Groundwater basins identified by DWR in the Butte Valley

hydrologic area are the Butte Valley, Bray Town Area, and Red Rock Valley. Approximately 28,000 acres are irrigated in the Butte Valley. Water not used for irrigation is pumped from the 4,000 acre Meiss Lake to the Klamath River via drainage facilities operated by Meiss Lake Ranch in order to regulate the water table.

In the Shasta Valley hydrologic area, domestic and agricultural water supply needs have historically been met through surface water diversions and from springs. Groundwater is used increasingly for domestic and agricultural supply. DWR has identified one groundwater basin in the Butte Valley. The principal water service agency in the Shasta Valley hydrologic area is the Montague Water Conservation District, which serves over 14,000 of the 48,000 acres irrigated in the subunit. The District's main supply source is 50,000 acre-foot Lake Shastina on the Shasta River. Several smaller irrigation districts in Shasta Valley serve from 1,500 to 3,500 acres each.

Domestic and agricultural water supply needs in the Scott Valley hydrologic area are met through surface water diversions, groundwater pumping, and springs. Approximately 33,000 acres are irrigated in the Scott Valley area. Increases in groundwater pumping for irrigation have prompted adjudication of groundwater in Scott Valley. DWR has identified one groundwater basin in this hydrologic area.

Domestic and agricultural water supply needs in the Middle Klamath hydrologic area are met through surface water diversions, groundwater pumping, and springs. DWR has identified two groundwater basins in this hydrologic area: Happy Camp Town Area and Seiad Valley.

Domestic water use in the Salmon River hydrologic area is supplied by surface water diversions and springs. No groundwater basins have been identified by DWR in this hydrologic area.

In the Lower Klamath River hydrologic area, domestic and agricultural water supply is provided through surface water diversions and groundwater pumping. DWR has identified one groundwater basin in this hydrologic area.

Four Pacific Power and Light Company hydroelectric reservoirs regulate Klamath River flows in the Upper and Middle Klamath River hydrologic areas. The uppermost is John Boyle Dam, located in Oregon about ten miles upstream from the border;its installed power plant capacity is 80,000 kilowatts (kw). Copco No. 1 (20,000 kw) is located just inside the California border; it is a 77,000 acre-foot reservoir impounded by a 132-foot high dam. Copco No. 2 is a 55 acre-foot diversion reservoir which serves a 27,000 kw power plant downstream. The lowermost power development is the 58,000 acre-foot Iron Gate Reservoir, located 17 miles downstream from the state line; it is formed by a l83 foot-high dam and supports an 18,000 kw power plant. The upper three plants are operated on a peaking basis, while Iron Gate is a baseload plant.

In the Trinity River hydrologic unit, domestic, agricultural, and industrial water is supplied through surface water diversions, groundwater pumping, and springs. Groundwater basins identified by DWR in this hydrologic unit are in the Hayfork Valley, Hoopa Valley, and Hyampon Valley.

The Trinity River Division of the Central Valley Project is the largest water development in the Klamath River Basin. The 538-foot-high Trinity Dam forms 2.5 million acre-foot Clair Engle Lake. Releases pass through the 105,556 kw Trinity power plant to Lewiston Reservoir (14,660 acre-feet), from which approximately one million acre-feet per year are diverted by tunnel to the Sacramento Valley. The diverted flows pass through two additional power plants with a combined capacity of 291,444 kw.

Further major developments on the Klamath and Trinity Rivers or on the Smith River and any of its tributaries are forbidden by the 1972 California Wild and Scenic Rivers Act. Only minor additional surface water development for local use is foreseen, primarily because of the high costs in relation to crops which can be grown in the area.

The North Coastal Basin

The North Coastal Basin is divided into nine hydrologic units: Redwood Creek, Trinidad, Mad River, Eureka Plain, Eel River, Cape Mendocino, Mendocino Coast, Russian River, and Bodega.

In the Redwood Creek and Trinidad hydrologic units,

there are no significant surface water developments.

Lake Sonoma and Warm Springs Dam, 1994 (C. Goodwin)

Bike path along Santa Rosa Plains near the Laguna de Santa Rosa, 1994 (C. Goodwin)

Groundwater and surface water diversions supply most of the domestic and agricultural needs. Groundwater basins identified by DWR in these units are in the Prairie Creek Area, Redwood Creek Valley, and Big Lagoon Area.

In the Mad River and Eureka Plain hydrologic units, water supply is adequate to meet currently projected requirements. The only major surface storage is provided by the 48,030 acre-foot capacity Ruth Reservoir on the Mad River which regulates municipal and industrial water supply for the Eureka/Arcata area by exporting Mad River subbasin water to the Eureka Plain subbasin. Groundwater basins have been identified by DWR in both of these hydrologic units. The main groundwater sources in the Eureka Plain are in the Elk River/Salmon Creek area and the Jacoby Creek/Freshwater Creek area.

The only major surface water development in the Eel River hydrologic unit is Lake Pillsbury, which is formed by Scott Dam, with a storage capacity of 80,700 acre-feet. This facility, in conjunction with Van Arsdale Dam and the Potter Valley Tunnel, provides for power and export of Eel River water to the Russian River unit. The City of Willits obtains its water supply from the 723 acre-feet capacity Morris Reservoir and the 635 acre-feet capacity Centennial Reservoir, both located on James Creek. Fifteen groundwater basins have been identified by DWR in this unit: Eel River Valley, Pepperwood Town Area, Larabee Valley, Hettenshaw Valley, Dinsmore Town Area, Laytonville Valley, Little Lake Valley, Weott Town Area, Garberville Town Area, Lower Laytonville Valley, Gravelly Valley, Sherwood Valley, Round Valley, Williams Valley, and Eden Valley. The Eel River hydrologic unit is an area of water surplus for currently projected requirements.

No significant surface water development has occurred in the Cape Mendocino hydrologic unit. Groundwater is used for domestic supply in this unit. DWR has identified two groundwater basins in this unit: Mattole River Valley and Honeydew Town Area.

There is no significant surface water storage within the Mendocino Coast hydrologic unit. Surface water diversions and groundwater pumping are used to supply agricultural needs. Groundwater is the principal source of domestic water supply. Eleven groundwater basins have been identified by DWR: Ten Mile River, Cottoneva Creek Valley, Branscomb Town Area, Little Valley, Fort Bragg Terrace Area, Big River Valley, Navarro River Valley, Anderson Valley, Garcia River Valley, Gualala River Valley, and Annapolis Ohlson Ranch Formation Highlands. The Mendocino Coast hydrologic unit is reaching its existing capacity.

Surface water storage in the Russian River hydrologic unit includes Lake Mendocino, which stores imported Eel River water and East Fork Russian River water, and Lake Sonoma, which is located on Dry Creek, a tributary of the Russian River. Lake Mendocino is formed by Coyote Dam and has a maximum storage capacity of 122,500 acre-feet with 70,000 acre-feet allocated to water supply. Lake Sonoma is formed by Warm Springs Dam and has a maximum storage capacity of 381,000 acre-feet with 212,000 acre-feet allocated to water supply. DWR has identified a number of groundwater basins in this unit. These include: Potter Valley, Ukiah Valley, Sanel Valley, MacDowell Valley, Cloverdale Area, Alexander Area, Alexander Valley, Healdsburg Area, Santa Rosa Plain, Santa Rosa Valley, Kenwood/Rincon Valley, Lower Russian River Valley, and Sebastopol Merced Formation Highlands. Groundwaters are used for domestic supply by the cities of Ukiah, Windsor, Santa Rosa, Rohnert Park, and Sebastopol, as well as in unincorporated areas outside of the City of Santa Rosa. There is sufficient water supply within this hydrologic unit to meet currently projected demands for the foreseeable future. Russian River water also is exported to northern Marin County.

The Bodega hydrologic unit has no significant surface water storage. One groundwater basin has been identified in the unit.

Four hydroelectric power generation plants exist in the North Coastal Basin. Matthews Dam at Ruth Reservoir is equipped with a 2 megawatt facility. Van Arsdale Dam supports a 9 megawatt plant. Coyote Dam at Lake Mendocino supports two power generation units with a combined capacity of 3.5 megawatts. Warm Springs Dam at Lake Sonoma is equipped with a 2.6 megawatt facility.

WATER QUANTITY AND QUALITY PROBLEMS

The present water quality within the Region generally meets or exceeds the water quality objectives set forth

in Section 3 of this Plan. In most cases the water quality is sufficient to support, and in some cases, enhance the beneficial uses assigned to water bodies in Section 2 of this Plan. However, there are a number of present or potential water quality problems which may interfere with beneficial uses or create nuisances or health hazards.

Updated summaries of existing water quality throughout much of the Region are contained in bulletins published by the Department of Water Resources and the U.S. Geological Survey, as well as in special reports issued periodically by the Regional Water Board.

An opportunity to address and assess water quality problems is provided in the triennial review of the Basin Plan. It is at this time that the Regional Water Board utilizes the input of interested agencies and individuals to identify and prioritize the water quality issues within the Region. In addition, the Regional Water Board, in its budget review process, addresses its water quality problem areas on an annual basis to determine the time and effort expended on each identified issue.

2. BENEFICIAL USES

The basis for the discussion of beneficial water uses which follows is Section 13050(f) of California's Porter-Cologne Water Quality Control Act, which states:

> "Beneficial uses" of the waters of the state that may be protected against water quality degradation include, but are not necessarily limited to, domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.

A key part of a water quality control plan is an assessment of the beneficial uses which are to be protected. Table 2-1 identifies beneficial uses for major surface water bodies in the Region, as well as for broad categories of waters (i.e., bays, estuaries, minor coastal streams). Protection will be afforded to the present and potential beneficial uses of waters of the North Coast Region as shown in Table 2-1. The beneficial uses of any specifically identified water body generally apply to all its tributaries. For unidentified water bodies, the beneficial uses will be evaluated on a case-by-case basis.

Water bodies within the Region that do not have beneficial uses designated for them in Table 2-1 are assigned MUN designations in accordance with the provisions of State Water Resources Control Board Resolution No. 88-63 "Sources of Drinking Water" policy (Appendix Section of this plan) which is, by reference, a part of this plan. These MUN designations in no way affect the presence or absence of other beneficial use designations in these water bodies.

The most sensitive beneficial uses from the standpoint of water quality management are municipal, domestic, and industrial supply, recreation, and uses associated with maintenance of resident and anadromous fisheries. The Klamath, Trinity, Smith, Eel, and Mad Rivers, and others within the North Coast Region, are renowned for salmon and steelhead fishing and support a substantial portion of the ocean sport and commercial fisheries for these species. Other notable features of the basin's beneficial uses are the wildfowl use on three national wildlife refuges in the Lost River
and Butte Valley hydrologic areas and an abundance of deer and other wildlife throughout the Region.

The codes used in Table 2-1 are explained in greater detail as follows:

Municipal and Domestic Supply (MUN) - Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

Agricultural Supply (AGR) - Uses of water for farming, horticulture, or ranching including, but not limited to, irrigation, stock watering, or support of vegetation for range grazing.

Industrial Service Supply (IND) - Uses of water for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection, or oil well repressurization.

Industrial Process Supply (PROC) - Uses of water for industrial activities that depend primarily on water quality.

Groundwater Recharge (GWR) - Uses of water for natural or artificial recharge of groundwater for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

Freshwater Replenishment (FRSH) - Uses of water for natural or artificial maintenance of surface water quantity or quality (e.g., salinity).

Navigation (NAV) - Uses of water for shipping, travel, or other transportation by private, military or commercial vessels.

Hydropower Generation (POW) - Uses of water for hydropower generation.

Water Contact Recreation (REC-1) - Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to,

swimming, wading, water-skiing, skin and scuba diving, surfing, white-water activities, fishing, or use of natural hot springs.

Non-Contact Water Recreation (REC-2) - Uses of water for recreational activities involving proximity to water, but not normally involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, tidepool and marine life study, hunting, sightseeing, or aesthetic enjoyment in conjunction with the above activities.

Commercial and Sport Fishing (COMM) - Uses of water for commercial or recreational collection of fish, shellfish, or other organisms including, but not limited to, uses involving organisms intended for human consumption or bait purposes.

Aquaculture (AQUA) - Uses of water for aquaculture or mariculture operations including, but not limited to, propagation, cultivation, maintenance, or harvesting of aquatic plants and animals for human consumption or bait purposes.

Warm Freshwater Habitat (WARM) - Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Cold Freshwater Habitat (COLD) - Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Inland Saline Water Habitat (SAL) - Uses of water that support inland saline water ecosystems including, but not limited to, preservation or enhancement of aquatic saline habitats, vegetation, fish, or wildlife, including invertebrates.

Estuarine Habitat (EST) - Uses of water that support estuarine ecosystems including, but not limited to, preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (e.g., estuarine mammals, waterfowl, shorebirds).

Marine Habitat (MAR) - Uses of water that support marine ecosystems including, but not limited to, preservation or enhancement of marine habitats, vegetation such as kelp, fish, shellfish, or wildlife (e.g., marine mammals, shorebirds).

Wildlife Habitat (WILD) - Uses of water that support terrestrial ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

Preservation of Areas of Special Biological Significance (BIOL) - Includes marine life refuges, ecological reserves and designated areas of special biological significance, such as areas where kelp propagation and maintenance are features of the marine environment requiring special protection.

Rare, Threatened, or Endangered Species (RARE) - Uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as rare, threatened or endangered.

Migration of Aquatic Organisms (MIGR) - Uses of water that support habitats necessary for migration or other temporary activities by aquatic organisms, such as anadromous fish.

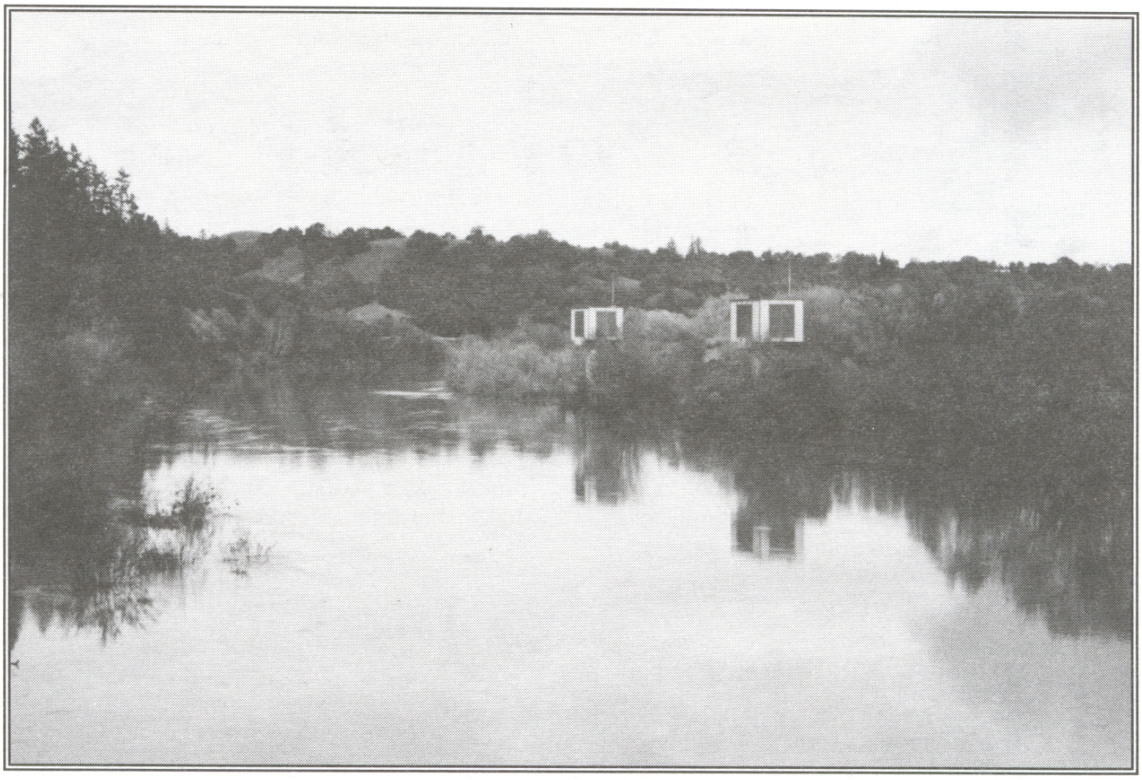
Spawning, Reproduction, and/or Early Development (SPWN) - Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish.

Shellfish Harvesting (SHELL) - Uses of water that support habitats suitable for the collection of filter-feeding shellfish (e.g., clams, oysters, and mussels) for human consumption, commercial, or sports purposes.

The list of beneficial uses in Table 2-1 reflects demands on the water resources of the Region. Water quality objectives based on those uses will adequately protect the quality of the Region's waters for future generations.

Current beneficial uses may be broadly categorized as

water supply, recreation, fish and wildlife habitat, navigation, power generation, and scientific study.



Ranney collectors for municipal water supply, Russian River, 1988 (B. Bacon)

Siskiyou County grazing lands as an example of agricultural water use, 1988 (unknown)

TABLE 2-1
BENEFICIAL WATER USES IN THE NORTH COAST REGION

WATER BODY [1]	MUN*	AGR*	IND*	PROC*	GWR	FRSH	NAV	POW	REC1	REC2	COMM	WARM	COLD	BIOL	SAL	WILD	RARE	MAR	MIGR	SPWN	SHELL	EST	AQUA
Lost River HA																							
Clear Lake Reservoir & Upper Lost River	P	E	P	P	E	E		P	E	E	E	E	E			E	E			E			P
Lower Lost River		E	P	P	E	E			P	E	E	E				E	E						P
Tule Lake		E				E			P	E	E	E				E	E						P
Lower Klamath Lake		E				E			P	E	E	E				E	E						P
Butte Valley HA																							
Meiss Lake		E							P	E	E	E				E							P
Shasta Valley HA																							
Shasta River	P	E	P	P	E	E		P	E	E	E	E	E			E			E	E			P
Lake Shastina	P	E	P	P	E	E			E	E		E	E			E				E			P
Scott River HA																							
Scott River	P	E	P	P	E	E			E	E	E		E			E			E	E			P
Salmon River HA																							
Salmon River	P	P	P	P		E			E	E	E		E			E			E	E			P
Middle Klamath River HA																							
Iron Gate and Copco Reservoir	P	P	P	P		E		E	E	E	E	E	E			E	E		E	E			E
Klamath River	E	E	E	E	E	E		E	E	E	E	E	E			E	E		E	E			E
Applegate River HA																							
Applegate River	E	E	E	E	P	E		P	E	E	E		E			E			E	E			P
Upper Trinity River HA																							
Clair Engle Lake and Lewiston Reservoir	E	E	E	E	E	E		E	E	E	E	E	E			E				E			E
Trinity River	E	E	E	P	E	E			E	E	E		E			E			E	E			E
South Fork Trinity River HA																							
South Fork Trinity River	E	E	P	P		E			E	E	E		E			E			E	E			P
Hayfork Creek	E	E	E	E	E	E		P	E	E	E		E			E			E	E			P
Ewing Reservoir	E								P	E	E	E	E			E							P
Lower Trinity River HA																							
Trinity River	E	E	P	P	E	E			E	E	E		E			E			E	E			P
Lower Klamath River HA																							
Klamath River	E	E	P	P	E	E	E		E	E	E	E	E			E			E	E		E	E

TABLE 2-1 (CONTINUED)
BENEFICIAL WATER USES IN THE NORTH COAST REGION

WATER BODY [1]	MUN*	AGR*	IND*	PROC*	GWR	FRSH	NAV	POW	REC1	REC2	COMM	WARM	COLD	BIOL	SAL	WILD	RARE	MAR	MIGR	SPWN	SHELL	EST	AQUA
Illinois River HA																							
Illinois River	E	E	E	P		E		P	E	E	E		E			E			E	E			P
Winchuck River HU																							
Winchuck River	E	E	E	P		E		P	E	E	E		E			E			E	E			P
Smith River HU																							
Smith River	E	E	E	E	E				E	E	E	E	E			E	E		E	E		E	E
Lake Earl									E	E	E	E				E			E			E	P
Lake Talawa									E	E	E	E				E			E			E	P
Crescent City Harbor							E		E	E	E					E		E	E	E	E		P
Redwood Creek HU																							
Redwood Creek	E	E	E						E	E	E		E			E	E		E	E		E	P
Mad River HU																							
Mad River	E	E	E	E	E			E	E	E	E	E	E			E	E		E	E		E	E
Eureka Plain HU																							
Humboldt Bay		E	E				E		E	E	E		E			E	E	E	E	E	E	E	E
Eel River HU																							
Eel River	E	E	E		E		E	E	E	E	E	E	E			E	E		E	E		E	E
Van Duzen River	E	E	E						E	E	E		E			E	E		E	E			E
South Fork Eel River	E	E	E		E				E	E	E		E			E	E		E	E			P
Middle Fork Eel River	E	E	E		E				E	E	E		E			E	E		E	E			P
Outlet Creek	P	E	E		E				E	E	E		E			E			E	E			P
Cape Mendocino HU																							
Bear River	P		E						E	E	E		E			E			E	E		E	P
Mattole River	E	E	E						E	E	E		E			E			E	E		E	P
Mendocino Coast HU																							
Ten Mile River	E	E	E		E				E	E	E		E			E			E	E		E	P
Noyo River	E		E		E				E	E	E		E			E			E	E		E	P
Jug Handle Creek	E	E	E		E				E	E	E		E			E			E	E		E	P
Big River	E	E	E		E				E	E	E		E			E			E	E		E	P
Albion River	E		E		E				E	E	E		E			E			E	E		E	P
Navarro River	E	E	E		E		E		E	E	E		E			E			E	E		E	P
Garcia River	P	E	E						E	E	E		E			E			E	E		E	P
Gualala River	E		E						E	E	E		E			E			E	E		E	P

TABLE 2-1 (CONTINUED)
BENEFICIAL WATER USES IN THE NORTH COAST REGION

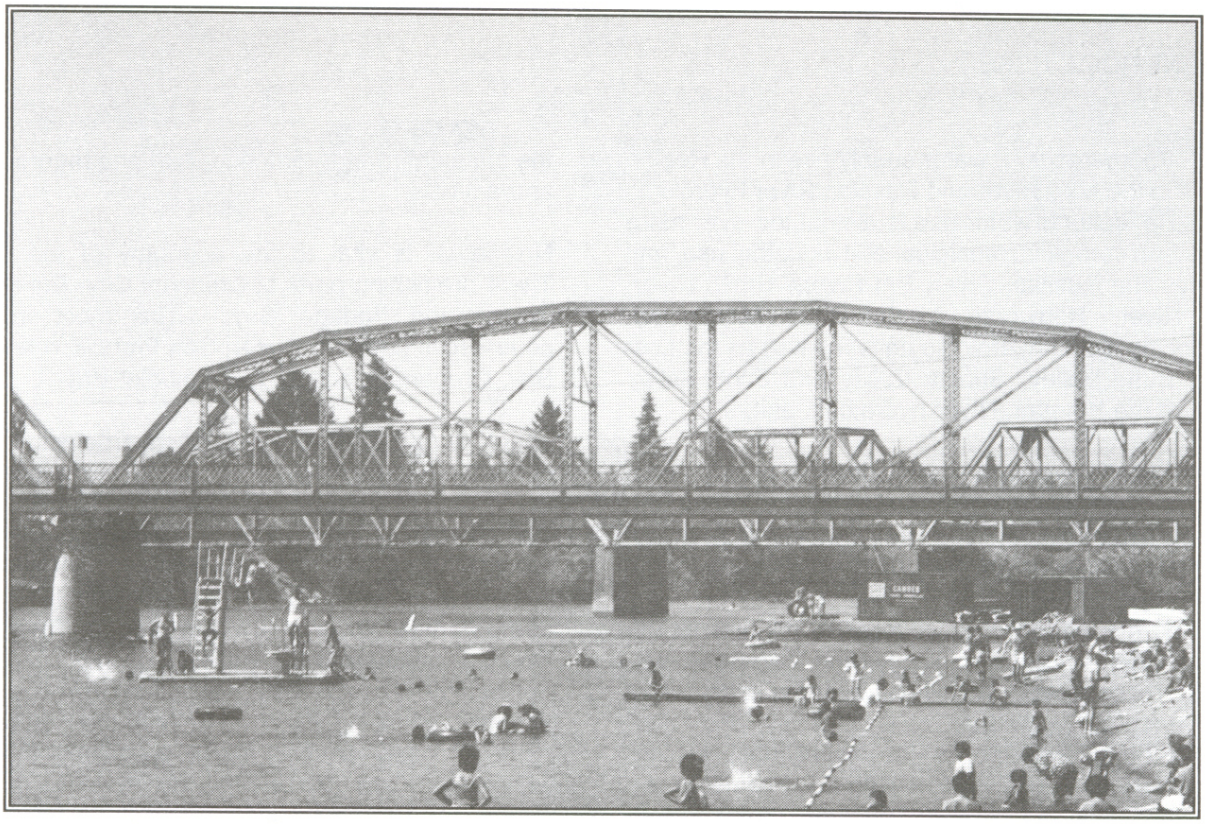
WATER BODY [1]	MUN*	AGR*	IND*	PROC*	GWR	FRSH	NAV	POW	REC1	REC2	COMM	WARM	COLD	BIOL	SAL	WILD	RARE	MAR	MIGR	SPWN	SHELL	EST	AQUA
Russian River HU																							
Russian River	E	E	E	E	E		E	E	E	E	E	E	E			E			E	E		E	E
Laguna de Santa Rosa		E	E						E	E	E		E			E							P
Bodega HU																							
Bodega Bay		E	E				E		E	E	E		E	E		E		E	E	E	E		E
Coastal Waters			E		E		E		E	E	E			E				E	E	E	E		E
Minor Coastal Streams Not Listed above**	E	P	P		P				P	P	E		P			P			P	P		E	P
OCEAN WATERS			P	P			E		E	E	E			P		E	E	E	E	E	E		E
BAYS			P	P			E		P	E	E			P		E	P	E	E	E	E	P	P
ESTUARIES			P	P			E		E	E	P			P		E	P	E	E	E	E	E	P

[1] Water bodies are grouped by hydrologic unit (HU) or hydrologic area (HA).

* Groundwater or surface water

P = Potential
E = Existing

** Permanent or intermittent



Recreational water use at Healdsburg Memorial Beach, 1987 (B. Bacon)

Commercial and sport fishing and navigation water uses at Noyo Harbor, Fort Bragg, 1987 (B. Bacon)

A major percentage of water supply use in the Region occurs in the Mad River and Russian River hydrologic units. Agricultural water use is distributed over more areas than domestic, municipal and industrial use, and includes the Russian River, Eel River, Smith River, Mad River, Redwood Creek, Cape Mendocino, Mendocino Coast hydrologic units, as well as the Lost River, Butte Valley, Shasta Valley and Scott Valley areas of the Klamath River hydrologic unit.

Recreational use occurs in all hydrologic units on both fresh and salt water. Coastal areas receiving the greatest recreational use have been the ocean beaches, the lower reaches of rivers flowing to the ocean, and Humboldt and Bodega Bays. Rivers receiving the largest levels of recreational use are the Russian, Eel, Mad, Smith, Trinity, and Navarro Rivers, and Redwood Creek. Activities cover the spectrum of water-oriented recreation, with fishing and river running being popular on the rivers, and fishing, clamming and beach combing predominating at the ocean beaches and bays. Sightseeing has been an important recreational activity throughout all of the North Coast Region.

Fish and wildlife are abundant in the Region. Coastal waters and streams support anadromous fish which are important for both sport and commercial fishing. The Smith River, Klamath River, Redwood Creek, Mad River, Eel River, Russian River and the coastal streams total over 1,000 miles of stream habitat suitable for salmon and steelhead. Humboldt and Bodega Bays support shellfish and fish populations which are very important to the commercial fishing industry and to the recreationalist. Both bays also provide refuge for wildlife populations, especially waterfowl, shorebirds, and other water-associated birds.

Several of the watersheds of the North Coast Region support plant and wildlife species that are now considered to be rare, threatened, and endangered. A few examples are the Swainson's hawk, Bald eagle, American peregrine falcon, California clapper-rail, Lost River sucker, Shortnose sucker, California freshwater shrimp, Howell's spineflower, Baker's larkspur, and Sebastopol meadowfoam, all of which have been observed on watershed areas in the North Coast Region. The Department of Fish and Game prepares an annual report which summarizes the status of rare, threatened, and endangered plants and animals.

Navigation is vital to the economy of the Region. There are fishing ports at Crescent City, Eureka, Fort Bragg, and Bodega Bay. The most important commercial harbor between San Francisco and Coos Bay, Oregon, is located at Humboldt Bay.

There is a small amount of hydroelectric power generation in the Region. Hydroelectric power plants are located at Iron Gate Reservoir and Copco Lake on the Klamath River, Clair Engle Lake on the Trinity River, Matthews Dam on the Mad River, Van Arsdale Dam on the Eel River, Coyote Dam on the East Fork of the Russian River, and Warm Springs Dam on Dry Creek, a tributary to the Russian River.

Scientific studies occur in all units of the Region. The more intensely studied areas are along the coast where there are two marine life reserves and one refuge. The three areas, which include the Del Mar Landing Ecological Reserve, the Gerstle Cove Reserve, and the Bodega Bay Refuge, are located in Sonoma County. In addition to these, there are five other sites which have been included in the statewide system and designated as areas of special biological significance. These are the Pygmy Forest Ecological Staircase, kelp beds at Saunders Reef, kelp beds at Trinidad Head, Kings Range National Conservation Areas, and Redwood National Park.

Groundwaters throughout the Region are used for domestic, agricultural, and industrial supply. Shallow groundwaters are frequently used for domestic supply. These shallow groundwaters are often interconnected to deeper aquifers through their stratigraphy and through wells constructed across multiple aquifers.

Projected Water Demands

The population of the North Coast Region is projected to increase into the twenty-first century. Additional demands will be placed on the water resources of the Region to supply more water for future residential, commercial, industrial and agricultural developments, to accommodate a higher recreational demand, and to produce more fish and wildlife to satisfy increased sport fishing and hunting interests and commercial fishing requirements. At the same time, the aesthetic

beauty of the Region and its waters must be protected and in some cases enhanced.

In order to meet the increasing water demands posed by population growth in the North Coast Region, conservation, reclamation, and reuse of water must be encouraged. Previous projections of water demands assumed that normal weather patterns would prevail. The droughts of 1976 to 1977 and 1987 to 1992 revealed the deficiencies in water supply that exist in specific areas of the North Coast Region, including Fort Bragg, the Mendocino Coast, the Humboldt Bay area, and the Klamath River Basin.

The greatest demands for local water supply are expected to be in Sonoma and Mendocino counties although increased demand is expected region-wide in response to population increases. Agricultural water use is expected to increase in the Eel River, Navarro River, and Russian River areas. Almost all areas will experience small demands for agricultural water supply.

Recreational demands for the Region are projected to increase. The ocean and coastal areas and the lower reaches of the streams flowing to the ocean are expected to receive a major portion of the increased recreational demand. In recognition of the unique aesthetic and wildlife values of the North Coast Region rivers, several have been included in the California Wild and Scenic River System. These include the Smith River and all of its tributaries; the Klamath River below Iron Gate Dam, and portions of its major tributaries, the Scott, Salmon, North Fork Salmon Rivers and Wooley Creek, in addition to the Trinity River below Lewiston Dam and portions of its major tributaries, the North and South Forks, and the New River; and the main stem of the Eel River and portions of its major tributaries, the North, Middle and South Forks, and the Van Duzen River.

The demand for fishing has probably peaked due to reductions in anadromous salmonid species in several north coast rivers and streams. Efforts are being made in several of these areas to restore natural habitat in order to improve conditions for the fisheries. Salmon and steelhead populations in several north coast streams are being supplemented by releases of hatchery reared fish.

3. WATER QUALITY OBJECTIVES

The California Water Code, Division 7, Chapter 4, Section 13241 specifies that each Regional Water Quality Control Board (Regional Water Board) shall establish water quality objectives which, in the Regional Water Board's judgment, are necessary for the reasonable protection of the beneficial uses and for the prevention of nuisance.

The federal Clean Water Act (33 U.S.C. § 303) requires the State to submit to the Administrator of the U.S. Environmental Protection Agency for approval all new or revised water quality standards which are established for surface and ocean waters. Under federal terminology, water quality standards consist of the beneficial uses enumerated in Table 2-1 and the water quality objectives contained in this section. The water quality objectives contained herein are designed to satisfy all state and federal requirements.

As new information becomes available, the Regional Water Board will review the appropriateness of the objectives contained herein. These objectives will be subject to public hearing at least once during each three-year period following adoption of this Basin Plan to determine the need for review and modification as appropriate.

The water quality objectives contained herein are a compilation of objectives adopted by the State Water Board, the Regional Water Board, and other state and federal agencies. Other water quality objectives and policies may apply that may be more stringent. Whenever several different objectives exist for the same water quality parameter, the strictest objective applies. In addition, the State Water Board "Policy With Respect to Maintaining High Quality Waters in California" also applies.

Controllable water quality factors shall conform to the water quality objectives contained herein. When other factors result in the degradation of water quality beyond the levels or limits established herein as water quality objectives, then controllable factors shall not cause further degradation of water quality. Controllable water quality factors are those actions, conditions, or circumstances resulting from man's activities that may influence the quality of the waters of the State and that may be reasonably controlled.

Water quality objectives form the basis for establishment of waste discharge requirements, waste discharge prohibitions, or maximum acceptable cleanup standards for all individuals and dischargers. These water quality objectives are considered to be necessary to protect those present and probable future beneficial uses enumerated in Table 2-1 and to protect existing high quality waters of the State. These objectives will be achieved primarily through the establishment of waste discharge requirements and through the implementation of this Basin Plan. The appropriate numeric water quality standards will be established in waste discharge orders.

The Regional Water Board, in setting waste discharge requirements, will consider, among other things, the potential impact on beneficial uses within the area of influence of the discharge, the existing quality of receiving waters, and the appropriate water quality objectives. The Regional Water Board will make a finding as to the beneficial uses to be protected within the area of influence of the discharge and establish waste discharge requirements to protect those uses and to meet water quality objectives. Resolution Nos. 87-113, 89-131, and 92-135 describe the policy of the Regional Water Board regarding the specific types of waste discharge for which it will waive issuance of waste discharge requirements. These resolutions are included in the Appendix Section of this Plan.

The water quality objectives for the Region refer to several classes of waters. Ocean waters are waters of the Pacific Ocean outside of enclosed bays, estuaries, and coastal lagoons, and within the territorial (3 mile) limit. Bays are indentations along the coast which include oceanic waters within distinct headlands or harbor works whose narrowest opening is less than 75 percent of the greatest dimension of the enclosed portion of the bay; this definition includes only Crescent City Harbor in the Klamath River Basin, and Humboldt Bay and Bodega Bay in the North Coastal Basin. Estuaries are waters at the mouths of streams which serve as mixing zones for freshwater and seawater; they generally extend from the upstream limit of tidal action to a bay or open ocean. The principal estuarine areas of the Region are at the mouths of the Smith and Klamath Rivers and Lakes

Earl and Talawa, and at the mouths of the Eel, Noyo, and Russian Rivers. Inland waters include all surface waters and groundwaters of the basin not included in the definitions of ocean waters, enclosed bays, or estuaries. Interstate waters include all rivers, streams, and lakes which flow across or form part of a state boundary. Groundwaters are any subsurface bodies of water which are beneficially used or usable. They include perched water if such water is used or usable or is hydraulically continuous with used or usable water.

The water quality objectives which follow supersede and replace those contained in the 1971 "Interim Water Quality Control Plan for the Klamath River Basin," the 1967 "Water Quality Control Policy for the Klamath River in California," the 1967 "Water Quality Control Policy for the Smith River in California," the 1967 "Water Quality Control Policy for the Humboldt-Del Norte Coastal Waters," the 1969 "Water Quality Control Policy for the Lost River," the 1971 "Interim Water Quality Control Plan for the North Coastal Basin," the 1967 "Water Quality Control Policy for the Sonoma-Mendocino Coast," the 1975 "Water Quality Control Plan for the Klamath River Basin (1A)," the 1975 "Water Quality Control Plan for the North Coastal Basin (1B)," and the 1988 "Water Quality Control Plan for the North Coast Region".

GENERAL OBJECTIVE

The following objective shall apply to all waters of the Region.

Whenever the existing quality of water is better than the water quality objectives established herein, such existing quality shall be maintained unless otherwise provided by the provisions of the State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California", including any revisions thereto. A copy of this policy is included verbatim in the Appendix Section of this Plan.

OBJECTIVES FOR OCEAN WATERS

The provisions of the State Water Board's "Water Quality Control Plan for Ocean Waters of California" (Ocean Plan), and "Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California" (Thermal Plan), and any revisions thereto shall apply. Copies of these plans are included verbatim in the Appendix Section of this Plan.

OBJECTIVES FOR INLAND SURFACE WATERS, ENCLOSED BAYS, AND ESTUARIES

In addition to the General Objective, the specific objectives contained in Table 3-1 and the following objectives shall apply for inland surface waters, bays, and estuaries.

Color

Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.

Tastes and Odors

Waters shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or that cause nuisance or adversely affect beneficial uses.

Numeric water quality objectives with regards to taste and odor threshholds have been developed by the State Department of Health Services and the U.S. EPA. These numeric objectives, as well as those available in the technical literature, are incorporated into waste discharge requirements and cleanup and abatement orders as appropriate.

Floating Material

Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.

Suspended Material

Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.

Settleable Material

Waters shall not contain substances in concentrations that result in deposition of material that causes

nuisance or adversely affect beneficial uses.

Oil and Grease

Waters shall not contain oils, greases, waxes, or other materials in concentrations that result in a visible film or coating on the surface of the water or on objects in the water, that cause nuisance, or that otherwise adversely affect beneficial uses.

Biostimulatory Substances

Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

Sediment

The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

Turbidity

Turbidity shall not be increased more than 20 percent above naturally occurring background levels. Allowable zones of dilution within which higher percentages can be tolerated may be defined for specific discharges upon the issuance of discharge permits or waiver thereof.

pH

The pH shall conform to those limits listed in Table 3-1. For waters not listed in Table 3-1 and where pH objectives are not prescribed, the pH shall not be depressed below 6.5 nor raised above 8.5.

Changes in normal ambient pH levels shall not exceed 0.2 units in waters with designated marine (MAR) or saline (SAL) beneficial uses nor 0.5 units within the range specified above in fresh waters with designated COLD or WARM beneficial uses.

Dissolved Oxygen

Dissolved oxygen concentrations shall conform to those limits listed in Table 3-1. For waters not listed in Table 3-1 and where dissolved oxygen objectives are not prescribed the dissolved oxygen concentrations shall not be reduced below the following minimum levels at any time.

Waters designated WARM, MAR, or SAL . 5.0 mg/l
Waters designated COLD . . . . . 6.0 mg/l
Waters designated SPWN . . . . 7.0 mg/l
Waters designated SPWN during critical spawning and egg incubation periods . . . .9.0 mg/l

Bacteria

The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following:

In waters designated for contact recreation (REC-1), 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 (State Department of Health Services).

At all areas where shellfish may be harvested for human consumption (SHELL), the fecal coliform concentration throughout the water column shall not exceed 43/100 ml for a 5-tube decimal dilution test or 49/100 ml when a three-tube decimal dilution test is used (National Shellfish Sanitation Program, Manual of Operation).

Temperature

Temperature objectives for COLD interstate waters, WARM interstate waters, and Enclosed Bays and Estuaries are as specified in the "Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays of California" including any revisions thereto. A copy of this plan is included verbatim in the Appendix Section of this Plan.

In addition, the following temperature objectives apply to surface waters:

The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not

adversely affect beneficial uses.

At no time or place shall the temperature of any COLD water be increased by more than 5°F above natural receiving water temperature.

At no time or place shall the temperature of WARM intrastate waters be increased more than 5°F above natural receiving water temperature.

Toxicity

All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life. Compliance with this objective will be determined by use of indicator organisms, analyses of species diversity, population density, growth anomalies, bioassays of appropriate duration, or other appropriate methods as specified by the Regional Water Board.

The survival of aquatic life in surface waters subjected to a waste discharge, or other controllable water quality factors, shall not be less than that for the same water body in areas unaffected by the waste discharge, or when necessary for other control water that is consistent with the requirements for "experimental water" as described in **Standard Methods for the Examination of Water and Wastewater**, 18th Edition (1992). As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour bioassay.

In addition, effluent limits based upon acute bioassays of effluents will be prescribed. Where appropriate, additional numerical receiving water objectives for specific toxicants will be established as sufficient data become available, and source control of toxic substances will be encouraged.

Pesticides

No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses. There shall be no bioaccumulation of pesticide concentrations found in bottom sediments or aquatic life.

Waters designated for use as domestic or municipal supply shall not contain concentrations of pesticides in excess of the limiting concentrations set forth in California Code of Regulations, Title 22, Division 4,

Chapter 15, Article 4, Section 64444.5 (Table 5), and listed in Table 3-2 of this Plan.

Chemical Constituents

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the limits specified in California Code of Regulations, Title 22, Chapter 15, Division 4, Article 4, Section 64435 (Tables 2 and 3), and Section 64444.5 (Table 5), and listed in Table 3-2 of this Plan.

Waters designated for use as agricultural supply (AGR) shall not contain concentrations of chemical constituents in amounts which adversely affect such beneficial use.

Numerical water quality objectives for individual waters are contained in Table 3-1.

Radioactivity

Radionuclides shall not be present in concentrations which are deleterious to human, plant, animal or aquatic life nor which result in the accumulation of radionuclides in the food web to an extent which presents a hazard to human, plant, animal, or indigenous aquatic life.

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the limits specified in California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64443, Table 4, and listed below:

MCL Radioactivity

Constituent	Maximum Contaminant Level, pCi/l
Combined Radium-226 and Radium-228	5
Gross Alpha particle activity (including Radium-226 but	15

excluding Radon and Uranium)

Tritium	20,000
Strontium-90	8
Gross Beta particle activity	50
Uranium	20

TABLE 3-1

SPECIFIC WATER QUALITY OBJECTIVES FOR NORTH COAST REGION

Waterbody[1]	Specific Conductance (micromhos) @ 77°F		Total Dissolved Solids (mg/l)		Dissolved Oxygen (mg/l)			Hydrogen Ion (pH)		Hardness (mg/l)	Boron (mg/l)	
	90% Upper Limit[3]	50% Upper Limit[2]	90% Upper Limit[3]	50% Upper Limit[2]	Min	90% Lower Limit[3]	50% Lower Limit[2]	Max	Min	50% Upper Limit[2]	90% Upper Limit[3]	50% Upper Limit[2]
Lost River HA												
Clear Lake Reservoir & Upper Lost River	300	200			5.0		8.0	9.0	7.0	60	0.5	0.1
Lower Lost River	1000	700			5.0		-	9.0	7.0	-	0.5	0.1
Other Streams	250	150			7.0		8.0	8.4	7.0	50	0.2	0.1
Tule Lake	1300	900			5.0		-	9.0	7.0	400	-	-
Lower Klamath Lake	1150	850			5.0		-	9.0	7.0	400	-	-
Groundwaters [4]	1100	500			-		-	8.5	7.0	250	0.3	0.2
Butte Valley HA												
Streams	150	100			7.0		9.0	8.5	7.0	30	0.1	0.0
Meiss Lake	2000	1300			7.0		8.0	9.0	7.5	100	0.3	0.1
Groundwaters [4]	800	400			-		-	8.5	6.5	120	0.2	0.1
Shasta Valley HA												
Shasta River	800	600			7.0		9.0	8.5	7.0	220	1.0	0.5
Other Streams	700	400			7.0		9.0	8.5	7.0	200	0.5	0.1
Lake Shastina	300	250			6.0		9.0	8.5	7.0	120	0.4	0.2
Groundwaters [4]	800	500			-		-	8.5	7.0	180	1.0	0.3
Scott River HA												
Scott River	350	250			7.0		9.0	8.5	7.0	100	0.4	0.1
Other Streams	400	275			7.0		9.0	8.5	7.0	120	0.2	0.1
Groundwaters [4]	500	250			-		-	8.0	7.0	120	0.1	0.1
Salmon River HA												
All Streams	150	125			9.0		10.0	8.5	7.0	60	0.1	0.0
Middle Klamath River HA												
Klamath River above Iron Gate Dam including Iron Gate & Copco Reservoirs	425	275			7.0		10.0	8.5	7.0	60	0.3	0.2
Klamath River below Iron Gate Dam	350	275			8.0		10.0	8.5	7.0	80	0.5	0.2
Other Streams	300	150			7.0		9.0	8.5	7.0	60	0.1	0.0
Groundwaters [4]	750	600			-		-	8.5	7.5	200	0.3	0.1
Applegate River HA												
All Streams	250	175			7.0		9.0	8.5	7.0	60	-	-
Upper Trinity River HA												
Trinity River [5]	200	175			7.0		10.0	8.5	7.0	80	0.1	0.0
Other Streams	200	150			7.0		10.0	8.5	7.0	60	0.0	0.0
Clair Engle Lake and Lewiston Reservoir	200	150			7.0		10.0	8.5	7.0	60	0.0	0.0

TABLE 3-1 (CONTINUED)

SPECIFIC WATER QUALITY OBJECTIVES FOR NORTH COAST REGION

Waterbody[1]	Specific Conductance (micromhos) @ 77°F 90% Upper Limit[3]	Specific Conductance (micromhos) @ 77°F 50% Upper Limit[2]	Total Dissolved Solids (mg/l) 90% Upper Limit[3]	Total Dissolved Solids (mg/l) 50% Upper Limit[2]	Dissolved Oxygen (mg/l) Min	Dissolved Oxygen (mg/l) 90% Lower Limit[3]	Dissolved Oxygen (mg/l) 50% Lower Limit[2]	Hydrogen Ion (pH) Max	Hydrogen Ion (pH) Min	Hardness (mg/l) 50% Upper Limit[2]	Boron (mg/l) 90% Upper Limit[3]	Boron (mg/l) 50% Upper Limit[2]
Hayfork Creek												
Hayfork Creek	400	275			7.0		9.0	8.5	7.0	150	0.2	0.1
Other Streams	300	250			7.0		9.0	8.5	7.0	125	0.0	0.0
Ewing Reservoir	250	200			7.0		9.0	8.0	6.5	150	0.1	0.0
Groundwaters 4	350	225			-		-	8.5	7.0	100	0.2	0.1
S.F. Trinity River HA												
S.F. Trinity River	275	200			7.0		10.0	8.5	7.0	100	0.2	0.0
Other Streams	250	175			7.0		9.0	8.5	7.0	100	0.0	0.0
Lower Trinity River HA												
Trinity River	275	200			8.0		10.0	8.5	7.0	100	0.2	0.0
Other Streams	250	200			9.0		10.0	8.5	7.0	100	0.1	0.0
Groundwaters 4	200	150			-		-	8.5	7.0	75	0.1	0.1
Lower Klamath River HA												
Klamath River	300[6]	200[6]			8.0		10.0	8.5	7.0	75[6]	0.5[6]	0.2[6]
Other Streams	200[6]	125[6]			8.0		10.0	8.5	6.5	25[6]	0.1[6]	0.0[6]
Groundwaters 4	300	225			-		-	8.5	6.5	100	0.1	0.0
Illinois River HA												
All Streams	200	125			8.0		10.0	8.5	7.0	75	0.1	0.0
Winchuck River HU												
All Streams	200[6]	125[6]			8.0		10.0	8.5	7.0	50[6]	0.0[6]	0.0[6]
Smith River HU												
Smith River-Main Forks	200	125			8.0		11.0	8.5	7.0	60	0.1	0.1
Other Streams	150[6]	125[6]			7.0		10.0	8.5	7.0	60[6]	0.1[6]	0.0[6]
Smith River Plain HSA												
Smith River	200[6]	150[6]			8.0		11.0	8.5	7.0	60[6]	0.1[6]	0.0[6]
Other Streams	1506	1256			7.0		10.0	8.5	6.5	606	0.16	0.06
Lakes Earl & Talawa	-	-			7.0		9.0	8.5	6.5	-	-	-
Groundwaters 4	350	100			-		-	8.5	6.5	75	1.0	0.0
Crescent City Harbor	-	-										
Redwood Creek HU												
Redwood Creek	220[6]	125[6]	115[6]	75[6]	7.0	7.5	10.0	8.5	6.5			
Mad River HU												
Mad River	300[6]	150[6]	160[6]	90[6]	7.0	7.5	10.0	8.5	6.5			
Eureka Plain HU												
Humboldt Bay	-	-	-	-	6.0	6.2	7.0	8.5	7			
Eel River HU												
Eel River	375[6]	225[6]	275[6]	140[6]	7.0	7.5	10.0	8.5	6.5			
Van Duzen River	375	175	200	100	7.0	7.5	10.0	8.5	6.5			

TABLE 3-1 (CONTINUED)

SPECIFIC WATER QUALITY OBJECTIVES FOR NORTH COAST REGION

Waterbody[1]	Specific Conductance (micromhos) @ 77°F		Total Dissolved Solids (mg/l)		Dissolved Oxygen (mg/l)			Hydrogen Ion (pH)		Hardness (mg/l)	Boron (mg/l)	
	90% Upper Limit[3]	50% Upper Limit[2]	90% Upper Limit[3]	50% Upper Limit[2]	Min	90% Lower Limit[3]	50% Lower Limit[2]	Max	Min	50% Upper Limit[2]	90% Upper Limit[3]	50% Upper Limit[2]
South Fork Eel River	350	200	200	120	7.0	7.5	0.0	8.5	6.5			
Middle Fork Eel River	450	200	230	130	7.0	7.5	10.0	8.5	6.5			
Outlet Creek	400	200	230	125	7.0	7.5	10.0	8.5	6.5			
Cape Mendocino HU												
Bear River	390[6]	255[6]	240[6]	150[6]	7.0	7.5	10.0	8.5	6.5			
Mattole River	300[6]	170[6]	170[6]	105[6]	7.0	7.5	10.0	8.5	6.5			
Mendocino Coast HU												
Ten Mile River	-	-	-	-	7.0	7.5	10.0	8.5	6.5			
Noyo River	185[6]	150[6]	120[6]	105[6]	7.0	7.5	10.0	8.5	6.5			
Jug Handle Creek	-	-	-	-	7.0	7.5	10.0	8.5	6.5			
Big River	300[6]	195[6]	190[6]	130[6]	7.0	7.5	10.0	8.5	6.5			
Albion River	-	-	-	-	7.0	7.5	10.0	8.5	6.5			
Navarro River	285[6]	250[6]	170[6]	150[6]	7.0	7.5	10.0	8.5	6.5			
Garcia River	-	-	-	-	7.0	7.5	10.0	8.5	6.5			
Gualala River	-	-	-	-	7.0	7.5	10.0	8.5	6.5			
Russian River HU												
(upstream) 8	320	250	170	150	7.0	7.5	10.0	8.5	6.5			
(downstream) 9	375[6]	285[6]	200[6]	170[6]	7.0	7.5	10.0	8.5	6.5			
Laguna de Santa Rosa	-	-	-	-	7.0	7.5	10.0	8.5	6.5			
Bodega Bay	-	-	-	-	6.0	6.2	7.0	8.5	7			
Coastal Waters 10	-	-	-	-	11	11	11	12	12			

1 Water bodies are grouped by hydrologic unit (HU), hydrologic area (HA), or hydrologic subarea (HSA).
2 50% upper and lower limits represent the 50 percentile values of the monthly means for a calendar year. 50% or more of the monthly means must be less than or equal to an upper limit and greater than or equal to a lower limit.
3 90% upper and lower limits represent the 90 percentile values for a calendar year. 90% or more of the values must be less than or equal to an upper limit and greater than or equal to a lower limit.
4 Value may vary depending on the aquifer being sampled. This value is the result of sampling over time, and as pumped, from more than one aquifer.
5

Daily Average Not to Exceed	Period	River Reach
60°F	July 1 - Sept. 14	Lewiston Dam to Douglas City Bridge
56°F	Sept. 15 - Oct. 1	Lewiston Dam to Douglas City Bridge
56°F	Oct. 1 - Dec. 31	Lewiston Dam to confluence of North Fork Trinity River

6 Does not apply to estuarine areas.
7 pH shall not be depressed below natural background levels.
8 Russian River (upstream) refers to the mainstem river upstream of its confluence with Laguna de Santa Rosa.
9 Russian River (downstream) refers to the mainstem river downstream of its confluence with Laguna de Santa Rosa.
10 The State's Ocean Plan applies to all North Coast Region coastal waters.
11 Dissolved oxygen concentrations shall not at any time be depressed more than 10 percent from that which occurs naturally.
12 pH shall not be changed at any time more than 0.2 units from that which occurs naturally.
- no water body specific objective available.

TABLE 3-2

INORGANIC, ORGANIC, AND FLUORIDE CONCENTRATIONS NOT TO BE EXCEEDED IN DOMESTIC OR MUNICIPAL SUPPLY [1, 2]

Constituent	LIMITING CONCENTRATION IN MILLIGRAMS PER LITER Lower	Optimum	Upper	Maximum Contaminant Level, mg/L
Fluoride [3]				
53.7 and below	0.9	1.2	1.7	2.4
53.8 to 58.3	0.8	1.1	1.5	2.2
58.4 to 63.8	0.8	1.0	1.3	2.0
63.9 to 70.6	0.7	0.9	1.2	1.8
70.7 to 79.2	0.7	0.8	1.0	1.6
79.3 to 90.5	0.6	0.7	0.8	1.4
Inorganic Chemicals				
* Aluminum				1.0
Arsenic				0.05
Barium				1.0
Cadmium				0.01
Chromium				0.05
Lead				0.05
Mercury				0.002
Nitrate-N (as NO_3)				45
Selenium				0.01
Silver				0.05
Organic Chemicals				
(a) Chlorinated Hydrocarbons				
Endrin				0.0002
Lindane				0.004
Methoxychlor				0.1
Toxaphene				0.005
(b) Chlorophenoxys				
2,4-D				0.1
2,4,5-TP (Silvex)				0.01
(c) Synthetics				
Atrazine				0.003
Bentazon				0.018
Benzene				0.001
Carbon Tetrachloride				0.0005
Carbofuran				0.018
Chlordane				0.0001

TABLE 3-2 (CONTINUED)

INORGANIC, ORGANIC, AND FLUORIDE CONCENTRATIONS NOT TO BE EXCEEDED IN DOMESTIC OR MUNICIPAL SUPPLY [1, 2]

Constituent	LIMITING CONCENTRATION IN MILLIGRAMS PER LITER Maximum Contaminant Level, mg/L
(c) Synthetics (cont'd.)	
1,2-Dibromo-3-chloropropane	0.0002
1,4-Dichlorobenzene	0.005
1,1-Dichloroethane	0.005
1,2-Dichloroethane	0.0005
cis-1,2-Dichloroethylene	0.006
trans-1,2-Dichloroethylene	0.01
1,1-Dichloroethylene	0.006
1,2-Dichloropropane	0.005
1,3-Dichloropropene	0.0005
Di(2-ethylhexyl)phthalate	0.004
* Ethylbenzene	0.680
Ethylene Dibromide	0.00002
Glyphosate	0.7
Heptachlor	0.00001
Heptachlor epoxide	0.00001
Molinate	0.02
Monochlorobenzene	0.030
Simazine	0.010
1,1,2,2-Tetrachloroethane	0.001
Tetrachloroethylene	0.005
* Thiobencarb	0.07
1,1,1-Trichloroethane	0.200
1,1,2-Trichloroethane	0.032
Trichloroethylene	0.005
Trichlorofluoromethane	0.15
1,1,2-Trichloro-1,2,2-Trifluoroethane	1.2
Vinyl Chloride	0.0005
* Xylenes [4]	1.750

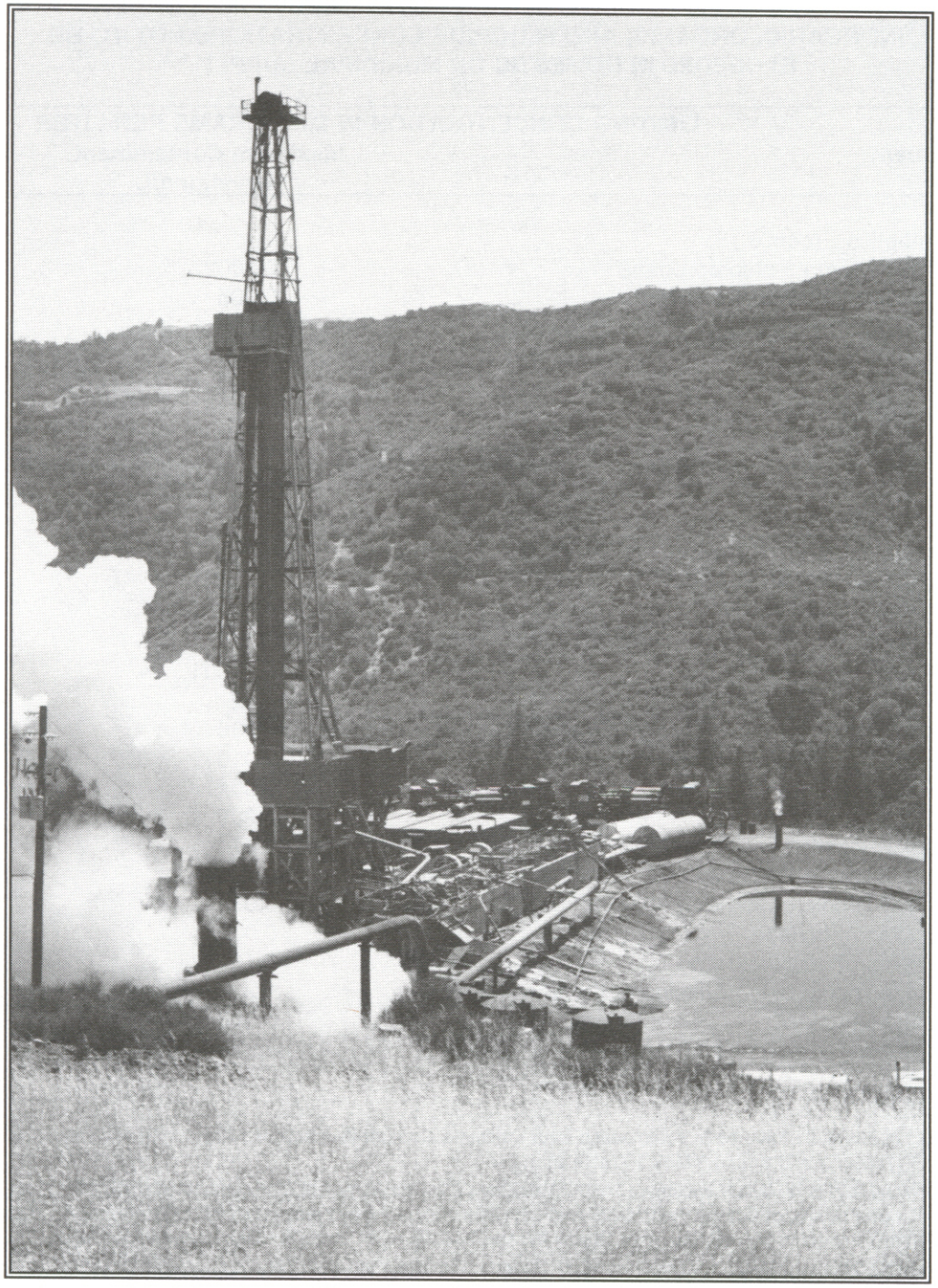
[1] Values included in this table have been summarized from California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Sections 64435 (Tables 2 and 3) and 64444.5 (Table 5).

[2] The values included in this table are maximum contaminant levels for the purposes of groundwater and surface water discharges and cleanup. Other water quality objectives (e.g., taste and odor thresholds or other secondary MCLs) and policies (e.g., State Water Board "Policy With Respect to Maintaining High Quality Waters in California") that are more stringent may apply.

[3] Annual Average of Maximum Daily Air Temperature, °F Based on temperature data obtained for a minimum of five years. The average concentration of fluoride during any month, if added, shall not exceed the upper concentration. Naturally occurring fluoride concentration shall not exceed the maximum contaminant level.

[4] Maximum Contaminant Level is for either a single isomer or the sum of the isomers.

* Constituents marked with an * also have taste and odor thresholds that are more stringent than the MCL listed. Taste and odor thresholds have also been developed for other constituents not listed in this table.



Geothermal steam well construction at the Geysers, Sonoma County, 1987
(D. Snetsinger)

WATER QUALITY OBJECTIVES FOR GROUNDWATERS

General Objectives

Tastes and Odors

Groundwaters shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.

Numeric water quality objectives have been developed by the State Department of Health Services and U.S. EPA. These numeric objectives, as well as those available in the technical literature, are incorporated into waste discharge requirements and cleanup and abatement orders as appropriate.

Bacteria

In groundwaters used for domestic or municipal supply (MUN), the median of the most probable number of coliform organisms over any 7-day period shall be less than 1.1 MPN/100 ml, less than 1 colony/100 ml, or absent (State Department of Health Services).

Radioactivity

Groundwaters used for domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the limits specified in California Code of Regulations, Title 22, Division r, Chapter 15, Article 5, Section 64443, Table 4 and listed in Table 3-2 of this Plan.

Chemical Constituents

Groundwaters used for domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the limits specified in California Code of Regulations, Title 22, Division 4, Chapter 15, Article 4, Section 64435 Tables 2 and 3, and Section 64444.5 (Table 5) and listed in Table 3-2 of this Plan

Groundwaters used for agricultural supply (AGR) shall not contain concentrations of chemical constituents in amounts that adversely affect such beneficial use.

Numerical objectives for certain constituents for individual groundwaters are contained in Table 3-1.

As part of the state's continuing planning process, data will be collected and numerical water quality objectives will be developed for those mineral and nutrient constituents where sufficient information is presently not available for the establishment of such objectives.

4. IMPLEMENTATION PLANS

This section presents the actions intended to meet water quality objectives and protect beneficial uses of the Klamath River Basin and North Coastal Basin. The following measures shall be taken with respect to actual and potential point and nonpoint sources of water quality degradation.

POINT SOURCE MEASURES

WASTE DISCHARGE PROHIBITIONS

Section 13243 of the Porter-Cologne Water Quality Control Act authorizes the Regional Water Board - in a water quality control plan or in waste discharge requirements - to specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted.

Under this authority and in order to achieve water quality objectives, protect present and future beneficial water uses, protect public health, and prevent nuisance, the Regional Water Board declares that point source waste discharges, except as stipulated by the Thermal Plan, the Ocean Plan, and the action plans and policies contained in the Point Source Measures section of this Water Quality Control Plan, are prohibited in the following locations in the Region:

Klamath River Basin

1. All surface, freshwater impoundments and their tributaries, with the exception of the lower Lost River system.

2. Crescent City Harbor and all estuaries in accordance with the provisions of the State Water Board's "Water Quality Control Policy for the Enclosed Bays and Estuaries of California."

3. Smith River and its tributaries.

4. Klamath River and its tributaries, including but not limited to the Trinity, Salmon, Scott, and Shasta rivers and their tributaries.

5. The Applegate, Illinois, and Winchuck rivers and their tributaries.

6. On all coastal streams and natural drainage ways that flow directly to the ocean, all new discharges will be prohibited. Existing discharges to these waters will be eliminated at the earliest practicable date.

7. All intertidal reaches of the coast.

8. Areas of Special Biological Significance.

9. All other tidal waters unless it is demonstrated on the basis of waste characteristics, degree and reliability of treatment, rate of mixing and dilution, and other technical factors that water quality objectives will be met and all beneficial uses will be protected.

North Coastal Basin

1. All surface fresh water impoundments and their tributaries.

2. All bays and estuaries in accordance with the provisions of the State Water Resources Control Board's "Water Quality Control Policy for the Enclosed Bays and Estuaries of California".

3. The Mad and the Eel rivers and their tributaries during the period May 15 through September 30 and during all other periods when the waste discharge flow is greater than one percent of the receiving stream's flow as set forth in NPDES permits.[1]

4. The Russian River and its tributaries during the period of May 15 through September 30 and during all other periods when the waste discharge flow is greater than one percent of the receiving stream's flow as set forth in NPDES permits. In

[1] For dischargers not in compliance with the seasonal prohibition and waste discharge rate limitation, time schedules shall be set forth in National Pollutant Discharge Elimination System (NPDES) permit updates for each discharger. In addition, each discharger not in compliance shall report to the Regional Water Board on progress towards compliance on an annual basis.

addition, the discharge of municipal waste during October 1 through May 14 shall be of advanced treated wastewater in accordance with effluent limitations contained in NPDES permits for each affected discharger, and shall meet a median coliform level of 2.2 mpn/100 ml. [2]

5. The Regional Water Board will consider exceptions for cause to the waste discharge rate limitations set forth in Prohibitions 3. and 4. (above). Exceptions shall be defined in NPDES permits for each discharger, on a case by case basis, and in accordance with the following:

   A. The wastewater treatment facility shall be reliable.

      Reliability shall be demonstrated through analysis of the features of the facility including, but not limited to, system redundancy, proper operation and maintenance, and backup storage capacity to prevent the threat of pollution or nuisance.

   B. The discharge of waste shall be limited to rates and constituent levels which protect the beneficial uses of the receiving waters.

      Protection shall be demonstrated through analysis of all the beneficial uses of the receiving waters. For receiving waters which support domestic water supply (MUN) and water contact recreation (REC1), analysis shall include expected normal and extreme weather conditions within the discharge period, including estimates of instantaneous and long-term minimum, average, and maximum discharge flows and percent dilution in receiving waters. The analysis shall evaluate and address cumulative effects of all discharges, including point and nonpoint source contributions, both in existence and reasonably foreseeable. For receiving waters which support domestic water supply (MUN), the Regional Water Board shall consider the California Department of Health Services evaluation of compliance with the Surface Water Filtration and Disinfection Regulations contained in Section 64650 through 64666, Chapter 17, Title 22 of the California Code of Regulations. Demonstration of protection of beneficial uses shall include consultation with the California Department of Fish and Game regarding compliance with the California Endangered Species Act.

   C. The exception shall be limited to that increment of wastewater which remains after reasonable alternatives for reclamation have been addressed.

   D. The exception shall comply with State Water Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality Waters in California," and the federal regulations covering antidegradation (40 CFR §131.12).

   E. There shall be no discharge of waste during the period May 15 through September 30.

6. On all other coastal streams and natural drainageways that flow directly to the ocean all new discharges will be prohibited. Existing discharges to these waters will be eliminated at the earliest practicable date.

7. All intertidal reaches of the coast.

8. Areas of Special Biological Significance.

9. All other tidal waters unless it is demonstrated on the basis of waste characteristics, degree and reliability of treatment, location of discharge, rate of mixing and dilution, and other technical factors that water quality objectives will be met and all beneficial uses will be protected.

[2] For dischargers not in compliance with the waste discharge rate limitation and/or advanced wastewater treatment, time schedules shall be set forth in NPDES permit updates for each discharger. In addition, each discharger not in compliance shall report to the Regional Water Board on progress towards compliance on an annual basis.

ACTION PLAN FOR HUMBOLDT BAY AREA

The purposes of this Action Plan for the Humboldt Bay Area are to:

1) acknowledge progress which has been made in the protection and enhancement of Humboldt Bay since the original (1975) Basin Plan and the 1980 and 1988 updates;

2) describe the current status of programs in the watershed;

3) describe the surveillance, monitoring and assessment activities necessary to provide ongoing protection and enhancement of the water quality of the Humboldt Bay watershed.

Progress

The original (1975) action plan for the Humboldt Bay Area was intended to guide publicly-funded cleanup of the Bay. It envisioned full implementation of the State Water Board's 1974 "Water Quality Control Policy for Enclosed Bays and Estuaries" (SWRCB Resolution 74-43) and called for elimination of discharge of municipal wastewaters and industrial process waters (exclusive of cooling water discharges) to Humboldt Bay. That action plan allowed the Regional Water Board to permit continued discharges based on findings that the wastewater in question would be consistently treated and discharged in a manner that would enhance the quality of receiving waters or beneficial uses above that which would occur in the absence of the discharge. NPDES permits were granted to the City of Eureka, the City of Arcata, and College of the Redwoods, in accordance with the State Water Board's 1974 "Water Quality Control Policy for Enclosed Bays and Estuaries". Six publicly-owned treatment works (POTW) discharges and numerous overflow-prone pumping stations have been eliminated. Hundreds of failure-prone on-site sewage disposal systems have been eliminated through the sewering of those areas.

Since the 1970s, numerous other measures to protect and enhance the water quality and beneficial uses of Humboldt Bay have been successfully implemented through application of Basin Plan action plans, policies
and programs administered by the Regional Water Board and other state and local agencies.

While these accomplishments and assessments are important, water quality problems and concerns still exist in the Humboldt Bay area. As illustrated in the statewide Water Quality Assessment program, the Bay has been affected by point and nonpoint sources

of water pollution and the potential for polluting episodes remains.

Bacterial Quality Concerns

The bacterial quality of Humboldt Bay is of particular concern due to the location of several of California's most important commercial oyster "farms" in the northern lobe of the estuary known as Arcata Bay. The shellfish harvest areas are classified by the California Department of Health Services according to several criteria, including their proximity to pollutant sources and the Department's knowledge that such areas are (or are not) of suitable sanitary quality. The Department is assisted in its classification process by close coordination with the Regional Water Board, sewage-management agencies, and the shellfish growers.

In Arcata Bay, shellfish harvest is permitted only in "Conditionally Approved" areas where water bacteriological quality meets the prescribed numerical standards described in Section 3 of this Plan, except during certain predictable periods. In this estuary, the exception occurs any time that a storm produces rainfall in excess of one-half inch within 24 hours. A harvest closure begins with each such storm and lasts for several days, depending on the storm pattern and intensity and the documented time required for "clearance" after the storm. This restriction recognizes that the bacterial quality of runoff into the Bay from all tributary watersheds causes the Bay waters to exceed the harvest-allowance standard.

In a federally-funded (Clean Water Act Section 208) study of the Bay in 1981-82, the Regional Water Board assessed the relative contributions of bacteria-laden runoff from different representative land-use areas including agricultural (pasture), rural residential, and urban areas. All were shown to produce significant bacterial concentrations in stormwater runoff. The major contribution was from pasture and rangelands. The assessment estimated that, should this land-use source be managed to preclude high-level bacterial discharges, there might be fewer days of shellfish harvest closure after each storm. The Department of Health Services, in its Humboldt Bay Management Plan, recognizes that such management has not been implemented.

Other Water Quality Concerns

Agricultural uses in the Humboldt Bay watershed include permanent pasture, confined animal facilities, commercial-scale flower and bulb farms, and grazing. These activities may result in erosion and runoff, producing discharges of sediment, nutrients, bacteria, and pesticides. Bacteria-laden runoff has been identified as the primary agriculturally-related discharge in the Humboldt Bay watershed. Continued Regional Water Board review and monitoring of agricultural activities is necessary.

Forestry activities in the watershed include timber harvesting, road construction, site preparation, and herbicide application. Timberland owners located in the upper watershed areas will continue to file timber harvest plans on lands zoned for timber harvest production. Road construction and reconstruction within streamside management zones and concentration of logging operations in a watershed will be given special scrutiny to avoid individual and cumulative impacts on the streams.

Urban runoff is affected by past and current land uses which range from thousands of individual households and small businesses to several wood-product factories, each with actual or potential discharges of pollutants via stormwater runoff. The recent stormwater NPDES regulations and possible small-municipality regulations must be implemented to advance the management of runoff-borne pollutants. In addition, the Regional Water Board has an active program to secure cleanup of contaminated soils, runoff and groundwater from such sites.

In addition, there are several sites around the bay where past spills and leaks have contaminated groundwater which discharges to the bay. The Regional Water Board, local agencies, and responsible parties must utilize appropriate cleanup and abatement practices to address these problems.

Regional Water Board and local agency programs to assist small business owners in preventing discharges of polluting chemicals must also be implemented.

Continued surveillance, monitoring, and assessment of water quality and land use activities around Humboldt Bay, and implementation of the Bays and Estuaries Policy are necessary to assure protection and enhancement of Humboldt Bay and its beneficial uses.

Accordingly, the Action Plan for Humboldt Bay includes the following elements:

1) Discharger surveillance and monitoring;

2) Review and assessment of land use activities; and

3) Continued coordination with other state and local agencies with various responsibilities with regards to Humboldt Bay.

ACTION PLAN FOR THE SANTA ROSA AREA
Interim Action Plan (1986 - 1990)[3] for the Santa Rosa Area:

On or before July 1, 1990, the Regional Water Board will formally review this Interim action plan and may revoke authority to discharge under the provisions of the plan or may extend the interim compliance date providing the City of Santa Rosa demonstrates to the Regional Water Board reasonable progress on the City's stated goal to eliminate direct disposal of treated waste in the Russian River.

1. There shall be no discharge of waste to the Russian River from the Laguna Regional Sewage Treatment Facility during the period of May 15 through September 30 each year. There shall

[3] On September 21, 1989, the Regional Water Board adopted Resolution No. 89-111 which recognized the City of Santa Rosa's progress in complying with the Long-Range Plan for the Russian River and provides for continued application of the Interim Action Plan standards to the Santa Rosa area through July 1, 1995. Cease and Desist Order No. 92-147 adopted by the Regional Water Board on December 10, 1992 extends the Interim Action Plan standards through September 30, 1997 and Cease and Desist Order No. 93-103 adopted by the Regional Water Board on October 27, 1993 further extends the Interim Action Plan standards through September 30, 1999. This action plan will be amended at a future

date.

be no discharge from the Laguna Regional Sewage Treatment Facility for all other periods except as follows:

A. To the extent possible, only advanced treated wastewater as defined in effluent limitations contained in an NDPES permit shall be discharged during October 1 to May 14. However, discharges of secondary treated wastewater as defined in effluent limitations contained in an NDPES permit meeting a median total coliform level of 23 MPN/100 ml from the Laguna Regional Sewage Treatment and Disposal Facilities may be discharged during October 1 to May 14 at rates not exceeding one percent of the flow of the Russian River. In any year, there shall be no discharge of secondary treated wastewater to the Russian River when the flow of the River as measured at Guerneville (USGS Gage No. 11-4670.00) is less than 1,000 cfs. In instances when secondary treated wastewater is discharged, the discharger shall submit a report documenting the reasons for such discharges. In no case when secondary treated wastewater is discharged in combination with advanced treated wastewater shall the total discharge exceed one percent of the flow of the Russian River.

B. Discharge of advanced treated wastewater in accordance with an NDPES permit from the Laguna Regional Treatment and Disposal Facilities to the Russian River may be permitted during October 1 through May 14 when all the following conditions are met:

1. The discharger shall meet a total coliform level of 2.2 MPN/100 ml;

2. In any year, discharge shall not commence until after the flow of the Russian River initially reaches 1,000 cfs as measured at Guerneville (USGS Gage No. 11-46700.00) or until authorized by the Regional Water Board or its Executive Officer. Such authorization shall be based on evidence that justifies the necessity for the discharge and that shows that all beneficial uses of the Russian River and tributaries will continue

to be protected. The discharger shall document that system inflow has not exceeded the 1985 dry weather average plus incremental inflows not exceeding any irrigation and/or storage capacity added since 1985. Under wintertime (October 1 - May 14) drought conditions when the flow of the Russian River is less than 1,000 cfs, the Regional Water Board or its Executive Officer may suspend authorization to discharge waste, if necessary, to protect the beneficial uses of the Russian River or its tributaries.

3. Such discharge shall be limited to one percent of the flow of the Russian River except under the following conditions:

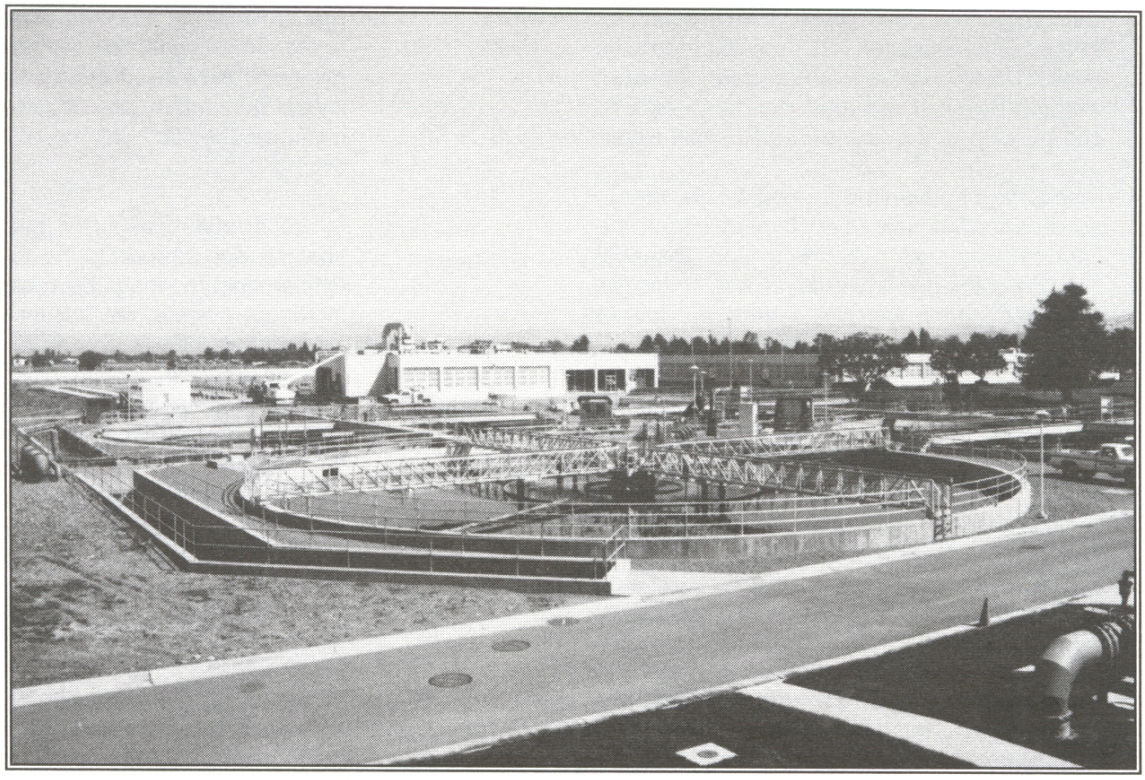
a. Discharges exceeding one percent of the flow of the Russian River shall be made in accordance with operating procedures to be incorporated into the NPDES permit for the Laguna Regional Wastewater Treatment Facilities. These operating procedures shall be designed to minimize the rate of discharge to the lowest percentage practicable, and to minimize the total volume of effluent discharged.

b. In such instances, the discharger shall provide a report to the Executive Officer documenting the reasons for increased waste discharges. The report shall include the dates, rates, and volumes of waste discharges and the circumstances necessitating such discharges and documentation that all beneficial uses of the Russian River and tributaries will be protected and that system inflow has not exceeded the 1985 dry weather average plus incremental inflow not exceeding any irrigation and/or

storage capacity added since 1985.

4. In no case shall any discharge of advanced treated wastewater exceed five percent of the flow of the Russian River.

Woodley Island Marina, Humboldt Bay, 1988 (C. Vath)



City of Santa Rosa Laguna Subregional Wastewater Treatment Plant, 1994 (C. Vath)

INTERIM ACTION PLAN FOR THE TRINITY RIVER

The purposes of this action plan are to describe those activities in the Trinity River watershed which implement the objectives listed below and to ensure a multi-agency collaborative approach to attainment of the objectives.

The Trinity River Division of the Central Valley Project, constructed in 1963 and operated by the United States Bureau of Reclamation, is a major water development project providing the transfer of water from the Trinity River to the Sacramento River Basin of California. Key features of the Trinity River Division are Lewiston Dam, Trinity Dam, and facilities which provide the diversion of runoff from the Trinity River watershed into the Sacramento River Basin. The construction of the dams and the diversion of approximately 80% of the natural flows of the Trinity River resulted in significant changes in the river.

The reduced flows resulted in changes to the river's temperature regime and disrupted physical cues for migration and spawning of salmon. To mitigate for the loss of fisheries habitat resulting from the project construction, the Trinity River Fish Hatchery was constructed at the base of Lewiston Dam. The fish populations have not been sustained, however, and both salmon and steelhead trout populations have declined since 1964, some stocks to as little as 10% of former levels. Efforts are currently underway to expand and improve the operations of the fish hatchery.

To the extent that factors are controllable as stated in Section 3 of this plan, the following temperature objectives shall apply to the activities in the Trinity River.

Daily Average Not to Exceed	**Period**	
60°F	July 1 - Sept. 14	Lewiston Dam to Douglas City Bridge
56°F	Sept. 15 - Oct. 1	Lewiston Dam to Douglas City Bridge
56°F	Oct. 1 - Dec. 31	Lewiston Dam to confluence of North Fork Trinity River

The Regional Water Board recognizes that the controllability of temperatures in the Trinity River downstream of Trinity and Lewiston Reservoirs is dependent on both climatic conditions and the operation of diversions to the Sacramento River.

The following ongoing efforts shall implement the temperature objective for the Trinity River:

The Trinity River Restoration Act (P.L. 98-541) authorized the Secretary of the Interior to formulate and implement a management program to restore fish and wildlife populations in the Trinity River Basin. To that end, the Bureau of Reclamation, the U.S. Fish and Wildlife Service, and the California Department of Fish and Game formed the Trinity River Task Force in 1971 to study the fish and wildlife problems of the basin and to prepare a plan for identification and mitigation of the problems. Membership in the Trinity River Fishery Restoration Task Force now also includes the U.S. Bureau of Indian Affairs, the California Department of Water Resources, Trinity County, Humboldt County, the Hoopa Valley Tribe, the Yurok Tribe, the U.S. Forest Service, the Bureau of Land Management, the U.S. Soil Conservation Service, the National Marine Fisheries Service, the California Department of Forestry and Fire Protection, and the State Water Resources Control Board.

The Trinity River Task Force shall seek to achieve the temperature objectives listed above through its individual and collective authorities. In addition, the authorities shall strive to optimize Trinity River restoration efforts through the efficient and balanced use of cold water reserves from Trinity and Lewiston reservoirs.

In 1981, the U.S. Fish and Wildlife Service and the Water and Power Resources Service of the Central Valley Project entered into an agreement, signed by the Secretary of the Interior, to work cooperatively to halt further fishery declines and to begin an effective restoration program in the Trinity River. In recognizing the problem of balancing the needs to sustain the fishery resources in the Trinity River and the uses outside of the basin for water and power, the agreement established flow allocations for normal, dry, and critically dry years for a period of twelve years. At the end of the twelve year evaluation period, the agreement calls for the U.S. Fish and Wildlife Service to submit a report to the Secretary of the Interior

which summarizes the effectiveness of restoration of flows and recommends an appropriate course of action for future management of Trinity River flows. The twelve-year evaluation period began in 1985 and is scheduled for completion in 1996. The agreement also recognizes the need for the completion of a Fish and Wildlife Management Plan by the Trinity River Task Force, and its implementation to successfully restore the anadromous resources of the Trinity River Basin.

Because of the successive dry-weather conditions since 1985 and the subsequent release of reduced flows to the Trinity River, the Secretary of the Interior amended the 1981 agreement to provide increased flows to the Trinity River in 1991 and in successive years until the U.S. Fish and Wildlife Service completes its study of the Trinity River flows.

As information from the twelve-year study becomes available, the Regional Water Board shall review the effectiveness of this action plan in attaining the water temperature objectives.

In 1985 the Bureau of Reclamation entered into a cooperative agreement with the California Department of Fish and Game, U.S. Fish and Wildlife Service, and the National Marine Fisheries Service to coordinate the operations of the Trinity River Division which impact the fishery resources. To that end, the agencies together attempt to establish the timing and the proportion of releases from Trinity Dam and Lewiston Dam which would most efficiently utilize the cold water reserves available for use by the anadromous fishery.

The above agencies shall collaborate to implement the objectives set forth in this plan, and shall apprise the Regional Water Board of the progress of this effort on an annual basis.

The State Water Board issued Orders WR 90-5 and 91-01 on May 5, 1990 and January 10, 1991, which set terms and conditions for fishery protection and set a schedule for completion of tasks for the thirty-two water rights permits, licenses, permitted applications and licensed applications for the Bureau of Reclamation's Central Valley Project. The orders included seven pending permitted applications for the diversion of cold water reserves from the Trinity River. The Orders recognized that protection of the upper Sacramento River fishery by means of water diversions from the Trinity River may adversely affect the Trinity River if not properly controlled, and chose to prevent and avoid any adverse effects to the Trinity River fishery as a result of the Order. The State Water Board will consider the comprehensive protection for the Trinity River fishery in a separate water rights proceeding in the near future. The State Water Board will consider the objectives set forth in this action plan in its future water rights proceedings for the Trinity River.

This action plan forms the basis for a collaborative approach to the management of fishery resources in the Trinity River and attainment of the water quality objectives.

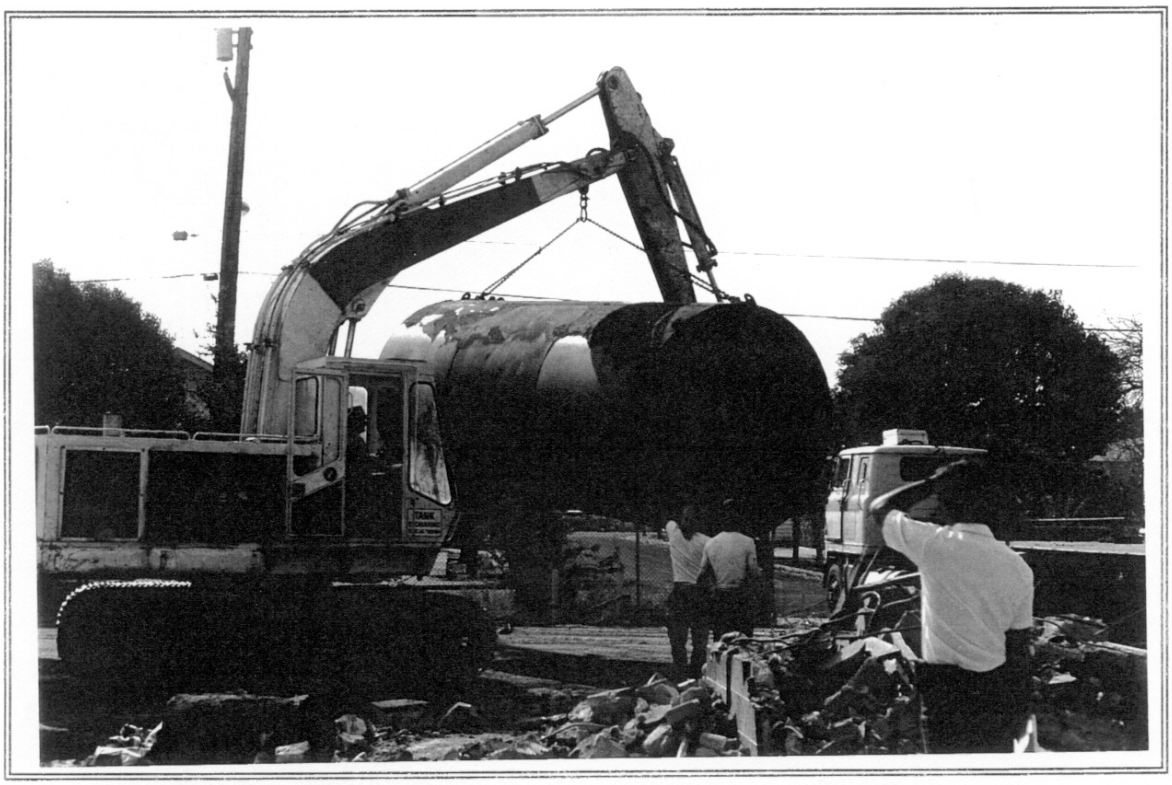
The Regional Water Board will periodically review this action plan and information resulting from temperature and fishery studies in the drainage and other areas to determine the need for modification.

INTERIM POLICY ON THE REGULATION OF WASTE DISCHARGES FROM UNDERGROUND PETROLEUM TANK SYSTEMS

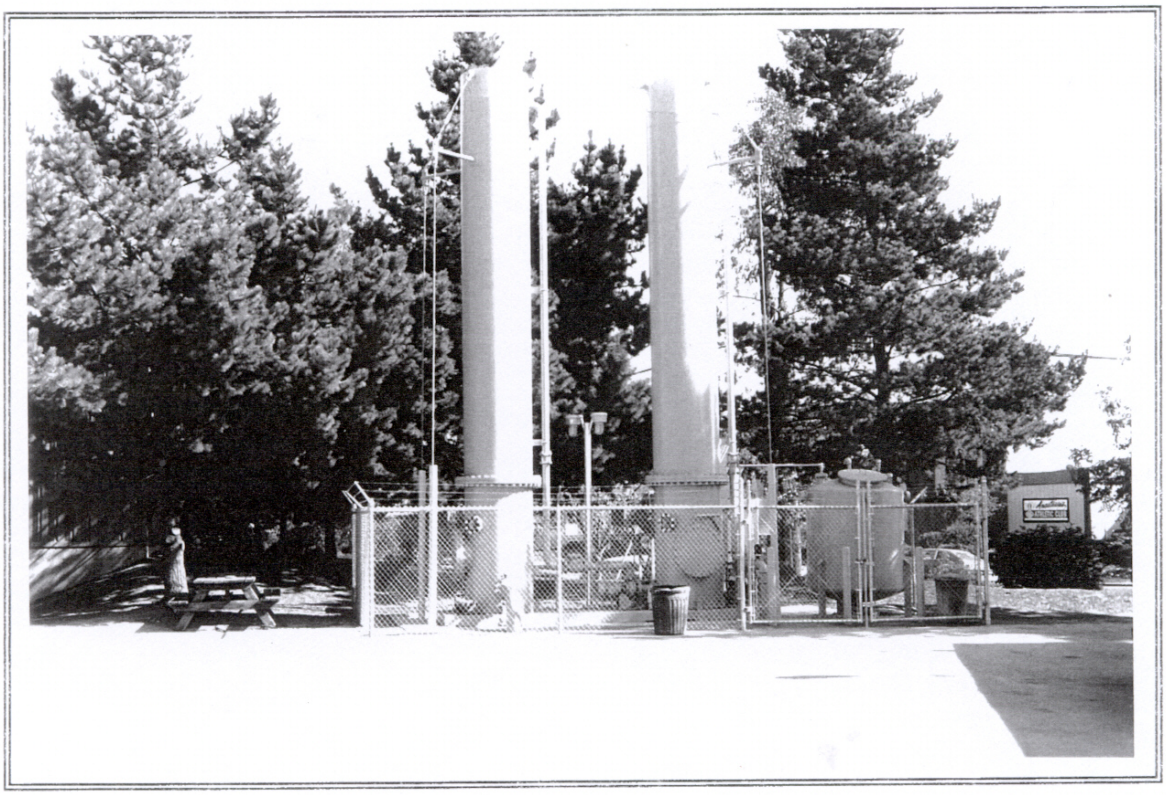
At present, the Regional Water Board is using the following laws, policies, regulations and guidelines as the basis for investigations and cleanup of discharges from underground petroleum tank systems:

- The Porter-Cologne Water Quality Control Act
- The Water Quality Control Plan for the North Coast Region
- Chapters 15 and 16, Division 3, Title 23, California Code of Regulations
- State Water Resources Control Board Resolution No. 68-16
- The Health and Safety Code

It shall be the policy of the Regional Water Board to implement a program to investigate and cleanup groundwater pollution caused by unauthorized releases of petroleum from underground tanks that protects water quality while at the same time minimizes the cost to responsible parties and the public in general. The following principles shall constitute the Regional Water Board's interim policy:



Underground tank removal, 1988 (C. Vath)



Air-stripping towers for groundwater cleanup, 1988 (C. Vath)

1. With respect to all underground petroleum tank cases in this Region, the Regional Water Board's highest priority will be to eliminate pollutant sources through tank removal, free product removal, and removal of contaminated soil to the extent practicable. If required, the need for further remedial action will be based on impacts on the beneficial uses of affected waters as determined by reasonable monitoring or other investigation.

2. The Regional Water Board will then assign the highest priority to the resolution of underground petroleum tank cases where drinking water sources are being adversely impacted or are imminently threatened to be adversely impacted.

3. Where practicable, the Regional Water Board will schedule the investigation and cleanup of petroleum pollution by responsible parties to coincide with the availability of funds.

4. Where practicable, the Regional Water Board will recognize the use of alternative cleanup techniques such as in-situ bioremediation and passive remediation.

5. The Regional Water Board will assist the State Water Resources Control Board and claimants to the State Underground Storage Tank Cleanup Fund to further reduce investigative and cleanup costs while continuing to protect water quality:

   a. through technology transfer;

   b. through appropriate regulatory policy and legislative recommendations; and

   c. through continuing coordination to implement regulatory policy and law.

INTERIM ACTION PLAN FOR CLEANUP OF GROUNDWATERS POLLUTED WITH PETROLEUM PRODUCTS AND HALOGENATED VOLATILE HYDROCARBONS

Discharges of waste from treatment facilities designed to remove pollutants from groundwaters polluted with petroleum products and halogenated volatile hydrocarbons shall be permitted to surface waters of the North Coast Region year-round with no discharge flow limitations based on the flow of the receiving water provided that the following conditions are met:

1. The discharge from the treatment facility shall be pollutant-free. [4]

2. The discharge shall not adversely affect the beneficial uses of the receiving water.

3. The discharge is necessary because a polluted groundwater cleanup operation is required by an action of the Regional Water Board.

4. The discharge is necessary because no feasible alternative to the discharge (reinjection, reclamation, evaporation, discharge to a community wastewater treatment and disposal system, etc.) is available.

5. The discharge is regulated by NPDES Permit/Waste Discharge Requirements.

6. The discharger has demonstrated consistent compliance with Provision 1, above.

7. The discharge is in the public interest.

ACTION PLAN FOR STORM WATER DISCHARGES

Although storm water runoff is part of the natural hydrologic cycle, human activities, particularly industrialization and urbanization, can result in significant and problematic changes to the natural hydrology of an area. As a result, when rain falls, pollutants may become dissolved in or eroded into, and carried by

4 For the purposes of this Interim Action Plan, pollutants are defined as those constituents and their breakdown products that were discharged to soils and/or groundwaters that necessitated a groundwater cleanup. Pollutant-free is defined as discharges that contain no detectable levels of pollutants as analyzed in currently approved EPA or State of California methodology. The Regional Water Board will define detectable levels in terms of numerical limits and shall

specify such limits in individual NPDES permits or waste discharge requirements.

runoff, without treatment, into surface waters. These pollutants, unless controlled, may degrade the beneficial uses of surface waters. To address the recognized storm water problems, the U.S. Congress added Section 402(p) to the federal Clean Water Act in 1987. This section, and the federal regulations which implement it (40 CFR 122, 123, 124, November 1990), require NPDES permits for storm water discharges from municipalities and industries, including construction. The 1987 Clean Water Act amendments require municipalities to reduce pollutant discharges to the maximum extent practicable, and industries, including construction, to implement Best Available Technology and Best Conventional Pollutant Control Technology to reduce pollutants.

As a result of Section 402(p), the State of California developed a program for the implementation of four types of storm water permits; areawide municipal, site-specific industrial or construction, and general construction. Within that framework, the regional water boards issue the municipal areawide permits and site-specific industrial – construction site permits, and the State Water Resources Control Board (State Water Board) issues statewide general permits for the regulation of storm water resulting from industrial and construction activities. Enforcement of all categories of storm water permits is the responsibility of the Regional Water Board.

The Regional Water Board will implement Section 402(p) of the Clean Water Act by permitting discharges of storm water from municipalities which own and operate storm water sewer systems, and discharges associated with industrial and construction activity (as defined in 40 CFR Part 122), to surface waters of the North Coast Region provided the following conditions are met:

1. The discharge and the activities which affect the discharge are described in a Notice of Intent or Application for NPDES Permit filed with the State or Regional Water Board; and/or

2. The discharge and the activities which affect the discharge are managed in conformance with the provisions of the applicable NPDES permit.

The following policy shall be implemented with respect to discharges from individual waste treatment and disposal systems.

POLICY ON THE CONTROL OF WATER QUALITY WITH RESPECT TO ON-SITE WASTE TREATMENT AND DISPOSAL PRACTICES

I. OBJECTIVE

The North Coast Region is one of the fastest growing areas of California, with widespread and increasing dependence on on-site systems for sewage treatment and disposal. Due to ever-increasing costs, the ultimate construction of sewerage systems in developing areas can no longer be relied upon as a future solution to sewage disposal needs. More and more, on-site systems must be viewed as permanent means for waste treatment and disposal, capable of functioning properly for the life of the structure(s) served. The preponderance of adverse physical conditions throughout the North Coast Region necessitates careful evaluation of site suitability and design parameters for every on-site wastewater disposal system. This policy sets forth region-wide criteria and guidelines to protect water quality and to preclude health hazards and nuisance conditions arising from the subsurface discharge of waste from on-site waste treatment and disposal systems.

II. FINDINGS

1. On-site waste treatment and disposal can be acceptable and successful. The success of the on-site system is dependent on suitable site location, adequate design, proper construction, and regular maintenance. Failure of the on-site system can result in water pollution and the creation of health hazards and nuisance conditions.

2. Waste from on-site systems must be disposed and disbursed below ground surface and away from high groundwater. There are existing parcels of land which, due to limitations in size, unsuitable soils, and/or high groundwater, cannot accommodate on-site waste disposal.

3. Division 7 of the California Water Code grants to the Regional Water Board jurisdiction over all discharges of waste, including those from individual waste treatment and disposal systems or from community collection and disposal systems which utilize subsurface disposal. Local regulatory agencies, however, can most effectively control individual waste treatment and disposal systems, provided they strictly enforce ordinances and regulations designed to provide protection of water quality and the public health. Regulation of on-site systems on federal lands is beyond the jurisdiction of local agencies and must remain with the Regional Water Board.

4. The many variations in physical conditions, population densities, and parcel sizes throughout the Region may affect the propriety of use of on-site water treatment and disposal systems. Adherence to the guidelines, criteria, and water conservation practices contained herein ordinarily will protect public health and water quality. Local regulatory agencies and the Regional Water Board are encouraged to adopt more stringent regulations when warranted by local conditions.

5. Factors may arise which will justify less stringent requirements than set forth in the guidelines and siting and design criteria contained herein. Provision for waiver is included in this policy to address such situations.

6. On-site waste treatment and disposal systems can be an excellent sanitation device in rural and rural-urban areas. However, in areas where population densities are generally high and the availability of land is limited, on-site systems are not desirable. On-site waste treatment and disposal systems should not be permitted if adequate community sewerage systems are available or feasible.

7. Water conservation practices may protect present and future beneficial uses and public health, and may prevent nuisance and prolong the effective life of on-site wastewater treatment and disposal systems. However, water conservation practices do not reduce the need to size on-site systems as set forth in this policy.

8. The life of on-site wastewater treatment and disposal systems may be severely limited if improperly maintained. A means must be available to assure adequate maintenance of individual waste treatment and disposal systems. Management by public entities is encouraged wherever practicable.

9. Soil characteristics play a dominant role in the suitability of a site for subsurface sewage disposal. Increased emphasis on determining and utilizing soils information will improve site suitability evaluations.

10. The installation of many on-site disposal systems within a given area may result in hydraulic interference between systems and adverse cumulative impacts on the quality of ground and surface waters. Physical solutions or limitations on waste load densities for land developments and other facilities may be necessary to avert such eventualities.

11. New technologies for on-site waste treatment and disposal continue to evolve. Means should be promoted to allows for timely and orderly consideration of promising alternative methods of waste treatment and disposal. Where alternative methods demonstrate enhanced performance, consideration may be given for utilization of different site criteria.

12. All aspects of on-site waste treatment and disposal would benefit from improved professional training and public education programs. Such training and education programs should be promoted by the Regional Water Board in cooperation with local regulatory agencies and public and private sector professional associations.

III. SITE EVALUATION CRITERIA AND METHODS

A. Criteria

The following site criteria are considered necessary for the protection of water quality and the prevention of health hazards and nuisance conditions arising from the on-site discharge of wastes from residential and small commercial establishments. They shall be treated as region-wide standards for assessing site suitability for

such systems. Waiver of individual criterion may be made in accordance with the "Provision for Waiver" contained in this policy. Systems resulting in large wastewater loads may require additional criteria which are not covered in this policy, and which will require review by the Regional Water Board on a case by case basis.

1. Subsurface Disposal

   On-site waste treatment and disposal systems shall be located, designed, constructed, and operated in a manner to ensure that effluent does not surface at any time, and that percolation of effluent will not adversely affect beneficial uses of waters of the State.

2. Ground Slope and Stability

   Natural ground slope in all areas to be used for effluent disposal shall not be greater than 30 percent.

   All soils to be utilized for effluent disposal shall be stable.

3. Soil Depth

   Soil depth is measured vertically to the point where bedrock, hardpan, impermeable soils or saturated soils are encountered.

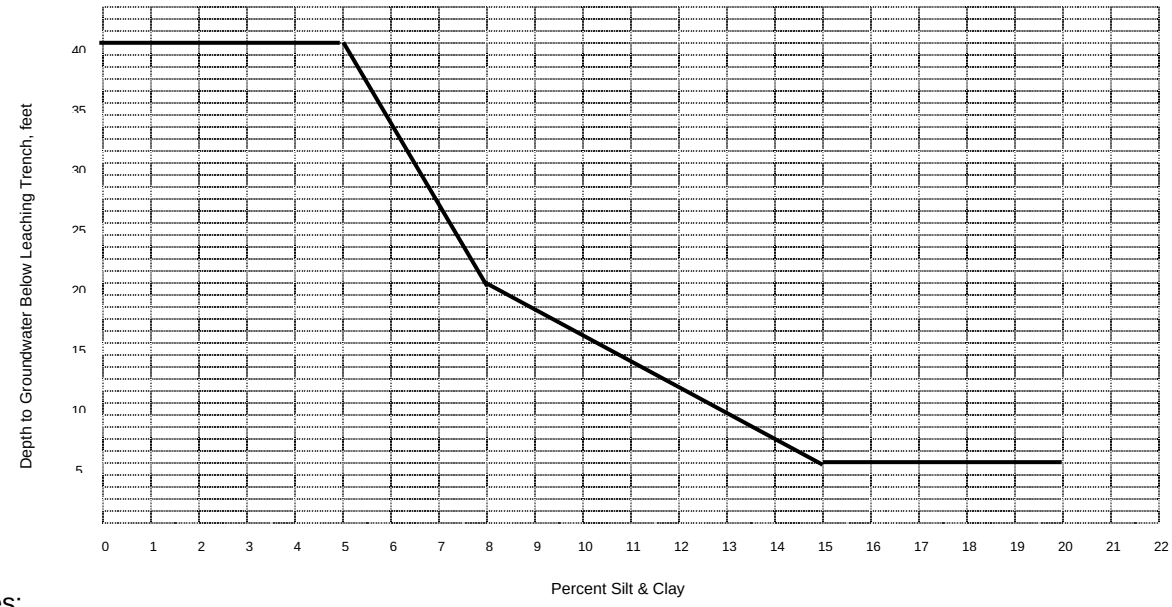
   The minimum soil depth immediately below the leaching trench shall be three feet.

   Lesser soil depths may be granted only as a waiver or for alternative systems.

4. Depth to Groundwater

   Minimum depth to the anticipated highest level of groundwater below the bottom of the leaching trench shall be determined from Figure 4-1.

FIGURE 4-1 MINIMUM DEPTH TO GROUNDWATER BELOW LEACHING TRENCH



Notes:

1. The Silt & Clay content shall be determined after adjustment for coarse fragments as indicated in the method set forth in Figure 4-2, and must exist for a minimum of three feet between the bottom of the leaching tranch and groundwater.
2. For percolation rates slower than 5 mpi, a minimum depth to groundwater below the leaching trench shall be five feet.
3. For soils having greater than 15% Silt & Clay, lesser depths to groundwater, to a minimum depth of two feet below the leaching trench, may be granted only as a waiver or for alternative systems.

5. Percolation Rates

Percolation test results in the effluent disposal area shall not be less than one inch per 60 minutes (60 MPI) for conventional leaching trenches. Percolation rates of less than one inch per 60 minutes (60 MPI) may be granted as a waiver or for alternative systems.

6. Setback Distances

Minimum setback distances for various features of individual waste treatment and disposal systems shall be as shown below in Table 4-1.

7. Replacement Area

An adequate replacement area equivalent to and separate from the initial effluent disposal area shall be reserved at the time of site approval. The replacement system area shall not be disturbed to the extent that it is no long suitable for wastewater disposal. The replacement system area shall not be used for the following: construction of buildings, parking lots or parking areas, driveways, swimming pools, or any other use that may adversely affect the replacement area.

B. Methods of Site Evaluation

Site evaluations are required in all instances to allow proper system design and to determine compliance with the proceeding site suitability criteria prior to approving the use of on-site waste treatment and disposal systems. The responsible regulatory agency or Regional Water Board should be notified prior to the conduct of site evaluations since verification by agency personnel maybe required. Site evaluation shall be conducted by individuals qualified as described in Section X.6 of this policy, and evaluation methods shall be in accordance with the following guidelines.

1. General Site Features

Site features to be determined by inspection shall include:

a. Land area available for primary disposal system and replacement area.

b. Ground slope in the effluent disposal and replacement area.

c. Location of cut banks, fills, or evidence of past grading activities, natural bluffs, sharp changes in slope, soil landscape formations, and unstable land forms within 50 feet of the disposal and replacement area.

TABLE 4-1

MINIMUM SETBACK DISTANCES
(FEET)

Facility	Well	Perennially Flowing Stream [1]	Ephemeral Stream [2]	Ocean Lake or Reservoir [3]	Cut Banks, Natural Bluffs and Sharp Changes in Slope	Unstable Land Forms
Septic Tank/Sump	100	50	25	50	25	50
Leaching Field	100	100	50	100	25 [4]	50

[1] As measured from the line which defines the limit of 10 year frequency flood.
[2] As measured from the edge of the water course.
[3] As measured from the high-water line.
[4] Where soil depth or depth to groundwater below the leaching trench are less than five feet, a minimum

set back distance of 50 feet shall be required.

d. Location of wells, intercept drains, streams, and other bodies of water on the property in question and within 100 feet on adjacent properties.

2. Soil Profiles

Soil characteristics shall be evaluated by soil profile observations. One backhoe excavation in the primary disposal field and one in the replacement area shall be required for this purpose. A third profile shall be required if the initial two profiles show conditions which are dissimilar enough so as to alter the ultimate design or location of the leachfield area.

Augered test holes shall be an acceptable alternative, upon determination of the responsible regulatory agency: (a) where use of a backhoe is impractical because of access or because of the fragile nature of the soils, (b) when necessary only to very conditions expected on the basis of prior soils investigations, or (c) when done in connection with geologic investigations. Where this method is employed, three test holes in the primary disposal field and three in the replacement area shall be required.

In the evaluation of new subdivisions, enough soil profile excavations shall be made to identify a suitable disposal and replacement area on each proposed parcel.

The following factors shall be observed and reported from ground surface to a limiting condition or five feet below the proposed leachfield system:

a. Thickness and coloring including Munsell Color Identification of soil layers, soil structure, and texture according to United States Department of Agriculture (USDA) classification.

b. Depth to a limiting condition such as hardpan, rock strata, a large volume of rock fragments, or impermeable soil layer.

c. Depth to observed groundwater.

d. Depth to and description of soil mottling and gleying.

e. Other prominent soil features which may affect site suitability, such as structure, stoniness, consistence, root zones and pores, dampness, massive and/or weak structured soils, etc.

3. Depth to Groundwater Determinations

The anticipated highest level of groundwater shall be estimated:

a. As the highest extent of soil mottling observed in the examination of soil profiles; or

b. By direct observation of groundwater levels during wet weather conditions. Methods for groundwater determinations and monitoring well construction shall be set forth by the local regulatory agency.

Where a conflict in the above methods of examination exists, the direct observation shall govern.

In those areas which, because of parent materials, soils lack the necessary iron compounds to exhibit mottling, direct observation during wet weather conditions shall be required. Guidance in defining such areas shall be provided by the Regional Water Board for each county within the Region.

4. Soil Percolation Suitability

Determination of a site's suitability for percolation of effluent shall be either of the following methods:

a. Percolation Testing

Stabilized percolation rates shall be established utilizing methods specified by the local regulatory agency.

Percolation testing of soils falling within Zone 1 and Zone 2 may be conducted in non-wet weather conditions provided presoaking of the test hole is accomplished with (a) a continuous 12 hour presoaking, or (b) a minimum of four complete refillings beginning during the day prior to that of the conduct of the test.

Percolation testing of soils within Zone 3 and Zone 4 shall be conducted during wet weather conditions. However, percolation testing of soils within Zones 3 and 4 may be conducted in non wet weather conditions provided the soils demonstrate a low shrink swell potential (Plasticity Index of less than 20, ASTM D 4318-84).

b. Soil Analysis

Soil samples representing the significant horizons within the excavated soil profile shall be obtained and analyzed for texture and bulk density according to methods prescribed by the Regional Water Board. The results shall be plotted on the soil textural triangle of Figure 402 as per indicated instructions.

(1) Soils within Zone 1 shall be considered to have minimal filtration capabilities, requiring increased depths to groundwater as per Figure 4-1.

(2) Soils within Zone 2 shall be considered suitable for effluent disposal without further testing.

(3) Soils within Zone 3 and 4 shall require percolation testing as per (a) above to verify suitability for effluent disposal.

5. Wet Weather Criteria

Wet weather testing periods shall be determined geographically by local regulatory agencies incorporating the following criteria as a minimum:

a. Between January 1 and April 30; and

b. Following 10 inches of rain in a 30-day period or after one-half of the seasonal normal precipitation has fallen.

Modification of wet weather testing beyond the limits of the above criteria may be made in accordance with a program of groundwater level monitoring instituted and conducted by the local regulatory agency.

C. Provision for Waiver

Waiver of site suitability criteria and evaluation methods specified herein may be granted by the Regional Water Board or county Health Officer when it can be satisfactorily demonstrated that water quality will not be impaired and public health will not be threatened as a result of such waivers.

Waivers may be granted for:

(1) Individual cases, or
(2) Defined geographical areas.

The local regulatory agency shall notify the Regional Water Board of the basis for each waiver. Prior to granting geographical area waivers, the local regulatory agency shall submit technical justification to the Regional Water Board for review and concurrence.

D. Waiver Prohibitions

Where surveys conducted by the local regulatory agencies and/or Regional Water Board staff indicate that discharges from on-site waste treatment and disposal systems in specific geographical areas are resulting in or threatening to result in health hazards or water quality impairment, the Regional Water Board may prohibit the issuance of waivers in said areas. Identification of "waiver prohibition areas" is incorporated into Section VII of this policy.

Exemptions to such prohibitions shall be granted by the Regional Water Board only where an authorized public agency can provide satisfactory assurance that individual systems will be appropriately designed, located, sized, shaped, constructed, and maintained to provide adequate protection of beneficial uses of water and prevention of nuisance, pollution, and contamination.

E. Individual Systems Prohibitions

The discharge from existing or new individual systems utilizing subsurface disposal shall be prohibited by the Regional Water Board in accordance with Section 13280 of the California Water Code where substantial evidence shows that such discharges will result in violation of water quality objectives, will impair present or future beneficial uses of water, will cause pollution, nuisance, or contamination, or will unreasonably degrade the quality of any waters of the State. Identification of "individual systems prohibition areas" is incorporated into Section VIII of this policy.

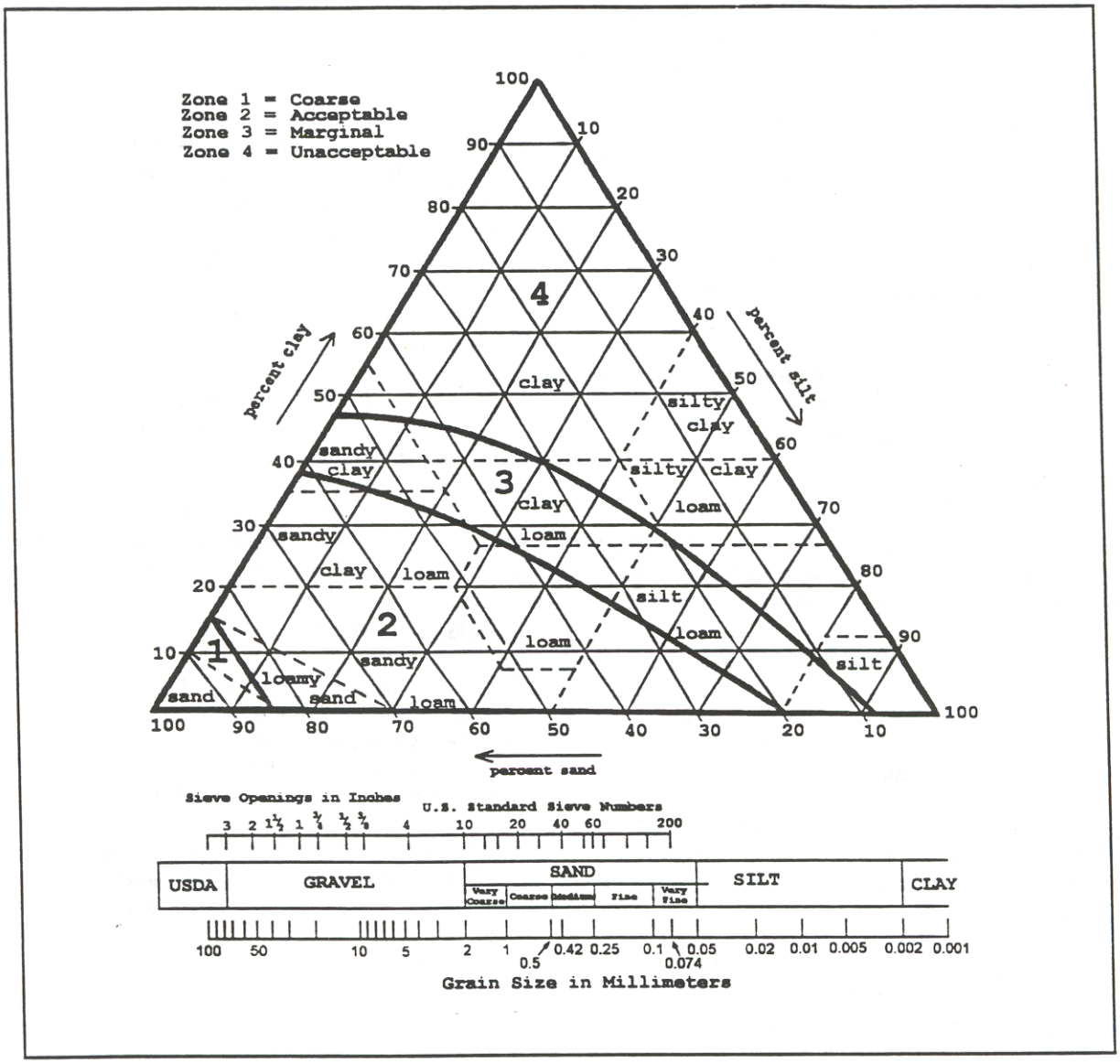
IV. DESIGN CRITERIA AND TECHNICAL GUIDELINES

A. Estimates of Wastewater Flows for Design Purposes

Although actual wastewater flows may in fact be less, estimates of wastewater flows for the design of conventional on-site systems shall be based on 150 gallons per day per bedroom. Local regulatory agencies may incorporate reduced flows into the design

of the on-site system upon approval by the Region Water Board or for alternative systems. Estimated glow rates for on-site systems receiving wastewater flows of greater than 1,500 gallons per day or from commercial

Figure 4-2 Soil Percolation Suitability Chart for Onsite Waste Treatment Systems



Instructions:

1. Plot texture on triangle based on percent sand, silt, and clay as determined by hydrometer analysis.

2. Adjust for coarse fragments by moving the plotted point in the 100 percent sand direction an additional 2% for each 10% (by volume) of fragments greater than 2mm in diameter.

3. Adjust for compactness of soil by moving the plotted point in the 100 percent clay direction an additional 15% for soils having a bulk-density greater than 1.7 gm/cc.

Note: For soils falling in sand, loamy sand, or sandy loam classification bulk density analysis will generally not affect suitability, and analysis is not necessary.

establishments shall take into account peak loading rates and the chemical characteristics of the wastewater.

B. Septic Tank Capacity, Construction, Inspection, and Testing

At a minimum, septic tank capacity, construction, inspection, and testing requirements shall be based upon the current edition of the International Association of Plumbing and Mechanical Officials Uniform Plumbing Code (1988 Edition), or other local agency regulations approved by the Regional Water Board.

Individual treatment units other than septic tanks shall require certification by the National Sanitation Foundation (NSF) or the International Association of Plumbing and Mechanical Officials (IAPMO) prior to approval for use.

C. Leachfield System Design

The design of the leachfield shall be based on both the estimated flows set forth in Section IV.A. of this policy, and the organic loading of the on-site system. Table 4-2, or other local regulatory agency regulations approved by the Regional Water Board shall be acceptable for conventional on-site systems.

Utilization of the upper horizons for wastewater disposal shall be encouraged. Sidewall depth below the bottom of the leaching pipe shall be a minimum of 12 inches and shall not exceed 36 inches. The use of trenches deeper than 36 inches below the bottom of the leaching pipe shall be acceptable only where site investigations and plans by a qualified individual (per Section X.6. of this policy) demonstrate the suitability of the system to accept wastewater and protect quality.

Trench width shall not exceed 36 inches. Plastic leaching chambers are acceptable, provided the size is based on Table 4-2 of this policy.

D. Cesspools

The use of cesspools for on-site waste treatment and disposal shall be prohibited.

Table 4-2. RATES OF WASTEWATER APPLICATION FOR ABSORPTION AREAS

Soil Texture	Percolation Rate Minutes per Inch	Application Rate Gallons per Day per Square Foot
Gravel, coarse sand	<1	Not Suitable
Coarse to medium sand	1 – 5	1.2
Fine sand, loamy sand	6 – 15	1.1 – 0.8
Sandy loam, loam	16 – 30	0.7 – 0.6
Loam, porous silt loam	31 – 60	0.5 – 0.4
Silty clay loam, clay loam –a,b	61 – 120	0.4 – 0.2

Note: Application rates may be interpolated based on percolation rates, within the ranges listed above.

a. Soils without expandable clays.
b. These soils may be easily damaged during construction.

E. Holding Tanks

The use of holding tanks shall be prohibited except where the responsible regulatory agency determines that:

1. It is necessary to abate an existing nuisance or health hazard; or
2. The proposed use is within a sewer service area, sewers are under construction or contracts have been awarded and completion is expected within two years, there is capacity at the wastewater treatment plant and the sewering agency will assume responsibility for maintenance of the tanks; or
3. It is for use at a campground or similar temporary public facility where a permanent sewage disposal system is not necessary or feasible and maintenance is performed by a public agency.

F. Intercept Drains

The use of intercept drains to lower the level of perched groundwater in the immediate leachfield area shall be acceptable under the following conditions:

1. Natural ground slope is greater than 5 percent;
2. Site investigations show groundwater to be perched on bedrock, hardpan, or an impermeable soil layer;
3. The intercept drain extends from ground surface into bedrock, hardpan, or the impermeable soil layer.

In no case shall the pervious section of an intercept drain be located less than 15 feet upgradient or 50 feet laterally from any leachfield.

Where all of the above conditions cannot be met, actual performance of the intercept drain shall be demonstrated prior to approval.

G. Fills

The use of fills to create a leachfield cover shall be acceptable under the following conditions:

1. Where the natural soils and the fill material meet the evaluation criteria as described in Section III of this policy;
2. Where the quantity and method of fill application is described;
3. Where the natural slope does not exceed 20 percent;
4. Where placement of fill will not aggravate slope stability or significantly alter drainage patterns or natural water courses.

Leachlines for wastewater disposal shall be placed entirely within natural soils. Fill material shall not be used to create a basal area for alternative systems or mounds.

Local agencies shall provide specific criteria for the use of fill material which are compatible with the provisions of this policy.

H. Water Saving Devices

The use of water-saving devices may be incorporated into the on-site system design where maintenance of such devices is provided by a responsible entity.

Regional Water Board waste discharge regulation of on-site disposal systems may specify the use of water conservation.

I. Alternative Systems

An alternative system may be appropriate where physical site constraints preclude the installation of a standard septic tank leachfield on-site wastewater disposal system. Alternative systems shall be subject to a program of monitoring provided by a legally responsible entity.

1. Mound Systems

   Mound systems utilize reduced criteria for soil permeability and depth to groundwater on slopes up to 12%. Percolation rates of up to 120 minutes per inch are allowed. A minimum of 24 inches of separation between groundwater and native ground surface is required. The mound design shall be based on the Design and Construction Manual for Wisconsin Mounds, Small Scale Wastewater Management Project, University of Wisconsin (January 1990).

2. Pressure Districution Systems

   Pressure distribution systems enable wastewater disposal in conditions of shallow topsoil over slowly permeable or fractured subsoils on slopes up to 30%. Percolation rates of 1 to 120 minutes per inch are required. The system shall have a minimum depth to groundwater, fractured or consolidated rock, or impermeable soils of 24 inches beneath trench bottom. The design shall comply with criteria set forth by the local regulatory agency.

3. At-Grade Systems

At-Grade Systems enable wastewater disposal in conditions of shallow topsoils on slopes up to 25%. Percolation rates of up to 120 minutes per inch are allowed. A minimum of 36 inches of separation between groundwater and native ground surface is required. The design shall be based on the Wisconsin At-Grade Soil Absorption System Siting, Design and Construction Manual, Small Scale Wastewater Management Project, University of Wisconsin (January 1990).

4. Sand Filters

Sand filters may be used to pretreat the effluent from a septic tank by application to a bed of specified media. Maintenance is required to assure the long-term effectiveness of san filters.

5. Proposals for alternative systems other than those listed above shall be evaluated jointly by the local regulatory agency and the Regional Water Board staff on a case by case basis.

J. Cumulative Effects

The potential cumulative effects on ground and surface waters include, but are not limited to, groundwater mounding and nitrate loading. The local regulatory agency and the Regional Water Board shall determine the need for cumulative impact assessment for on-site systems, and will consider in particular, subdivision developments, commercial establishments, and on-site systems receiving greater than 1,500 gallons per day. For most on-site systems, the assessment of cumulative effects is not necessary.

Analysis of cumulative impact effects shall be conducted using accepted principles of groundwater hydraulics, shall describe the specific methodology, and shall include literature references as appropriate. The wastewater flow used for cumulative impact analysis shall normally be as follows: 100 gallons per day per bedroom for individual residential system; design sewage flow for multi-family and other non-residential systems.

a. Groundwater Mounding Analysis

Groundwater mounding analysis shall be used to predict the highest rise of the water table and shall account for background groundwater conditions during the wet weather season. The maximum acceptable rise of the water table for short periods of time during the wet weather season, as estimated from groundwater mounding analysis, shall be as follows:

For systems with design flows of less than 1,500 gallons per day, groundwater mounding beneath the disposal field shall not result in more than a 50 percent reduction in the minimum depth to seasonally high groundwater as specified in this policy.

For systems with design flows of 1,500 gallons per day or more, a minimum groundwater clearance of 24 inches shall be maintained beneath the system.

b. Nitrate Loading

Analysis of nitrate loading effects shall be based, at a minimum, on an estimate of an annual chemical-water mass balance.

Minimum values used for the total nitrogen concentration of septic tank effluent shall be: 40 mg/l as N (for average flow conditions) for residential wastewater, or as determined from sampling of comparable system(s) or from literature values.

On-site systems shall not cause the groundwater nitrate concentration to exceed 10.0 mg/l as N at any source of drinking water on the property nor on any off-site potential drinking water source.

K. Septage Disposal

Septage disposal shall comply, as a minimu, with the California Code of Regulations, Title 23, Division 3, Chapter 15 and with federal regulations as described in 40 CFR Part 503.

V. MAINTENANCE RESPONSIBILITIES

Maintenance, monitoring, and repair of individual waste treatment and disposal systems shall be the responsibility of:

1. The individual property owner; or

2. A legally responsible entity of dischargers empowered to carry out such functions. That legally responsible entity shall be a public agency, unless demonstration is made to the Regional Water Board that an existing public agency is unavailable and formation of a new public agency is unreasonable. If such a demonstration is made, a private entity must be established with adequate financial, legal, and institutional resources to assume responsibility for waste discharge.

For subdivision developments where waste discharge requirements are prescribed by the Regional Water Board, the existence or formation of a legally responsible entity of dischargers shall be required.

VI. ABATEMENT

Abatement of failing individual waste treatment and disposal systems shall be obtained in accordance with local agency codes and procedures. When such remedies are ineffective and for systems subject to waste discharge requirements, abatement shall be obtained through Regional Water Board enforcement action.

Abatement of failing systems shall include short-term mitigation and permanent corrective measures. At a minimum, short-term mitigation shall include reduction of effluent flows and the posting of areas subject to the surfacing of inadequately treated sewage effluent.

VII. WAIVER PROHIBITION AREAS

Surveys conducted by local regulatory agencies with the assistance of the Regional Water Board staff indicate that discharges from septic tanks in specific areas are resulting in health hazards and water quality impairment. In accordance with the provisions of this policy, the Regional Water Board hereby prohibits the discharge of wastes from new septic tanks in the Jacoby Creek and Old Arcata Road areas in Humboldt County unless all provisions of the above policy are met without waiver.

(**Note:** This waiver prohibition exists by a prior Regional Water Board Order. The map has not been reproduced here in the interest of brevity.)

VIII. INDIVIDUAL SYSTEM PROHIBITIONS

In order to achieve water quality objectives, protect present and future beneficial water uses, protect public health and prevent nuisance, discharge of waste from new individual disposal systems may be prohibited forthwith and discharge of waste from existing individual disposal systems may be prohibited in defined areas.

The Regional Water Board may grant an exemption to the prohibition for:

1. New individual disposal systems after presentation of geologic and hydrologic evidence by the proposed discharger that such systems will not individually or collectively result in a pollution or a nuisance; and
2. Existing individual disposal systems if it finds that the continued operation of such systems in a particular area will not individually or collectively directly or indirectly affect water quality adversely.

IX. EDUCATION AND TRAINING

Informational bulletins concerning construction, use, maintenance, and repair of individual waste treatment and disposal system shall be made available for public education by local regulatory agencies.

Professional training concerning site evaluations and new alternative systems design concepts for subsurface effluent disposal shall be promoted periodically by Regional Water Board staff in cooperation with local regulatory agencies and public and private sector professional associations.

X. IMPLEMENTATION

1. Local agencies, shall, as necessary, revise existing sewage disposal ordinances to be compatible with the provisions of this policy. The Regional Water Board shall be notified by local agencies of the revisions.
2. Local agencies shall submit for Regional Water Board approval a report describing:
    a. The current program and methods for disposing of septic tank pumpage; and
    b. Plans for meeting future septage disposal needs.
3. Proposals for on-site waste treatment and disposal systems shall be processed as follows:
    a. Processed entirely by the local regulatory agency:
        i. Systems to serve a single dwelling unit within a recorded land development;
        ii. Systems for less than 1,500 gpd domestic waste flows from commercial/industrial establishments;
        iii. Land developments consisting of four or fewer parcels;
        iv. Dwellings involving four or fewer family units.

The Regional Water Board shall be notified of waivers granted for any of the above.

b. Reviewed by the Regional Water Board for possible establishment of waste discharge requirements:
   i. Land developments consisting of five or more parcels;

   ii. Dwellings involving five or more family units;

   iii. Systems for commercial/industrial establishments with domestic waste flows equal to or greater than 1,500 gpd.

   iv. All systems proposed for new construction or repairs on federal lands.

c. The Regional Water Board shall retain jurisdiction over any individual waste treatment and disposal systems which may in its judgment result in water pollution, nuisance and/or health hazards.

4. The Regional Water Board and local regulatory agency shall develop and maintain working agreements concerning procedures and guidelines to be followed in the issuance of waivers as provided by this policy.

5. The Regional Water Board shall, as necessary, request of each local regulatory agency in the Region, an identification of geographical areas that may qualify for establishment of:

   a. On-site wastewater management district,

   b. Waiver prohibition areas, or

   c. Individual system prohibitions.

   Designation of such areas by the Regional Water Board shall be made formal by incorporation into this policy.

5. Site evaluations in accordance with this policy shall be performed by individuals who by virtue of their education, training, and experience, are qualified to examine and assess soil, geologic, and hydrologic properties as related to subsurface effluent disposal. Credentials required of such individuals shall be specified by local regulatory agencies and shall include, as a minimum, education, training, and experience as geologist, soil scientist, registered civil engineer, or registered environmental health specialist.

7. Laboratory analysis of soils shall be conducted at commercial soils testing laboratories, or at other firms or establishments which can demonstrate to the satisfaction of the Regional Water Board the necessary equipment and personnel capabilities for performing the required tests. Procedures for laboratory analysis shall be provided by the Regional Water Board. Examination of soil testing capabilities shall be conducted by the Regional Water Board according to the demand.

8. Alternative systems shall be evaluated as follows:

   a. The Regional Water Board shall, as necessary, prepare a written report which summarizes the progress and findings of the alternative systems within the Region.

   b. The local regulatory agency shall prepare a written report following the construction season which describes the number of alternative systems permitted and the operational status of the alternative systems within its jurisdiction.

      The Regional Water Board shall prepare annually a report which summarizes the status of mound systems within the North Coast Region.

   c. The Regional Water Board shall maintain a literature and information file which pertains to alternative systems.

9. The Regional Water Board shall maintain a literature and information file which pertains to water conservation.

10. The local regulatory agencies shall establish, as necessary, a time schedule for compliance of septage disposal sites to be compatible with the provisions of this policy.

XI. DEFINITIONS

The following definitions apply to this policy.

Alternative System. Any individual system that does not include a standard septic tank or an NSF or IAPMO certified device for treatment, or does not include standard leaching trenches for effluent disposal, which has been demonstrated to function in such a manner as to protect water quality and preclude health hazards and nuisance conditions.

Bedrock. Solid rock, which may have fractures, that lies beneath soils and other unconsolidated material. Bedrock may be exposed at the surface or have an overburden several hundred feet thick.

Bulk Density. The mass of dry soil per unit bulk volume. The bulk volume is determined before drying to a constant weight of 105°.

Coarse Fragments. Rock or mineral particles greater than 2.0 mm in diameter.

Conventional On-Site Waste Treatment and Disposal System. Any system using a standard septic tank for treatment and standard leaching trenches or seepage pit for effluent disposal.

Cumulative Effects. The persistent and/or increasing effect of individual waste treatment and disposal systems resulting from the density of such discharges in relation to the assimilative capacity of the ground environment. Examples include salt or nitrate additions to groundwater, nutrient enrichment of surface water, and hydraulic interference with groundwater and between adjacent systems.

Cut Bank. A man-made excavation of the natural terrain in excess of three feet.

Dual Leachfield System. An effluent disposal system consisting of two complete standard leachfields connected by an accessible diversion valve and intended for alternating use on an annual or semiannual basis.

Entity of Dischargers. A public agency, or a party which can demonstrate to the Regional Water Board comparable, legal and financial authority and responsibility, for the purpose of monitoring, inspecting, and maintaining individual waste treatment and disposal systems.

Ephemeral Stream. Any observable water course that flows only in direct response to precipitation. It receives no water from springs and no long-continued supply from melting snow or other surface source. Its stream channel is at all times above the local water table. Any water course that does not meet this definition is to be considered a perennial stream for the purposes of this policy.

Failure. The ineffective treatment and disposal of waste resulting in the surfacing of sewage effluent and/or the degradation of ground and surface water quality.

Greywater. Untreated household wastewater which has not come into contact with toilet waste. Graywater includes used water from bathtubs, showers, bathroom wash basins, and water from clothes washing machines, and laundry tubs. It does not include wastewater from kitchen sinks, dishwaters or laundry water from soiled diapers.

Groundwater. Any subsurface body of water which is beneficially used or is usable. It includes perched water if such water is used or usable, or is hydraulically continuous with used or usable water.

Hardpan. An irreversibly hardened soil layer caused by the cementation of soil particles. The cementing agent may be silica, calcium carbonate, iron, or organic matter.

Impermeable Soil Layer. Any layer of soil having a percolation rate slower than 120 MPI or a Zone 4 Soil Texture according to Figure 4-2 of this policy which has a high shrink swell potential (Plasticity Index of greater than 20, ASTM D 4318-84).

Incompatible Use. Any activity or land uses that would preclude or damage an area for future use as an effluent disposal site. Includes the construction of buildings, roads or other permanent structures and activities that may result in the permanent compaction or removal of existing soil.

Intercept Drain: A drain, installed to intercept the lateral movement of groundwater and discharge it to a suitable area. Often referred to as a certain drain.

Limiting Soil Layer. The portion of the soil profile that because of percolation characteristics, most restricts the successful operation of a leachfield.

Local Regulatory Agency. Any agency having authority as provided by county or city ordinances to control approval, installation, and use of individual waste treatment and disposal systems. May include county/city health department, building departments, or department of public works.

Mottles. Irregular spots of different colors that vary in number and size. The redoximorphic features of soils (mottling and gleying) are used to indicate poor aeration and lack of drainage.

On-Site Wastewater Disposal Zone. An area designated for operation and maintenance of individual waste treatment and disposal systems by a public agency entrusted with powers in accordance with the provisions of Chapter 3, Part 2, Division 6, of the State Health and Safety Code.

Perched Water. A subsurface body of water separated from the main groundwater body of a relatively impermeable stratum above the main groundwater body.

Perennial Stream. Any stretch of a stream that can be expected to flow continuously or seasonally. They are generally fed in part by springs.

Saturated Soil. The condition of soil when all available pore space is occupied by water and the soil is unable to accept additional moisture. In fine textured soils a free water surface may not be apparent. The extent of saturated soil conditions and anticipated level of high groundwater can be estimated by the extent of soil mottling.

Soil. The unconsolidated material on the surface of the earth that exhibits properties and characteristics that are a product of the combined factors of parent material, climate, living organisms, topography, and time.

Soil Depth. The combined thickness of adjacent soil layers that are suitable for effluent filtration. Soil depth is measured vertically to bedrock, hardpan, impermeable soil layer, or saturated soil.

Soil Horizon or Layer. A layer of soil approximately parallel to the land surface and differing from adjacent (underlying or overlying) layers in some property or characteristic. Differences include, but are not limited to, color, texture, pH, structure, and porosity.

Soil Texture (United States Department of Agriculture (USDA)). The relative amounts of sand, silt, and clay as defined by the classes of the soil textural triangle. Textural classes may be modified when coarse fragments are present in sufficient number, i.e., gravelly sandy loam, cobbled clay, etc.

Standard Leaching Trenches. Leaching trenches designed in accordance standard practice in local agency regulations.

Unstable Landform. An area which shows evidence of mass downslope movement such as debris flow, landslides, rockfills, and hummocky hillslopes with undrained depressions upslope. Unstable landforms may exhibit slip surfaces roughly parallel to the hillside; landslide scars and curving debris ridges; fences, trees, and telephone poles which appear tilted; or tree trunks which bend uniformly as they enter the ground. Active sand dunes are unstable land forms.

POLICY ON DISPOSAL OF SOLID WASTES

Solid waste is discarded to land throughout the North Coast Region. Solid waste can adversely affect water quality through (1) direct contact with receiving waters, (2) production of leachate which can subsequently commingle with receiving waters, and (3) the production of carbon dioxide which can subsequently dissolve in receiving waters. The resulting adverse effects on water quality may include: bacterial contamination, toxicity, tastes and odors, oxygen depletion, discoloration, turbidity, and increases in mineral and organic compound concentrations.

The Regional Water Board's solid waste program focuses on the protection of water quality by implementing the following regulations, laws, and policies:

1) California Code of Regulations, Title 23, Division 3, Chapter 15, Discharges of Waste to Land;

2) The mandated tasks of the solid waste assessment testing (SWAT) program carried out pursuant to Section 13273 of the Water Code;

3) The federal regulations for municipal landfills under the Resource Conservation and Recovery Act

(RCRA), Subtitle D, (Title 40, Code of Federal Regulations, Part 258 (40CFR258));

4) The State Water Board's Policy for Water Quality Control for Regulation of Discharges of Municipal Solid Waste (Resolution No. 93-62).

The laws and regulations governing the discharges of solid wastes have been revised and strengthened in the last few years.

The Regional Water Board policy on disposal of solid waste is to require the orderly implementation of

Chapter 15 requirements for all activities which constitute a discharge of waste to land and the application of federal Subtitle D regulations for municipal landfills.

Chapter 15 of the California Code of Regulations provides the overriding framework for solid waste regulation in California. These regulations provide criteria for classifying wastes according to their potential to affect water quality, and establish appropriate siting, design, and containment standards and corrective actions for each waste category. Chapter 15 also specifies monitoring requirements for discharges of waste to land and describes the documentation that a discharger must submit to allow the Regional Water Board to develop appropriate waste discharge requirements for the discharge. For example, waste discharge requirements for a typical municipal landfill contain provisions for the siting, design, construction, water quality monitoring, closure, types of waste to be discharged, and financial responsibility requirements.

On October 9, 1991, the U.S. Environmental Protection Agency promulgated regulations pursuant to Subtitle D of the Resource Conservation and Recovery Act, that apply, in California, to dischargers who own and operate landfills which accept municipal solid waste on or after October 9, 1991. The majority of the federal regulations became effective on October 9, 1993. The U.S. EPA has identified several areas of Chapter 15 which are not adequate to ensure compliance with certain provisions of the federal regulations. To ensure adequate compliance, the State Water Board adopted the "Policy for Water Quality Control" (Resolution 93-62) on June 17, 1993. The Policy directs the Regional Water Boards to henceforth implement in waste discharge requirements for discharges at municipal solid waste landfills, both the Chapter 15 regulations and those applicable provisions of the federal regulations that are necessary to protect water quality. The Regional Water Boards shall revise existing waste discharge requirements to accomplish this by October 9, 1993.

The Regional Water Board continues to implement the SWAT program as resources become available. The primary goal of the SWAT program is to determine if disposal sites are discharging hazardous wastes into surface waters or groundwaters. The California Integrated Waste Management Board (CIWMB) is currently providing funding to the State and Regional Water Boards to work on Ranks 1 through 5. These were the sites which were perceived to pose the greatest threat to water quality. Work on high priority SWAT sites in the North Coast Region is expected to be completed in 1994.

Any additional work required at disposal sites in order to evaluate the threat or impact on beneficial uses of waters will be addressed through the implementation of Chapter 15 requirements.

In carrying out its mandate to protect water quality and regulate solid waste, the Regional Water Board has significant interaction with the CIWMB permitting, compliance, closure, and remediation programs. The CIWMB's the lead agency for nonhazardous waste management in California. The Regional Water Board also interacts with the local enforcement agencies, which enforce the requirements of the CIWMB and issue solid waste facility permits.

This policy describes the collaborative approach to the management of solid waste as required by federal and state regulations and policies. Implementation of this policy is necessary to protect beneficial uses of surface and ground waters in the North Coast Region.

POLICY FOR AGRICULTURAL WASTEWATER MANAGEMENT

The regulation of wastewater resulting from confined animal facilities is described in the California Code of Regulations, Title 23, Division 3, Chapter 15.

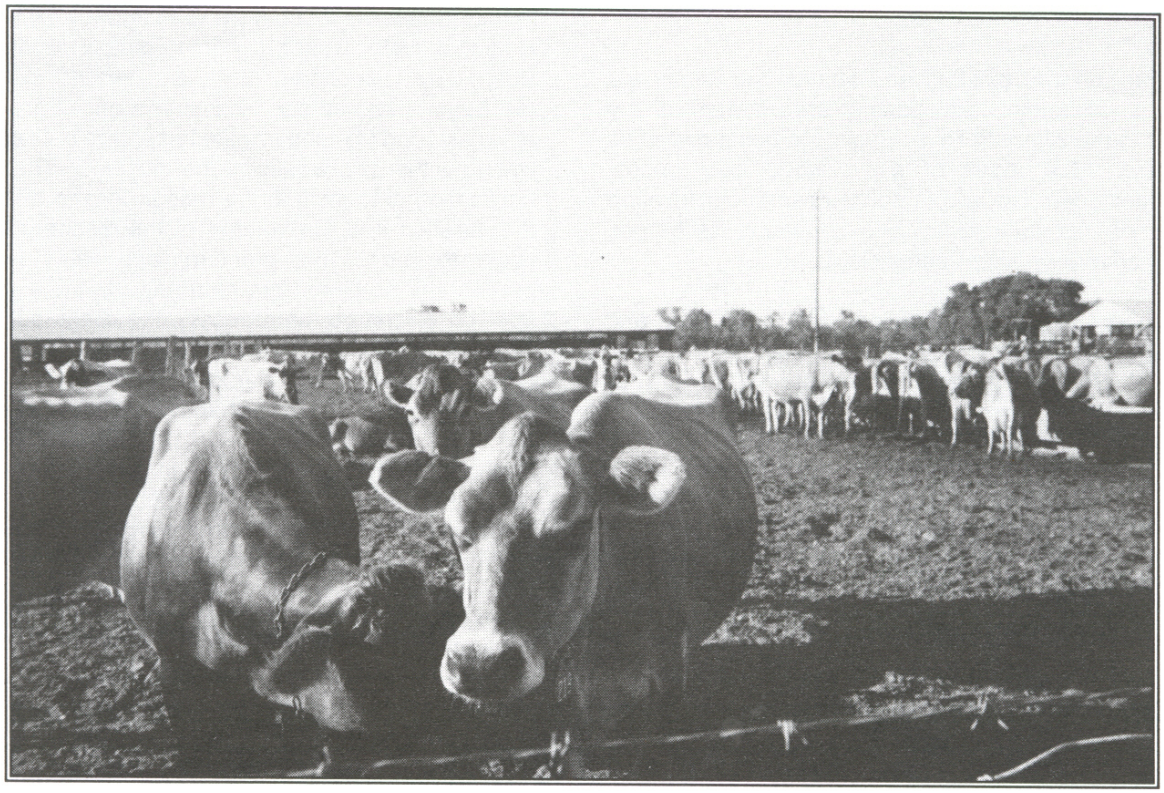
In addition, the 1972 Amendments to Public Law 92-500 directed the U.S. Environmental Protection Agency to set up a permit system for all dischargers. The authority to administer the permit program was transferred to the State of California for waters within the State. Currently, federal regulations require permits only for point source surface water discharges from the following agricultural operations:

1. Feed lots with 1,000 or more slaughter steers and heifers.

2. Dairies with 700 head or more, including milkers, pregnant heifers, and dry mature cows, but not

calves.

Entrance to Sonoma County Central Solid Waste Disposal Site, 1994 (C. Goodwin)



Sonoma County dairy, 1994 (C. Goodwin)

3. Swine facilities with 2,500 or more 55-pound swine.

4. Sheep feedlots with 10,000 head or more.

5. Turkey lots with 55,000 birds unless the facilities are covered and dry.

6. Laying hens and broilers, with continuous flow watering and 100,000 or more birds.

7. Laying hens and broilers with liquid manure handling systems and 30,000 or more birds.

8. Irrigation return flow from 3,000 or more acres of land when conveyed to navigable waters from one or more point sources.

However, the state may prescribe waste discharge requirements for any point source discharger regardless of size.

ACTION PLAN FOR REGULATION OF MINING WASTES

Several hundred existing and abandoned mines are located within the north coastal area. Many of the mines in the Klamath River Basin are being reworked for gold as a result of rising world gold prices. Improper operation and in some cases poor location have resulted in turbidity and sediment discharges which adversely affect beneficial uses.

A number of mining operations, principally sand and gravel extraction, occur in the watersheds of the North Coastal Basin. In addition to sand and gravel, numerous other commodities such as manganese, copper, mercury, and crushed rock have been mined. The major potential problems relating to these operations are increased turbidity resulting from wash-off or discharge of tailings, and the toxic threat of heavy metals to aquatic organisms.

The regulation of mining waste is described in the California Code of Regulations, Title 23, Division 3, Chapter 15. To implement the Code and to protect the quality of waters from adverse effects resulting from mining waste discharges, the Regional Water Board shall (1) adopt waste discharge requirements on operations which could potentially adversely affect water quality in the Region, (2) immediately issue cleanup and abatement orders to mining operations which are potentially or actually adversely affecting water quality, (3) immediately begin documentation of waste discharges for purposes of taking enforcement actions if necessary, (4) issue enforcement orders when appropriate, and (5) seek civil penalties and/or refer violations of cleanup and abatement orders and cease and desist orders to the Attorney General.

ACTION PLAN FOR ACCIDENTAL SPILLS AND CONTINGENCIES

On July 24, 1974, the Regional Water Board adopted Resolution No. 74-151 entitled "Contingency Planning and Notification Requirements for Accidental Spills and Discharges". The Order was formulated and adopted by the Regional Water Board when it became apparent that specific waste dischargers were unprepared for emergency situations.

The Order requires entities which discharge, convey, supply, store, or otherwise manage wastes to (1) formulate and submit a contingency plan to the Regional Water Board, (2) immediately report to the Board by telephone any accidental discharge, (3) begin immediate cleanup and abatement activities, and (4) confirm the telephone notification in writing within two weeks of the incident. The written notification is to include the reason for the discharge, the duration and the volume of the discharge, steps taken to correct the problem, and steps taken to prevent the problem from recurring. In the event of a spill or discharge emergency, the Regional Water Board acts as a liaison with the discharger and other affected agencies and persons to provide assistance in clean-up and abatement activities.

Section 25180.7 of the Health and Safety Code requires designated employees of the Regional Water Board to inform local agencies of any illegal discharge or threatened illegal discharge of a hazardous waste.

Section 13271 (a) of the Porter-Cologne Water Quality Control Act requires immediate notification of illegal and accidental discharges of sewage or hazardous substances to the Office of Emergency Services and the Regional Water Board, and further requires that the Regional Water Board: 1) list all such notifications

at its next business meeting, and 2) notify appropriate local health officials.

POLICY ON THE REGULATION OF FISH HATCHERIES, FISH REARING FACILITIES, AND AQUACULTURE OPERATIONS

Fish hatcheries, fish rearing facilities, and aquaculture operations, if regulated, may enhance beneficial water uses. These operations characteristically require the utilization of large quantities of water on a continuous basis. Most of the water is used to satisfy the flow-through requirements of the fish, and is returned to the receiving waters without alteration of beneficial uses. Wastes generated during the care and feeding of fish may include suspended and settleable solids, salt (sodium chloride), antibiotics, anesthetics, and disease control agents. The following criteria shall apply to the discharge from fish hatcheries, rearing facilities, and aquaculture operations:

1. The discharge shall not adversely impact the recognized existing and potential beneficial uses of the receiving waters.

2. The discharge of waste resulting from cleaning activities shall be prohibited.

3. The discharge of detectable levels of chemicals used for the treatment and control of disease, other than salt (NaCl) shall be prohibited.

4. The discharge will be subject to review by the Regional Water Board for possible issuance of Waste Discharge Requirements/NPDES permit.

5. The Regional Water Board may waive Waste Discharge Requirements for fish hatcheries, fish rearing, and aquaculture facilities, provided that the discharge complies with applicable sections of the Water Quality Control Plan for the North Coast Region and satisfies the conditions for waiver which are described in Regional Water Board Resolution No. 87-113 (Appendix Section of this Plan).

6. The public interest is served by the fish hatchery, rearing facility, or aquaculture operation.

POLICY ON POWERPLANT COOLING

Utilization of fresh waters of the basin for powerplant cooling poses both quantity and quality problems. Approximately 25,000 acre-feet of water per year are required for cooling purposes for each 1,000 megawatts of installed generating capacity if evaporative cooling towers are used. Losses of cooling water through evaporation would be approximately 22,000 acre-feet per each 1,000 megawatts of generating capacity. Such losses for powerplant cooling could seriously affect the availability of water for other consumptive uses, and may impair the beneficial use of the water for such nonconsumptive uses as esthetic, fish and wildlife habitat, and recreation purposes.

The utilization of fresh inland waters of the Region for powerplant cooling is regulated by the State Water Resources Control Board's Thermal Plan, (Appendix Section of this Plan). In addition, the Regional Water Board can adopt waste discharge requirements on powerplant cooling operations which could potentially adversely affect water quality in the Region.

POLICY ON RESIDUAL WASTES

Residual wastes such as raw sludge from sewage treatment plants shall be disposed of only at sites approved by the Regional Water Board. In approving such sites the Board shall be guided by the regulations contained in the California Code of Regulations, Title 23, Division 3, Chapter 15.

NONPOINT SOURCE MEASURES

California has achieved considerable improvements in controlling point source discharges, such as wastewater from municipalities and industrial facilities. It is now recognized that in many areas nonpoint source discharges, such as stormwater runoff, are the principal sources of contaminant discharges to surface water and groundwater.

In contrast to point sources, which discharge wastewater of predictable quantity and quality at a discrete point (usually at the end of a pipe), nonpoint

source discharges are diffuse in origin and variable in quality. Management of nonpoint source discharges is in many ways more difficult to achieve, since it requires an array of control techniques customized to local watershed conditions.

Section 319 of the 1987 amendments to the federal Clean Water Act establishes the framework for nonpoint source activities. Section 319 requires each state to develop nonpoint source management plans and to conduct an assessment of the impact nonpoint sources have on the State's waterbodies. In response to these requirements, the State Water Board adopted the Nonpoint Source Management Plan in 1988 and the Water Quality Assessment in 1990.

This section presents the actions intended to meet water quality objectives and protect beneficial uses with regards to nonpoint source discharges. The following measures shall be taken with respect to actual and potential nonpoint sources of water quality degradation. The action plans contained in this section are consistent with the State Water Board's Nonpoint Source Management Plan (see Section 5). The action plans emphasize cooperation with local governments and other agencies to promote the voluntary implementation of best management practices and remedial projects in a three-tiered approach: 1) voluntary implementation, 2) regulatory-based encouragement, and 3) effluent limitations.

ACTION PLAN FOR LOGGING, CONSTRUCTION, AND ASSOCIATED ACTIVITIES

The following waste discharge prohibitions pertain to logging, construction, and associated activities in the North Coast Region.

1. The discharge of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, or associated activity of whatever nature into any stream or watercourse in the basin in quantities deleterious to fish, wildlife, or other beneficial uses is prohibited.

2. The placing or disposal of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, or associated activity of whatever nature at locations where such material could pass into any stream or watercourse in the basin in quantities which could be deleterious to fish, wildlife, or other beneficial uses is prohibited.

Similarly, the guidelines for implementation of the prohibitions have proven most helpful to the Regional Water Board and its staff as well as to potential waste dischargers.[5] They reflect state regulations, objectives, and procedures, and are as follows:

GUIDELINES FOR IMPLEMENTATION AND ENFORCEMENT OF DISCHARGE PROHIBITIONS RELATING TO LOGGING, CONSTRUCTION, OR ASSOCIATED ACTIVITIES

These guidelines, which are hereby incorporated into the Water Quality Control Plan for the North Coast Region (Basin Plan), have been developed with the objective of (1) defining the criteria by which the Regional Water Board will consider that violations of the prohibitions have occurred or threaten to occur; (2) instructing the Regional Water Board staff of procedures and actions they will take in implementing the prohibitions; (3) advising all potential dischargers of the scope and intent of the prohibitions; and (4) advising all interested parties that it is the intent of this Regional Water Board to carry out its responsibilities in this matter in a reasonable and effective manner.

Criteria

A. Section 3 of the Basin Plan contains water quality objectives, which specify limitations on certain water quality parameters that are not to be exceeded as a result of waste discharges. Accordingly, the Executive Officer of the Regional Water Board is directed to investigate and report to the Regional Water Board evidence of violations of the water quality objectives contained in the Basin Plan which result or threaten to result in unreasonable effects on the beneficial uses of the waters of the Region. When such

5. Since 1984 these guidelines have been applied to watershed disruptions which might be caused by small hydropower development projects, and the prohibitions are recognized by project sponsors as the water quality protection standard for these activities.

investigation reveals that such violations are occurring or are threatened due to the discharge or threatened discharge of waste, the Executive Officer shall take all appropriate actions as directed by the Enforcement section of these guidelines.

The following water quality objectives, from Section 3 of the Basin Plan, are considered of particular importance in protecting beneficial uses from unreasonable effect due to discharges from logging, construction, or associated activities:

1. Waters shall be free of coloration that causes nuisance or adversely affects beneficial uses.

2. Turbidity shall not be increased more than 20 percent above naturally occurring background levels.

3. Waters shall not contain taste or odor-producing substances in concentrations that impart undesirable tastes or odors tofish flesh or other edible products of aquatic origin, that cause nuisance or adversely affect the beneficial uses.

4. Waters shall not contain floating material, including solids, liquids, foams, and scum, in concentrations that cause nuisance or adversely affect beneficial uses.

5. Waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or adversely affect beneficial uses.

6. The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

7. All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life.

8. Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.

B. Definitions

1. Definitions for the following terms in these guidelines, are provided in Section 13050 of the Porter-Cologne Act:

   a. "**Waste**" includes sewage and any and all other substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation of whatever nature, including such waste placed within containers of whatever nature prior to, and for purposes of, disposal.

   b. "**Beneficial uses**" of the waters of the State that may be protected against quality degradation include, but are not necessarily limited to, domestic, municipal, agricultural and industrial supply; power generation; recreation, aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources of preserves.

   c. "**Water quality objectives**" means the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.

   d. "**Water quality control**" means the

regulation of any activity or factor which may affect the quality of the waters of the State and includes the prevention and correction of water pollution and nuisance.

e. "**Water quality control plan**" consists of a designation or establishment for the waters within a specified area of (1) beneficial uses to be protected, (2) water quality objectives, and (3) a program of implementation needed for achieving water quality objectives.

f. "**Pollution**" means an alteration of the quality of the waters of the State by waste to a degree which unreasonably affects: (1) such waters for beneficial uses, or (2) facilities which serve such beneficial uses. "Pollution" may include "contamination".

2. The definition for "stream or watercourse" as those terms are used in the waste discharge prohibitions relative to logging and construction activities shall be interpreted by the Regional Water Board to mean the following: Natural watercourse as designated by a solid line or dash and three dots symbol shown in blue on the largest scale United States Geological Survey Topographic Map most recently published.

C. The Regional Water Board acknowledges that it does not have jurisdiction for direct enforcement of the rules and regulations of other local, state, or federal agencies. However, the Regional Water Board directs the Executive Officer to investigate the violation or threatened violation of those rules and regulations of other agencies which have been adopted to protect the quality of the waters in the Region. The violation of the following rules, regulations, or provisions may be considered a threatened violation of the waste discharge prohibitions and accordingly the Executive Officer shall take appropriate action as directed by the Enforcement section of these guidelines.

1. A violation of current rules for forest practices relating to erosion control or water quality protection in any logging or related activity being conducted pursuant to regulations administered by the California Department of Forestry and Fire Protection.

2. A violation of the Best Management Practices designated in the U.S. Forest Service document entitled "Water Quality Management for National Forest System Lands in California", dated April, 1979.

3. A violation of the water pollution control provisions of the current California Standard Specifications in any highway project being constructed under contract entered into by the Department of Transportation, State Department of Public Works.

4. A violation of Sections 1601, 1602, 1603, 5650, and 5948 of the California Fish and Game Code when such violation involves activities or discharges enumerated in the aforesaid prohibition.

Investigative and Coordinating Activities

A. The Regional Water Board directs the Executive Officer to implement the following investigative activities. It is intended that, wherever possible, existing state reporting procedures and requirements will be utilized to minimize additional administrative burden on prospective waste dischargers.

1. The staff of the Regional Water Board is directed to investigate and review, on a continuing basis, logging operations, road building, and related construction activities within the Region to determine the effect, or potential effect, of such activities on water quality.

2. The staff shall consult with any individual associated with logging operations, road building or construction activities having an effect on the quality of waters in the Region,

and shall investigate such activities when requested to do so.

3. The staff shall obtain from the California Department of Forestry and Fire Protection, the Board of Forestry, and the Department of Fish and Game copies of all notices received from timber operations, timber harvesting plans, and stream alteration activities within the Region.

3. The staff shall obtain from the Department of Transportation the names of all contractors

performing work that could result in violation of the discharge prohibitions. The Forest Service, USDA and other federal agencies will be requested to furnish the Regional Water Board, as early as feasible, with the names, addresses, and location of anticipated operations of all private contractors who will be engaged in logging, construction or related activities on lands in the region which are under their control. In connection with these contracts, request will be made for copies of any special conditions or regulations for the control of erosion or protection of water quality.

5. Upon receipt and review of such information, the staff will transmit to the permittee or contractor copies of the discharge prohibitions and provisions as contained in the Regional Basin Plans and copies of this or subsequent implementation statements on this subject issued by the Regional Water Board.

6. The staff will request that the California Department of Forestry and Fire Protection notify the Regional Water Board's office of citations or of other notices issued by Forestry personnel for violation of erosion control sections of the Forest Practice Rules. The staff will request that the Department of Fish and Game advise the Regional Water Board's office of all violations of its code Sections 5650, 1601, 1602, and 5948 resulting from logging, road building, or associated construction activities. The staff will request that the Department of Transportation notify the Regional Water Board office of all violations of the water pollution control provisions of the California Standard Specifications and will request that the Forest Service, USDA, and other federal agencies, notify the Regional Water Board's office of all violations of rules and regulations for the control of erosion or protection of water quality.

7. The staff will notify the State Department of Fish and Game, the California Department of Forestry and Fire Protection, the State Department of Transportation, the Forest Service, USDA, and the violating timber

operator and/or land owner, of all violations of the discharge prohibitions and of all actions taken by the Regional Water Board with regard to such violations or threatened violations.

8. The staff may request additional information from any individual or firm engaged in timber operations, road building, or related construction activity in accordance with Water Code Section 13267(b) as may be necessary to implement their investigations and carry out the policy of this Regional Water Board.

B. The Regional Water Board considers that implementation of the discharge prohibitions relating to logging, construction, or associated activities can provide appropriate protection to waters of the region from these sources of waste and, in the great majority of their activities, will waive the need for reports of waste discharge and waste discharge requirements. However, where investigations indicate that the beneficial uses of water may be adversely affected by waste discharges, the staff shall require the submission of Reports of Waste Discharge.

Enforcement Activities

When investigation by the staff reveals that violations as described in the Criteria section of these guidelines are occurring or are threatened due to the discharge or threatened discharge of waste, the actions to be taken by the Executive Officer are as follows:

A. Cleanup and Abatement Order

1. If the discharge of waste can be cleaned up or its adverse effects abated, a cleanup or abatement order shall be issued to the discharger or other responsible persons.

2. The order and all relevant information shall be transmitted to the discharger as provided in the Manual of Administrative Procedures. Copies of these materials shall be transmitted concurrently to all Regional Water Board members and all other interested agencies.

3. The Regional Water Board may hold a public hearing for purposes of making the necessary findings under Water Code Section 13350(a) (2) with respect to a cleanup or abatement order or violation of waste discharge prohibition at any regular meeting of the Regional Water Board, or at a special meeting of the Regional Water Board called by the Chairman, on his own motion or at the request of the Executive Officer, or when called by two Regional Water Board members as provided in Water Code Section 13204.

B. Cease and Desist Order

If a cleanup or abatement order would not be the most expeditious means of achieving compliance with the prohibitions, the Executive Officer shall notify the Regional Water Board Chairman of his intention to bring the matter before the Regional Water Board, at either a regular or a special meeting, for consideration of evidence and recommendation that a cease and desist order be issued. The decision by the Executive Officer to recommend a cease and desist order hearing shall be made after consideration of the following factors:

1. The nature of the activity of the discharger.

2. The anticipated length of time the discharger will be carrying on the activity which results or threatens to result in a waste discharge.

3. The potential deleterious and unreasonable effect on beneficial uses of the waters during the time before the Regional Water Board will be able to take action on the violation of the prohibitions.

4. Other relevant factors considered applicable by the Executive Officer as necessary to bring before the Regional Water Board for their consideration and deliberation.

POLICY FOR THE CONTROL OF DISCHARGES OF HERBICIDE WASTES FROM SILVICULTURAL APPLICATIONS

It is the policy of this Regional Water Board to assure that the use and possible discharge of herbicide wastes be controlled to provide all necessary protection of the beneficial uses of water. Accordingly, the Regional Water Board establishes a program to control the discharge of herbicides to waters of the State within the North Coast Region to protect water quality. It is the policy of this Regional Water Board to determine safe limits for the discharge of pollutants, including herbicides. All limits will be incorporated into the Action Plan as they are determined and self-monitoring programs will be developed and prescribed to assure compliance with all appropriate limits.

ACTION PLAN FOR CONTROL OF DISCHARGES OF HERBICIDE WASTES FROM SILVICULTURAL APPLICATIONS

The Regional Water Board acknowledges that it is not the lead agency in regulating pesticide use in the North Coast; the lead agency is the Department of Food and Agriculture (DFA). However, the Regional Water Board recognizes its obligation in regulating all wastes discharged to water and in protecting water quality. It is not the Regional Water Board's intent to prescribe waste discharge requirements for pesticide applications when the rules, regulations, and guidelines of other agencies adequately protect beneficial water uses. It is not the intent of the Regional Water Board to require the discharger to

furnish information that has already been furnished to other agencies. Accordingly, the Executive Officer shall obtain the needed information from other governmental agencies to the maximum extent possible. Therefore, the Regional Water Board directs the Executive Officer to obtain information on proposed aerial herbicide application projects which will provide assurance that the proposed silvicultural herbicide use will protect water quality. Such information includes, but is not limited to, the following:

a. Topographic map or other map scaled at not less than four inches equals one mile or other scale acceptable to the Executive Officer which clearly delineates the treatment areas and all nearby water courses, wells, ponds, irrigation ditches, or wet areas.

b. Description of the application method and means employed to avoid discharge to water.

c. A water monitoring plan responsive to the need for an "early warning" capability.

d. A spill contingency and control plan indicating downstream water users and the mechanism to provide "early warning" in the event of substantial water contamination.

e. This information should be received by the Regional Water Board 45 days in advance of the operation.

The Executive Officer shall consult with the discharger and the lead agencies to mitigate threatened discharges which would violate any section of this Action Plan. Issues unable to be resolved shall be brought before this Regional Water Board for consideration of the need to adopt waste discharge requirements.

The Regional Water Board acknowledges that it does not have jurisdiction for direct enforcement of the rules and regulations of other local, state, or federal agencies. However, the Regional Water Board directs the Executive Officer to investigate the violation or threatened violation of those rules and regulations of other agencies which have been promulgated to protect the quality of the waters of the state within the North Coast Region and to appropriately enforce violations of the Water Code.

The violation of the following rules, regulations, or provisions may be considered a violation of the waste discharge prohibitions in this Action Plan and accordingly the Executive Officer shall take appropriate action.

1. A violation of current rules, regulations, or guidelines relating to water quality protection from any silvicultural herbicide application being conducted pursuant to permits issued by the County Agricultural Commissioners.

2. A violation of federal or state label requirements relating to water quality protection.

3. A violation of current rules, regulations, or guidelines of the DFA relating to water quality protection.

In accordance with this policy, limits have been determined for three herbicides. Accordingly, the following prohibitions apply to waste discharges from herbicide applications of 2,4,5-T, 2,4,5-TP, and 2,4-D:

1. There shall be no discharge of 2,4,5-T or 2,4,5-TP to waters of the State within the North Coast Region.

2. There shall be no discharge of 2,4-D PGBE ester to waters of the State within the North Coast Region that would cause the concentration of this substance in the receiving waters to exceed an instantaneous value of 40 parts per billion (ppb) acid equivalent or a 24-hour average of 2 ppb acid equivalent.

Monitoring programs will be designed to measure both the maximum instantaneous concentration and a statistically valid 24-hour average concentration of 2,4-D. Sampling locations for monitoring will be selected on the basis of the risk of discharge and the probable presence of beneficial water uses to be protected. Discharge monitoring will occur during and shortly after spraying and with stormwater.

Violations of water quality objectives contained in Chapter 4, particularly the objectives relating to pesticides and toxicity, shall be brought to the immediate attention of the County Agricultural Commissioner. In addition, the California Environmental Quality Act functional equivalent requirements of Section 21080.5 as adopted by the DFA and certified by the Resources Agency on November 1, 1979, require that the County Agricultural Commissioners meet quarterly with the Regional Water Board staff and other agencies concerned with resource protection. These quarterly consultations should develop needed mitigation to prevent violation of waste discharge prohibitions and Basin Plan objectives.

The United States Forest Service has developed Best Management Practices for the application of herbicides and other pesticides on public lands to ensure protection of water quality. Accordingly,

1. The North Coast Regional Water Quality Control Board hereby accepts United States Forest Service Practices 5.8-5.14 as Best Management Practices (BMPs) for water quality protection from aerial herbicide application on Forest Service lands within the North Coast Region, and recognizes the "Aerial Herbicide Application Handbook" (FSH 2109.21) as a management practice that best protects water quality.

2. Experience gained over the past several years by the United States Forest Service on implementation of these management practices has led the Regional Water Board to conclude that discharges from aerial spray applications can be controlled such that: (1) past or present standards for protection of water quality are not violated, (2) Basin Plan water quality objectives are met, (3) most (99 percent) United States Forest Service spray application monitored result in less than 2 ppb of 2,4-D or similar herbicides being detected in receiving waters.

3. The Basin Plan contains provisions (as specified in the Action Plan above) for adequate descriptions of treatment areas and application practices, monitoring programs, and spill contingency planning that, combined with the implementation of Best Management Practices by the United States Forest Service or other entity, will result in the waiver of issuance of waste discharge requirements (excluding issuance of requirements under No. 4 below).

   Adoption of waste discharge requirements are hereby waived as not contrary to the public interest when the United States Forest Service Best Management Practices are implemented, relevant Basin Plan provisions are followed, and water quality is protected.

4. Waste Discharge Requirements shall be issued on a case-by-case basis where the implementation of Best Management Practices proposed for specific projects will be insufficient for protection of water quality.

The State Legislature, Department of Food and Agriculture, and the County Agricultural Commissioners have developed a body of laws, regulations, and permit conditions for the application of herbicides and other pesticides on forest lands to ensure protection of water quality. Accordingly,

1. The North Coast Regional Water Quality Control Board accepts the practices conducted pursuant to the state pesticide regulatory program and the County Agricultural Commissioner regulatory program as Best Management Practices (BMPs) for water quality protection from aerial herbicide application on private lands within the North Coast Region, and recognizes the mitigation measures developed through permit conditions set by the County Agricultural Commissioners as management practices that best protect water quality.

2. Experience gained over the past several years by private forest landowners on implementation of these management practices has led the Regional Water Board to conclude that discharges from aerial spray applications can be controlled such that: (1) past or present standards for protection of water quality are not violated, (2) Basin Plan water quality objectives are met, (3) most (98%) of private landowner spraying applications monitored result in less that 10 ppb of 2,4-D or similar herbicides being

detected in receiving waters (92% result in less than 2 ppb.)

3. The Basin Plan (as specified in the Action Plan above) contains provisions for adequate descriptions of treatment areas and application practices, monitoring programs, and spill contingency planning that, combined with the implementation of Best Management Practices by private landowners, will result in the waiver of issuance of waste discharge requirements (excluding issuance of requirements under Number 4 below).

   Adoption of waste discharge requirements are hereby waived as not contrary to the public interest when Best Management Practices are implemented, relevant Basin Plan provisions are followed, and water quality is protected.

4. Waste Discharge Requirements shall be issued on a case-by-case basis where the implementation of Best Management Practices proposed for specific projects will be insufficient for protection of water quality.

ACTION PLAN FOR THE GARCIA RIVER WATERSHED SEDIMENT TMDL

Note: The "*Action Plan for the Garcia River Watershed Sediment TMDL"* was approved by the North Coast Regional Water Quality Control Board, the State Water Resources Control Board, and the Office of Administrative Law under the more lengthy title of the "G*arcia River Watershed Water Quality Attainment Action Plan for Sediment."*

The Garcia River watershed comprises approximately 73,223 acres in southwestern Mendocino County and discharges to the Pacific Ocean. In 1996, the state of California identified the Garcia River as a high-priority waterbody according to the requirements in Section 303(d) of the federal Clean Water Act (CWA). Section 303(d)(1)(A) of the CWA requires that states list those waters within its boundaries for which existing management practices are not sufficient to achieve water quality standards. The Garcia River was identified as a high-priority waterbody due to excessive sedimentation. Accelerated erosion from land use practices and other causes was identified as affecting the migration, spawning, reproduction, and early development of cold-water fish such as coho salmon and steelhead trout. When the Garcia River was designated a high-priority waterbody under the requirements of the CWA, the development of a Total Maximum Daily Load (TMDL) for the river became necessary.

As a result of the designation of the Garcia River as a high-priority waterbody under the guidelines of the CWA, landowners, land managers, resource protection agencies, and interested members of the public provided input in the preparation of the *Garcia River Watershed Water Quality Attainment Strategy for Sediment* (1997) (Strategy). The Strategy has been revised and renamed to reflect its role as a supporting document to a Basin Plan amendment and is now known as the *Reference Document for the Garcia River Watershed Water Quality Attainment Action Plan for Sediment* (Reference Document). The Reference Document and the Strategy are staff-level tools for landowners; land managers; interested public; and state, local and federal resource protection agency personnel to use as an aid for developing and implementing plans to reduce sediment delivery to the Garcia River and its tributaries. It also is useful for providing additional detail about the concepts that follow. It is a planning document that should be revised or updated over time

as factors affecting sediment conditions are better understood. The following Action Plan describes the approach of the Regional Water Board to achieve sedimentation reduction and attain beneficial uses in the Garcia River watershed and serves as a phased TMDL, implementation plan, and monitoring plan for the Garcia River watershed. As a phased TMDL, it will be updated and revised, through Basin Plan amendments, based on new information gathered by Regional Water Board staff and/or submitted by landowners, other agencies, academic institutions and the public that provides an improved assessment of conditions in the Garcia River watershed.

I. Problem Statement

The Garcia River and its tributaries have experienced a reduction in the quality and amount of instream habitat that is capable of fully supporting the beneficial use of a cold-water fishery, due to increased sedimentation. This has resulted in a reduction in the stocks of coho salmon and steelhead trout. The acceleration of sediment delivery in the Garcia River watershed due to land management activities has resulted in the loss or reduction of pools necessary for salmonid rearing and the loss or degradation of potential spawning gravel. In addition, the loss or reduction of instream channel structure in the Garcia River watershed due to land management activities has contributed to this habitat loss or reduction.

II. Numeric Targets

The Numeric Targets, as derived from the scientific literature, focus on the elimination of sediment as a pollutant of concern, and provide instream water quality goals for restoring the cold-water fishery habitat. The Numeric Targets represent the desired future condition of the watershed, and are intended to be consistent with existing water quality objectives and beneficial uses, but are not themselves enforceable. The Numeric Targets will be revised through Basin Plan amendments if additional site-specific data for the watershed or additional research support the need for revision. They are expected to be attained throughout the watershed by the year 2049. Table 4-3 provides the Numeric Targets for the Garcia River watershed.

TABLE 4-3 NUMERIC TARGETS FOR THE GARCIA RIVER WATERSHED

PARAMETER	NUMERIC TARGET
Migration barriers on Class I watercourses[1]	Zero human-caused barriers
Embeddedness on Class I watercourses	Improving trend[2]
Percent fines < 0.85 mm on Class I watercourses	<14 percent
Percent fines < 6.5 mm on Class I watercourses	<30 percent
Primary pool frequency in Class I watercourses [3]	Primary pools covering 40 percent of the length of the watercourse
V* in 3rd order streams with slopes between 1 percent and 4 percent[4]	<0.21 (mean) <0.45 (max)
Median particle size diameter (d_{50}) in 3rd order stream with slopes between 1 percent and 4 percent	>69 mm (mean) >37 mm (min)
Large woody debris in Class I , II, and III watercourses	Improving trend[5]
Width-to-depth ratio in Class I, II, and III watercourses	Improving trend[6]
Thalweg profile in Class I, II, and III watercourses	Increasing variability around the mean
Inman, Signal and Hathaway (Planning Watersheds 113.70014, 113.70020 and 113.70026 except mainstem)	0 percent open stream channel[7]
Pardaloe, Larmour, Whitlow, and Blue Waterhole and North Fork (Planning Watersheds 113.70010 – 113.70013 and 113.70025)	<1 percent open stream channel
Rolling Brook (Planning Watershed 113.70024)	<3 percent open stream channel
Graphite, Beebe (Planning Watersheds 113.70021 – 113.70022)	<6 percent open stream channel
South Fork (Planning Watershed 113.70023)	<20 percent open stream channel

[1] Class I watercourses are watercourses that contain domestic water supplies, including springs, on site and/or within 100 feet downstream, or have fish always or seasonally present onsite, or contain habitat to sustain fish migration and spawning. Class I watercourses include historically fish-bearing watercourses.
Class II watercourses are watercourses that have fish always or seasonally present offsite within 1000 feet downstream, or contain aquatic habitat for non-fish aquatic species. Class II watercourses do not include Class III watercourses that are directly tributary to Class I watercourses.
Class III watercourses are watercourses that do not have aquatic life present, but show evidence of being capable of sediment transport to Class I and II watercourses under normal high flow conditions during and after completion of land management activities.

[2] Embeddedness measures the degree to which the larger particles (boulders, rubble, or gravel) of watercourse channels are surrounded or covered by fine sediment, impeding the ability of fish to dig an adequate redd, or nest. Measurements are generally recorded as 0-25 percent, 25-50 percent, 50-75 percent, or 75-100 percent embedded. An improving trend would be represented by a decrease in embeddedness as measured over a rolling 10 year period.

[3] Primary pools have a depth greater than three feet at the pool's deepest point, a width greater than one-half the width of the low flow channel at the pool's widest point (measured by a transect perpendicular to flow), and a length greater than the width of the low-flow channel at the pool's longest point (measured by a transect parallel to flow). Primary pool frequency will be measured by surveying segments of the watercourse that provide a statistically significant representation of the watercourse as a whole and are located based on field conditions.

[4] V* is a numerical value that represents the proportion of fine sediment that occupies the scoured residual volume of a pool. Stream order is the designation of the relative position of stream segments in the drainage basin network. For example, a first order stream is the smallest, unbranched, tributary that terminates at the upper point. A second order stream is formed when two first order streams join.

[5] An improving trend in large woody debris would be represented by an increase in the volume of large woody debris measured within a given stream segment over a rolling 10 year period. Large woody debris is defined as a piece of woody material having a diameter greater than 30 cm (12 inches) and a length greater than 2 m (6 feet) that is located in a position where it is in the watercourse channel or may enter the watercourse channel.

[6] An improving trend in the width-to-depth ratio would be represented by a change over a rolling 10 year period in the existing width-to-depth ratio towards the width-to-depth ratio appropriate for the stream channel type in question, as determined using the Rosgen stream classification system described in *Applied River Morphology* (1996) by Dave Rosgen.

[7] Open stream channels are those segments of channel, as viewed in aerial photographs with a 1:24,000 resolution or better, that are not covered by canopy and thus are visible.

III. Source Analysis

The analysis of sediment sources is divided into three components: mass wasting (primarily landslides), fluvial erosion (primarily from gullies), and surface erosion (primarily from rills and sheetwash). For each of these categories, data was reviewed to estimate the sediment delivery rate associated with natural background, roads (including but not limited to private, public, rural residential and skid trails), timber harvest units, and agricultural operations. Aerial photograph interpretation and road density data analysis were used to estimate the existing rates of sediment delivery from the above sources and from natural background, where the data was sufficient to do so. The estimates are contained in Table 4-4. Based on the existing data, at a minimum, the Garcia River watershed produced an average of 1,380 tons of sediment per square mile per year as measured from 1956 to 1996.

TABLE 4-4 AVERAGE ANNUAL SEDIMENT LOAD
(Derived from*: Garcia River Sediment Total Maximum Daily Load, Table 16*, promulgated by USEPA, Region IX on March 16, 1998)

SOURCE	ESTIMATED AVERAGE ANNUAL SEDIMENT LOAD (tons/mi^2/yr)
Natural Background	
Mass wasting	162
Fluvial erosion	Insufficient data
Surface erosion	Insufficient data
Roads (including skid trails)	
Mass wasting	486
Fluvial erosion	532
Surface erosion	38
Timber Harvest Units	
Mass wasting	162
Fluvial erosion	Insufficient data
Surface erosion	Insufficient data
Agricultural Operations	
Mass wasting	Insufficient data
Fluvial erosion	Insufficient data
Surface erosion	Insufficient data
TOTAL	1,380

IV. Loading Capacity Calculation

Data from the Garcia River watershed were compared to that from other north coast watersheds with similar physical, climatic, and geologic characteristics to the Garcia River watershed. In particular, data from the North and South Forks of Caspar Creek, also located in western Mendocino County, were used to estimate the reduction in sediment loading needed to achieve the desired future condition in the Garcia River. South Fork Caspar Creek was heavily logged by ground-based equipment (tractors) up until the 1970s and is reported by Pacific Watershed Associates (1997) to produce 1,420 tons/mi^2/yr of sediment. North Fork Caspar Creek, on the other hand, received very little tractor logging up through the 1970s and is reported by Pacific Watershed Associates (1997) to produce 680 tons/mi^2/yr of sediment. The U.S. Environmental Protection Agency Region IX (USEPA) promulgated a TMDL for the Garcia River on March 16, 1998. In it, USEPA assumes that the condition of South Fork Caspar Creek is comparable to the existing condition of the Garcia River watershed and that North Fork Caspar Creek represents a reference for the desired future condition of the Garcia River watershed, a condition similar to that which existed prior to the steep decline in salmonid populations. As a result, a

reduction in sediment delivery of 52 percent is identified as appropriate to achieve the desired future conditions in the Garcia River watershed [(1420-680)/1420=0.52]. Applying a margin of safety of 8 percent to account for uncertainties in the data and differences between the Garcia River watershed and the Caspar Creek watershed, an overall reduction in sediment loading of 60 percent is established. (*Garcia River Sediment Total Maximum Daily Load,* USEPA, Region IX, March 16, 1998).

A 60 percent reduction of the average annual sediment load to the Garcia River watershed (1,380 tons/mi^2) results in a Loading Capacity of 552 tons/mi^2/yr [a)1,380 X 0.60=828; b) 1,380-828=552]. The loading capacity of 552 tons/mi^2/yr is a conservative estimate based on the best available data, and will be measured over a 40-year period. This loading capacity is the TMDL for the purposes of 40 CFR 130.2 and 130.7. As a phased TMDL, the loading capacity can be modified through a Basin Plan amendment if new information is made available that supports such modification. Neither the order of magnitude of the overall sediment budget nor that of the loading capacity is expected to change significantly as a result of new information.

V. Load Allocations

The existing data are insufficient to allocate specific components of the TMDL to individual landowners or to individual land management activities. That is, it does not include estimates of sediment delivery from individual properties, all landuse, or the amount of sediment delivery that can be reasonably controlled. These three elements are necessary to form rational individual load allocations.

To address the limitations in the existing data, a general load allocation is developed as follows. It is phased, as contemplated in a phased TMDL. First, landowners are required to inventory the Sediment Delivery Sites on their property. Sediment Delivery Sites are controllable, human-caused erosion sites that are currently eroding or have the potential to erode in such a manner as to deliver sediment to a watercourse. Landowners are then directed to reduce the controllable volume of sediment at the inventoried Sediment Delivery Sites. Correction or control of these sites is required according to a schedule contained in the Implementation Schedule section. Landowners are also directed to assess their property for Unstable Areas. Unstable Areas are areas with a naturally high risk of erosion and areas or sites that will not reasonably respond to efforts to prevent or mitigate sediment discharges. Finally, landowners are directed to implement protective land management measures designed to control future sediment delivery from land management activities on the identified unstable areas and on riparian areas, and from activities related to roads, skid trails, landings, agricultural facilities, and gravel mining. These practices are to be implemented in accordance with the schedules contained in the Implementation Section.

In short, as the first phase, landowners are directed to identify and control all existing and future controllable discharges of sediment. Controllable discharges are those discharges resulting from human activities that can influence the quality of waters of the State and that can be reasonably controlled by prevention or mitigation. For the purposes of the TMDL equation, the load allocation is expressed as zero controllable discharges. For the purpose of implementation and as noted in Table 4-5, it is recognized that measures to control discharges are not 100 percent effective. In the absence of additional data, the Regional Water Board judges that this program of source identification and source control will result, over time, in a reduction in the rate of sediment delivered to watercourses in the Garcia River watershed that is comparable to the rate that existed prior to the steep decline in salmonid populations and attainment of the desired future conditions. As per the Loading Capacity Calculation, that level of sediment delivery is estimated to be 552 tons/mi^2/yr. Should additional data be made available to the Regional Water Board that supports a revision to the Load Allocation, the Regional Water Board will consider such revisions in a Basin Plan Amendment.

VI. Implementation Plan

The Implementation Plan is intended to control existing and future sources of sediment delivery resulting from human activity to the Garcia River and its tributaries. To control these sources, three options are offered to landowners. These options are:

Option1. Comply with the waste discharge prohibitions that apply within the Garcia River watershed.

Option 2. Comply with an approved Erosion Control Plan and an approved Site-Specific Management Plan, or

Option 3. Comply with an approved Erosion Control Plan and the Garcia River Management Plan.

Waste Discharge Prohibitions that Apply within the Garcia River Watershed

The following waste discharge prohibitions apply within the Garcia River watershed:

1. The controllable discharge of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, gravel mining, agricultural, grazing, or other activity of whatever nature into waters of the State within the Garcia River watershed is prohibited.

2. The controllable discharge of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, gravel mining, agricultural, grazing, or other activity of whatever nature to a location where such material could pass into waters of the state within the Garcia River watershed is prohibited.

Controllable discharges are those discharges resulting from human activities that can influence the quality of the water of the State and that can be reasonably controlled through prevention, mitigation or restoration. The above two waste discharge prohibitions replace the region-wide waste discharge prohibitions contained in the action plan for logging, construction, and associated activities. The region-wide waste discharge prohibitions no longer apply to activities in the Garcia River watershed. The above two prohibitions do not apply to landowners who are conducting their land management activities in accordance with an approved Erosion Control Plan *and* either an approved Site-Specific Management Plan or the Garcia River Management Plan (Options 2 and 3, respectively). If the Regional Water Board finds that significant discharges or threatened discharges of sediment occur despite the implementation of an approved Erosion Control Plan and either an approved Site-Specific Management Plan or the Garcia River Management Plan, it will consider the need to revise the plans and will consider the issuance of a Cleanup and Abatement Order to address the discharge, but it will not impose administrative civil liabilities for violations of the prohibitions.

All landowners choosing either Option 2 or 3 as described above must submit an Erosion Control Plan. The general purpose of the Erosion Control Plan is to outline the program by which a landowner or landowners will identify areas of sediment delivery, identify areas at risk of sediment delivery, and control all sediment delivery associated with past and present land management activities. The necessary components of an Erosion Control Plan are enumerated below.

In addition, landowners choosing Option 2 must submit a Site-Specific Management Plan. Those choosing Option 3 must comply with the Garcia River Management Plan, as outlined below. (The Site-Specific Management Plan and Garcia River Management Plan are collectively referred to as Management Plans.) The general purpose of the Management Plans is to outline the program by which a landowner or landowners will manage their property or properties to reduce the future risk of initiating new sediment delivery problems and to increase the ability of the Riparian Management Zone to properly function with regard to sediment filtering, large woody debris recruitment and stream bank stabilization.

A Site-Specific Management Plan differs from the Garcia River Management Plan. With the Site-Specific Management Plan, the landowner is able to select land management measures for controlling sediment that are suitable for the specific activities and conditions on his or her land. In the Garcia River Management Plan, more general land management measures are specified for unstable areas and riparian areas, and for activities related to roads, skid trails, landings, near stream facilities, and gravel mining. The Regional Water Board strongly encourages all landowners to prepare Site-Specific Management Plans and to use the Garcia River Management Plan only until they can develop their own plans to control discharges of sediment from their properties. The Regional Water Board also encourages groups of dischargers with similar land management activities to develop collective watershed-based Erosion Control Plans and Site-Specific Management Plans (Group Plans), where appropriate.

Erosion Control Plans, Site-Specific Management Plans, and the Garcia River Management Plan are not independently enforceable. The submission of an

Erosion Control Plan and Site-Specific Management Plan by a landowner does not create an obligation by the landowner to implement the plans. However, if the landowner chooses not to implement the plans, then Option 1 will apply. In addition, none of the land management measures contained in a Management Plan shall be construed as a gift or dedication of private lands to the general public. A landowner may submit to the Executive Officer a request for an interim extension of time to develop or implement either the Erosion Control Plan or the Management Plan. If the Executive Officer determines that the landowner is making a good faith effort to develop or implement the plans in accordance with the final timelines described in the Implementation Schedule, the extension will be granted. A landowner who is not making a good faith effort to develop or implement an Erosion Control Plan and a Management Plan is subject to the above prohibitions (Option 1).

The elements of an approvable Erosion Control Plan and Site-Specific Management Plan are described below. In addition, the Garcia River Management Plan is outlined in detail. Erosion Control Plans must be submitted no later than January 3, 2005. Site-Specific Management Plans can be submitted at any time. The Garcia River Management Plan must be implemented by January 3, 2002 or substituted by an approved Site-Specific Management Plan.

Elements of an Erosion Control Plan

1. Baseline Data Inventory

   A Baseline Data Inventory includes an ownership-wide inventory of Sediment Delivery Sites. Sediment Delivery Sites are controllable, human-caused erosion sites that are currently eroding or have the potential to erode in such a manner as to deliver at least 10 cubic yards of sediment to a watercourse over the life of the TMDL. They include such features as undersized culverts, culverts with diversion potential, eroding sidecast or fill, downcutting inside ditches, etc.

   The Baseline Data Inventory shall include a description of all active and potential sediment sources resulting from roads, landings, skid trails, timber operations and agricultural operations, and other significant human-caused earth movement activities that have or might have the ability to enter waters of the state.

   The Baseline Data Inventory shall include, at a minimum:

   - A description of the inventory method used;
   - A topographic map with 80 foot intervals showing the ownership boundary and the location of all inventoried sites, as well as roads and drainages; and
   - For each site, an estimate of the volume of sediment and the relative potential for sediment delivery.

   The Baseline Data Inventory must be comprehensive and may follow as examples, completely or in part, the inventory methods described in the *Assessment and Implementation Techniques for Road-Related Sediment Inventories and Storm-Proofing* and contained in the draft *Sustained Yield Plan/Habitat Conservation Plan* for the Pacific Lumber Company (August 25, 1997, Appendix 20, prepared by William Weaver, of Pacific Watershed Associates, Inc.); the *STAR* Worksheet system of the *Watershed and Aquatic Habitat Assessment* (September 29, 1997, Appendix 6:1 prepared by Coastal Forestlands, Ltd.); or the *Sediment TMDL Inventory and Monitoring Worksheet* developed by U.C. Davis (1998).

2. Sediment Reduction Schedule

   The Sediment Reduction Schedule shall describe how and in what order of priority the sediment discharges from the Sediment Delivery Sites identified in the Baseline Data Inventory will be reduced in accordance with the schedule set forth in Table 4-5 of the Implementation Schedule section. The Baseline Data Inventory described in 1. above shall be used when prioritizing and conducting sediment delivery reduction activities, and the highest priority for sediment delivery reduction shall be assigned to those sites with the greatest potential to discharge sediment to a watercourse that supports fish.

3. Assessment of Unstable Areas

   The Assessment of Unstable Areas shall identify through modeling, data analysis and/or a field inventory, areas of instability across the property.

Unstable Areas are areas with a naturally high risk of erosion and areas or sites that will not reasonably respond to efforts to prevent, restore or mitigate sediment discharges. Unstable Areas are characterized by slide areas, gullies, eroding stream banks, or unstable soils that are capable of delivering sediment to a watercourse. Slide areas include shallow and deep seated landslides, debris flows, debris slides, debris torrents, earthflows, headwall swales, inner gorges and hummocky ground. Unstable soils include unconsolidated, non-cohesive soils and colluvial debris.

The Assessment of Unstable Areas shall include, at a minimum:

- All known active and potential shallow and deep-seated landslides, debris flows, debris slides, debris torrents, earthflows, headwall swales, inner gorges, and unstable soils.
- All known active or potentially active gullies and streambank erosion sites, as appropriate, but should not include the sites identified in 1. above.

Preparers of the Assessment of Unstable Areas may but are not required to use existing California Department of Conservation maps such as the series entitled "Geology and Geomorphic Features Related to Landsliding" or a digital terrain-type model like the one developed by Louisiana Pacific Corporation in its draft *Sustained Yield Plan for Coastal Mendocino County* (1997) in combination with field-based maps of Unstable Areas.

4. Monitoring Plan

The Monitoring Plan shall describe the method for monitoring the effectiveness of the sediment control efforts the landowner or group of landowners has implemented for the Sediment Delivery Sites identified in the Baseline Data Inventory. The monitoring method must be consistent with the submitted Baseline Data Inventory method so that results are comparable from year to year. The results of the sediment control efforts and any other erosion control related activities, including the implementation of land management measures, shall be submitted to the Regional Water Board in an annual report, due January 30. Any changes in ownership or primary land management activities shall also be included in the annual report. In addition, individual landowners are encouraged to establish instream monitoring points above and below any significant land management activity on their properties and in potential anadromous fish refugia. (See Monitoring section, below).

Elements of a Site-Specific Management Plan

1. Description of Land Management Measures to Control Sediment Delivery

A Site-Specific Management Plan shall include a description of, and schedule for, the Land Management Measures the landowner proposes to implement to control the future delivery of sediment from the following land management activities:

- Roads, landings, skid trails, watercourse crossing construction, reconstruction, maintenance, use, and obliteration;
- Operations on unstable slopes;
- Use of skid trails and landings;
- Use of near stream facilities, including agricultural activities; and
- Gravel mining.

In addition, the description must include:

- A Long-term Road System Plan (Road Plan) similar to that described below in the Garcia River Management Plan, and
- Supporting information that demonstrates that the proposed Land Management Measures will provide a level of water quality protection that is roughly equivalent to that expected from the corresponding measures of the Garcia River Management Plan.

2. Description of Land Management Measures to Improve the Condition of the Riparian Management Zone

The Site-Specific Management Plan shall include a description of, and schedule for, the Land Management Measures and any restoration activities the landowner proposes to improve or maintain the condition of the Riparian Management Zone such that it provides:

- Stream bank protection,
- Filtering of eroded material prior to its entering the watercourse channel, and
- Recruitment of large woody debris to the watercourse channel and flood plain.

In addition, the description shall include supporting information that demonstrates that the proposed Land Management Measures will provide a level of water quality protection that is roughly equivalent to that expected from the corresponding riparian measures of the Garcia River Management Plan.

Group Plans

Dischargers with similar land management activities may choose to develop collective Erosion Control Plans and Management Plans (Group Plans). Group Plans offer landowners the ability to work together to solve their erosion problems, while also affording a measure of privacy to the members of the Group. The Group Plan shall clearly indicate the members of the Group and the land that is covered under the Group Plan. Where a Group member has multiple land management activities (e.g., ranching and timber harvesting), the Group Plan will cover only that portion of the member's land that is used for land management activities that are similar to those of the remainder of the Group.

The Implementation Plan applies to Groups in the same manner as it applies to individual landowners except as noted below. A Group Erosion Control Plan shall contain the same elements and level of detail as an individual Erosion Control Plan, with the following exceptions. (1) The Baseline Data Inventory Map shall show the perimeter boundary of the land covered by the Group Plan, but it does not need to depict the members' interior ownership boundaries. Shading or cross-hatching shall be used to depict any properties within the perimeter that are not covered by the Group Plan. (2) The Baseline Data Inventory Map shall show the location of the Group's Sediment Delivery Sites, but the specific Sediment Delivery Sites do not need to be associated with any individual landowner. (3) The Sediment Reduction Schedule shall be consistent with the schedule in Table 4-5, but the sediment control work may be prioritized on a Group basis, rather than an individual landowner basis. (4) The Assessment of Unstable Areas does not need to be associated with any individual landowner. The Group Management Plan shall include the elements of either a Site Specific Management Plan or the Garcia River Management Plan (or a combination of the two), but the management measures shall be associated with the Group, rather than any of the individual landowners.

All members of the Group are responsible for ensuring that the Group Plans are developed and implemented. The waste discharge prohibitions do not apply to any of the members of the Group as long as the approved Group Plans are being implemented. If the Group Plan is not developed or implemented due to a member's failure to make a good faith effort to develop or implement the Group Plan, then that individual member of the Group is subject to the Prohibitions. Membership in a Group shall be based upon consent of all the members of the Group. The Group may change its membership by submitting a revised Group Plan for approval by the Executive Officer.

Relation of Other Planning Efforts to Erosion Control Plans and Management Plans

The Regional Water Board does not intend for landowners to engage in duplicative or overly complex planning efforts if they are already involved in planning efforts that will satisfy the requirements of this Basin Plan Amendment. For example, the Regional Water Board will consider all of the following to be approvable as an Erosion Control Plan and Management Plan, as long as three conditions are met. First, the document(s) must include, or be modified to include, the elements described above. Second, the document(s) must demonstrate water quality protection and restoration for the area of ownership that is roughly equivalent to the Garcia River Management Plan. Third, the document(s) must provide an assurance that the Implementation Schedule will be met.

- Non-Industrial Timber Management Plans
- Sustained Yield Plans
- Habitat Conservation Plans
- Letters of Intent followed by Ranch Plans as described in the *California Rangeland Water Quality Management Plan* (July 1995)
- Timber Harvest Plans that cover entire ownerships

The Garcia River Management Plan

The term “roads” as used in the Garcia River Management Plan include private roads, public roads, rural residential roads, skid trails, and landings. The term “near stream facility” includes any building, equipment, corral, pen, pasture, field, trail, livestock crossing or other feature or structure which is associated with commercial land use operations and is close enough to any watercourse to have the potential to cause the discharge of sediment to the watercourse. The term “feasible” means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technical factors.

Land Management Measures That Apply To Roads, Watercourse Crossings, and Near Stream Facilities Throughout the Garcia River Watershed

1. By January 3, 2005, a Long-term Road System Plan (Road Plan) shall be developed and submitted which describes the long-term road system, and identifies all roads and watercourse crossings. The road system described in the Road Plan shall be designed and constructed to provide surfacing, drainage, and watercourse crossings to match the intended road use and maintenance abilities. Roads (including road prism and watercourse crossing drainage structures) that are constructed or reconstructed after January 3, 2002, shall comply with the standards below. Existing usable roads will be scheduled for upgrading as necessary as Sediment Delivery Sites under the Erosion Control Plan. Roads that are not needed as part of the long-term road system and that discharge or threaten to discharge earthen material to waters of the state shall be scheduled as necessary for abandonment or obliteration as Sediment Delivery Sites under the Erosion Control Plan. The road plan shall include, at a minimum:

    - The location of all roads and watercourse crossings within the ownership,
    - The current status of each road, including road surface material, road and watercourse design, and use restrictions, and
    - The future plan and schedule for each road.

    A. Roads used year round shall be designed, constructed, reconstructed or upgraded to permanent road status with the application of an adequate layer of competent rock for surface material and the installation of permanent watercourse crossings and road prism drainage structures. These roads shall receive regular and storm period inspection and maintenance.

    B. Roads used primarily during the dry season but to a limited extent during wet weather shall be designed, constructed, reconstructed or upgraded to seasonal road status with the application of spot rocking where needed to provide a stable running surface during the period of use. These roads shall be designed, constructed, reconstructed, and upgraded to provide permanent watercourse crossings and road surface drainage structures. These roads shall receive inspection at least once during the wet weather period and shall receive at least annual maintenance.

    C. Roads that are not used or maintained during wet weather shall be constructed or reconstructed to a temporary road status. Spot rocking of the road surface shall be used, where needed, to provide a stable running surface during the period of use. Road surface drainage structures shall be designed and constructed to prevent erosion so that regular and storm period maintenance is not needed to prevent sediment discharge to watercourses. All roads that will not receive at least annual maintenance shall have watercourse crossings, except rock fords, removed prior to October 15 of each year of installation.

2. All watercourse road crossings shall, at a minimum, utilize the standards described on pages 64 - 79 of the *Handbook for Forest and Ranch Roads* (prepared by Weaver and Hagans, 1994). These standards include but are not limited to the design and installation of permanent crossings using a culvert with a minimum diameter designed to pass at least a 50-year flood frequency event. Larger diameter culverts shall be used if debris that might result in blockage of the culvert inlet is present in the channel. All crossings shall be designed and installed to prevent the diversion of stream flow down or through the road prism in the event of

culvert failure, and to provide free passage to fish at all flow regimes. All watercourse road crossings that do not meet these minimum standards as of January 3, 2002, must be scheduled as necessary for upgrade as Sediment Delivery Sites under the Erosion Control Plan. All watercourse road crossings installed after January 3, 2002, must be installed according to these minimum standards.

3. All road design, construction, and reconstruction shall use, at a minimum, the standards described on pages 39 - 54 and 81 - 120 of the *Handbook for Forest Ranch Roads* (prepared by Weaver and Hagans, 1994). These standards include but are not limited to the outsloping of the road prism (whenever feasible and safe) and the installation of rolling dips (rather than water bars) for additional road drainage. If insloped roads are necessary, ditch relief culverts shall be installed, at a minimum, at the distances described in Table 20 of the *Handbook for Forest and Ranch Roads*, and located to prevent discharge of road drainage directly onto erodible soils. All roads that do not meet the minimum standards as of January 3, 2002, must be scheduled as necessary for upgrade as Sediment Delivery Sites under the Erosion Control Plan. All roads constructed or reconstructed after January 3, 2002, must be constructed or reconstructed to these minimum standards.

4. Straw bale check dams or silt fences shall be installed at the outlet of all road drainage structures prior to use of the road for all roads used after January 3, 2002, if less than one hundred feet of 90 percent vegetative buffer exists between the outlet and a watercourse. Road drainage structures with less than one hundred feet of 90 percent vegetative buffer that are associated with roads not in use after January 3, 2002, must be scheduled as necessary for upgrade as Sediment Delivery Sites.

5. After January 3, 2002, there shall be no construction, reconstruction, or use of roads within the channel of any watercourse. This measure does not apply to watercourse crossings.

6. After January 3, 2002, there shall be no construction, reconstruction, or use of skid trails on slopes greater than 40 percent within 200 feet of a watercourse, as measured from the channel or bankfull stage, whichever is wider.

7. After January 3, 2002, there shall be no use of roads or near stream facilities, when the activity contributes to the discharge of visibly turbid water from the road or near stream facility surface or is flowing in an inside ditch in amounts that cause a visible increase in the turbidity of a watercourse. As an exception, short-term, temporary use of near stream facilities may occur if there is no feasible alternative.

8. After January 3, 2002, the use of heavy equipment (defined as 1.5 tons) between October 15 and May 1 shall be limited to roads that have permanent drainage and are surfaced with an adequate layer of rock to maintain a stable road surface throughout the period of use. A stable road surface is defined as a surface that does not allow the concentration of road runoff to the extent that depressions or rills that are capable of channeling water are formed on the road surface. On near stream facilities, use of heavy equipment in this time period shall be limited to facilities with drainage collection and storage capabilities and/or facilities with a stable soil surface throughout the period of use. As an exception, short-term, temporary use of heavy equipment on near stream facilities may occur if there is no feasible alternative.

9. After January 3, 2002, all roads and other near stream facilities that are actively used shall have drainage and/or drainage collection and storage facilities installed before the start of any rain that causes overland flow across or along the disturbed surface and could result in the delivery of sediment to a watercourse. Roads and near stream facilities that are no longer actively used and have the potential to discharge sediment to a water of the state shall be addressed as necessary as Sediment Delivery Sites.

10. After January 3, 2002, there shall be no road construction, reconstruction, or upgrading from October 15 to May 1, except for emergency road maintenance.

11. After January 3, 2002, all new crossings installed as temporary watercourse crossings and

designed to carry less water and debris than predicted for a 50 year flood discharge shall be removed and stabilized by October 15 of each year of installation. For all watercourses, the approaches to all temporary watercourses crossings shall be pulled back to create side slopes of less than 50 percent, and stabilized with rock, grass seed, mulch, or slash from the lowest (closest) drainage structure to the watercourse transition line. Existing temporary watercourse crossings not removed and stabilized by January 3, 2002, shall be addressed as necessary as Sediment Delivery Sites.

12. After January 3, 2002, off-channel water drafting and livestock watering locations shall be developed to the extent feasible.

Land Management Measures That Apply in Unstable Areas – effective date January 3, 2002

13. No road construction shall occur across unstable areas without the field review and development of site specific mitigation measures by a Certified Engineering Geologist registered in the State of California. A report prepared by the Certified Engineering Geologist shall be submitted to the Regional Water Board before construction/ reconstruction activities begin.

14. No more than 50 percent of the existing basal area formed by tree species shall be removed from unstable areas that have the potential to deliver sediment into a watercourse.

15. No concentrated flow shall be directed across the head, toe, or lateral margin of any unstable area.

16. Agricultural activities on unstable slopes that have the potential to deliver sediment to a water of the state shall be minimized to the extent practical.

Land Management Measures That Apply in the Riparian Management Zone

A Riparian Management Zone width shall be assigned to each watercourse based on the class of the watercourse. For Class I and II watercourses, the Riparian Management Zone is a 100-foot strip of land on each side of, and adjacent to, the watercourse. For Class III watercourses, the Riparian Management Zone is a 50-foot strip of land on each side of, and adjacent to, the watercourse. The Riparian Management Zone shall be measured from the active channel or bankfull stage, whichever is wider.

17. All roads within the Riparian Management Zone used after January 3, 2002, shall be surfaced with competent rock to a sufficient depth prior to use of the road to prevent road fines from discharging into watercourses.

18. After January 3, 2002, any new soil exposure within the Riparian Management Zone caused by land management activities shall be stabilized with the application of grass seed, mulch, slash or rock before October 15 of the year of disturbance. Stabilization measures shall achieve at least 90 percent coverage of all soil within the Riparian Management Zone exposed by land management activities. Existing exposed soil caused by land management activities that is not stabilized prior to January 3, 2002, shall be addressed as Sediment Delivery Sites.

19. After January 3, 2002, to promote stream bank stability, each landowner shall ensure that there are no commercial land management activities, including commercial or salvage timber harvest, grazing or crop agriculture, within the first 25 feet of the Riparian Management Zone for Class I or II watercourses. This measure does not apply to watercourse crossings. Commercial land management activities existing prior to January 3, 2002, must be phased out by January 3, 2007.

20. After January 3, 2002, in order to maintain present levels and promote future instream large woody debris, each landowner shall restrict commercial land use activities within the Riparian Management Zone to ensure that:

    A. There is no removal of downed large woody debris from watercourse channels unless the debris is causing a safety hazard.

    B. On Class I and II watercourses, at least five standing conifer trees greater than 32 inches in diameter at breast height (DBH) are permanently retained at any given time per 100 linear feet of watercourse. Where sites lack enough trees to meet this goal, there shall be no commercial harvest of the five largest diameter trees per 100 linear feet of watercourse.

    C. There is no removal of trees from unstable areas within a Riparian Management Zone that have the potential to deliver sediment to a water of the State unless the tree is causing a safety hazard.

Land Management Measures That Apply to Gravel Mining in the Garcia River Watershed – effective date January 3, 2002

21. In-channel gravel mining shall follow the following recommendations from the *Garcia River Gravel Management Plan,* prepared for the Mendocino County Water Agency, August 1996.

    A. Establish an Absolute Elevation below Which No Extraction May Occur. The absolute elevation below which no mining could occur would be surveyed on a site specific basis. A "redline" elevation tied to National Geodetic Vertical Datum of 1929 (NGVD) or North American Vertical Datum (NAVD) should be established below which mining may not take place, in order to avoid impacts to structures such as bridges and to avoid vegetation impacts associated with downcutting due to excess removal of sediment. A redline elevation should be 2 feet above the low flow water surface elevation (at the edge of the bar closest to the low flow channel) during the first year following adoption of the gravel management plan (assuming that this will occur in 1996) [note: The Mendocino County adopted the Gravel Management Plan on December 9, 1996]. A 2-foot minimum elevation as a buffer with a 2% grade toward the bank is consistent with that required by the National Marine Fisheries Service (NMFS).

    B. Limit In-channel Extraction Methods To "Bar Skimming" or an Alternative Method Recommended by the Mendocino County Data Evaluation Team. If mining is limited to the downstream end of the bar as described above with a riparian buffer on both the channel and hillslope (or floodplain) side, bar skimming would minimize impacts. Other methods such as excavation of trenches or pools in the low flow channel lower the local base level, and maximize upstream (headcutting and incision) and downstream (widening and braiding) impacts. In addition, direct disturbance of the substrate in the low flow channel should be avoided. Trenching on bars (described in the Eel River EIR; EIP, 1992) may be beneficial in the future for the Garcia if it becomes severely aggraded, flat, shallow, and braided and has few invertebrates. The Department of Fish and Game should be consulted in order to determine if the Garcia River meets these conditions in the future. In the future, the Mendocino County Data Evaluation Team should have flexibility to decide on the most appropriate method to enhance habitat on a site specific basis.

    An excavated pool (or larger in-stream pit) acts as a local base level, and can cause upstream and downstream incision as the channel re-establishes its gradient. Incision is a negative effect of trenching that may result in increased bank erosion and loss of habitat. In-channel excavation of pools would take place in summer after June 15 – after the need for spawning habitat has passed. Subsequent winter flows may re-fill the pool before it can be used by fish in the following season.

    C. Grade Slope of Excavated Bar to Prevent Fish Entrapment. Excavation on bars by gravel skimming would have a 2% slope toward the bank. After extraction, gravel bars must be left void of isolated pockets or holes.

    D. Extract Gravel from the Downstream Portion of the Bar. Retaining the upstream one to two thirds of the bar and riparian vegetation while excavating from the downstream third of the bar is accepted as a method to promote channel stability and protect the narrow width of the low flow channel necessary for fish. Gravel would be redeposited in the excavated downstream one to two thirds of the bar (or downstream of the widest point of the bar) where an eddy would form during sediment transporting flows. In contrast, if excavation occurs on the entire bar after removing existing riparian vegetation, there is a greater potential for widening and braiding of the low flow channel.

    E. Concentrate Activities to Minimize Disturbance. In-channel extraction activities should be concentrated or localized to a few bars rather than spread out over many bars. This localization of extraction will minimize the area of disturbance of upstream and downstream effects. Skimming decreases habitat and species diversity - these effects

should not be expanded over a large portion of the study area.

F. Maintain Flood Capacity. Flood capacity in the Garcia River should be maintained in areas where there are significant flood hazards to existing structures or infrastructure.

G. Minimize Activities That Release Fine Sediment to the River. No washing, crushing, screening, stockpiling, or plant operations should occur at or below the streams "average high water elevation," or the dominant discharge. In the Garcia River the elevation of the dominant discharge is near the top of bank. These and similar activities have the potential to release fine sediments into the stream, providing habitat conditions deleterious to salmonids. The Regional Water Board regulates fine sediment releases to the river from gravel processing through its waste discharge requirements. Gravel mining and processing applicants should notify the Regional Water Board if waste discharge requirements are applicable to their operation.

H. Avoid Dry Road Crossings. Dry road crossings disrupt the substrate and can result in direct mortality or increased predation opportunity on fry. The crossing of choice and the one utilized in recent years in the lower Garcia is the free-span seasonal bridge. This type of crossing protects the upstream habitat as well as improving river conditions for recreation. If dry crossings are unavoidable, they should not be placed in the channel prior to June 15, and should be removed by October 15 so that they do not interfere with incubating or migrating salmonids. The number of crossings should be kept to a minimum. Placement of crossings should also take into account the damage which might occur to riparian vegetation. Roads should lead directly to the crossings and not long distances through the riparian corridor. Placement of any road crossing should be done with the approval of the Data Evaluation Team. Any structure placed across a river or recreationally navigable stream should be designed and installed so as to provide sufficient overhead clearance to allow unobstructed and safe passage for small recreational craft.

I. Limit In-channel Operations to the Period Between June 15 and October 15. Gravel extraction for outside this window may interfere with salmonid incubation and migration. The hatching period for late steelhead spawners may extend for 40-50 days. Therefore, the June 15 start date is necessary to protect eggs laid from late April to May. Spawning salmonids have been observed in the Garcia River system as late as June 2.

J. Avoid Expansion of Instream Mining Activities Upstream of River Mile 3.7. The reach of channel upstream of River Mile 3.7 is important to steelhead spawning. Gravel mining increases the probability of additional fine sediments in spawning gravels. In order to maintain suitable spawning gravels of riffles in this reach, it is strongly recommended that gravel mining within this reach be restricted to the site of present operations.

22. Floodplain (Off-Channel) gravel mining shall follow the following recommendations from the *Garcia River Gravel Management Plan,* prepared for the Mendocino County Water Agency, August 1996.

A. Floodplain Gravel Extraction Should Be Set Back from the Main Channel. In a dynamic alluvial system, it is not uncommon for meanders to migrate across a floodplain. In areas where gravel extraction occurs on floodplains or terraces, there is a potential for the river channel to migrate toward the pit. If the river erodes through the area left between the excavated pit and the river, there is a potential for "river capture," a situation where the low flow channel is diverted through the pit. In the Garcia River, a setback of at least 400 feet is recommended to minimize the potential for river capture. In order to avoid river capture, excavation pits should set back from the river to provide a buffer and should be designed to withstand the 100-year flood. Adequate buffer widths and reduced pit slope gradients are preferred over engineered structures

which require maintenance in perpetuity. Hydraulic, geomorphic and geotechnical studies should be conducted prior to design and construction of the pit and levee.

In addition to river capture, extraction pits create the possibility of stranding fish. To avoid this impact, California Department of Fish and Game (CDFG) requires that all off-channel mining be conducted above the 25-year floodplain.

B. The Maximum Depth of Floodplain Gravel Extraction Should Remain above the Channel Thalweg. Floodplain gravel pits should not be excavated below the elevation of the thalweg in the adjacent channel. This will minimize the impacts of potential river capture by limiting the potential for headcutting and the potential of the pit to trap sediment. A shallow excavation (above the water table) would provide a depression that would fill with water part of the year, and develop seasonal wetland habitat. An excavation below the water table would provide deep water habitat.

C. Side Slopes of Floodplain Excavation Should Range from 3:1 to 10:1. Side slopes of a floodplain pit should be graded to a slope that ranges from 3:1 to10:1. This will allow for a range of vegetation from wetland to upland. Steep side slopes excavated in floodplain pits on other systems have not been successfully reclaimed, since it is difficult for vegetation to become established. Terrace pits should be designed with a large percentage of edge habitat with a low gradient which will naturally sustain vegetation at a variety of water levels. Pit margins should be reclaimed with riparian buffer zones of fifty feet surrounding them. Islands should be incorporated into the reclaimed pits as waterfowl refugia. Pits should be designed with input from the Mosquito Abatement District.

D. Place Stockpiled Topsoil above the 25-year Floodplain. Stockpiled topsoil can introduce a large supply of fines to the river during a flood event and degrade salmonid habitat. The CDFG considers storage above the 25-year flood inundation level sufficient to minimize this risk.

E. Floodplain Pits Should Be Restored to Wetland Habitat or Reclaimed for Agriculture. There are very few examples of successfully restored or reclaimed gravel extraction pits on other river systems with gravel extraction. The key to over coming barriers to successful restoration or reclamation is to conserve or import adequate material to re-fill the pit, while ensuring that pit margins are graded to allow for development of significant wetland and emergent vegetation.

Review of Individual Land Management Projects

Proposed land management projects that require Regional Water Board review for possible issuance of waste discharge requirements pursuant to Section 13260 of the California Porter-Cologne Water Quality Control Act, Clean Water Act Section 404 permits, and/or Clean Water Act Section 401 certification shall comply with this Action Plan, including TMDL, Implementation Plan and Monitoring Plan, as appropriate.

Restoration Projects

Landowners, agencies, and interested groups are encouraged to continue their interest, participation, and cooperation with restoration activities in the Garcia River watershed. Restoration is a tool useful for both stabilizing eroding stream banks throughout the watershed and improving instream habitat conditions. To ensure that stream restoration projects are planned and implemented in a manner that allows compliance with the provisions of the Action Plan, each landowner conducting restoration projects on his/her ownership shall notify the Regional Water Board in writing of any stream restoration activity, its location, the time frame of the project, and a summary of the work proposed. Landowners may propose to conduct restoration work in lieu of controlling a Sediment Delivery Site. The Executive Officer may consider allowing such a substitute in those cases where a greater environmental benefit would result.

Implementation Schedule

This Action Plan, including TMDL, Implementation Plan, and Monitoring Plan will take effect on January 3, 2002, in order to give landowners in the watershed the opportunity to implement voluntary actions.

Regional Water Board staff will send a letter to each landowner in the Garcia River watershed requesting a Statement of Intent regarding this Action Plan. The Regional Water Board letter will describe the options available to the landowner, which are as follows:

Option 1 Comply with the waste discharge prohibitions that apply to the Garcia River watershed.

Option 2 Comply with an approved Erosion Control Plan and a Site-Specific Management Plan.

Option 3 Comply with an approved Erosion Control Plan and the Garcia River Management Plan.

Landowners must comply with this Action Plan, including TMDL, Implementation Plan and Monitoring Plan through one of these three options or face potential permitting and/or enforcement action in the event of discharges of sediment. Landowners who do not submit a Statement of Intent are subject to the waste discharge prohibitions (Option 1).

Regional Water Board staff will review and respond to each Statement of Intent. The Board will then prioritize efforts in the Garcia River watershed, based on its general estimates of relative threat to water quality. Highest priority will be assigned on an ownership by ownership basis to those sites identified as having the highest existing discharge or potential discharge of sediment to a watercourse that supports fisheries.

Landowners who intend to follow either Option 2 or Option 3 are encouraged to do so as soon as possible and to submit their plans to the Regional Water Board. Regional Water Board staff will acknowledge receipt of each plan submitted and will review each plan for completeness. The Executive Officer will approve the plans if the review indicates that the plans meet the requirements specified above and complies with the schedule contained in Table 4-5, below. The Executive Officer will notify the landowner of his/her approval in a letter. Prior to approving an Erosion Control Plan or Site-Specific Management Plan, the Executive Officer will provide notice and an opportunity to comment to those who have requested it. At the Executive Officer's discretion, a Regional Water Board workshop may be scheduled to receive comments. Time extensions and minor revisions to approved Erosion Control Plans and Site-Specific Management Plans may be approved by the Executive Officer without notice.

TABLE 4-5 SCHEDULE FOR REDUCING SEDIMENT DELIVERY FROM LAND MANAGEMENT ACTIVITIES IN THE GARCIA RIVER WATERSHED

SOURCE AND LAND USE	FINAL COMPLIANCE DATE	ACTIVITY AND INTERIM SCHEDULE[1]
Roads, landings, skid trails, timber harvest operations, agricultural operations, gravel mining, and other significant human-caused earth movement	January 3, 2005, and every 10 years thereafter, as necessary if new Sediment Delivery Sites are identified	Prepare an ownership-wide Baseline Data Inventory of controllable Sediment Delivery Sites and a Sediment Reduction Schedule for the reduction of sediment from the inventoried sites. No interim schedule.
Unstable Areas	January 3, 2005, and every 10 years thereafter, as necessary if new Unstable Areas are identified	Prepare an ownership-wide Assessment of Unstable Areas. No interim schedule.

SOURCE AND LAND USE	FINAL COMPLIANCE DATE	ACTIVITY AND INTERIM SCHEDULE[1]
Sediment Delivery Sites associated with Roads	January 3, 2015	Following the completion of the Baseline Data Inventory, control, in order of priority, all controllable Sediment Delivery Sites identified in the Baseline Data Inventory in such a manner as to reduce the sediment from sites representing 10 percent of the overall volume of inventoried sediment every year, or until 100 percent of the sites are controlled, whichever occurs first. Control measures are predicted to be 90 percent effective at reducing sediment delivery.
Sediment Delivery Sites associated with Timber Harvest Operations, including skid trails and landings	January 3, 2015	Following the completion of the Baseline Data Inventory, control, in order of priority, all controllable Sediment Delivery Sites identified in the Baseline Data Inventory in such a manner as to reduce the sediment from sites representing 10 percent of the overall volume of inventoried sediment every year, or until 100 percent of the sites are controlled, whichever occurs first. Control measures are predicted to be 90 percent effective at reducing sediment delivery.
Sediment Delivery Sites associated with agricultural operations in the Riparian Management Zone	January 3, 2025	Following the completion of the Baseline Data Inventory, control, in order of priority, all controllable Sediment Delivery Sites in the Riparian Management Zone in such a manner as to reduce the sediment from sites representing 20 percent of the overall volume of inventoried sediment every four years, or until 100 percent of the sites have been controlled, whichever occurs first. Control measures in the Riparian Management Zone are predicted to be 90 percent effective at reducing sediment delivery.
Sediment Delivery Sites associated with agricultural operations on the hillslopes	January 3, 2025	Following the completion of the Baseline Data Inventory, control, in order of priority, all controllable Sediment Delivery Sites on hillslopes in such a manner as to reduce the overall volume of inventoried sediment by 20 percent every four years, or until a 100 percent of the sites have been controlled, whichever occurs first. Control measures on the hillslopes are predicted to be 50 percent effective at reducing sediment delivery.
Activities on Unstable Areas and in Riparian Management Zones, and activities related to roads, watercourse crossings, near stream facilities, and gravel mining	See the Garcia River Management Plan or the approved Site-Specific Management Plan	Implement Land Management Measures contained in an approved Site-Specific Management Plan or the Garcia River Management Plan in accordance with the schedule contained therein.
Annual Report	January 30, 2004 and each January 30th thereafter	Report to the Regional Water Board all erosion control-related activities and sedimentation reduction results of the previous year.

[1] Compliance with the interim schedules for the control of Sediment Delivery Sites will be calculated by dividing the volume of sediment controlled during each one year or four year period by the overall volume of inventoried sediment associated with that category of source or land use.

VII. Monitoring Plan

Monitoring is intended to provide information regarding the effectiveness of sediment control efforts in attaining the Numeric Targets over time. Instream and hillslope monitoring parameters, monitoring protocols, and frequency of monitoring are described in Table 4-6. Instream and hillslope monitoring by landowners (except for the Sediment Delivery Site monitoring described in the Erosion Control Plan, above) is on a voluntary basis. Regional Water Board staff will coordinate instream monitoring efforts of the landowners, other regulatory agencies, academic institutions, and members of the public and shall set a goal of establishing at least one instream monitoring point in each of the twelve Planning watersheds in the Garcia River watershed. In addition, Regional Water Board staff will work together with the University of California Cooperative Extension to assist landowners in developing voluntary monitoring plans.

Landowners choosing Option 2 or Option 3 should assess the landscape associated with their property to determine which of the listed instream and hillslope monitoring parameters are most appropriately measured and are encouraged to submit their plans for voluntary monitoring to the Regional Water Board for comment prior to implementing them. Landowners are strongly encouraged to conduct voluntary instream and hillslope monitoring as a means of improving the scientific understanding of the Garcia River watershed and to provide a site specific basis for revising the Action Plan over time. Landowners are particularly encouraged to establish instream monitoring points above and below any significant land management activity on their properties and in potential anadromous fish refugia.

Landowners are required to submit by January 30 of each year an annual report describing the erosion control-related activities of the previous year and the sediment delivery reduction results of those activities, including source reduction volumes. In addition, landowners are encouraged to disclose in the annual reports the results of any voluntary instream and hillslope monitoring. At least annually, Regional Water Board staff will compile and evaluate the results of the annual reports provided by landowners for review by the Regional Water Board to assess the progress of the Action Plan. In the event that sufficient information to assess the progress of the Action Plan is not gained through the voluntary monitoring efforts of landowners and others as augmented by the Regional Water Board, revisions to the monitoring provisions of the Action Plan, through a Basin Plan amendment, will be contemplated.

VIII. Estimated Total Cost and Potential Sources of Funding

An estimated cost to implement the sedimentation reduction efforts described in the Action Plan is $5 million plus unquantified costs which include inventory costs and the opportunity cost of the volume of unharvested timber, up to an additional $2 million. Potential training and financing resources available to landowners include but are not limited to the Wildlife Habitat Incentive Program (WHIP), the Environmental Quality Incentives Program (EQUIP), the Conservation Reserve Program (CRP), the Salmon and Steelhead Restoration Program (SSRP), the Forestry Incentive Program (FIP), the Salmon and Steelhead Restoration Account (SSRA), and Clean Water Act Section 205(j) and Section 319(h) funding.

IX. Plan for Future Review of the Strategy

Public participation was a key element in the development of the Strategy and will continue to be an essential component in its implementation. Interested persons will have the opportunity to comment on the progress of the Action Plan at watershed meetings, and to the Regional Water Board at least once every 3 years, at which time the Regional Water Board shall determine if there is sufficient progress toward implementation of erosion control and management activities, as well as movement towards attainment of the Numeric Targets described in the Action Plan. If sufficient progress as described above is not documented, the Regional Water Board will consider revising the Action Plan through a Basin Plan amendment. If the Regional Water Board concludes that the Numeric Targets are being attained throughout a Planning watershed, it may consider suspending or terminating some or all of the Action Plan for landowners within that Planning watershed.

TABLE 4-6 SUMMARY OF MONITORING PARAMETERS AND PROTOCOLS

PARAMETER	PROTOCOL	BRIEF DESCRIPTION (Protocol should be consulted for detailed methodology)	FREQUENCY
INSTREAM MONITORING			
Sediment-related barriers	Any defensible method	Stream survey; identification of sediment deltas, underground stream sections, shotgun culverts, reaches with water depths less than 0.18 meters, etc.; measurement or estimate of extent of barrier and mapping of location.	Annual
Embeddedness	Flosi and Reynolds (1994), Burns (1984)	Identify at least 5 riffle habitat units in Class I streams. Randomly select at least 50 cobbles from each habitat unit and measure or estimate the percent of each cobble which is covered or surrounded by fines. This will be obvious from a dark ring around the cobble indicating its exposure to stream flow. Rate each cobble 1, 2, 3, or 4 as follows: score of 1=cobbles 0-25% surrounded or covered by fines; 2=26-50%; 3=51-75%; 4=76-100%.	Annual
% fines, gravel composition	McNeil protocol, Valentine (1995)	Identify at least 5 riffle habitat units in Class I streams. Collect at least 2 bulk core samples of sediment in each habitat unit in the first at the pool/riffle break immediately downstream of pool crests. Measure the amount of volume of sediment associated with each size class in the field. Bag at least 5 samples to be weighed in the laboratory to establish a correlation between weight and volume.	Annual
Pool characteristics	Flosi and Reynolds (1994)	Identify at least 10 pool habitat units within a reach that is 20-30 bankfull widths long in Class I streams. Measure habitat unit length, characterize habitat types in each unit, and measure mean width of low flow channel. Measure maximum length, width and depth of all pools in each unit. Measure depth of each pool tail crest.	Annual
Frequency of primary pools	Flosi and Reynolds (1994)	Within each reach (as described above), identify the maximum length of all pools which are >3 feet deep, > in width then 1/2 width of low flow channel, and > in length then width of low flow channel.	Annual
V*	Lisle and Hilton (1992), Knopp (1993)	Identify at least 10 survey units within a reach of 20-30 bankfull widths in length in 3rd order streams with slopes 1-4%. Measure the residual volume of each pool within the unit with a graduated rod along transects, as described by Lisle and Hilton.	Annual
D50	Knopp (1993), Rosgen (1996)	Identify at least 5 survey units within a reach of at least 20-30 bankfull channel widths long in 3rd order streams with slopes 1-4%. Lay out transects, as described by Rosgen, and collect at least 100 particles in each reach. Measure the particle, as described, and tally for later graphing.	Annual
Volume of large woody debris	Shuett-Hames (1994) for Timber, Fish and Wildlife Watershed Assessment Manual (Level 2 analysis)	Identify at least 10 survey units of at least 500 feet long within Class I, II and III streams. Identify and measure all pieces of large woody debris, including logs at least 4 inches in diameter and 72 inches long, and root wads. Note the location of the LWD in the channel, the channel length, wood type, stabilizing factors, pool formation function and orientation and decay class.	At least once every three years

PARAMETER	PROTOCOL	BRIEF DESCRIPTION (Protocol should be consulted for detailed methodology)	FREQUENCY
Cross-section	Rosgen (1996)	Identify at least 1 survey unit within a reach of 20-30 bankfull widths long in each Class I and II streams. Establish at least 3 transects across the bankfull channel in each survey unit and collect evenly spaced measurements of the depth to channel along each transect. The transect should be marked for return at subsequent samplings.	At least once every three years
Thalweg profile	Dunne and Leopold (1976)	Identify at least 1 survey unit within a reach of at least 20-30 bankfull widths long in each Class I and II streams. Survey units must be no less than 30 times the bankfull channel width with 3-4 meanders within the survey unit.	At least once every three years
Miles of open stream channel	Grant (1988)	Modified RAPID analysis measuring linear distance of open stream channels from aerial photographs.	At least once every ten years
Flow and/or stage height	Gordon, et. al. (1992)	Measurements or estimates determined during instream sampling. Continuous measurements are desirable but require sophisticated equipment that is vulnerable to damage. Point measurements of stage height during storm event and routinely through the year are more manageable.	Ongoing
Rainfall		Daily measurement using a gage with a sensitivity of 0.1 inch.	Ongoing
HILLSLOPE MONITORING			
Landslides, fluvial, and surface erosion associated with roads, landings and skid trails	Pacific Watershed Associates or similar method	Road inventory; identification of existing and potential sediment delivery sites; measurement or estimation of volume of sediment associated with each site.	Annual
Landslides associated with harvest units	Timber, Fish and Wildlife (Washington State)	Aerial photographs; identification of landslide features associated with timber harvest units; measurement of the area of the landslide feature; estimate of the volume of sediment delivered to the stream from each feature.	Annual
Landslides, fluvial, and surface erosion associated with agricultural activities	Any defensible method	Property survey; identification of existing and potential erosion problems; measurement or estimation of volume of sediment associated with each site or situation.	Annual
Stream crossing failures	Pacific Watershed Associates or similar method	Road survey after storms with a 20 year recurrence interval or greater; identify location of failed or partially failed crossings; measurement or estimation of volume of sediment associated with failure.	Once in summer of years having storms with a 20 year recurrence interval, or greater
Density of unpaved roads	Any defensible method	GIS and/or THP data review; cumulative tally of miles of road per tributary or Planning Watershed, the average width of the road system, and the density of unpaved roads.	At least once every ten years

5. PLANS AND POLICIES

INTRODUCTION

The Regional Water Board is required to implement the provisions of several statewide plans and policies. These are listed below, and full copies are included in the Appendix Section of this Plan, unless otherwise indicated.

STATE WATER BOARD PLANS

Thermal Plan

The "Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California" adopted by the State Water Resources Control Board on May 18, 1972, specifies water quality objectives, effluent quality limits, and discharge prohibitions related to thermal characteristics of interstate waters and waste discharges.

Ocean Plan

The "Water Quality Control Plan for Ocean Waters of California" was adopted by the State Water Board on July 6, 1972 and revised in 1978, 1983, 1988, and 1990. This plan establishes beneficial uses and water quality objectives for waters of the Pacific Ocean adjacent to the California Coast outside of enclosed bays, estuaries, and coastal lagoons. Also, the Ocean Plan prescribes effluent quality requirements and management principles for waste discharges and specifies certain waste discharge prohibitions.

The Ocean Plan also provides that the State Water Board shall designate Areas of Special Biological Significance and requires wastes to be discharged at locations which will assure maintenance of natural water quality conditions in these areas.

Nonpoint Source Management Plan

On November 15, 1988, the State Water Board adopted the Nonpoint Source Management Plan pursuant to Section 319 of the Clean Water Act. This plan establishes the framework for statewide nonpoint source activities. The plan identifies nonpoint source control programs and milestones for their accomplishment. The plan emphasizes cooperation

with local governments and other agencies to promote the voluntary implementation of Best Management Practices and remedial projects in a three-tiered approach: 1) voluntary implementation, 2) regulatory-based encouragement, and 3) effluent limitations. A copy of the Nonpoint Source Management Plan is not included in the Appendix Section of this Plan. A copy of the Nonpoint Source Management Plan may be requested by contacting the North Coast Regional Water Quality Control Board.

STATE WATER BOARD POLICIES

Policy With Respect to Maintaining High Quality Waters in California (Resolution No. 68-16)

On October 28, 1968, the State Water Board adopted Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California". While requiring the continued maintenance of existing high quality waters, the policy provides conditions under which a change in water quality is allowable. A change must:

- be consistent with maximum benefit to the people of the state;
- not unreasonably affect present and anticipated beneficial uses of water; and
- not result in water quality less than that prescribed in water quality control plans or policies.

Sources of Drinking Water Policy (Resolution No. 88-63)

On May 19, 1988, the State Water Board adopted Resolution No. 88-63, a Policy Entitled "Sources of Drinking Water". This policy was set forth to provide full protection of current and potential sources of drinking water as well as realistic standards for the waters of the State. The policy states that all surface

waters and ground waters are to be considered suitable or potentially suitable, for municipal or domestic water supply, and should be so designated by the regional water boards, with specific exceptions. The policy affirms the authority of the regional water boards to amend the use designations contained in

their basin plans, as long as consistency with all applicable regulations adopted by the U.S. Environmental Protection Agency is maintained.

Bays and Estuaries Policy

The "Water Quality Control Policy for the Enclosed Bays and Estuaries of California" adopted by the State Water Board on May 16, 1974, provides water quality principles and guidelines for the prevention of water quality degradation and to protect the beneficial uses of waters. Decisions by the Regional Water Board are required to be consistent with the provisions of this policy. This policy does not apply to wastes from vessels or land runoff except as specifically indicated for siltation and combined sewer flows.

Power Plant Cooling Policy

The "Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling" was adopted by the State Water Board on June 19, 1975. This policy describes the State Water Board's position on power plant cooling, specifying that fresh inland waters should be used for cooling only when other alternatives are environmentally undesirable or economically unsound.

Reclamation Policy

On January 6, 1977, the State Water Board adopted Resolution No. 77-1, "Policy with Respect to Water Reclamation in California". This policy requires the regional water boards to conduct reclamation surveys and specifies reclamation actions to be implemented by the State and regional water boards as well as other agencies.

Shredder Waste Disposal Policy

On March 19, 1987, the State Water Board adopted Resolution No. 87-22, "Policy on the Disposal of Shredder Waste". This policy describes specific conditions to be enforced by the Regional Water Board with regards to disposal of mechanically destructed car bodies, old appliances, or other similar castoffs at landfills.

6. SURVEILLANCE AND MONITORING

The effectiveness of a water quality control plan cannot be judged without the information supplied by a strong and systematic surveillance and monitoring program. The overall objectives of an adequate water quality surveillance and monitoring program are:

1. To measure achievement of the plan's water quality objectives.

2. To measure effects of water quality changes on beneficial uses.

3. To measure water quality background conditions and long-term trends.

4. To locate and identify sources of water pollution that pose a threat to the environment.

5. To help relate receiving water quality to mass emissions of pollutants by waste dischargers.

6. To provide data for determining waste discharger compliance with permit conditions.

7. To measure waste loads discharged to a receiving water body and identify the limits of their effect as a necessary step in the development of waste load allocations.

8. To provide documentation to support enforcement of permit conditions required of waste dischargers.

9. To provide data needed to carry on the continuing planning process.

10. To measure the effects of water rights decisions on water quality to guide the State Water Board in its responsibility to regulate unappropriated water for the control of quality.

11. To provide a clearinghouse for water quality data gathered by other agencies and private parties cooperating in the program.

12. To report on water quality conditions as required by federal and state regulations or requested by others.

STATEWIDE MONITORING PROGRAMS

Toxic Substances Monitoring Program

The Toxic Substances Monitoring Program (TSMP) was initiated in 1976 by the State Water Board to provide a uniform statewide approach to the detection and evaluation of toxic substances in organisms found in fresh, estuarine, and marine waters of the State. The California Department of Fish and Game (DFG) carries out the statewide TSMP for the State Water Board under an interagency agreement by collecting and analyzing fish and other aquatic organisms from selected sampling stations. Station selection is based primarily on requests from the regional water boards, but requests from other agencies are also considered. In many instances, the regional water boards request that stations be monitored to meet specific monitoring needs. If no problems are found, or if a problem has been sufficiently studied, that station is dropped to make way for new stations elsewhere. In this way the program can monitor as many locations as possible over time. In addition, a number of stations are sampled on a regular basis to monitor trends or changes in the levels of toxic substances over time.

In the North Coast Region, sampling under TSMP has led to information indicating potential threats to human health and wildlife. Sampling priorities are directed towards areas of immediate concern.

State Mussel Watch Program

The California State Mussel Watch (SMW) Program is a long-term monitoring program administered by the State Water Board. Actual sampling and analysis are performed by the Department of Fish and Game. SMW provides the State Water Board and the six coastal regional water boards with an indication of geographical and temporal (year-to-year) trends in toxic pollutants along the California coast.

Mussels (the common bay mussel, *Mytilus edulis*, and the California mussel, *M. californianus*) have been shown to be efficient bioaccumulators of many toxic substances in their water environment. Further, the sedentary nature of mussels, whether native or transplanted, permits a time integrated sampling of

toxic pollutants at one location. The merits of

employing mussels as water quality indicators are well established in the scientific literature, previous SMW reports, and other scientific publications. The North Coast Region will continue to participate in existing SMW monitoring and the development of freshwater applications.

The North Coast Region has been involved in developing freshwater applications of SMW methodology, using freshwater clams, *Corbicula sp*. The North Coast Region has required that some discharges be monitored using these techniques. There are current plans to expand the use of these organisms as indicators in sensitive areas.

In the North Coast Region sampling under the SMW program has led to the detection and mitigation of controllable releases of toxic substances. Sampling priorities are directed toward areas of immediate concern.

Bay Protection and Toxic Cleanup Program

The Bay Protection and Toxic Cleanup Program (BPTCP) is a statewide program for the investigation of coastal waters. Specific goals of the BPTCP include: (1) protection of existing and future beneficial uses of bay and estuarine waters; (2) identification and characterization of toxic hot spots; (3) planning for the prevention of further pollution and the remediation of existing hot spots; and (4) development and maintenance of a comprehensive information source (database) to provide for future assessment and regulatory efforts, accessible public information, and to facilitate management decisions.

In the North Coast Region, monitoring under BPTCP is directed toward areas of known or potential contamination.

Water Quality Assessment

The Water Quality Assessment (WQA) is a catalog of the state's water bodies and their water quality condition. The WQA identifies the water quality condition as good, intermediate, impaired, or unknown. The data used to categorize water bodies in the WQA are obtained from the various monitoring programs described in this section. All regional water boards adopt their regional WQA at public meetings

and submit them to the State Water Board for inclusion in the state WQA. In addition, for impaired and high priority waters, fact sheets are prepared to provide additional detail. The State Water Board intends the WQA to be updated on a regular basis, generally every two years.

The WQA serves many different purposes. The WQA, a public document, reports the condition of the state's water bodies in a summary format. The lists of impaired water bodies included in the WQA satisfy several Clean Water Act listing requirements.

Water Quality Inventory

The 305(b) Report, also known as the National Water Quality Inventory Report, is a summary of all states' water quality reports compiled by the U.S. Environmental Protection Agency. The report is prepared biennially from information the states are required to submit pursuant to Section 305(b)(1) of the Clean Water Act.

The State Water Board prepares the state report using information taken from the WQA. The state 305(b) Report includes: (a) a description of the water quality of major navigable waters in the state during the preceding years; (b) an analysis of the extent to which significant navigable waters provide for the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities in and on the water; (c) an analysis of the extent to which elimination of the discharge of pollutants has been achieved; and (d) an estimate of the environmental impact, the economic and social costs necessary to achieve the "no pollutant discharge" objective of the CWA, the economic and social benefits of such achievement, and the date of such achievement; and (e) a description of the nature and extent of nonpoint sources of pollutants and recommendations as to the programs which must be taken to control them, with estimates of cost.

Inland Surface Waters Toxicity Testing Program

This program was started in 1990, the most recent program to be initiated by the State Water Board. The goal of the program is to evaluate the extent,

magnitude, nature, and sources of toxicity in surface waters. Emphasis is on those waters where toxicity is associated with unregulated discharges such as runoff from agriculture, mining, or urban areas. As part of this program a toxicity testing facility at the University of California, Davis, was established to conduct State and Regional Water Board studies. The Regional Water Board performs the sampling of the water bodies in the Region and supplies the testing facility with the samples.

The toxicity testing measures the combined effects of toxicants in the water and is not used to separate and identify a specific toxic substance. Toxicity is determined by using water column samples from a water body under lab conditions. Appropriate test organisms are observed for their response by using growth, reproduction, or mortality as indicators in both acute and chronic tests.

REGIONAL MONITORING PROGRAMS

Surface Water Monitoring

The Surface Water Monitoring Network was a program of surface water monitoring at selected locations throughout the Region. It included analyses for physical, chemical, and biological parameters such as minerals, heavy metals, turbidity, coliform bacteria, phytoplankton, zooplankton, and biochemical oxygen demand. The results of the sampling provided the basis for data summaries and baseline information which was coordinated by the State Water Resources Control Board to comply with federal regulations.

The State Water Board and the Monitoring Coordinating Committee (MCC) have discontinued the Surface Water Monitoring Network as a formal program. However, the North Coast Region is committed to the development of a comprehensive and rigorous surface water monitoring program, concentrating especially on investigations and monitoring of water bodies with important or threatened beneficial uses, and where data is not sufficient for sound regulatory decision making.

Discharger Self-Monitoring

All self-monitoring information generated as a result of National Pollutant Discharge Elimination System (NPDES) permits and waste discharge requirements is collected and screened for overall assessment of operations and instances of compliance and noncompliance. Self-monitoring reports are submitted by the discharger as required by the permit conditions.

Compliance Monitoring

Compliance monitoring is carried out by the Regional Water Board staff to check the discharger self-monitoring work and to provide data for enforcement actions. Its scope depends on the number and complexity of waste discharge requirements (NPDES and other permits) issued by the Regional Water Board. Waste discharge requirements may or may not include specific discharger self-monitoring and reporting requirements.

Each discharger is periodically visited by Regional Water Board personnel on both announced and unannounced "facility inspections". The intent of announced visits is to work with the discharger through personal contact and communication to review his procedures in order to assure quality control. The intent of the unannounced inspections is to survey the operation, inspect the waste facilities, discharge area, and collect check or reference samples.

Complaint Investigations

Complaint investigations are carried out by Regional Water Board staff in response to complaints of citizens and public or governmental agencies regarding the discharge of pollutants or creation of nuisance conditions. Regional Water Board responsibilities may include field and telephone investigations, documentation of observed conditions (reports, letters, photographs), and enforcement actions as appropriate.

Special Studies/Intensive Surveys

Special studies and intensive surveys are usually performed to obtain detailed information about a specific water quality problem. They usually involve localized, intermittent sampling at a higher than normal frequency. Special situations requiring

intensive monitoring range from studies of industrial discharges to watershed-wide inventories to characterize water quality conditions. Special studies and intensive surveys are conducted on an as-needed basis and often involve coordination with other regulatory and governmental agencies.

Aerial Surveillance

Aerial surveillance is used primarily to gather photographic records of discharges and water quality conditions. Aerial surveillance is particularly effective because of the overall view of a watershed or facility that is obtained and because many facilities can be observed in a short period of time.

Water Quality Models

Water quality models are useful tools to:

- provide a framework for organizing knowledge about a water body;
- reveal gaps in the knowledge and data on a water body;
- formulate baseline and trend monitoring programs;
- simulate water quality changes in response to point and nonpoint discharges to receiving waters; and
- assess potential conformance to proposed and existing water quality objectives.

Water quality models currently available to the staff of the North Coast Region include: a Water Quality Model for the Russian River, prepared by the Center for Environmental and Water Resources Engineering, Department of Civil Engineering, University of California, Davis, and; a Santa Rosa Plains Ground Water Model, prepared by the California Department of Water Resources.

Groundwater Monitoring

Regional Water Board staff investigate the quality of groundwater in response to complaints, as a part of the Well Investigation Program, and through other specifically-funded groundwater quality investigations. Most of the groundwater investigations in the Region are performed by dischargers, by order of the Regional Water Board. This type of discharger-funded groundwater investigation falls within discharger self-monitoring addressed earlier in this section.

Groundwater has been impaired at various locations regionwide particularly as a result of agricultural, industrial, and commercial chemical handling, storage, and disposal practices. Particular problems are known to exist in several groundwater basins within the Region, including the Santa Rosa Plains, Smith River Plain, and Eureka Plain. Monitoring contract funds have been requested in recent years for the acquisition of data with which to more effectively understand and address the impairment of these and other groundwater basins. Very little funding has been available for this purpose, and data is suggestive of more extensive problems. Further groundwater data will continue to be sought by the North Coast Region through all avenues to address problems resulting from contamination by pesticides, nitrates, solvents, fuel, and other chemicals.

Nonpoint Source Investigations

Nonpoint source investigations are conducted on an as-needed basis and as funding allows. Typical sources of funding include Clean Water Act 205(j), 208, and 319(h) funds. The objectives of nonpoint source investigations are to identify the location(s) of the nonpoint source pollutant sources; develop information on the quantity, strength, character and variability of nonpoint source pollutants; evaluate the impact on receiving water quality and biota; provide information useful in management of nonpoint source pollutants; and to monitor the results of any control plan. Investigations are typically undertaken on a statewide priority basis.

Laboratory Support and Quality Assurance

In response to federal requirements, the State Water Board has developed a Quality Assurance Program to ensure that data generated from environmental measurement studies are technically sound and legally defensible. The State Water Board Quality Assurance Program Plan (QAPP) summarizes procedures to be followed by the State Water Board and Regional Water Boards in administering state and federally funded programs that involve measurement

of environmental parameters. The QAPP applies to special water quality studies involving surface, ground, or marine waters, State Mussel Watch Program, State Toxic Substances Monitoring Program, as well as to surveillance and compliance monitoring of discharges.

Dischargers must use laboratories approved by the Regional Water Board's Executive Officer and/or certified by the State Department of Health Services. The Regional Water Board's contract laboratories have approved quality assurance/quality control programs, and Regional Water Board staff follow a standard chain of custody process in the collection, transport, and handling of samples.

The methods employed for sample collection, handling, preservation, transport, analysis, and results reporting must be such that the results of the analyzed sample accurately represent the conditions in the sampled water body. Federal regulations require the establishment of criteria and standard methods to assure that quality is maintained throughout the work from sample collection to reporting of the results.

Briefly, these regulations require that (a) physical and professional capabilities be adequate to perform the analysis for all parameters in the sampling plan; (b) sample collection, handling, and preservation be conducted according to U.S. EPA manuals; (c) time-sensitive samples be transported and analyzed within specific holding times; (d) sample integrity be provided for a legal chain of custody of samples collected for support of enforcement actions; (e) analytical methods be in accordance with standardized methods; and (f) analytical quality control procedures be established for intra-laboratory checking of reference samples. Laboratory records including reference sample results, are to be available for U.S. EPA review.

APPENDIX SECTION

APPENDIX 1

Summary of Basin Plan Amendments

SUMMARY OF BASIN PLAN AMENDMENTS
NORTH COAST REGION

Order No.	Action
75-2	Approve Part 1 of Draft Basin Plan and Abstract for Klamath River Basin. March 20, 1975. Approved by State Board Res. No. 75-28 on April 17, 1975.
75-3	Approve Part 1 of Draft Basin Plan and Abstract for North Coastal Basin. March 20. 1975. Approved by State Board Res. No. 75-28 on April 17, 1975.
	Amendment
76-93	Modifying the Klamath River Basin Water Quality Control Plan. March 26, 1976. Approved by State Board Res. No. 76-049.
76-94	Modifying the North Coastal Water Quality Control Plan. March 25, 1976. Approved by State Board Res. No. 76-049.
77-124	Modifying the North Coastal Water Quality Control Plan - Individual Treatment and Disposal System Prohibition, Geyserville, Sonoma County. June 23, 1977. Approved by State Board Res. No. 77-084. Notified of approval by EPA on January 9, 1980.
Resolution No.	
79-3	Recognizing the U.S. Forest Service as the Management Agency for Implementing Best Management Practices for Water Quality on U.S. Forest Service Lands, and Amending the Water Quality Control Plans for the Klamath River Basin (1A) and the North Coastal Basin (1B). June 21, 1979. Approved by State Board Res. No. 79-69 on Aug. 16, 1979.
79-5	Modifying the Water Quality Control Plans for the Klamath River Basin (1A) and the North Coastal Basin (1B). June 21, 1979. Approved by State Board Res. No. 79-69 on Aug. 16, 1979.
79-7	Amending the North Coast Basin Plan to Include a Waiver Prohibition Regarding the Policy Governing the Use of Individual Water Treatment and Disposal Systems in the Jacoby Creek and Old Arcata Road Areas. September 28., 1979. Approved by State Board Res. No. 79-101 on Nov. 15, 1979.
80-17	Amending the Water Quality Control Plans for the Klamath River Basin (1A) and the North Coastal Basin (1B) to Incorporate Water Conservation into the Policy on the Control of Water Quality with Respect to Individual Waste Treatment and Disposal Practices. Dec. 4, 1980 Approved by State Board Res. No. 81-018 on Feb. 19, 1981.
80-20	Amending the Water Quality Control Plan for the Klamath River Basin (1A) to Prohibit the Discharge of Waste from Individual Disposal Systems in the Campbell Tract Area, Siskiyou County. Dec. 4, 1980. Approved by State Board Res. No. 81-023.
80-21	Amending the Water Quality Control Plan for the North Coastal Basin (1B) to Revise the Action Plan for Point source Discharges to Humboldt Bay and Mad River. Dec. 4, 1990. Approved by State Board Res. No. 81-054 on May 21, 1981.
81-2	Amending the Water Quality Control Plan for the North Coastal Basin (1A) and the North Coastal Basin (1B) to Incorporate New Policy for the Utilization of Mounds for Individual Wastewater Disposal. May 28, 1981. Approved by State Board Res. No. 81-085 on Aug. 20, 1981.

Resolution No.

81-10 Amending the Water Quality Control Plans for the Klamath River Basin and the North Coastal Basin, Policy and Action Plan for Control of Discharges of Herbicide Waste from Silvicultural Applications. Sept. 3, 1981. Approved by State Board Res. No. 81-094.

81-13 Amending the Water Quality Control Plan for the North Coastal Basin (1B) to Prohibit the Discharge of Waste from Individual Disposal Systems in the Curtis Heights Area of Arcata and the Community of Bayside in Humboldt County. Aug. 27, 1981. Approved by State Board Res. No. 81-028.

82-13 Amending the Water Quality Control Plans for the Klamath River Basin and North Coastal Basin, Policy and Action Plan for Control of Discharges of Herbicide Wastes from Silvicultural Applications. Dec. 2, 1982. Approved by State board Res. No. 83-017.

83-3 Amending the Policy on the Control of Water Quality with Respect to Individual Waste Treatment and Disposal Practices which is Contained in the Water Quality Control Plans for the Klamath River Basin (1A) and the North Coastal Basin (1B). April 28, 1983. Approved by State Board Res. No. 83-061.

83-8 Amending the Policy on the Control of Water Quality with Respect to Individual Waste Treatment and Disposal Practices which is contained in the Water Quality Control Plans for the Klamath River Basin (1A) and the North Coastal Basin (1B). July 28, 1983. Approved by State Board Res. No. 83-061.

83-10 Amending the Water Quality Control Plans for the Klamath River Basin and the North Coastal Basin, Policy and Action Plan for Control of Discharge of Herbicide Wastes from Silvicultural Applications. July 28, 1983. Approved by State Board Res. No. 83-092.

84-2 Amending the Water Quality Control Plans for the Klamath River Basin and the North "Coastal Basin, Policy and Action Plan for Control of Herbicide Wastes from Silvicultural Applications. May 31, 1984. Approved by State Board Res. No. 85-079.

86-73 Modifying the Water Quality Control Plan, North Coastal Basin (1B), Individual Waste Treatment and Disposal System Prohibition, Willowside Estates Area. April 10, 1986. Approved by State Board Res. No. 87-034.

86-121 Amending the Water Quality Control Plan for the North Coastal Basin (1B) with Respect to the Point Source Measures, Waste Discharge Prohibitions for the Russian River, the Action Plan for the Santa Rosa Area, and Addition of an Interim Action Plan for the Russian River. June 27, 1986. Partially approved by State Board Res. No. 86-76 on Oct. 14, 1986. Section 2(b) remanded back to the Regional Board.

87-58 Amending the Water Quality Control Plan for the North Coastal Basin (1B) with Respect to the Point source Measures, Waste Discharge Prohibitions and the Action Plan for the Russian River and the Santa Rosa Plains. May 28, 1987, Approved by State Board Res. No. 87-99 on Nov. 17, 1987. Approved by EPA on April 19, 1988.

87-59 Amending the Water Quality Control Plan for the North Coastal Basin (1B) to Revise Section 3, Point Source Measures, the Policy on the Control of Water Quality with Respect to On-Site Waste Treatment and Disposal. Section VIIII, Individual Systems Prohibitions, to Include the Willowside Estates Area in Sonoma County. May 28, 1987. Approved by State Board Res. No. 87-100 on

Nov. 17, 1987. Approved by EPA on April 19, 1988.

Resolution No.

88-62 Combining the Water Quality Control Plans and Abstracts for the Klamath River Basin (1A) and the North Coastal Basin (1B). April 28, 1988. Approved by State Board Res. No. 88-121 on Nov. 15, 1988.

89-37 Amending Section 2, Beneficial Uses, Section 5, Statewide Plans and Policies, and the Appendix Section of the Water Quality Control Plan for the North Coast Region to include State Water Resources Control Board Resolution No. 88-63, a Policy Entitled "Sources of Drinking Water.": March 30, 1989. Approved by State Board Res. No. 89-75 on Aug. 17, 1989.

89-46 Amending Point Source Measures in Section 4 of the Water Quality Control Plan for the North Coast Region to include an Interim Action Plan for Cleanup of Groundwaters Polluted with Petroleum Products. April 26, 1989. Approved by State Board Res. No. 89-84 on Sept. 21, 1989.

89-69 Amending Point Source Measures in Section 4 of the Water Quality Control Plan for the North Coast Region to Incorporate a Policy on the Regulation of Fish Hatcheries, Fish Rearing Facilities, and Aquaculture Operations. May 24, 1989. Approved by State Board Resolution No. 89-61 on July 20, 1989.

91-61 Amending Section 3 Table 5 and Section 4 of the Water Quality Control Plan for the North Coast Region to Include a Site-Specific Temperature Objective and an Interim Action Plan for the Trinity River. Approved by State Board Res. No. 91-94 on Sepstember 26, 1991.

92-2 Amending the Water Quality Control Plan for the North Coast Region Interim Action Plan for Cleanup of Groundwaters Polluted with Petroleum Products to Include Cleanup of Groundwaters Polluted with Halogenated Volatile Hydrocarbons. Approved by State Board Res. No. 92-35 on May 18, 1992.

93-59 Amending Section 4 of the Water Quality Control Plan for the North Coast Region to Include an Interim Policy in the Regulation of Waste Discharges from Underground Fuel Tank System. May 27, 1993. Approved by the State Board Res. No. 94-29 on March 21, 1994. Approved by the State Office of Administrative Law on August 18, 1994.

93-89 Amending the Water Quality Control Plan for the North Coast Region to Update Descriptions and Correct Inaccuracies. December 9, 1993. Approved by State Board Res. No. 94-29 on March 21, 1994. Approved by the State Office of Administrative Law on August 18, 1994.

94-49 Amending the Water Quality Control Plan for the North Coast Region, Section IV, Implementation Plans, Point Source Measures, Waste Discharge Prohibitions for the North Coastal Basin. March 24, 1994. Approved by the State Board Res. No. 94-52 on June 16, 1994. Approved by the State Office of Administrative Law on August 30, 1994.

95-53 Amending Point Source Measures in Section IV of the Water Quality Control Plan for the North Coast Region to Include an Action Plan for Storm Water Discharges. Approved by the State Board Res. No. 95-87 on November 16, 1995. Approved by the State Office of Administrative Law on February 21, 1996.

96-16 Amending the Water Quality Control Plan for the North Coast Region, Section 4, Implementation Plans, Point Source Measures, Policy on the Control of Water Quality with Respect to On-Site Waste Treatment and Disposal Practices. Approved by the State Board Res. No. 96-061 on August 15, 1996. Approved by the State Office of Administrative Law on November 20, 1996.

Resolution No.

98-66	Amending the Water Quality Control Plan for the North Coast Region to Include Relevant Portions of the Water Quality Attainment Strategy (Total Maximum Daily Load) for Sediment for the Garcia River Watershed. Approved by the Regional Board on May 28, 1998, and revised by the Regional Board on December 10, 1998. Approved by the State Board Res. No. 2000-070 on September 21, 2000. Withdrawn from the State Office of Administrative Law review on February 15, 2001.
R1-2001-072	Revision to the Garcia River Watershed Water Quality Attainment Action Plan for Sediment, Including the Total Maximum Daily Load, Implementation Plan, and Monitoring Plan for Inclusion as an Amendment into the Water Quality Control Plan for the North Coast Region. Approved by the Regional Board on June 28, 2001. Approved by the State Board Res. No. 2001-126 on November 15, 2001. Approved by the State Office of Administrative Law on January 3, 2002. Approved by the United States Environmental Protection Agency on March 7, 2002.