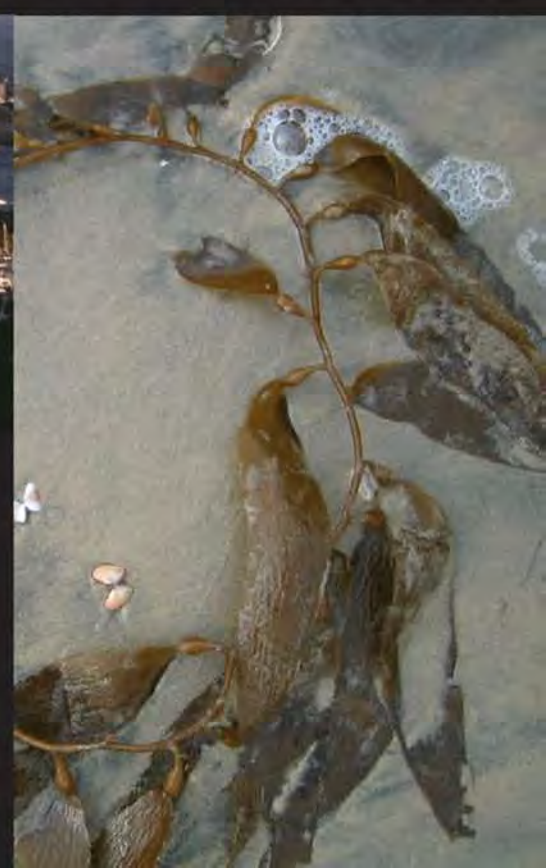
Presented below are water quality standards that are in effect for Clean Water Act purposes.

EPA is posting these standards as a convenience to users and has made a reasonable effort to assure their accuracy. Additionally, EPA has made a reasonable effort to identify parts of the standards that are not approved, disapproved, or are otherwise not in effect for Clean Water Act purposes.

EPA has approved all provisions in this document that are water quality standards, and those provisions are in effect for Clean Water Act purposes. Note that not all provisions of the attached document are water quality standards that require EPA review and approval.

Water Quality Control Plan

FOR THE SAN DIEGO BASIN



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION

WATER QUALITY CONTROL PLAN
FOR THE SAN DIEGO BASIN (9)

SEPTEMBER 8, 1994

(with amendments effective on or before May 17, 2016)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN DIEGO REGION

WATER QUALITY CONTROL PLAN FOR THE SAN DIEGO BASIN (9)

Adopted by the
California Regional Water Quality Control Board
San Diego Region
on September 8, 1994

Approved by the
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Office of Administrative Law
on April 26, 1995

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FOREWORD

The most basic goal of the California Regional Water Quality Control Board, San Diego Region (Regional Board) is to preserve and enhance the quality of water resources in the San Diego Region for the benefit of present and future generations. The federal Clean Water Act and the California Porter-Cologne Water Quality Control Act require that the Regional Board adopt a water quality control plan to guide and coordinate the management of water quality in the Region. The purpose of the plan is to: (1) designate beneficial uses of the Region's surface and ground waters; (2) designate water quality objectives for the reasonable protection of those uses; and (3) establish an implementation plan to achieve the objectives. In conformance with this legislative mandate, the Regional Board adopted the *Comprehensive Water Quality Control Plan for the San Diego Basin* (Basin Plan) in 1975. The Regional Board subsequently adopted numerous amendments modifying specific Basin Plan water quality standards and policies to reflect current water quality conditions and priorities.

Over twenty years have passed since the Basin Plan was published in 1975. In the ensuing years the San Diego Region population has continued to grow and approaches to water quality management have changed. Water quality management has become a complex mix of public input, environmental legislation and regulations, regulatory programs, research, and litigation. Pollution from point source discharges such as sewage treatment plants and industry has largely been controlled through stringent pollution control laws and the efforts of the Regional Board and other agencies. The focus of the Regional Board's regulatory efforts in the coming years will be surface water bottom sediment contamination, ground water contamination and nonpoint sources of pollution. These concerns are the greatest remaining threats to water quality. To address these remaining challenges, pollution prevention needs to be emphasized and the cumulative effects of pollution on entire watersheds must be considered. These changes in the complexity and emphasis of the Regional Board's water quality program have resulted in the need for a major update and rewrite of the 1975 Basin Plan.

This Basin Plan, the *Water Quality Control Plan for the San Diego Basin* (9) was adopted by the Regional Board on September 8, 1994. It supersedes the previous 1975 Basin Plan and its amendments. Public involvement was extensive in the development and adoption of this Basin Plan. The Regional Board held several public hearings and workshops to allow interested persons, organizations, and governmental agencies an opportunity to comment on the content and adequacy of the Basin Plan prior to its adoption. All comments were responded to in writing and the Regional Board carefully considered them in developing the final Basin Plan. The Regional Board appreciates the efforts of all those who contributed a substantial amount of time and effort in commenting on the earlier administrative drafts.

The six chapters of this Basin Plan together comprise the "*blueprint*" plan the Regional Board will use for water quality management and control in the San Diego Region. Chapter 1 provides a summary overview of the physical features of the San Diego Region, the functions of the State and Regional Board, and the legal basis and authority for the Basin Plan. Chapter 2 designates the beneficial uses of surface and ground waters to be protected. Chapter 3 designates the water quality objectives necessary to ensure the reasonable protection of the beneficial uses. Chapter 4 describes the implementation plan for achieving and maintaining the beneficial uses and water quality objectives. The implementation plan describes the key Regional Board regulatory programs and policies the Board uses to manage and control water quality. The implementation plan also designates certain conditions and areas where waste discharges are prohibited. Chapter 5 describes applicable statewide water quality policies and plans developed by the State Water Resources Control Board. Finally, Chapter 6 provides a summary description of the Regional Board water quality monitoring and surveillance program.

This Basin Plan is a dynamic rather than fixed document and is always subject to modification based on changing needs and circumstances. Accordingly, the Regional Board will periodically consider changes to this Basin Plan as necessary and at a minimum of every three years. The Regional Board will continue to place a high priority on keeping the Basin Plan current with respect to applicable laws, policies, technologies, water quality conditions, and priorities in the Region.

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1. INTRODUCTION

INTRODUCTION

In California, the regulation, protection and administration of water quality are carried out by the State Water Resources Control Board (State Board) and nine California Regional Water Quality Control Boards. The State Board consists of five full-time members appointed by the Governor for four year terms. In general, the State Board has overall responsibility for setting statewide policy on the administration of water rights and water quality control in California. The work of the State Board is carried out by a technical, legal, and administrative staff supervised by an executive director.

In recognition of the regional differences in water quality and quantity, the State is divided into nine regions (see Figure 1-1) for the purposes of regional administration of California's water quality control program. Each of the nine regions has a California Regional Water Quality Control Board (Regional Board) comprised of nine part-time members who are appointed by the Governor for four year terms. The regional boards are responsible for adoption and implementation of water quality control plans, issuance of waste discharge requirements, and performing other functions concerning water quality control within their respective regions, subject to State Board review or approval. The work of each regional board is carried out by a technical and administrative staff supervised by an executive officer.

Each of the nine regional boards is required to adopt a Water Quality Control Plan, or Basin Plan, which recognizes and reflects regional differences in existing water quality, the beneficial uses of the Region's ground and surface waters, and local water quality conditions and problems. This document is called the *Water Quality Control Plan for the San Diego Basin (9)*. (The terms Water Quality Control Plan and Basin Plan are used interchangeably throughout this document.)

There are two types of Water Quality Control Plans, Regional Board Basin Plans such as this document and statewide Water Quality Control Plans such as the *Ocean Plan* and *Thermal Plan*. Statewide plans are discussed in Chapter 5, *Plans and Policies*. Key terms and abbreviations used throughout this Basin Plan are included as a glossary and acronyms respectively, in Appendix A.

FUNCTION OF THE BASIN PLAN

The San Diego Regional Board's Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan: (1) designates beneficial uses for surface and ground waters; (2) sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's antidegradation policy; (3) describes implementation programs to protect the beneficial uses of all waters in the Region; and (4) describes surveillance and monitoring activities to evaluate the effectiveness of the Basin Plan [California Water Code sections 13240 thru 13244, and section 13050(j)]. Additionally, the Basin Plan incorporates by reference all applicable State and Regional Board plans and policies.

The goal of the Regional Board is to achieve a balance between the competing needs of mankind for water of varying quality. Often times the constituents and quality of water needed to protect various beneficial uses will be different. The Basin Plan is the Regional Board's plan for achieving the balance between competing uses of surface and ground waters in the San Diego Region. Accordingly, this Basin Plan establishes or designates beneficial uses and water quality objectives for all the ground and surface waters of the Region. Beneficial uses are the uses of water necessary for the survival and well being of man, plants and wildlife. These uses of water serve to promote the tangible and intangible economic, social, and environmental goals of mankind. Water quality objectives are the levels of water quality constituents or characteristics which must be met to protect the beneficial uses. This Basin Plan also establishes an implementation program describing the actions by the Regional Board and others that are necessary to achieve and maintain the designated beneficial uses and water quality objectives of the Region's waters.

The Regional Board regulates waste discharge and reclaimed water use to minimize and control adverse effects on the quality and beneficial uses of the Region's ground and surface waters.

VICINITY MAP, BASIN PLANNING AREAS

Figure 1 - 1.

The Regional Board issues permits, called "*waste discharge requirements*" and "*master reclamation permits*" which require that waste and reclaimed water not be discharged in a manner that would cause an exceedance of applicable water quality objectives or adversely affect beneficial uses designated in the Basin Plan. The Regional Boards enforce these permits through a variety of administrative means.

GEOGRAPHICAL SETTING

The geographical setting of the San Diego Region results in a number of physiographic and environmental characteristics. A discussion of each of the major elements is presented in the following subsections.

PHYSIOGRAPHY

The San Diego Region occurs within the Peninsula Range Physiographic Province of California. One of the most prominent physical features in the region is the northwest-trending Peninsula Range which includes from north to south, the Santa Ana, Agua Tibia, Palomar, Volcan, Cuyamaca and Laguna mountains. The region exhibits a gently sloping dissected western surface and a steep eastern slope and is separated from the West Colorado River area (Region 7A) by abrupt fault scarps of marked relief.

The San Diego Region is divided into a coastal plain area, a central mountain-valley area, and an eastern mountain valley area. The coastal plain area comprises a series of wave cut benches covered by thin terrace deposits. This terraced surface has been deeply dissected by streams draining to the sea, and has been smoothed and rounded by local erosion. The surface of this area ranges from sea level to about 1,200 feet (ft) and extends from the coast inland in a band of about 10 miles in width. The central mountain-valley area is characterized by ridges and intermontane basins which extend from the coastal plain, northeastward to the Elsinore fault zone. The basins or valleys range in elevation from 500 to about 5,000 ft and are generally of fault block origin modified by erosion. The floors of the intermontane valleys are generally underlain by moderate thicknesses of alluvium and residuum; notable examples occur near El Cajon, Escondido and Ramona which range in elevation from about 500 to 1,500 ft above sea level. At higher elevations plateau surfaces have been developed in the central mountain-valley area. These surfaces are probably also of erosional origin; they occur at elevations ranging from 2,000 to 6,000 ft near the Laguna mountains, Santa Ysabel and Valley Center.

To the northeast of the Elsinore fault zone, the region has been designated as the eastern mountain-valley area. The area contains broad, relatively flat valleys which are structurally of block fault origin. Locally, the grabens contain thick sections of alluvial deposits. These valleys generally rise to the southeast from about 1,000 ft elevations near Temecula to the rolling plateaus of Glenoak, Lewis and Reed valleys which range from 3,000 to 3,500 ft in elevation. Surrounding mountains including Red mountain, Cahuilla mountain and Bachelor mountain, attain elevations ranging from 4,000 to 7,500 ft.

CLIMATE

The San Diego Region's coastal climate is generally mild. Temperatures average about 65 degrees Fahrenheit (^{o} F) and precipitation averages 10 to 13 inches. Proceeding inland, as elevations increase, average temperatures decline to 57^{o} F in the Laguna mountain area and precipitation increases to more than 45 inches in the Palomar mountain area. Most of the precipitation falls during November through February. Temperature and rainfall intensity variations are larger in the inland portions. The maximum rainfall intensity was recorded as 11.5 inches in 90 minutes, at Campo on August 12, 1891. Precipitation occurs principally as rain, with snow common only in the high mountains. Runoff in the Region results mainly from rainfall. The melting of snowpack and surfacing ground water springs also contribute small additional amounts of runoff. The flow of surface and ground waters in the Region is in an east to west direction toward the Pacific Ocean.

LAND USE / POPULATION

Land use within the Region varies considerably. The regional growth forecast for various land uses within the Region, for the San Diego Association of Governments', and for the Southern California Association of Governments' sphere of influence are shown in Appendix B-1 and B-2, respectively. The San Diego Association of Governments' regional growth forecast by hydrologic unit (HU) is shown in Appendix B-3.

The Region is experiencing and is expected to continue to experience population growth. Table 1-1 shows population projections for San Diego, Riverside, and Orange counties.

REGIONAL BOUNDARIES

Shorebirds at Tijuana Estuary shoreline

The San Diego Region forms the southwest corner of California and occupies approximately 3,900 square miles of surface area. The western boundary of the Region consists of the Pacific Ocean coastline which extends approximately 85 miles north from the United States and Mexico border. The northern boundary of the Region is formed by the hydrologic divide starting near Laguna Beach and extending inland through El Toro and easterly along the ridge of the Elsinore Mountains into the Cleveland National Forest. The eastern boundary of the Region is formed by the Laguna Mountains and other lesser known mountains located in the Cleveland National Forest. The southern boundary of the Region is formed by the United States and Mexico border.

The San Diego Region encompasses most of San Diego county, parts of southwestern Riverside county and southwestern Orange county. The Region is divided into 11 major hydrologic units (HUs),[1] 54 hydrologic areas (HAs),[2] and 147 hydrologic subareas (HSAs).[3] The geographic boundaries and names of these HUs are shown in Table 1-2 and Figure 1-2.[4] A larger scale map of these HAs is contained in the rear pocket of this Basin Plan. The boundaries were initially designated by the State Department of Water Resources (DWR) and described in the report Names and Areal Code Numbers of Hydrologic areas in the Southern District which was published in April, 1964. The HUs, HAs and HSAs were subsequently enumerated by the State Board in the early 1970's. In accordance with the early DWR definitions, HUs are the entire watershed of one or more streams; HAs are major tributaries and/or major groundwater basins within the HU; and HSAs are major subdivisions of HAs including both water-bearing and nonwater-bearing formations.

San Juan Hydrologic Unit (1.00)

The San Juan HU is a generally trapezoid-shaped area of 500 square miles. Laguna Beach, San Juan Capistrano, Dana Point, and San Clemente are other major population centers. Several smaller towns are scattered along the coast.

The two major natural surface water bodies of the unit are San Juan Creek and San Mateo Creek. San Juan Creek divides the unincorporated communities of Dana Point and Capistrano Beach in Orange county, and enters the Pacific Ocean at Doheny Beach State Park. The mouth of the creek is normally open to the ocean. Usually, the water at the mouth of the creek is essentially the same as that of the adjacent coastal waters. The mouth of San Mateo Creek forms a salt water tidal marsh and is entirely within the Camp Pendleton Naval Reservation.

The San Juan HU is comprised of the following five HAs; the Laguna, Mission Viejo, San Clemente, San Mateo, and San Onofre HAs.

TABLE 1-1. POPULATION PROJECTIONS FOR THE STATE OF CALIFORNIA AND SAN DIEGO, RIVERSIDE, AND ORANGE COUNTIES

Location	Year 1990	1995	2000	2005	2010	2015
San Diego County	2,421,233	2,677,058	2,915,692	3,143,155	3,373,422	3,618,554
Riverside County	1,195,400	1,493,558	1,771,276	2,076,538	2,402,889	2,759,172
Orange County	2,415,269	2,667,706	2,862,106	2,992,855	3,099,374	3,193,64
Total for California	29,777,448	32,958,921	36,214,623	39,194,880	42,178,903	45,344,961

TABLE 1 –2. HYDROLOGIC UNITS, AREAS AND SUBAREAS OF THE SAN DIEGO REGION

BASIN NUMBER	HYDROLOGIC BASIN		BASIN NUMBER	HYDROLOGIC BASIN	
1.00	SAN JUAN HYDROLOGIC UNIT		2.74	Burnt	HSA
1.10	Laguna	HA	2.80	Aguanga	HA
1.11	San Joaquin Hills	HSA	2.81	Vail	HSA
1.12	Laguna Beach	HSA	2.82	Devils Hole	HSA
1.13	Aliso	HSA	2.83	Redec	HSA
1.14	Dana Point	HSA	2.84	Tule Creek	HSA
1.20	Mission Viejo	HA	2.90	Oakgrove	HA
1.21	Oso	HSA	2.91	Lower Culp	HSA
1.22	Upper Trabuco	HSA	2.92	Previtt Canyon	HSA
1.23	Middle Trabuco	HSA	2.93	Dodge	HSA
1.24	Gobernadora	HSA	2.94	Chihuahua	HSA
1.25	Upper San Juan	HSA			
1.26	Middle San Juan	HSA	3.00	SAN LUIS REY HYDROLOGIC UNIT	
1.27	Lower San Juan	HSA	3.10	Lower San Luis	HA
1.28	Ortega	HSA	3.11	Mission	HSA
1.30	San Clemente	HA	3.12	Bonsall	HSA
1.31	Prima Deshecha	HSA	3.13	Moosa	HSA
1.32	Segunda Deshecha	HSA	3.14	Valley Center	HSA
1.40	San Mateo Canyon	HA	3.15	Woods	HSA
1.50	San Onofre	HA	3.16	Rincon	HSA
1.51	San Onofre Valley	HSA	3.20	Monserate	HA
1.52	Las Pulgas	HSA	3.21	Pala	HSA
1.53	Stuart	HSA	3.22	Pauma	HSA
			3.23	La Jolla Amago	HSA
2.00	SANTA MARGARITA HYDROLOGIC UNIT		3.30	Warner Valley	HA
2.10	Ysidora	HA	3.31	Warner	HSA
2.11	Lower Ysidora	HSA	3.32	Combs	HSA
2.12	Chappo	HSA			
2.13	Upper Ysidora	HSA	4.00	CARLSBAD HYDROLOGIC UNIT	
2.20	DeLuz	HA	4.10	Loma Alta	HA
2.21	DeLuz Creek	HSA	4.20	Buena Vista Creek	HA
2.22	Gavilan	HSA	4.21	El Salto	HSA
2.23	Vallecitos	HSA	4.22	Vista	HSA
2.30	Murrieta	HA	4.30	Agua Hedionda	HA
2.31	Wildomar	HSA	4.31	Los Monos	HSA
2.32	Murrieta	HSA	4.32	Buena	HSA
2.33	French	HSA	4.40	Encinas	HA
2.34	Lower Domenigoni	HSA	4.50	San Marcos	HA
2.35	Domenigoni	HSA	4.51	Batiquitos	HSA
2.36	Diamond	HSA	4.52	Richland	HSA
2.40	Auld	HA	4.53	Twin Oaks	HSA
2.41	Bachelor Mountain	HSA	4.60	Escondido Creek	HA
2.42	Gertrudis	HSA	4.61	San Elijo	HSA
2.43	Lower Tucalota	HSA	4.62	Escondido	HSA
2.44	Tucalota	HSA	4.63	Lake Wohlford	HSA
2.50	Pechanga	HA			
2.51	Pauba	HSA	5.00	SAN DIEGUITO HYDROLOGIC UNIT	
2.52	Wolf	HSA	5.10	Solana Beach	HA
2.60	Wilson	HA	5.11	Rancho Santa Fe	HSA
2.61	Lancaster Valley	HSA	5.12	La Jolla	HSA
2.62	Lewis	HSA	5.20	Hodges	HA
2.63	Reed Valley	HSA	5.21	Del Dios	HSA
2.70	Cave Rocks	HA	5.22	Green	HSA
2.71	Lower Coahuila	HSA	5.23	Felicita	HSA
2.72	Upper Coahuila	HSA	5.24	Bear	HSA
2.73	Anza	HSA			

TABLE 1 –2. HYDROLOGIC UNITS, AREAS AND SUBAREAS OF THE SAN DIEGO REGION

BASIN NUMBER	HYDROLOGIC BASIN	
5.30	San Pasqual	HA
5.31	Highland	HSA
5.32	Las Lomas Muertas	HSA
5.33	Reed	HSA
5.34	Hidden	HSA
5.35	Guejito	HSA
5.36	Vineyard	HSA
5.40	Santa Maria Valley	HA
5.41	Ramona	HSA
5.42	Lower Hatfield	HSA
5.43	Wash Hollow	HSA
5.44	Upper Hatfield	HSA
5.45	Ballena	HSA
5.46	East Santa Teresa	HSA
5.47	West Santa Teresa	HSA
5.50	Santa Ysabel	HA
5.51	Boden	HSA
5.52	Pamo	HSA
5.53	Sutherland	HSA
5.54	Witch Creek	HSA
6.00	PENASQUITOS HYDROLOGIC UNIT	
6.10	Miramar Reservoir	HA
6.20	Poway	HA
6.30	Scripps	HA
6.40	Miramar	HA
6.50	Tecolote	HA
7.00	SAN DIEGO HYDROLOGIC UNIT	
7.10	Lower San Diego	HA
7.11	Mission San Diego	HSA
7.12	Santee	HSA
7.13	El Cajon	HSA
7.14	Coches	HSA
7.15	El Monte	HSA
7.20	San Vicente	HA
7.21	Fernbrook	HSA
7.22	Kimball	HSA
7.23	Gower	HSA
7.24	Barona	HSA
7.30	El Capitan	HA
7.31	Conejos Creek	HSA
7.32	Glen Oaks	HSA
7.33	Alpine	HSA
7.40	Boulder Creek	HA
7.41	Inaja	HSA
7.42	Spencer	HSA
7.43	Cuyamaca	HSA
8.00	PUEBLO SAN DIEGO HYDROLOGIC UNIT	
8.10	Point Loma	HA
8.20	San Diego Mesa	HA
8.21	Lindbergh	HSA
8.22	Chollas	HSA
8.30	National City	HA
8.31	El Toyan	HSA
8.32	Paradise	HSA
9.00	SWEETWATER HYDROLOGIC UNIT	
9.10	Lower Sweetwater	HA
9.11	Telegraph	HSA
9.12	La Nacion	HSA
9.20	Middle Sweetwater	HA
9.21	Jamacha	HSA
9.22	Hillsdale	HSA
9.23	Dehesa	HSA
9.24	Galloway	HSA
9.25	Sequan	HSA
9.26	Alpine Heights	HSA
9.30	Upper Sweetwater	HA
9.31	Loveland	HSA
9.32	Japatul	HSA
9.33	Viejas	HSA
9.34	Descanso	HSA
9.35	Garnet	HSA
10.00	OTAY HYDROLOGIC UNIT	
10.10	Coronado	HA
10.20	Otay Valley	HA
10.30	Dulzura	HA
10.31	Savage	HSA
10.32	Proctor	HSA
10.33	Jamul	HSA
10.34	Lee	HSA
10.35	Lyon	HSA
10.36	Hollenbeck	HSA
10.37	Engineer Springs	HSA
11.00	TIJUANA HYDROLOGIC UNIT	
11.10	Tijuana Valley	HA
11.11	San Ysidro	HSA
11.12	Water Tanks	HSA
11.20	Potrero	HA
11.21	Marron	HSA
11.22	Bee Canyon	HSA
11.23	Barrett	HSA
11.24	Round Potrero	HSA
11.25	Long Potrero	HSA
11.30	Barrett Lake	HA
11.40	Monument	HA
11.41	Pine	HSA
11.42	Mount Laguna	HSA
11.50	Morena	HA
11.60	Cottonwood	HA
11.70	Cameron	HA
11.80	Campo	HA
11.81	Tecate	HSA
11.82	Canyon City	HSA
11.83	Clover Flat	HSA
11.84	Hill	HSA
11.85	Hipass	HSA

Figure 1-2. San Diego Region Hydrologic Units, Areas and Subareas.

0 4 8 16 Miles

1:760,000

Derived from an edited version of Calwater 2.21 to comply with the 1994 Basin Plan
Map created October 2004
State Water Resources Control Board

Santa Margarita Hydrologic Unit (2.00)

Arroyo chub at Rainbow Creek

The Santa Margarita HU is a rectangular area of about 750 square miles. Included in it are portions of Camp Pendleton as well as the civilian population centers of Murrieta, Temecula and part of Fallbrook.

The unit is drained largely by the Santa Margarita River, Murrieta Creek and Temecula River. The only coastal lagoon of the unit is the Santa Margarita Lagoon which lies totally within the Camp Pendleton Naval Reservation of the U.S. Marine Corps. The slough at the mouth of the river is normally closed off from the ocean by a sandbar.

The major surface water storage areas are Vail Lake and O'Neill Lake. Annual precipitation ranges from less than 12 inches near the coast to more than 45 inches inland near Palomar mountain.

The San Margarita HU is comprised of the following nine HAs; the Ysidora, Deluz, Murrieta, Auld, Pechanga, Wilson, Cave Rocks, Aguanga, and Oak Grove HAs.

San Luis Rey Hydrologic Unit (3.00)

San Luis Rey HU is a rectangular area of about 565 square miles, and includes the population centers of Oceanside, and Valley Center, and portions of Fallbrook and Camp Pendleton. In addition there are several Indian reservations in the unit. The major stream system, the San Luis Rey River, is interrupted by Lake Henshaw, one of the largest water storage areas in the San Diego Region. Annual precipitation is heavier than in other units, ranging from less than 12 inches near the ocean to 45 inches near Palomar mountain.

The San Luis Rey Unit contains two coastal lagoon areas, the mouth of the San Luis Rey River and Loma Alta Slough. The mouth of the San Luis Rey River is entirely within the city of Oceanside and is adjacent to the city's northern boundary. The slough area at the mouth of the river is contiguous with Oceanside Harbor. Loma Alta Slough is entirely within the city of Oceanside and is the mouth of Loma Alta Creek. The slough is normally blocked off from the ocean by a sandbar.

The San Luis Rey HU is comprised of the following three HAs; the Lower San Luis, Monserate and Warner Valley Hydrologic areas.

Carlsbad Hydrologic Unit (4.00)

Shore crab at
Scripps Coastal Reserve

Carlsbad HU is a roughly triangular-shaped area of about 210 square miles, extending from Lake Wohlford on the east to the Pacific ocean on the west, and from Vista on the north to Cardiff-by-the-Sea on the south. The unit includes the cities of Oceanside, Carlsbad, Leucadia, Encinitas, Cardiff-by-the-Sea, Vista, and Escondido. The area is drained by Buena Vista, Agua Hedionda, San Marcos and Escondido creeks.

The Carlsbad HU contains four major coastal lagoons; Buena Vista, Agua Hedionda, Batiquitos and San Elijo. Buena Vista lies between the cities of Carlsbad and Oceanside, and is partially within each city. A sandbar occasionally forms across the mouth forming an ocean beach. The water level in the lagoon is maintained by an inflow of rising groundwater and return irrigation water from the area upstream on Vista Creek. A portion of the lagoon has been designated as a bird sanctuary.

Agua Hedionda Lagoon, at the mouth of Agua Hedionda Creek, is within the city of Carlsbad. The lagoon is routinely dredged to keep it open to the ocean. The lagoon serves as an integral part of a utility's power plant cooling water intake system and also provides a reserve cooling water supply. The easterly portion of the lagoon is used for water oriented recreation.

Batiquitos Lagoon, at the mouth of San Marcos Creek, enters the Pacific Ocean between the city of Carlsbad and the unincorporated community of Leucadia. San Elijo Lagoon is the tidal marsh at the mouth of Escondido Creek. The marsh is normally closed off from the ocean but is subject to tidal fluctuations.

The Carlsbad HU is comprised of the following six HAs; the Loma Alta, Buena Vista Creek, Agua Hedionda, Encinas, San Marcos and Escondido Creek HAs.

San Dieguito Hydrologic Unit (5.00)

San Dieguito HU is a rectangular-shaped area of about 350 square miles. It includes the San Dieguito River and its tributaries, along with Santa Ysabel and Santa Maria creeks.

The unit contains two major reservoirs - Lake Hodges and Sutherland, and a smaller facility, the San Dieguito Reservoir.

The unit contains one coastal lagoon, the San Dieguito Slough, located at the mouth of the San Dieguito River, which forms the northerly edge of the city of Del Mar. The lagoon is normally closed off from the ocean by a sandbar.

The San Dieguito HU is divided into five HAs; the Solana Beach, Hodges, San Pasqual, Santa Maria Valley and Santa Ysabel HAs.

Penasquitos Hydrologic Unit (6.00)

Penasquitos HU is a triangular-shaped area of about 170 square miles, extending from Poway on the east to La Jolla on the west. There are no major streams in this unit although it is drained by numerous creeks. Miramar Reservoir, a major storage facility, contains imported Colorado River water.

The unit contains two coastal lagoons, Sorrento Lagoon and Mission Bay. Sorrento Lagoon is the mouth of Penasquitos Creek and empties into the ocean near the northerly boundary of the city of San Diego. Mission Bay and the mouth of the San Diego River form a 4,000 acre aquatic park. Water quality within Mission Bay generally is lower than that of the coastal ocean water due to the poor flushing characteristics of the bay and the input of nutrient material from storm runoff. Sludge from the city of San Diego's Point Loma plant is piped to an island in Mission Bay (Fiesta Island) for use as a soil conditioner and fertilizer.

Annual precipitation in the unit ranges from less than 8 inches along the ocean to 18 inches inland. Poway, and La Jolla are the major population centers.

The Penasquitos HU is comprised of the following five HAs; the Miramar Reservoir, Poway, Scripps, Miramar, and Tecolote HAs.

Grunion spawning at Ocean Beach

San Diego Hydrologic Unit (7.00)

San Diego HU is a long, triangular-shaped area of about 440 square miles drained by the San Diego River. El Capitan, San Vicente, Cuyamaca, Jennings, and Murray reservoirs are the major storage facilities. San Vicente Reservoir, Murray Reservoir, Jennings, and Murray Reservoir store mainly Colorado River water, whereas, El Capitan mainly stores local runoff and some Colorado River water. Cuyamaca Reservoir stores only local runoff.

Much of the impounded water is used to serve major population centers, including a portion of the San Diego metropolitan area and the communities of El Cajon, Santee, Lakeside, Alpine and Julian. Annual precipitation ranges from less than 11 inches at the coast to about 35 inches around Cuyamaca and El Capitan Reservoir. The San Diego HU is comprised of the following four HAs; Lower San Diego, San Vicente, El Capitan and Boulder Creek HAs.

Pueblo San Diego Hydrologic Unit (8.00)

Pueblo San Diego HU is a triangular-shaped area of about 60 square miles with no major stream system. It is bordered to the north, by the watershed of the San Diego River and on the south, in part, by that of the Sweetwater River. The major population center is the city of San Diego. The unit is relatively dry with an annual precipitation of less than 11 inches to 13 inches. The Pueblo San Diego HU is comprised of the following three HAs; the Point Loma, San Diego Mesa and National City HAs.

San Diego Bay lies offshore of this unit. The bay is approximately 13 miles long and varies from ½ to 1½ miles in width.

Sweetwater Hydrologic Unit (9.00)

Sweetwater HU is an elongated northeasterly trending strip with an area of about 230 square miles. It is traversed along its length by the Sweetwater River. The annual precipitation varies from less than 11 inches at the coast to about 35 inches inland.

The Sweetwater HU is comprised of the following three HAs; the Lower Sweetwater, Middle Sweetwater, and Upper Sweetwater HAs.

Otay Hydrologic Unit (10.00)

Otay HU is a club-shaped area of about 160 square miles. The major stream system traversing the area is the Otay River and its tributaries. The Lower Otay Reservoir is the terminus of the second San Diego Aqueduct. Major population centers include the communities of Imperial Beach in the coastal area and Dulzura inland. The annual precipitation generally increases landward from the coast and varies from less than 11 to 19 inches.

The Coronado, Otay, and Dulzura HAs comprise the Otay HU. The Coronado HA is composed of the North Island Naval Air Station, the city of Coronado and the Silver Strand.

Tijuana Hydrologic Unit (11.00)

Tijuana HU is a triangular-shaped area that is drained by Cottonwood and Campo creeks, which are tributaries to the Tijuana River. It covers an area of about 470 square miles and lies mainly in the mountain-valley section.

The unit's only coastal lagoon is the Tijuana Estuary which occupies approximately 2,000 acres and is generally open to the ocean. Most of the area can be classified as a salt water marsh with a number of arms of open water. Water quality is generally the same as that of the sea water except during periods of runoff when a variety of wastes, which originate in Mexico, are carried into the lagoon from the surface flow in the Tijuana River.

Willet at Tijuana Estuary shoreline

The unit is sparsely populated with the major population centers at San Ysidro and Campo. Annual precipitation varies from less than 11 inches near the coast to more than 25 inches farther inland near Laguna mountain. Runoff is captured by Morena Reservoir and Barrett Lake on Cottonwood Creek.

The Tijuana HU is comprised of the following eight HAs; the Tijuana Valley, Potrero, Barrett Lake, Monument, Morena, Cottonwood, Cameron and Campo HAs. The Tijuana Valley Hydrologic Area (HA) is arbitrarily divided by the United States - Mexico boundary. Surface water quality has been adversely affected by runoff coming across the border from Mexico. Ground water quality has been affected by seawater intrusion and waste discharges in both the United States and Mexico.

WATER RESOURCES

The water resources in the San Diego Region are classified as coastal waters, surface waters, ground waters, imported surface waters, and reclaimed water. Fresh water supplied within the Region is obtained from local surface and ground water development projects and imported surface water programs.

Gray whale

COASTAL WATERS

Coastal waters in the Region include bays, harbors, estuaries, beaches, and open ocean. Deep draft commercial harbors include San Diego Bay and Oceanside Harbor. Shallower small craft harbors include Mission Bay and Dana Point Harbor. Important estuaries are represented by coastal lagoons such as Tijuana Estuary, Sweetwater Marsh, San Diego River flood control channel, Kendall-Frost wildlife reserve, San Dieguito River Estuary, San Elijo Lagoon, Batiquitos Lagoon, Agua Hedionda Lagoon, Buena Vista Lagoon, San Luis Rey River Estuary, and Santa Margarita River Estuary.

SURFACE WATERS

The San Diego Region has thirteen principal stream systems originating in the western highlands which flow to the Pacific Ocean. From north to south these stream systems are Aliso Creek, San Juan Creek, San Mateo Creek, San Onofre Creek, Santa Margarita River, San Luis Rey River, San Marcos Creek, Escondido Creek, San Dieguito River, San Diego River, Sweetwater River, Otay River, and the Tijuana River. Most of the streams of the San Diego Region are interrupted in character having both perennial and ephemeral components due to the rainfall pattern and the development of surface water impoundments. Surface water impoundments capture flow from nearly all the Region's major surface water streams. Many of the major surface water impoundments are a blend of natural runoff and imported water.

GROUND WATERS

All major drainage basins in the San Diego Region contain ground water basins. The basins are relatively small in area and usually shallow. Although these ground water basins are limited in size, the ground water yield from the basins has been historically important to the development of the Region. A number of the larger ground water basins can be of future significance in the Region for storage of both imported waters and reclaimed wastewaters. Nearly all of the local ground waters of the Region have been intensively developed for municipal and agricultural supply purposes.

IMPORTED SURFACE WATERS

The San Diego Region receives all of its imported water supplies from the Metropolitan Water District of Southern California (MWD). The MWD was created by the California State Legislature as a special district in 1928. MWD distributes wholesale water through 27 member agencies (cities and water districts) in portions of Los Angeles, Orange, Riverside, San Bernardino, San Diego and Ventura Counties. The MWD serves more than one-half of the drinking water supply used by 16 million persons in the coastal plain of Southern California.

The MWD supplies water to the following five member agencies in the San Diego Region: (1) Coastal Municipal Water District, (2) Municipal Water District of Orange County, (3) Western Municipal Water District of Riverside County, (4) Eastern Municipal Water District and (5) San Diego County Water Authority. The San Diego County Water Authority, the largest purveyor of MWD water in the San Diego Region, allocates water supplies to member agencies in San Diego County. The MWD obtains its water supplies from the Colorado River Aqueduct and the State Water Project.

The Colorado River Aqueduct is owned and operated by the MWD. Construction of the aqueduct began in 1931 and the first deliveries of imported water to member agencies took place in 1941. This aqueduct transports water from Lake Havasu on the Colorado River, 242 miles to its terminus at Lake Matthews in Riverside County. The aqueduct has an annual maximum capacity of 1.3 million acre-feet.

In 1964, the United States Supreme Court limited California's annual diversions from the Colorado River on a dependable basis to 4.4 million acre-feet in the case Arizona vs. California. As a result of the Supreme Court's decision, MWD's annual diversions from the Colorado River were limited to approximately 550,000 acre-feet. The United States Department of the Interior has the discretion to allow California to use any water that Arizona and Nevada have available from the Colorado River, but do not use. During declarations of surplus, MWD has the highest priority of any California contractor to divert surplus waters from the Colorado River.

MWD's other primary source of water is the State Water Project (SWP). The SWP is owned by the State of California and operated by the California Department of Water Resources. SWP water originates from Lake Oroville on the Feather River and surplus flows in the Sacramento - San Joaquin Delta in northern California. The project transports water from the Sacramento-San Joaquin Delta via the 444-mile long California Aqueduct to 29 contract agencies in the State.

The MWD has an annual entitlement to SWP water of 2,011,500 acre-feet out of a total maximum contractual entitlement of 4.2 million acre-feet for the 29 contractors. The current firm yield of the SWP, 2.4 million acre-feet, falls below the total SWP contractor requests of approximately 3.6 million acre-feet. The current firm yield of the SWP is based on the average annual water supplies available if the hydrologic conditions during the years 1928 - 1934 reoccurred. The firm yield of the SWP can supply only about one-half of the contract entitlement due to the lack of sufficient SWP water conveyance facilities. The demand for SWP water is expected to increase to 4.2 million acre-feet by the year 2010. MWD water supply from the SWP will be subject to limitations unless SWP supplies are increased.

Steadily increasing demands for water have led to the need to import water from the Colorado River and the State Water Project. In November 1947, construction was completed on the first pipeline of the San Diego Aqueduct to deliver Colorado River water into the Region. The pipeline was constructed by the U.S. Navy to meet the increased demand for water caused by accelerated population and industrial growth during the World War II years of 1941 - 1945. Additional pipelines to convey imported water were constructed in subsequent years. Beginning in 1978, State Water Project water from Lake Oroville on the Feather River and surplus flows in the Sacramento - San Joaquin Delta in northern California were blended with the Colorado River water.

In the recent past the MWD water supplies consisted of approximately seventy percent from the Colorado River and thirty percent from the State Water Project. In 1993, the drought reduced the availability of State Water Project waters during the year and MWD water supplies consisted of approximately ninety-three percent from the Colorado River and seven percent from the State Water Project. The San Diego Region is highly dependent upon imported water supplies to meet the residential, industrial, commercial, agricultural, and public water demand. Imported water (i.e., Colorado River and State Water Project) supplies about ninety percent of the demand; surface runoff into local reservoirs and local ground water supplies the remaining ten percent.

The delivery of the maximum amount of SWP water benefits the Region in the following ways:

- SWP water improves the potential for conjunctive uses of water resources.

- SWP water enhances and maintains designated beneficial uses of the Region's surface and ground waters;

- SWP water improves the potential for attainment of water quality objectives;

- SWP water improves the viability of recharge of ground water basins;

- SWP water increases the potential for water reclamation.

The effective implementation of water reclamation in the Region is contingent on the availability of supply waters with relatively low salinity, or total dissolved solids (TDS) concentration. The Colorado River has a high TDS concentration of 600 - 750 milligrams per liter (mg/l). When this water is used for urban needs the TDS increases by about 300 mg/l to 900 -1050 mg/l. This quality of water is, at best, marginal for agricultural and ground water recharge uses of reclaimed water. In contrast, TDS concentrations in State Water Project waters are approximately 250 mg/l except during drought periods. The lower TDS concentrations found in State Water Project waters enables water supply agencies to blend SWP waters with Colorado River water supplies to meet drinking water quality standards and reclaimed water discharge limitations.

Water supply demand is expected to continue to increase as a result of population growth in the Region. To meet the projected water demand, water supply agencies are working to increase both the capacity and flexibility of conveyance systems and to intensify development of local water supplies through wastewater reclamation, ground water management, and desalination of seawater. The increased use of local supplies is expected to meet eighteen percent of the total water supply needed by the year 2010. The remaining eighty-two percent of the demand will have to be met by imported water.

RECLAIMED WATER

Reclaimed water is an important and growing component of the Region's water supply. Reclaimed water is obtained through extensive treatment of municipal wastewater to produce a safe and reliable water supply for non-potable uses. Reclaimed water is used to irrigate parks, agriculture, planned community greenbelt areas, golf courses and freeway landscaping. Reclaimed water use to the maximum extent feasible is important because it reduces dependence on imported water supply and leaves the Region less vulnerable to imported water supply shortages. The use of reclaimed water in the Region is expanding. For example, the San Diego County Water Authority reported that in Fiscal Year 1993, the total volume of reclaimed water used in the Authority's service area was

9,713 acre-feet; this represented a 24 percent increase in reclaimed water use over the previous year. The Authority estimates that the total reclaimed water use volume in their service area will increase to 50,000 acre-feet per year when currently planned water reclamation projects are completed in the year 2010.

REGIONAL BOARD WATER QUALITY MANAGEMENT POLICY

The five policy statements in this section form the Regional Board's Water Quality Management Policy for the San Diego Region. Following each principle policy statement are interpretations and examples of applications of the policy. In certain instances the Regional Board may find it necessary to exercise discretion in applying these policies within the interpretations presented.

POLICY ONE

Water quality objectives, beneficial uses, and water quality control plans and policies adopted by the State Water Resources Control Board and the Regional Water Quality Control Board shall be an integral part of the basis for water quality management.

★ Whenever the existing water quality exceeds the water quality objectives contained in the *Water Quality Control Plan for the San Diego Basin (9),* such existing high quality shall be maintained until it has been demonstrated to the Regional Board that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial uses of such water, and will not result in water quality less than that described in the *Water Quality Control Plan for the San Diego Basin (9).*[5]

★ Any waste discharged to existing high quality water will be required to meet waste discharge requirements that will result in the best practicable treatment or control of the discharge necessary to assure that pollution will not occur and the highest water quality consistent with maximum benefit to the people of the State will be maintained.[5]

POLICY TWO

Water shall be reclaimed and reused to the maximum extent feasible.

★ The Regional Board will encourage and recommend funding for water reclamation projects that meet the following conditions and that do not adversely affect vested water rights, unreasonably impair instream beneficial uses, or place an unreasonable burden on present water supply systems: [6]

√ Beneficial uses will be made of wastewater that would otherwise be discharged to marine or brackish receiving water or evapotranspiration ponds.

√ Reclaimed water will be used to replace or supplement the use of fresh water or better quality water.

√ Reclaimed water will be used to preserve, restore, or enhance instream beneficial uses that include but are not limited to, fish, wildlife, recreation, and aesthetics associated with any surface water body or wetlands.

★ The Regional Board will encourage and promote water reclamation while taking into consideration the Regional Board's responsibility of protecting and enhancing beneficial uses and recognizing the need to protect the public health and environment.

★ The Regional Board will require wastewater treatment facilities to provide for appropriate disposal or storage of surplus reclaimed water.

POLICY THREE

Point sources and nonpoint sources of pollution shall be controlled to protect designated beneficial uses of water.[7]

★ Treatment levels at least as stringent as those defined in the federal Clean Water Act will be required of municipal and industrial point sources which are subject to regulation under the Clean Water Act.[8]

★ Sewage collection agencies shall implement a comprehensive pretreatment program including industrial waste ordinances to control the quality and quantity of pollutants which may adversely affect the operation of a municipal wastewater treatment facility, or which may cause the effluent limitations for the facility to be exceeded, or which may pass through the treatment works or will otherwise be incompatible with such works.

★ Nonpoint sources will be controlled in conformance with the Clean Water Act and the Coastal Zone Act Reauthorization Amendments. Nonpoint source control programs will generally be the responsibility of federal, state, and local agencies, and individuals having land management responsibilities. Such controls will be implemented preferably through best management practices,[9] (BMPs). If BMPs fail, controls will be implemented through waste discharge requirements or other regulatory actions.[7]

POLICY FOUR

Instream beneficial uses shall be maintained, and when practical, restored, and enhanced.

★ Coordination shall be encouraged among local agencies with regard to all aspects of planning and land use control.

★ Plans for future development and management of the State's water resource must assure adequate protection of existing instream beneficial uses, and where feasible, include measures to enhance these uses.

★ Instream uses for recreation, fish, wildlife, and related purposes shall be balanced with other uses.

★ The need for water to be impounded must be demonstrated, taking full account of instream values.

★ Reservoir operations shall involve careful consideration of instream uses, even where such uses satisfy altered or enhanced instream values.

POLICY FIVE

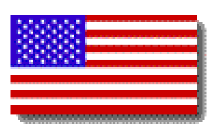
A detailed and comprehensive knowledge of the beneficial uses, water quality and activities affecting water quality throughout the Region shall be maintained.

★ The development of a modern comprehensive information gathering, storing, and retrieval system to effectively aid in evaluating water quality throughout the Region shall be encouraged.

LEGAL BASIS AND AUTHORITY

Federal and state laws have been enacted which establish the requirements for adequate planning, implementation, management and enforcement, for the control of water quality. The principal federal and state laws pertaining to the regulation of water quality are known respectively as, the 1972 Federal Water Pollution Control Act (also known as the Clean Water Act) and Division 7 of the 1969 California Water Code (also known as the Porter-Cologne Water Quality Control Act). The laws are similar in many ways. The fundamental purpose of both laws is to protect the beneficial uses of water. An important distinction between the two is that the Porter-Cologne Water Quality Control Act addresses both ground and surface waters while the Clean Water Act addresses surface water only.

In addition, federal and state regulations and policies have been developed to augment and clarify the laws and to provide detail not included in the law.



FEDERAL LAWS AND REGULATIONS

The basic federal law dealing with surface water quality control is the Federal Water Pollution Control Act of 1972 (Clean Water Act). Certain statutory provisions in two other federal laws, the National Environmental Policy Act of 1969 and the Endangered Species Act, supplement the Clean Water Act. Federal regulations implementing the Clean Water Act provisions for water quality planning and management are contained in 40 CFR 130, *EPA Requirements for Water Quality Planning and Management* and 40 CFR 131, *EPA Procedures for Approving State Water Quality Standards*.

FEDERAL WATER POLLUTION CONTROL ACT

The Federal Water Pollution Control Act was amended in 1972 and is commonly referred to as the Clean Water Act. The objective of the Clean Water Act is to "*restore and maintain the chemical, physical and biological integrity of the Nation's waters*" to make all surface waters "*fishable*" and "*swimmable*". The seven goals set forth in the law to achieve this objective are to:

(1) Eliminate the discharge of pollutants to navigable waters by 1985;

(2) Provide water quality which protects and fosters propagation of fish, shellfish and wildlife and allows recreation in and on the water by 1983;

(3) Prohibit discharge of toxic pollutants in toxic amounts;

(4) Provide financial assistance to construct publicly owned treatment systems;

(5) Develop and implement areawide waste treatment management plans;

(6) Develop technology necessary to carry out these goals; and

(7) Develop and implement programs for control of nonpoint sources of pollution.

In 1972, five titles were added as amendments to the Clean Water Act. Title 1 provides for research and related programs, Title 2 provides grants for construction of treatment works, Title 3 provides for standards and enforcement, Title 4 provides for permits and licenses, and Title 5 provides for general provisions.

Clean Water Act sections 106, 205(j), 205(g), 208, 303 and 305 establish requirements for state water quality planning, management, and implementation in regard to surface waters. The Clean Water Act requires that states adopt water quality standards to protect public health or welfare, enhance the quality of water, and serve the purposes of the Clean Water Act. "*Serve the purposes of the Act*" (as defined in sections 101(a), 101(a)(2), and 303(c) of the Act) means that water quality standards:

- Include provisions for restoring and maintaining the chemical, physical, and biological integrity of state waters;

- Whenever attainable, achieve a level of water quality that provides for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water ("*fishable*" and "*swimmable*"); and

- Consider the use and value of state waters for public water supplies, propagation of fish and wildlife, recreation, agriculture and industrial purposes, and navigation.

The states are also required to have a continuing planning process called the Triennial Review process, which includes public hearings at least once every three years to review the water quality standards and revise them if necessary.

NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

The National Environmental Policy Act (NEPA) declares a national environmental policy and its goals. The overall objectives of NEPA are: (1) to ensure that environmental factors are considered in the decision making process of any federal action and (2) to provide full public disclosure of any federal action. Accordingly, NEPA requires that an Environmental Impact Statement (EIS) shall be "*included in every recommendation or report on proposals for legislation and other major federal actions significantly affecting the quality of the human environment*". Federal actions include the operation of programs; the construction of facilities; the provision of funding to others; and a federal agency's decision on whether to grant its required permission for activities of others, such as private businesses or state or local governments.

NEPA establishes a continuing policy for all levels of government and concerned public and private organizations to create and maintain conditions under which man and nature can exist in productive harmony and fulfill the social, economic and other requirements of present and future generations. NEPA directs an interdisciplinary approach to ensure integrated use of all talents in planning and decision making having impact on the environment (section 102). Each report or recommendation must be accompanied by a detailed statement prepared by the responsible official on:

- The environmental impact of the proposed action;
- Any adverse environmental effects which cannot be avoided if the action is taken;
- Alternatives to the action;
- Relationship between local short-term uses of the environment, and maintenance and enhancement of long-term productivity; and
- Any irreversible and irretrievable commitments of resources if the proposed action is taken.

Appropriate alternatives to proposed actions must be studied and developed when conflicts in use of available resources are encountered.

NEPA directs the preservation of acceptable environments and the restoration of those that have been degraded. The spirit of the Act is also carried into the State reviews of proposed actions upon the environment. (See discussion on the California Environmental Quality Act later in this chapter).

ENDANGERED SPECIES ACT

The federal Endangered Species Act (ESA) establishes federal policy regarding protection of endangered and threatened species. The ESA is directed specifically at projects subject to the NEPA which may adversely affect endangered and threatened species. Section 7 of the federal ESA requires all federal agencies, in consultation with the Fish and Wildlife Service and the National Marine Fisheries Service, ensure that their actions do not jeopardize the existence of threatened or endangered species or result in the destruction or adverse modification of critical habitat. The definition of a federal action is very broad and covers almost every water program administered by the United States Environmental Protection Agency (USEPA). All aspects of the USEPA's surface water quality criteria and standards adoption and implementation process are subject to the consultation process. The overriding goal of the consultation process is to provide for the protection and recovery of threatened and endangered species and the ecosystems on which they depend.

APPLICABLE FEDERAL REGULATIONS

The federal regulations, promulgated by the USEPA to implement the Clean Water Act provisions for water quality planning and management, are contained in 40 CFR 130, EPA Requirements for Water Quality Planning and Management and 40 CFR 131, EPA Procedures for Approving State Water Quality Standards. The regulations contained in 40 CFR 131 require states to:

- Designate appropriate beneficial uses for surface waters;
- Establish narrative and numeric criteria to protect beneficial uses;
- Establish an antidegradation policy to protect and maintain existing beneficial uses and the water quality necessary to protect those uses; and
- Hold a public hearing to review surface water quality standards at least once every three years and revise them if appropriate.

The regulations contained in 40 CFR 130 require states to also develop and follow a water quality planning and management system consisting of the following elements:

- Monitoring methods and procedures to compile and analyze data on surface waters;
- Identification of surface waters that are "*water quality limited*" or not meeting water quality standards;
- A ranking of surface water bodies based on severity of pollution and beneficial uses of the waters. The surface water body ranking must also include a determination of how best to utilize available resources to solve the water quality problems; and
- Pollutant loading allocations to ensure that water quality standards are not exceeded.

These regulations are discussed in detail in Chapters 2 and 3.

CALIFORNIA LAWS AND REGULATIONS

State of California laws that directly affect water resources planning are contained principally in the California Water Code. Certain statutory provisions in the Water Resources Code, Health and Safety Code, Public Resources Code, Fish and Game Code, Food and Agriculture Code, Government Code, Harbors and Navigation Code, California Environmental Quality Act, and the California Endangered Species Act supplement the water quality provisions of the California Water Code. The chief state regulations in the CCR pertaining to water quality are contained in Title 22 and Title 23.

CALIFORNIA WATER CODE

The California Water Code contains provisions which control almost every consideration of water and its use. Division 2 of the Water Code provides that the State Board shall consider and act upon all applications for permits to appropriate waters. The State Board's authority includes water quality considerations in granting a water right. Division 3 deals with dams and reservoirs; Division 5 pertains to flood control; Division 6 controls conservation, development and utilization of the state water resources; Division 7, covers water quality protection and management; and Divisions 11 through 21 provide for the organization, operation, and financing of municipal, county and local, water-oriented agencies.

ADJUDICATIONS TO PROTECT THE QUALITY OF GROUND WATER (DIVISION 2 OF THE CALIFORNIA WATER CODE)

California Water Code section 2100 provides that the State Board may make a formal determination or judgment in order to protect ground water quality. Thus, the State Board, upon a finding of existing or threatened irreparable damage, may file an action in the Superior Court to restrict pumping or to impose physical solutions, or both, to the extent necessary to prevent destruction of, or irreparable injury to, the quality of ground water. The State Board may take such action only if an affected local agency charged with this responsibility fails to take appropriate action.

PORTER-COLOGNE WATER QUALITY CONTROL ACT

Division 7 of the California Water Code is the basic water quality control law for California. This law is titled the Porter-Cologne Water Quality Control Act (Porter-Cologne Act). The Porter-Cologne Act establishes a regulatory program to protect water quality and to protect beneficial uses of the state waters.

The Porter-Cologne Act section 13000 provides that:

- The quality of all waters of the state shall be protected for the use and enjoyment by the people of the state; and

- Activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality that is reasonable, considering all demands being made or to be made and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.

The Porter-Cologne Act establishes the State Board and the regional boards as the principle state agencies responsible for control of water quality. The State Board is responsible for:

- Issuing rights for the appropriation of surface water;

- Preventing waste and unreasonable use of water;

- Adjudicating water rights at the request of water users or the courts;

- Adopting state-wide water quality control policy;

- Reviewing actions of regional boards;

- Implementing the federal Clean Water Act; and

- Operation of a grants and loan program for the construction of sewage treatment plants.

The regional boards are responsible for:

- Issuance of waste discharge requirements to regulate the discharge of waste to surface and ground waters;

- Enforcement of the waste discharge requirements by the issuance of cease and desist orders, cleanup and abatement orders, administrative civil liability orders, and court action;

- Water quality control planning within their region; and

- Surveillance and monitoring to detect new sources of pollution and to ensure that ongoing discharges are in compliance with waste discharge requirements.

The Porter-Cologne Act empowers the regional boards to formulate and adopt, for all areas within the regions, a Water Quality Control Plan (Basin Plan) which designates beneficial uses and establishes such water quality objectives as in its judgment will ensure reasonable protection of beneficial uses. Each regional board establishes water quality objectives that will insure the reasonable protection of beneficial uses and the prevention of nuisance. The California Water Code provides flexibility for some change in water quality provided that beneficial uses are not adversely affected. The factors which are to be considered by the Regional Board in establishing water quality objectives are described in Chapter 3, Water Quality Objectives, (page 3-1).

The State Board may adopt water quality control plans for surface waters that overlap Regional Board boundaries, are statewide in scope, or are otherwise considered significant. Statewide plans supersede Regional Water Quality Control Plans where conflict occurs. The Regional Water Quality Control Plans are required to conform with policies of the State Board.

The California Water Code also requires that each regional board include an implementation plan in the Basin Plan. Implementation plans must include as a minimum:

- A description of the nature of the actions necessary to achieve the water quality objectives, including recommendations for appropriate actions by any entity, public or private;

- A time schedule for the actions to be taken; and

- A description of the surveillance to be undertaken to determine compliance with the water quality objectives.

CALIFORNIA ENVIRONMENTAL QUALITY ACT OF 1973

The California Environmental Quality Act (CEQA) is a very important and expansive environmental protection law in California. It was enacted by the state legislature in 1973 and is contained in the Public Resources Code sections 21000 through 21177. CEQA is the state-level equivalent of the federal NEPA.

The overall objectives of both laws, NEPA and CEQA, are to provide full public disclosure of a project and to ensure that environmental factors are considered in the decision making process. CEQA requires all state agencies, boards and commissions to include in any report on any project having significant effect on the environment an Environmental Impact Report (EIR). The EIR records the scope of the applicant's proposal and analyzes all its known environmental effects. The EIR must discuss any significant environmental effects which cannot be avoided if the proposal is implemented, proposed mitigative measures to minimize the impact of the project and alternatives to the project. Also the EIR must discuss the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity and the growth-inducing impacts of the proposed project. The EIR is circulated to interested agencies and members of the public who request a copy. The public has a 45 day period for review during which comments on the EIR are accepted.

State agencies cannot approve a project for which alternatives or mitigation measures exist which would significantly reduce the environmental impacts, unless overriding social and/or economic considerations apply.

Activities of the State and Regional Boards subject to CEQA include adoption of Basin Plans and amendments thereto, issuance of National Pollutant Discharge Elimination System

(NPDES) permits, and Waste Discharge Requirements (WDRs). The basin planning process however, has been certified by the Secretary of Resources as being exempt from CEQA's requirement for preparation of an EIR or negative declaration and initial study CCR Title 14, section 15251). Under the basin planning process, a plan amendment, as well as a technical report and backup materials, serve as a functional equivalent to an EIR or negative declaration and initial study. The CEQA Notice of Filing, Environmental Checklist Form, and Notice of Decision must be filed to comply with CEQA.

CALIFORNIA ENDANGERED SPECIES ACT

The California Endangered Species Act (CESA) as amended in 1987 (California Fish and Game Code, sections 2050 thru 2098) establishes state policy regarding protection of endangered and threatened species. CESA is directed specifically at projects subject to the CEQA which may adversely affect endangered and threatened species.

Pursuant to CESA, the Regional Board must consult with the California Department of Fish and Game (DFG) to determine if the Basin Plan would jeopardize the continued existence of any endangered or threatened species or adversely affect the habitat of the species. CESA requires the DFG to issue written findings regarding whether or not Regional Board adoption of the Basin Plan will cause jeopardy to endangered or threatened species.

CESA policy requires that the Regional Board not approve a Basin Plan, which in DFG's opinion, would jeopardize endangered or threatened species. CESA also requires the Regional Board to adopt reasonable and prudent alternatives in the Basin Plan which would minimize any adverse effects identified by DFG to endangered or threatened species. If the alternatives are infeasible, the Regional Board is required to adopt reasonable mitigation and enhancement measures in the Basin Plan.

OTHER STATE STATUTES

Certain statutory provisions contained in the Health and Safety Code, Fish and Game Code, Harbors and Navigation Code, and the Food and Agriculture Code, supplement the water quality provisions of the California Water Code. The Health and Safety Code has statutory provisions providing for the regulation of hazardous waste, hazardous materials, surface impoundments containing hazardous waste, underground and aboveground storage of hazardous substances, and underground injection of toxic substances and the discharge of cancer causing chemicals to sources of drinking water. The Harbors and Navigation Code has statutory provisions to prevent the unauthorized discharges of waste from vessels to surface waters. The Food and Agriculture Code has statutory provisions providing for the prevention of pollution of ground water which may be used for drinking water supplies. The Fish and Game Code has statutory provisions to prevent unauthorized diversions of any surface water body as well as waste discharges deleterious to fish, plant, animal, or bird life. The Government Code requires the Governor to establish a state oil spill and toxic disaster contingency plans.

CALIFORNIA CODE OF REGULATIONS

The administrative procedures of the State Board and regional boards and regulations relating to many facets of water rights and water quality are contained in Title 23, (WATERS) Division 3, (Water Resources Control Board) Chapters 3, 4, 15, and 16 California Code of Regulations (CCR). Requirements for quality of water for domestic uses, wastewater reclamation criteria, and hazardous waste management are contained in Title 22, Division 4 (Environmental Health).

HISTORY OF BASIN PLANNING IN THE SAN DIEGO REGION

The Dickey Act, enacted by the State of California in 1949, established nine Regional Water Pollution Control Boards in California. Regional Water Pollution Control Boards were directed to establish water quality objectives in order to protect the quality of receiving waters from adverse impacts of discharges. During the first few years, the San Diego Regional Water Pollution Control Board only established narrative objectives for discharges. By 1952, the San Diego Regional Water Pollution Control Board began including numerical limits in requirements for discharges and adopting water quality objectives for receiving waters.

In the late 1960's the San Diego Regional Board conducted an extensive investigation to define water quality objectives for the entire San Diego

Region. A report was prepared for each major hydrologic unit of the Region. These reports described the following topics for each hydrologic unit:

- Geology and land use;
- Precipitation and runoff;
- Water quality;
- Surface and ground water use;
- Imported water use;
- Waste disposal;
- Beneficial uses;
- Water quality objectives; and
- The water quality implementation program.

These early reports led to the definition and designation of beneficial uses for the surface and ground waters of the Region. The beneficial uses defined in the early reports have remained intact, for the most part, to the present day.

With the enactment of the Porter-Cologne Water Quality Act in 1969, the names of the Regional Water Pollution Control Boards were changed to Regional Water Quality Control Boards, and their authority was broadened. Furthermore, the Act required the Regional Water Quality Control Boards to initiate development of comprehensive regional Water Quality Control Plans.

In 1971, the San Diego Regional Board adopted an Interim Water Quality Control Plan (Interim Plan) which expanded the number of beneficial uses designated for inland surface waters, and coastal waters subject to tidal action. The Interim Plan was prepared to satisfy state and federal requirements for grant programs for sewage treatment plant construction. In addition, the Interim Plan satisfied the Porter-Cologne Act requirements that each regional board adopt a Water Quality Control Plan. As the term "*interim*" implies, the document was adopted as the first step towards development of a comprehensive fully developed Water Quality Control Plan. The Interim Plan was amended in 1972 to designate a beneficial use for clamming and shellfish harvesting at various locations in coastal waters.

In 1975, the San Diego Regional Board adopted the Comprehensive Water Quality Control Plan Report for the San Diego Region that compiled all of the existing beneficial uses, water quality objectives, and policies into one document and rescinded all individually-adopted objectives and policies. The 1975 Basin Plan was amended by the Regional Board on numerous occasions since 1975. A summary of Basin Plan amendments adopted by the Regional Board between 1979 and 2005 and approved by the State Board, Office of Administrative Law, and USEPA is presented in Chapter 5 (Plans and Policies) of this Basin Plan.

Since 1975, progress has been made toward the control of a number of water quality problems identified in the 1975 Basin Plan, including the control of point source discharges and the development of new programs to address nonpoint source pollution issues in the Region. At the same time, many new issues and areas of concern have arisen as health scientists have identified increasingly lower concentrations of toxic substances as health risks. Furthermore, advancing analytical technology enables detection of contaminants at increasingly lower concentrations. The State and Regional Board's Continuing Planning Process, based on the latest scientific information, addresses both "*old*" and "*new*" water quality issues.

CONTINUING PLANNING PROCESS

As part of the State's continuing planning process, components of the Basin Plan are reviewed as new data and information become available or as specific needs arise. Comprehensive updates of the Basin Plan occur in response to state and federal legislative requirements and as funding becomes available. In addition, State Board and other governmental entities' (federal, state, and local) plans, which can affect water quality, are incorporated into the planning process. The Basin Plan provides consistent long-term standards and program guidance for the Region.

BASIN PLAN REVIEW AND AMENDMENT PROCESS

The following discussion applies to the review and amendment process for any Water Quality Control Plan, (i.e., a Statewide Plan or a Regional Board Basin Plan).

TRIENNIAL REVIEW

Statewide plans and Regional Board Basin Plans are flexible documents which must be reviewed and revised regularly to adapt to changing conditions. A major review of both types of Plans is performed every three years as part of the update process for the "*Triennial Review*". The Triennial Review is required by the federal Clean Water Act [section 303(c)(1)]. In addition, state law requires that water quality control plans be reviewed periodically (California Water Code section 13240), and that the State Board review statewide plans at least every three years (California Water Code sections 13170 and 13170.2). These reviews are comprehensive and include a public scoping hearing to identify the issues and water quality standards to be addressed. The review identifies standards which are appropriate and, therefore, require no revisions. Information on new or existing water quality objectives comes from monitoring data, compliance inspections, discharger reports, and public complaints. Monitoring data provides information on background conditions which are used to set water quality objectives.

The State or Regional Board evaluates all available information and determines whether revisions to water quality standards are needed and the nature of any necessary revisions. A work plan is prepared which identifies appropriate revisions. These revisions, and a time schedule for implementation, are then incorporated into the Statewide Plan or Regional Board Basin Plan by way of the amendment process discussed below.

BASIN PLAN AMENDMENT PROCESS

Whenever a Statewide Plan or Regional Board Basin Plan for surface waters is to be revised, public participation requirements must be met, as called for in 40 CFR Part 25 (Public Participation in Programs Under the Resource Conservation and Recovery Act and the Clean Water Act). When water quality standards are changed, a public hearing must be held. Notice for the public hearing generally must be given 45 days prior to the hearing, and the documents to be considered at the hearing must be available to the public 30 days prior to the hearing. After the hearing, a summary of comments received and responses to those comments must be prepared before action is taken.

For Regional Board adoption of a Basin Plan amendment, a quorum of Board members must be present (five of the nine members). For State Board approval of a proposed Regional Board amendment, a quorum must also be present (three of the five members). In both cases the vote of a majority of the quorum is required to take action. If a State Board hearing is being held regarding a Statewide Plan or to review an amendment proposed by a Regional Board, one or more members of the State Board may conduct the hearing upon authorization of the State Board. In cases where such a hearing is conducted, any final action must be taken by a majority of all members of the State Board (i.e., 3 votes). Usually State Board hearings are of a controversial nature and most, if not all, Board members elect to attend. The State Board may approve a Basin Plan amendment proposed by a Regional Board or return it to the Regional Board for further consideration. Upon resubmission, the State Board may either approve or, after a public hearing in the affected region, revise and approve such plan (California Water Code section 13245).

Basin planning is also influenced by several federal administrative guidance documents, such as USEPA's Technical Support Document for Water Quality-Based Toxics Control, the Water Quality Standards Handbook, and "*Gold Book*" Quality Criteria for Water, 1986 and waste load allocation manuals.

Basin Plan amendments are generally initiated by the appropriate Regional Board, and Statewide Plan amendments are initiated by the State Board. Amendments may also be initiated by any other interested parties. In this case, the proposed amendment submitted by the interested party is reviewed by Regional Board to determine if the information is adequate to support the requested change to the Basin Plan. The Regional Board will review the technical information and may either accept it as complete or reject it as incomplete. Whenever new or revised water quality standards are proposed in a Regional Board Basin Plan amendment, the standards must be approved by the State Board before the amendment becomes effective. A proposed standard revision to a statewide plan or Regional Board Basin Plan takes effect upon approval by the Office of Administrative Law (OAL). A standard contained in a Regional Basin Plan amendment which relates to surface waters or a standard in a statewide plan must be submitted to the United States Environmental Protection Agency (USEPA) for approval [40 CFR section 131.20 (c)] following State Board review. If the standard revision is disapproved by the USEPA, the original standard remains in effect until revised by the basin planning process, or the USEPA promulgates its own rule which supersedes the standard revision [40 CFR section 131.21 (c)].

BASIN PLAN AMENDMENT PROCEDURES

(1) Advance notice of plan amendments is required (California Water Code §13244) and must be advertised for hearings. For amendments that include a prohibition, a public notice must be published for three consecutive days in a newspaper of wide circulation in the area of the prohibition. For other actions, notice must be published for one day in a newspaper of wide circulation. Usually, the hearing notice must be published at least 45 days prior to the hearing (40 CFR section 25.5).

A CEQA Notice of Filing must be circulated at least 45 days prior to State and Regional Board action on a proposed amendment. Where the hearing(s) process is completed and adoption is scheduled for a regularly scheduled State or Regional Board Meeting, a ten-day notice requirement for agenda items applies (Government Code section 11125).

(2) For controversial and/or complex amendments, comments should be requested from interested persons prior to drafting an amendment. This step would be informal by written correspondence or in a workshop session (the public can attend such workshops, which are not "*public hearings*" and would precede the hearing notice in number 3 below). Comments received would be considered in the initial draft of the amendment and the alternatives.

(3) The hearing notice must be specific enough to allow an effective opportunity for public participation. Although it is preferable to include the draft plan amendment and technical report with the hearing notice, as indicated above, these documents can be made available at a later date that is at least 30 days before the hearing (40 CFR section 25.5). The notice should include:

(a) The general area to be regulated;
(b) The specific proposed plan amendment and a statement of the availability of a technical report and backup material;
(c) Either of the following,
    (i) Alternatives to the proposal or
    (ii) A statement that additional rules, consistent with the general purpose of the plan amendment and complementary to the specific proposed rules, are under consideration.
(d) A statement as to whether action on the amendment will be taken immediately at the close of the hearing.

(4) A copy of the hearing notice should be sent to:

(a) Those who normally receive notices of plan review or those who, in the judgment of staff, would be interested in the proposed amendment(s).
(b) Those who have commented on the plan review or amendment.
(c) Those federal, state and local agencies who have jurisdiction by law or who have expertise with respect to the subject(s) of the proposed amendment(s).
(d) Specific interested parties affected by the proposed action.

(5) The State or Regional Board(s) may require that written testimony or other evidence be submitted in advance of the public hearing (Title 23 CCR section 649.4). If this option is chosen, the hearing notice should specify the details. Charts, graphs, and other testimony which are presented as evidence must be left with the State or Regional Board(s) in order to be considered as part of the record.

(6) The hearing notice can state that more than one hearing is scheduled and list the dates for each in order to save processing time. Alternatively, the notice may state that action on the amendment could take place following the close of the hearing. Some delays may also be avoided by

having special hearings on dates other than regularly scheduled State or Regional Board meetings.

(7) The State or Regional Board(s) must prepare written responses to comments received at least 15 days before the State or Regional Board intends to take action. Copies of responses will be available at the State or Regional Board meeting for any person to review. Late comments should be responded to at the State or Regional Board meeting. If appropriate, the Environmental Checklist Form may be revised based on a review of comments received.

(8) The State or Regional Board(s) must prepare a summary report including:
   (a) A brief description of the proposed activity;
   (b) Reasonable alternatives to the proposed activity; and
   (c) Mitigation measures to minimize any potential significant adverse environmental impacts of the proposed activity identified in the Environmental Checklist Form. Conclusions must be made as to what, if any, potential significant adverse impacts, feasible alternatives, and feasible mitigation measures exist. These conclusions must be accompanied by a statement of supporting facts. In adopting proposed amendments, the State or Regional Board must mandate those feasible alternatives or feasible mitigation measures which are within its jurisdiction. The State or Regional Board cannot approve the proposed amendment if there are feasible alternatives or feasible mitigation measures which would substantially lessen the potential significant adverse environmental impacts (Public Resource Code section 21080.5).

(9) The hearing must, at a minimum, be recorded electronically (Title 23 CCR section 647.4). Controversial matters usually are recorded by a stenographic reporter.

(10) At the hearing, all interested persons are given an opportunity to be heard. Reasonable limitations on public participation are appropriate and may be indicated in an opening statement (i.e., impose time limits on testimony, encourage groups to designate a spokesperson, and require witnesses to summarize written testimony). There is no right to cross-examination at the hearings. Persons wishing clarification of prior evidence or comments may request the same from the State or Regional Board.

Cross-examination must be allowed when an amendment takes on quasi-judicial features; for example, when considering a prohibition against increasing existing discharges from a relatively small number of dischargers. Cross-examination may also be allowed at the discretion of the Chairperson, if it appears that the cross-examination will assist the State or Regional Board in its deliberations.

(11) At the close of the hearing, it may be desirable to leave the record open to provide interested persons an additional opportunity to submit written comments. If the record is left open, all interested persons will be told at the hearing that they may review and respond to written comments received during the time that the record is left open. For example, the record could be left open ten days for written submittals and an additional five days for written comments in response to these submittals. Once the record is closed, no additional evidence will be received at the State or Regional Board meeting to consider adoption of the amendment; however, brief comments on the proposal will be allowed.

(12) After the close of the hearing and any comment period, the amendment may be adopted as proposed. If the draft amendment is to be modified, based on the hearing, and the notice is adequate as outlined in number 3 above, a final plan amendment may be adopted when the product is a logical outgrowth of the draft amendment or a statement in the notice. Where changes in the final draft are not a logical outgrowth of the original proposal, an additional notice, hearing, and opportunity to comment will be provided. When changes are proposed by the State or Regional Board, the procedure is:

(a) For each proposed change, consideration is given as to whether the change is a logical outgrowth of the original proposal. If the change was (1) not contemplated in the technical report, notice, or draft amendment and (2) not discussed during the hearing(s) or in written comments received, it is not a logical outgrowth of the original proposal; and an additional notice and comment period will be provided. When the issues are complex, controversial, or confusing, an additional comment period on a new draft amendment is often allowed (even if it can be argued that the changes are a logical outgrowth of the original proposal).

(b) If the change is a logical outgrowth of the original draft amendment, it may be voted upon without an additional notice and comment period. If the vote on the amendment is delayed so that the full amendment can be retyped, etc., normal meeting notice requirements may be followed (Title 23 CCR section 647.2).

(c) If the change is not a logical growth, a motion may be made to incorporate it into the draft amendment. If this motion passes, consideration of the amendment should be continued so that the revisions can be circulated for comments as provided in number 4 above.

(13) Revisions to plan amendments are based on the evidence developed at the hearing. This requirement does not preclude the State or Regional Board(s) from adopting an amendment immediately after the hearing if all evidence has been considered.

(14) If a Basin Plan amendment is quasi-judicial (focused on the rights and duties of a limited number of individuals such as in a small isolated prohibition area), the State or Regional Board resolution adopting the plan amendment will contain findings that are adequate to enable another interested person to "*bridge the analytical gap*" between the evidence the amendment itself.

(15) When a Regional Board amendment is adopted, it must then be forwarded to the State Board for approval. The State Board will review the proposed amendment with extensive evaluation of technical, policy, and legal consistency considerations. The State Board is required to act upon submission of a water quality control plan or revision within 60 days after the Regional Board has submitted the plan, or 90 days after resubmission of the plan (California Water Code section 13246). A Basin Plan revision adopted by a Regional Board is not effective until it is approved by State Board (California Water Code section 13245) and the Office of Administrative Law. An amendment package to be processed for approval must include all of the following:

(a) A memorandum of transmittal including a list of all material that was part of the Regional Board record, staff contact person, and request date for State Board action. If expeditious treatment is requested, the reason for this request should be stated.

(b) A copy of the certified Regional Board resolution including adopted amendments as it will be incorporated into the appropriate Basin Plan and a copy of all documents which were considered by the Regional Board prior to adoption of the Basin Plan amendment.

(c) The Regional Board technical report with detailed rationale for changes, any technical support documentation or background information, and information regarding any relevant State Board or Regional Board actions.

(d) An environmental document and any related CEQA documents.

(e) Copies of written public comments and written Regional Board responses.

(f) A responsiveness summary of any verbal responses to comments received after written comment deadline.

(g) A tape recording or transcript of the public hearing.

(h) Two sets of interested persons mailing lists, typed on self-adhesive address labels or pre-addressed envelopes, plus a typed interested persons list for State Board files.

(16) State Board review of a proposed plan amendment may result in approval or return to the Regional Board for consideration and resubmission. Upon resubmission, the State Board may approve, or, after a public hearing in the affected region, revise and approve the proposed plan amendment (California Water Code section 13245).

(17) Following State Board approval of the plan amendment, there is a 30-working day review period by the Office of Administrative Law. The Regional Board is responsible for preparing the administrative record (Items 15 b, c, d, e, f, and g above), a clear and concise summary, and a summary of necessity for review by the Office of Administrative Law. The summary of necessity is normally contained in the technical report. The Office of Chief Counsel at the State Board prepares a certification that the action was taken in compliance with all applicable requirements of Porter-Cologne.

(18) When the proposed Regional Board amendment has been approved by the Office of Administrative Law, the Regional Board must post a CEQA Notice of Decision with the Secretary of Resources for at least 30 days following Office of Administrative Law approval. When the State Board adopts a Statewide Plan amendment, the State Board must post the 30-day Notice of Decision.

(19) If water quality standards for surface waters are revised in the plan update, the revised plan must be submitted to the USEPA for approval, pending an USEPA determination that the standards meet the requirements of the Clean Water Act (40 CFR 130.10). The amendments must be forwarded to USEPA within 30 days of adoption by the State Board.

REFERENCES

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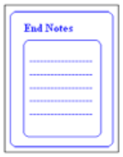

ENDNOTES

1. Hydrologic Unit - A classification embracing one of the following features which are defined by surface drainage divides: (1) In general, the total watershed area, including water- bearing and non - water bearing formations, such as the total drainage area of the San Diego River Valley; and (2) in coastal areas, two or more small contiguous watersheds having similar hydrologic characteristics, each watershed being directly tributary to the ocean and all watersheds emanating from one mountain body located immediately adjacent to the ocean.

2. Hydrologic Area - A major logical subdivision of a hydrologic unit which includes both water- bearing and nonwater - bearing formations. It is best typified by a major tributary of a stream, a major valley, or a plain along a stream containing one or more ground water basins and having closely related geologic, hydrologic, and topographic characteristics. Area boundaries are based primarily on surface drainage boundaries. However, where strong subsurface evidence indicates that a division of ground water exists, the area boundary may be based on subsurface characteristics.

3. Hydrologic Subarea - A major logical subdivision of a hydrologic area which includes both water- bearing and nonwater - bearing formations.

4. On February 10, 1994 the Regional Board adopted Resolution No. 94-25, A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region for the Laguna (1.10), Mission Viejo (1.20), and San Clemente (1.30), Hydrologic Areas. These hydrologic subareas are: Oso (1.21), Upper Trabuco (1.22), Middle Trabuco (1.23), Upper San Juan (1.25), Middle San Juan (1.26), Lower San Juan (1.27) and Ortega (1.28). The San Clemente Hydrologic Area (1.30) is broken into two hydrologic subareas: Prima Deshecha (1.31) and Segunda Deshecha (1.32).

5. State Water Resources Control Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California.

6. State Water Resources Control Board Resolution No. 77-1, Policy with Respect to Water Reclamation in California.

7. Point sources of pollution refer to pollutants discharged to water through any discernible, confined, and discrete conveyance. Nonpoint sources of pollution refer to pollutants from diffuse sources that reach water through means other than a discernable, confined, and discrete conveyance.

8. State Board Policy for Regulating Point and Nonpoint Sources of Pollution in Accordance with the Federal Water Pollution Control Act.

9. Best Management Practices are defined as the practice, or combination of practices, that are determined to be the most effective, practicable means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals (including technological, economic, and institutional consideration.

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CHAPTER 2
BENEFICIAL USES

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2. BENEFICIAL USES

INTRODUCTION

The purpose of this chapter is to designate the beneficial uses for all surface and ground waters in the San Diego Region. Beneficial uses form the cornerstone of water quality protection under the Basin Plan. Once beneficial uses are designated, appropriate water quality objectives can be established and programs that maintain or enhance water quality can be implemented to ensure the protection of beneficial uses.

Beneficial uses are defined as the uses of water necessary for the survival or well being of man, plants and wildlife. These uses of water serve to promote the tangible and intangible economic, social and environmental goals of mankind. Examples include drinking, swimming, industrial and agricultural water supply, and the support of fresh and saline aquatic habitats.

Section 303 of the federal Clean Water Act (33 U.S.C. section1313) defines the term water quality standards as both the uses of the surface (navigable) waters and the water quality criteria which are applied to protect those uses. A water quality standard defines the water quality goals for a water body by designating the use or uses to be made of the water body, by setting criteria to protect the uses, and by protecting water quality through antidegradation provisions. Under the Porter-Cologne Water Quality Control Act (California Water Code, Division 7, Chapter 2 section13050), these concepts are defined separately as beneficial uses and water quality objectives. Beneficial uses and water quality objectives are required to be established for all waters of the State, both surface and ground waters. Beneficial uses of the surface and ground waters of the San Diego Region are discussed in this chapter; water quality objectives and water quality criteria are discussed in Chapter 3. Numerous key terms used throughout this chapter are defined in the Glossary which is included as Appendix A of this Basin Plan.

BENEFICIAL USES

The designation of beneficial uses must satisfy all of the applicable requirements of the California Water Code, Division 7 and the federal Clean Water Act. California Water Code, Division 7 is also known as the Porter-Cologne Water Quality Control Act. These two names are used interchangeably.

The designation of beneficial uses for the waters of the State by the Regional Board is mandated under California Water Code section 13240. The Clean Water Act, section 303 requires that the State adopt designated beneficial uses for surface waters. The requirements of both Acts applicable to the designation of beneficial uses are summarized below.

BENEFICIAL USE DESIGNATION UNDER THE PORTER-COLOGNE WATER QUALITY CONTROL ACT

The Porter-Cologne Act establishes a comprehensive program for the protection of beneficial uses of the waters of the state. California Water Code section 13050(f) describes the beneficial uses of surface and ground waters that may be designated by the State or Regional Board for protection as follows:

"*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 or preserves.*"

Significant points regarding the designation of beneficial uses are:

(1) Fish, plants, and other wildlife, as well as humans, use water beneficially. Designation of beneficial uses often includes subcategories of the above beneficial uses cited in California Water Code section 13050(f).

(2) Waste transport or waste assimilation in the state's surface and ground waters may not be designated as beneficial uses under the Porter-Cologne Act. The direction of the Act is to protect surface and ground waters against the adverse effects of waste constituents. (California Water Code section 13000, section 13241, and section

13263). Surface or ground waters may be used for waste disposal or waste assimilation if designated beneficial uses are protected. In authorizing the discharge of waste, the Regional Board need not authorize utilization of the full waste assimilation capacities of the receiving waters [California Water Code section 13263(d)]. All discharges of waste into waters of the state are privileges not rights [California Water Code section 13263(g)].

(3) Designated beneficial uses may include potential beneficial uses if existing water quality will support the use or if the necessary level of water quality can reasonably be achieved. [Water Code section13241 (a) and (c)]. Potential and existing uses are defined later in this chapter.

(4) An existing beneficial use ordinarily must be designated for protection unless another beneficial use requiring more stringent objectives is designated. The existing beneficial use designation is necessary to comply with the statutory policy in California Water Code section 13000, which provides in part that "*...the quality of all waters in the state shall be protected for use and enjoyment by the people of the state.*"

(5) California Water Code section 13000 provides in part that: "*The Legislature ...finds and declares that activities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest possible water quality that is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.*" This policy establishes a general principal of nondegradation, with flexibility to allow some change in water quality which is in the best interests of the state. Changes in water quality are allowed only where beneficial uses are not unreasonably affected.

(6) The designation of beneficial uses must take into account the constitutional prohibition of waste and unreasonable waste of water. Designation of a beneficial use for protection should not require a waste of water pursuant to the California Constitution, article X, section 2.

(7) The protection and enhancement of beneficial uses require that certain quality and quantity objectives be met for surface and ground waters.

BENEFICIAL USE DESIGNATION UNDER THE CLEAN WATER ACT

Beneficial uses for surface waters are designated under the Clean Water Act section 303 in accordance with regulations contained in 40 CFR 131. The State is required to specify appropriate water uses to be achieved and protected. The beneficial use designation of surface waters of the state must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation.

Significant points regarding the designation of beneficial uses under the Clean Water Act are:

(1) Existing beneficial uses are those uses actually attained in the water body on or after November 28, 1975 [40 CFR 131.3(e)].

(2) States are prohibited from adopting waste transport or waste assimilation as a designated use for surface waters [40 CFR 131.10(a)].

(3) The water quality standards of downstream waters must be considered and maintained [40 CFR 131.10(b)].

(4) States may adopt sub-categories of a use and set the appropriate criteria to reflect the varying needs of such sub-categories of uses. For example criteria should be set to differentiate between cold water and warm water fisheries [40 CFR 131.10(c)].

(5) At a minimum, uses are deemed attainable if they can be achieved by the imposition of effluent limits required under Clean Water Act, sections 301(b) and 306 and cost effective and reasonable best management practices for nonpoint source control [40 CFR 131.10(d)].

(6) States may adopt seasonal uses as an alternative to redesignation of the beneficial uses of a water body to uses requiring less stringent water quality criteria [40 CFR 131.10(f)].

(7) States may remove a designated beneficial use or substitute sub-categories of a use only if (a) the use is not an existing use and (b) the state can demonstrate that attaining the designated use is not feasible for one of the following reasons [40 CFR 131.10(g)]:

- naturally occurring pollutant concentrations prevent the attainment of the use; or

- natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use; or

- human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

- dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or

- physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or

- controls more stringent than the controls for effluent limitations in Clean Water Act sections 301 (b) and 306 would result in substantial and widespread economic and social impact.

(8) States may not remove designated uses if (a) they are existing uses, unless a use requiring more stringent criteria is added, or (b) such uses will be attained by implementing effluent limits under Clean Water Act sections 301 (b) and 306 and by implementing best management practices for nonpoint source control [40 CFR 131.10(h)].

(9) If existing uses are higher than those specified in water quality standards, a state must revise its standards to reflect the uses actually being attained [40 CFR 131.10(i)].

(10) If the designated uses do not include the uses specified in section 101(a) (2) of the Clean Water Act, or if the state wants to remove a use specified in section 101 (a) (2), the state must conduct a "*use attainability analysis*" [40 CFR 131.10(j)]. A use attainability analysis is defined in 40 CFR 131.3(g) as a "*structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors.*" The uses listed in section 101 (a)(2) are protection and propagation of fish, shellfish, and wildlife, and recreation (i.e., fishable/ swimmable uses).

BENEFICIAL USE DEFINITIONS

In 1972, the State Board adopted a uniform list and description of beneficial uses to be applied throughout all basins of the State. During the 1994 Basin Plan update, beneficial use definitions were revised and some new beneficial uses were added. Overall, the following twenty-three beneficial uses are now defined statewide and are designated within the San Diego Region:

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

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

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

Industrial Service Supply (IND) - Includes 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 re-pressurization.

Ground Water Recharge (GWR) - Includes uses of water for natural or artificial recharge of ground water for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.

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

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

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


Beachgoers at La Jolla Shores

Contact Water Recreation (REC-1) - Includes 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) - Includes the 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) - Includes the 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) - Includes the 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) - Includes 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) - Includes 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) - Includes 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) - Includes 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).


Los Penasquitos Lagoon

Marine Habitat (MAR) - Includes 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) - Includes 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.

Kelp on beach at
San Diego – La Jolla Ecological Reserve

Preservation of Biological Habitats of Special Significance (BIOL) - Includes uses of water that support designated areas or habitats, such as established refuges, parks, sanctuaries, ecological reserves, or Areas of Special Biological Significance (ASBS), where the preservation or enhancement of natural resources requires special protection.

The following coastal waters have been designated as ASBS and State Water Quality Protection Areas (SWQPAs) in the San Diego Region. SWQPAs are a nonterrestrial marine or estuarine area designed to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, ASBS that have been designated by the State Water Resources Control Board through its water quality planning process. ASBS are a subset of State Water Quality Protection Areas (SWQPAs). For detailed descriptions of the boundaries of SWQPAs/ASBS, see the discussion on SWQPAs/ASBS in Chapter 5, Plans and Policies:

- Irvine Coast, Orange County
- Heisler Park, Orange County
- La Jolla, San Diego County
- San Diego-Scripps, San Diego County

The following areas are designated Marine Life Refuges. A legal description of the boundaries of each marine life refuge is contained in the Fish and Game Code of California, Division 7 (Refuges), Chapter 2 (Specific Refuge Boundaries), Article 6 (Marine Life Refuge):

- Irvine Coast Marine Life Refuge, Orange County
- Laguna Beach Marine Life Refuge, Orange County
- South Laguna Beach Marine Life Refuge, Orange County
- Niguel Marine Life Refuge, Orange County
- Dana Point Marine Life Refuge, Orange County
- Doheny Beach Marine Life Refuge, Orange County
- City of Encinitas Marine Life Refuge, San Diego County
- San Diego Marine Life Refuge, San Diego County

The following coastal waters have been designated by the California legislature as Marine Protected Areas. Marine Protected Areas are named discrete geographic areas designated to protect and conserve marine life and habitat. All State Marine Parks, State Marine Reserves, and/or State Marine Conservation Areas are classified as Marine Protected Areas. A coastal water may be designated with more than one classification. A legal description of the boundaries of each Marine Protected Area can be found at California Department of Fish and Game, Marine Region, 20 Lower Ragsdale Drive, Suite 100, Monterey, CA 93940.

The following areas are designated State Marine Parks:

- Irvine Coast State Marine Park, Orange County
- Laguna Beach State Marine Park, Orange County
- South Laguna Beach State Marine Park, Orange County
- Niguel State Marine Park, Orange County
- Dana Point State Marine Park, Orange County
- Doheny Beach State Marine Park, Orange County
- Buena Vista Lagoon State Marine Park, San Diego County
- Batiquitos Lagoon State Marine Park, San Diego County
- San Elijo Lagoon State Marine Park, San Diego County
- San Dieguito Lagoon State Marine Park, San Diego County

The following areas are designated State Marine Reserves:

- Heisler Park State Marine Reserve, Orange County
- Agua Hedionda Lagoon State Marine Reserve, San Diego County

The following areas are designated State Marine Conservation Areas:

- Crystal Cove State Marine Conservation Area, Orange County
- Doheny State Marine Conservation Area, Orange County
- Encinitas State Marine Conservation Area, San Diego County
- Cardiff and San Elijo State Marine Conservation Area, San Diego County
- San Diego – Scripps State Marine Conservation Area, San Diego County
- La Jolla State Marine Conservation Area, San Diego County
- Mia J. Tegner State Marine Conservation Area, San Diego County

The following areas are designated Ecological Reserves by the Fish and Game Commission (California Code of Regulations, Title 14, section 630). A legal description of the boundaries of each ecological reserve is on file at the California Department of Fish and Game headquarters, 1416 Ninth Street, Sacramento, CA 95814, and at California Department of Fish and Game, Lands and Facilities Branch, 1812 Ninth Street, Sacramento, CA 95814:

- Agua Hedionda Lagoon Ecological Reserve, San Diego County
- Batiquitos Lagoon Ecological Reserve, San Diego County
- Blue Sky Ecological Reserve, San Diego County
- Boden Canyon Ecological Reserve, San Diego County
- Boulder Creek/Rutherford Ranch, San Diego County
- Buena Vista Lagoon Ecological Reserve, San Diego County
- Carlsbad Highlands Ecological Reserve, San Diego County
- Crestridge Ecological Reserve, San Diego County
- Dairy Mart Ponds Ecological Reserve, San Diego County
- Del Mar Mesa/ Lopez Ridge Ecological Reserve, San Diego County
- Heisler Park Ecological Reserve, Orange County
- Laguna Laurel Ecological Reserve, Orange County
- Lake Hodges Ecological Reserve, San Diego County
- McGinty Mountain Ecological Reserve, San Diego County
- Meadowbrook Ecological Reserve, San Diego County
- Otay Mountain Ecological Reserve, San Diego County
- Pilgrim Creek Ecological Reserve, San Diego County
- Plaisted Creek Ecological Reserve, San Diego County
- Rancho Jamul Ecological Reserve, including the Headquarters Unit, San Diego County
- San Diego - La Jolla Ecological Reserve, San Diego County
- San Diego River Ecological Reserve, San Diego County
- San Dieguito Lagoon Ecological Reserve, San Diego County
- San Elijo Lagoon Ecological Reserve, San Diego County
- San Luis Rey River Ecological Reserve, San Diego County
- Santa Rosa Plateau Ecological Reserve, Riverside County
- Sycuan Peak Ecological Reserve, San Diego County

The following area is designated a Wildlife Area by the Fish and Game Commission (California Code of Regulations, Title 14, section 630). A legal description of the boundaries of the wildlife area is on file at the California Department of Fish and Game headquarters, 1416 Ninth Street, Sacramento 95814, and at California Department of Fish and Game, Lands and Facilities Branch, 1812 Ninth Street, Sacramento, CA 95814:

- Hollenbeck Canyon Wildlife Area, San Diego County

The following areas are designated Natural Preserves by the State Park and Recreation Commission (Public Resources Code, Division 5, Chapter 1, Article 1.7 section 5019.71). A legal description of each natural preserve is on file at the California Department of Parks and Recreation headquarters, 1416 Ninth Street, Sacramento, CA 95814:

- Trestles Wetlands Natural Preserve, San Diego County
- Los Penasquitos Marsh Natural Preserve, San Diego County
- Ellen Browning Scripps Natural Preserve, San Diego County
- Silver Strand Natural Preserve, San Diego County
- Tijuana Estuary Natural Preserve, San Diego County

The following area is designated a National Estuarine Research Reserve by the National Oceanic and Atmospheric Administration (NOAA) (Coastal Zone Management Act of 1972 as amended section 315, 16 USC 1461). A legal description of the boundaries of the national estuarine research reserve is on file at the NOAA headquarters, Office of Ocean and Coastal Resource Management, NOAA, Washington, D.C., 20235:

- Tijuana River National Estuarine Research Reserve, San Diego County

Tijuana River mouth

The following areas are managed by the U.S. Fish and Wildlife Service as part of the National Wildlife Refuge System A legal description of the boundaries of each National Wildlife Refuge is on file at the San Diego National Wildlife Refuge Complex, 6010 Hidden Valley Road, Carlsbad, CA 92011:

- San Diego National Wildlife Refuge, San Diego County
  - Otay – Sweetwater Unit
  - Vernal Pool Unit
- San Diego Bay National Wildlife Refuge, San Diego County
  - South San Diego Bay Unit
  - Sweetwater Marsh Unit
- Tijuana Slough National Wildlife Refuge, San Diego County

Rare, Threatened, or Endangered Species (RARE) - Includes 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) - Includes uses of water that support habitats necessary for migration, acclimatization between fresh and salt water, or other temporary activities by aquatic organisms, such as anadromous fish.

Spawning, Reproduction, and/or Early Development (SPWN) - Includes uses of water that support high quality habitats suitable for reproduction, early development and sustenance of marine fish and/or cold freshwater fish.

Shellfish Harvesting (SHELL) - Includes 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 sport purposes.

EXISTING AND POTENTIAL BENEFICIAL USES

The water resources of the San Diego Region have been extensively developed over the years and today's existing beneficial uses will probably continue into the future. Since the adoption of the Basin Plan in 1975, changes in land use patterns and resultant changes in water quality have led to some subsequent modifications of beneficial use designations. Minor modifications have also been also made to clarify the definition of some of the beneficial use designations.

The beneficial use designations described in this chapter are categorized as "*existing*" or "*potential*" beneficial uses. An existing beneficial use can be established by demonstrating that:

- Fishing, swimming, or other uses have actually occurred since November 28, 1975; or
- The water quality and quantity is suitable to allow the use to be attained.

Existing beneficial uses were originally determined as part of a use survey of water resources in the Region described in Chapter 1, *History of Basin Planning in the San Diego Region.* Beneficial use designations have also been determined using additional information gathered since 1975. Beneficial uses are designated as "*potential*" for a variety of reasons, including:

- Plans are proposed to put the water to a future use;
- Potential exists to put the water to a future use;
- The public desires to put the water to future use;
- The water is potentially suitable for municipal or domestic water supply under the terms of the *Sources of Drinking Water* Policy (State Board Resolution No. 88-63); or
- The Regional Board has designated a beneficial use as a regional water quality goal.

BENEFICIAL USES FOR SPECIFIC WATER BODIES

Designated beneficial uses are summarized in the tables at the end of this chapter as follows:

Table 2-2 Inland Surface Waters,

Table 2-3 Coastal Waters,

Table 2-4 Reservoirs and Lakes, and

Table 2-5 Ground Water.

In the tables, a "●" indicates an existing beneficial use that was actually attained in the surface or ground water on or after November 28, 1975. A "O" indicates a potential beneficial use that may develop in future years. A "+" indicates that the water body has been exempted by the Regional Board from the municipal use designation under the terms and conditions of State Board Resolution No. 88-63, *Sources of Drinking Water* Policy.

Designated beneficial uses are generally, but not always, present throughout the entire reach of a particular hydrologic unit, area, subarea, or water body. Designated beneficial uses may not be present throughout the year. Specific beneficial uses near or below discharges will be carefully evaluated by the Regional Board during the development of waste discharge requirements or enforcement orders.

Beneficial uses are designated for (a) native waters and (b) imported waters stored in a reservoir. They do not represent the use of water directly imported into the hydrologic basin, unless storage of the imported water occurs within the basin. The lack of a beneficial use listed for any given area does not rule out the possibility of existing or future beneficial uses. Existing beneficial uses which have not been formally designated in this Basin Plan are protected as well as designated uses.

DESIGNATION OF RARE BENEFICIAL USE

The RARE beneficial use designation was based, in large part, on the information contained within RareFind. RareFind is the personal computer application of the California Department of Fish and Game's (DFG’s) Natural Diversity Data Base (NDDB). The NDDB tracks the location and condition of California's rare, threatened, endangered, and sensitive plants, animals and natural communities. The NDDB is the most complete single source of information on California's rare, endangered, threatened and sensitive species, and natural communities. However, the absence of a special animal, plant or natural community from the RareFind report does not necessarily mean that they are absent from the area in question, only that no occurrence data are currently entered in the NDDB inventory.

Under the Fish and Game Code, as well as the California Environmental Quality Act, a state lead agency is required to consult with the Department of Fish and Game (DFG) to determine whether a project under consideration (e.g., the Basin Plan or a permitting process) will adversely affect any threatened or endangered species. The consultation process is important in identifying bodies of water that support threatened or endangered species. During the Basin Plan consultation process in 1994, the DFG provided recent sightings of the bald eagle (*Haliaeetus leucocephalus*). The U.S. Fish and Wildlife Service provided recent surveys for the least Bell's vireo (*Vireo belli pusillus*) and southwestern willow flycatcher (*Empidonax trailli extimus*). These and other information sources are listed in the references for this chapter.

To ensure the applicability of the RareFind information, only current sightings (i.e., those sightings since November 28, 1975) were used. In addition, consideration was given to the frequency, abundance, and occurrence history for each sighting(s), and how recent the sighting was. The RARE designation has been added where there is substantial evidence that the water body supports threatened or endangered species. By definition, water bodies with a RARE designation 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. Those plant or animal species which were used in the designation of specific water bodies with the RARE beneficial use are shown in Table 2-1. The Regional Board can provide specific information about the sighting(s) used to designate the RARE beneficial use. However, it is the responsibility of the lead agency or project sponsor to provide adequate information as to whether a proposed project will affect fish and wildlife (including plants) and their habitats.

The RARE beneficial use is generally, but not always, present throughout the entire reach of a particular waterbody. Also, the RARE beneficial use may not be present throughout the year. The RARE designation is placed on bodies of water where the protection of a threatened or endangered species depends on the water either directly, or to support its habitat. The purpose of the RARE designation for a particular water body is to highlight the existence of the threatened or endangered species. This will ensure that, absent extraordinary circumstances, they are not placed in jeopardy by the quality of the discharges to those water bodies.

Recognition that a water body is used by threatened or endangered species (RARE designation) does not necessarily mean that any particular suite of water quality objectives will be applied to the water body. In the absence of species specific or site specific objectives, the Regional Board would rely on objectives for WARM and COLD to implement the RARE designation. The existing WARM and COLD beneficial use designations are believed to be stringent enough to protect threatened or endangered species. If these issues arise in the future, they will be decided on a case-by-case basis, considering the most recent scientific data, site-specific factors, and other beneficial uses.

DESIGNATION OF COLD FRESHWATER HABITAT BENEFICIAL USE

Water bodies with a "*Cold Freshwater Habitat*" (COLD) beneficial use designation support cold freshwater ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

In the San Diego Region, the cold freshwater fish used for the COLD designation is the rainbow trout. The rainbow trout, *Oncorhynchus mykiss*, is native to the Region. Rainbow trout which migrate from fresh water to the ocean are known as steelhead and those which remain in fresh water are known as a resident population. In addition, hatchery stocked rainbow trout have been planted throughout the Region since the 1880's. Some of these hatchery stocked trout have developed wild populations, and some have hybridized with native trout populations. Other species of trout may have been stocked from time to time, by various mechanisms into the Region's water bodies. (One of these trout is the European brown trout, *Salmo trutta*. At the present time, the brown trout is no longer stocked due to concern for its impacts on fishery resources and the fact that it is picivorous.)

Cold fresh water bodies are usually below 70° F, contain well-oxygenated water, and contain cold freshwater aquatic habitat suitable for cold freshwater fish. Optimum temperatures for growth and for most life stages of rainbow trout are 56 to 70° F (Moyle, 1976). The temperature tolerance for rainbow trout is reported to be from about 32° F to the mid-80's depending on the oxygen content of the water, size of fish, and the degree of acclimation. To survive at the higher water temperatures, trout require a gradual acclimation and water that is saturated with oxygen. Also, smaller trout may withstand the higher temperatures better than the larger fish.

Rainbow trout prefer well-oxygenated water but can survive at very low oxygen levels, the level tending to be less at lower temperatures and longer periods of acclimation. For example, mean lethal oxygen concentrations range from 1.05 part per million (ppm) at 52° F to 1.51 ppm at 68° F for rainbow trout averaging 3.8 inches in length (McAfee, 1966).

Rainbow trout do well in waters of pH from 7 to 8 and have adapted to waters of varying pH, ranging from at least 5.8 to 9.6 (Sigler, 1987).

Table 2 - 1. Water - Dependent Threatened or Endangered Species Which Were Considered in the RARE Beneficial Use Designation

NAME	STATUS*	TYPE	HABITAT REMARKS
Blue whale *Balaenoptera musculus*	FE	Mammal	Ocean
Western snowy plover *Charadrius alexandrinus nivosus* (breeding)	FE, CSC	Shore bird	Beaches, Estuarine Salt Ponds
Pacific green sea turtle *Chelonia mydas*	FE	Reptile	Marine
Salt-marsh bird's beak *Cordylanthus maritimus* ssp. *maritimus*	SE, FE	Plant	Salt Marsh
Southwestern willow flycatcher *Empidonax traillii extimus*	SE, Proposed FE	Bird	Riparian Woodland Habitat
Tidewater goby *Eucyclogobius newberryi* (Girard)	FE	Fish	Shallow Marine Waters, and in the Lower Reaches of Streams
Bald eagle *Haliaeetus leucocephalus*	SE, FT, CP	Bird	Lake
Humpback whale *Megaptera novaeangliae*	FE	Mammal	Ocean
Willowy monardella *Monardella linoides* ssp. *viminea*	SE, C2	Plant	Riparian Scrub Habitat
Belding's savannah sparrow *Passerculus sandwichensis beldingi*	SE, C2	Bird	Coastal Wetlands
California brown pelican *Pelecanus occidentalis californicus*	SE, FE	Bird	Estuarine, Marine, Subtidal, and Marine Pelagic Waters
Light-footed clapper rail *Rallus longirostris levipes*	FE, CP	Bird	Coastal Marshes, Mudflats
California least tern *Sterna antillarum browni*	SE, FE	Bird	Marine, Coastal Area Waters
Least Bell's vireo *Vireo bellii pusillus*	SE, FE	Bird	Riparian Woodland Habitat

Status *

Federally threatened (FT) or endangered (FE) species are defined under section 3 of the federal Endangered Species Act of 1973 (50 CFR 17). An endangered species is any species, including subspecies and varieties, "*in danger of extinction throughout all or a significant portion of its range*." A threatened species is any species "*likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range*." Threatened and endangered species have been the subject of a proposed and final rule (or regulation) published in the Federal Register. Thus, these species are also referred to as listed species. Proposed species are species proposed for listing as a threatened or endangered species for which a proposed rule, but not a final rule, has been published in the Federal Register.

Proposed species are granted limited protection under the federal Endangered Species Act. These species must be addressed by federal agencies in biological assessments (section 7), and are given special management consideration by regulatory agencies. Candidate species are species under consideration for listing, but have not been subject to a proposed rule. Categories for candidate species relate solely to the level of biological information available and not to the degree of threat. Candidate species are not protected under the federal Endangered Species Act.

Candidate species however, are afforded special management consideration due to their status and sensitivity. The U.S. Fish and Wildlife Service provides technical assistance to Federal, State and local agencies on the conservation and management of candidate species. Candidate species in category 1 (C1) are those taxa that seem to conform to the State definition of threatened or endangered species and should be added to the offical list. Candidate species in category 2 (C2) are those taxa that have populations that are low, scattered, or highly localized. Their populations have declined in abundance in recent years and so require management to prevent them from becoming threatened species.

The definitions of state threatened (ST) or endangered (SE) species under the California Endangered Species Act are the same as under the federal Endangered Species Act. Under the State Act, all animals previously listed as Rare have been "*grandfathered*" into the State Act as threatened. All plants previously listed as Rare have been kept as Rare. All plants now listed under the State Act are listed as threatened or endangered.

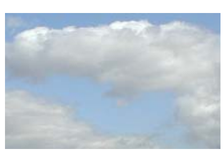
California Species of Special Concern (CSC) are animal species that have no specific status as a state listed species, but which appear to be vulnerable to extinction because of declining populations, limited ranges, or rarity. CSC meet the criteria for state listing and are commonly addressed under the California Environmental Quality Act. The category of California Fully Protected Species (CP) was established by the California legislature and prohibits the possession or taking of sensitive animals, or parts thereof (sections 3511, 4700, 5050, and 5515, Fish and Game Code).

In cold fresh water bodies, where the water body is free-flowing, such as in a river, stream or creek, the habitat usually supports a diversity of aquatic insects, including those aquatic insects which require a high quality of water. Typically, there is overhanging cover and shade, provided by a variety of aquatic plants, terrestrial plants, and trees. Another characteristic is that the bottom substrate usually contains structure, provided by tree root wads, logs, boulders, or gravel.

DESIGNATION OF SPAWNING, REPRODUCTION, AND/ OR EARLY DEVELOPMENT BENEFICIAL USE

In the San Diego Region, the 'spawning, reproduction and/or early development' (SPWN) beneficial use designation is assigned only to water bodies with MAR and/ or COLD beneficial uses. The marine fish used for the SPWN designation includes any marine fish. The cold freshwater fish used for the SPWN designation is the rainbow trout. Rainbow trout usually spawn in the Spring, and require spawning areas with gravel and cool, free-flowing, well-oxygenated water. Rainbow trout prefer to spawn in rivers, streams and creeks with a moderate gradient and containing riffles, however some populations of rainbow trout are also known to successfully spawn in lake inlets and outlets. The fry of rainbow trout need suitable nurseries, which allow protection from predators, such as the slow, shallow areas adjacent to riffles, with shade from bank vegetation. The fry also require an abundance of aquatic insects for forage.

SOURCES OF DRINKING WATER POLICY


Clouds

In November 1986, the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) was approved by the California voters. Proposition 65 prohibits the discharge of toxic substances into "*sources of drinking water*". The State Board has defined the term "*sources of drinking water*" in Resolution No. 88-63, *Sources of Drinking Water* Policy. This policy specifies that, except under specifically defined conditions, all surface and ground waters of the state are to be protected as existing or potential sources of municipal and domestic water supply. The exceptions include where:

- The total dissolved solids concentration of surface and ground waters exceed 3,000 milligrams per liter (mg/l);
- The water source has a low sustainable yield of less than 200 gallons per day for a single well;
- There is contamination that cannot reasonably be treated for domestic use with either best management practices or best economically available treatment practices;
- The surface waters are in particular municipal, industrial, and agricultural conveyance and holding facilities; and
- The ground waters are regulated geothermal energy ground waters.

Resolution No. 88-63 provides that any water body designated with an existing or potential municipal and domestic supply (MUN) beneficial use is also defined as a suitable or potentially suitable source of drinking water. The policy also allows a water body to retain beneficial use designations assigned prior to the State Board's adoption of the "*Sources of Drinking Water*" Policy.

EXCEPTIONS TO THE "SOURCES OF DRINKING WATER" POLICY

In 1989 the Regional Board adopted Resolution No. 89-33, *'Incorporation of "Sources of Drinking Water"* Policy into the Water Quality Control Plan (Basin Plan) of the San Diego Region'. Resolution No. 89-33 incorporates the State Board's "*Sources of Drinking Water*" Policy into the Basin Plan. Resolution No. 89-33 also provides an initial list of surface and ground water hydrologic units (HUs), areas (HAs), and subareas (HSAs) which the Regional Board has previously determined do not support the MUN or "*Sources of Drinking Water*" designation. Since 1989, additional areas have also been identified as exceptions to the "*Sources of Drinking Water*" Policy. These ground and surface water HUs, HAs, and HSAs are identified in Tables 2-2 and 2-5 with a "+" indicating that the water body has been exempted by the Regional Board from the municipal use designation under the terms and conditions of State Board Resolution No. 88-63, "*Sources of Drinking Water*" Policy.


Arroyo chub

INLAND SURFACE WATERS

Inland surface waters consist of all waters in the Region exclusive of the waters of the Pacific Ocean, enclosed bays and estuaries, coastal lagoons, and ground waters. The existing and potential beneficial uses of inland surface waters and their tributaries in the Region are presented in Table 2-2. Hydrologic unit, area, and subarea numbers are noted in Table 2-2 as a cross reference to the classification system developed by the California Department of Water Resources. For those surface water bodies that cross into other hydrologic units, such water bodies appear more than once in a table. In Table 2-2, starting from the north and proceeding towards the south within the Region, watersheds are listed by the direction of flow from the headwaters downstream to the outlet. Within a particular watershed, the mainstream water body is listed first and is placed flush left in the table, the upstream tributaries are listed below the mainstream water body and placed to the right. In most instances, surface waters are subdivided into reaches at hydrologic subarea boundaries. Those waters not specifically listed (generally smaller tributaries) are designated with the same beneficial uses as the streams, lakes, or reservoirs to which they are tributary.

Although most free flowing streams in the Region are essentially interrupted in character having both perennial and ephemeral components, several beneficial uses, including aesthetic enjoyment and habitats for fish and wildlife, are made of these surface waters. Beneficial uses of inland surface waters generally include REC-1 (swimmable) and WARM or COLD. Additionally, inland waters are usually designated as IND, PRO, REC-2, WILD, and are sometimes designated as BIOL and RARE. Inland surface waters that meet the criteria mandated by the *Sources of Drinking Water* Policy are designated MUN. Unless otherwise designated by the Regional Board, all inland surface waters in the Region are considered suitable or potentially suitable as a municipal and domestic water supply.

COASTAL WATERS

Coastal waters discussed in this section may be defined as waters subject to tidal action and include the water bodies defined below. Beneficial uses of coastal waters in the region generally include REC-1, REC-2, EST, WILD, RARE, and MAR. The Pacific Ocean and San Diego Bay also include NAV.

- ***Ocean Waters***

Ocean Waters are the territorial marine waters of the Region as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons.

- ***Enclosed Bays***

Enclosed bays are indentations along the coast which enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays includes all bays where the narrowest difference between the headlands or outermost harbor works is less than 75% of the greatest dimension of the enclosed portion of the bay. Enclosed bays do not include inland surface waters or ocean waters.

- ***Estuaries***

Estuaries means waters, including coastal lagoons, located at the mouths of streams which serve as areas of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams which are temporarily separated from the ocean by sandbars are considered estuaries. Estuarine waters are considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and sea water. Estuaries do not include inland surface waters or ocean waters.

Beneficial uses for these coastal waters provide habitat for marine life and are used extensively for recreation, boating, shipping, and commercial and sport fishing. Coastal waters in the San Diego Region have as many as fourteen designated beneficial uses.

All coastal lagoons of the Region are included in the category "*Coastal Waters*". The mouths of most of the rivers and creeks are continually affected by tidal action and present a relatively stable environment for wildlife and vegetation. Other coastal lagoons may be separated from tidal action by earthen deposits and thus present an environment with major seasonal variations. Such conditions result in the development of a unique biologic community highly specific to that area. Occasionally, the mouths of these coastal lagoons are opened, subjecting the lagoons to tidal flushing to enhance their value for recreational use. This action would not alter the categories of beneficial uses of the coastal lagoons.

A listing of coastal waters in the San Diego Region and the existing and potential beneficial uses of each are summarized in Table 2-3.

Lower Otay Reservoir

RESERVOIRS AND LAKES

The water resources with the greatest diversity of beneficial uses in the Region are the man-made water storage reservoirs and lakes. Located in nearly all of the Region's hydrologic units, these reservoirs and lakes intercept surface runoff and store imported water supplies. As such, the storage reservoirs serve as: (1) sources of supply for municipalities, agricultural areas, and industrial operations; (2) recreational bodies; and (3) habitats for fish and wildlife. In a few cases, such as reservoirs used primarily for drinking water, REC-1 uses can be restricted or prohibited by the entities that manage these waters. Many of these reservoirs, however, are designated as potential for REC-1, reflecting federal Clean Water Act goals.

A listing of existing and potential beneficial uses of major reservoirs and lakes in the San Diego Region is given in Table 2-4.

GROUND WATERS

Ground water is defined as subsurface water that occurs beneath the water table in soils and geologic formations that are fully saturated. Ground water bearing formations sufficiently permeable to transmit and yield significant quantities of water are called aquifers (Bouwer, 1978). A ground water basin is defined as a hydrogeologic unit containing one large aquifer or several connected and interrelated aquifers (Todd, 1980).

The principal ground water basins in the San Diego Region are small and shallow. Only a small portion of the Region is underlain by permeable geologic formations that can accept, transmit and yield appreciable quantities of ground water. In many parts of the Region, usable ground water occurs outside of the principal ground water basins. There are ground water bearing geologic formations in the Region that do not meet the definition of an aquifer. Accordingly, the term "*ground water*" for basin planning and regulatory purposes, includes all subsurface waters that occur in fully saturated zones within soils, and other geologic formations. Subsurface waters are considered ground water even if the waters do not occur in an aquifer or an identified ground water basin.

Ground waters in the San Diego Region can have as many as six designated beneficial uses including: (1) municipal and domestic; (2) agricultural; (3) industrial service supply; (4) industrial process supply; (5) ground water recharge; and (6) freshwater replenishment. Nearly all of the ground water development in the Region has been for the purpose of municipal and agricultural supply. Ground water uses in some hydrologic units have been expanded to include industrial uses, especially gravel and sand washing. The fresh water replenishment designation has been assigned to ground water basins that are utilized for supplying water to a lake or stream. The ground water recharge designation has been applied to ground water hydrologic units which are used to recharge another hydrologic unit.

Most of the ground waters in the Region have been extensively developed; the availability of potential future uses of ground water resources is limited. Further development of ground water resources would probably necessitate ground water recharge programs to maintain adequate ground water table elevations.

Ground waters that meet the criteria mandated by the *Sources of Drinking Water* Policy are designated MUN. Unless otherwise designated by the Regional Board all ground waters in the Region are considered suitable or potentially suitable as sources of drinking water.

The Regional Board has deleted beneficial use designations in portions of certain hydrologic ground water units, areas or subareas. Available information indicated that the beneficial uses in portions of these hydrologic ground water basins did not occur and were not likely to occur in the future. The Regional Board will issue waste discharge requirements and enforcement orders in these basins in conformance with the terms and conditions of State Board Resolution No. 68-16, *Statement of Policy With Respect to Maintaining High Quality of Waters in California*. It is the Regional Board's intent that water quality be maintained in conformance with the terms and conditions of Resolution No. 68-16.

A listing of the beneficial uses of the ground waters in the Region is presented in Table 2-5.

BENEFICIAL USE TABLES

Designated beneficial uses are summarized in the tables at the end of this chapter as follows:

Table 2-2 Inland Surface Waters;
Table 2-3 Coastal Waters;
Table 2-4 Reservoirs and Lakes; and
Table 2-5 Ground Water.

In the tables, a "●" indicates an existing beneficial use that was actually attained in the surface or ground water on or after November 28, 1975. A "○" indicates a potential beneficial use that will probably develop in future years through the implementation of various control measures. Potential uses also include uses that have been developed in the past but have been abandoned for reasons other than water quality. A "+" indicates that the water body has been exempted by the Regional Board from the municipal use designation under the terms and conditions of State Board Resolution No. 88-63, *Sources of Drinking Water* Policy.

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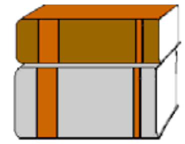

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Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Orange County Coastal Streams																
Moro Canyon	1.11	+	●						○	●		●		●		
unnamed intermittent coastal streams	1.11	+	●						○	●		●		●		
Emerald Canyon	1.11	+	●						○	●		●		●		
Boat Canyon	1.11	+	●						○	●	●	●		●		
Laguna Canyon	1.12	+	●						○	●		●		●		
Blue Bird Canyon	1.12	+	●						○	●		●		●		
Rim Rock Canyon	1.12	+	●						○	●		●		●		
unnamed intermittent coastal streams	1.13	+	●						○	●		●		●		
Hobo Canyon	1.13	+	●						○	●		●		●		
Aliso Creek Watershed																
Aliso Creek [3]	1.13	+	●						○	●		●		●		
English Canyon	1.13	+	●						○	●		●		●		
Sulphur Creek	1.13	+	●						○	●		●		●		
Wood Canyon	1.13	+	●						○	●		●		●		
Aliso Creek Mouth	1.13	See Coastal Waters – Table 2-3														

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

[3] Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives,* Bacteria –Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci*,* and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Dana Point Watershed																
unnamed intermittent coastal streams	1.14	+	●						○	●		●		●		
Salt Creek	1.14	+	●						○	●		●		●		
San Juan Canyon	1.14	+	●						○	●		●		●		
Arroyo Salada	1.14	+	●						○	●		●		●		
San Juan Creek Watershed																
San Juan Creek [3]	1.25	+	●	●					●	●		●	●	●		
Morrell Canyon	1.25	+	●	●					●	●		●	●	●		
Decker Canyon	1.25	+	●	●					●	●		●	●	●		
Long Canyon	1.25	+	●	●					●	●		●	●	●		
Lion Canyon	1.25	+	●	●					●	●		●	●	●		●
Hot Spring Canyon	1.25	+	●	●					●	●		●	●	●		●
Cold Spring Canyon	1.25	+	●	●					●	●		●	●	●		
Lucas Canyon	1.25	+	●	●					●	●		●	●	●		
Aliso Canyon	1.25	+	●	●					●	●		●	●	●		
Verdugo Canyon	1.25	+	●	●					●	●		●	●	●		
Bell Canyon	1.25	+	●	●					●	●		●	●	●		
Fox Canyon	1.25	+	●	●					●	●		●	●	●		

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

[3] Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives,* Bacteria -Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Juan Creek Watershed – continued																
Dove Canyon	1.24	+	●	●					●	●		●	●	●		
Crow Canyon	1.25	+	●	●					●	●		●	●	●		
San Juan Creek	1.26	+	●	●					●	●		●	●	●		
Trampas Canyon	1.26	+	●	●					●	●		●	●	●		
Canada Gobernadora	1.24	+	●	●					●	●		●	●	●		
Canada Chiquita	1.24	+	●	●					●	●		●	●	●		
San Juan Creek	1.28	+	●	●					●	●		●	●	●		
San Juan Creek	1.27	+	●	●					●	●		●	●	●		
Horno Creek	1.27	+	●	●					●	●		●	●	●		
Arroyo Trabuco Creek	1.22	+	●	●					●	●		●	●	●		●
Holy Jim Canyon	1.22	+	●	●					●	●		●	●	●		●
Falls Canyon	1.22	+	●	●					●	●		●	●	●		
Rose Canyon	1.22	+	●	●					●	●		●	●	●		
Hickey Canyon	1.22	+	●	●					●	●		●	●	●		
Live Oak Canyon	1.22	+	●	●					●	●		●	●	●		
Arroyo Trabuco Creek	1.23	+	●	●					●	●		●	●	●		
Tijeras Canyon	1.23	+	●	●					●	●		●	●	●		

● Existing Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Juan Creek Watershed – continued																
Arroyo Trabuco Creek	1.27	+	●	●					●	●		●	●	●		
Oso Creek	1.21	+	●	●					●	●		●	●	●		
La Paz Creek	1.21	+	●	●					●	●		●	●	●		
San Juan Creek Mouth	1.27	See Coastal Waters – Table 2-3														
Orange County Coastal Streams																
Prima Deshecha Canada	1.31	+	●						○	●		●		●		
unnamed intermittent coastal streams	1.30	+	●						○	●		●		●		
Segunda Deshecha Canada	1.32	+	●						○	●		●		●		
San Mateo Creek Watershed																
San Mateo Creek	1.40	+							○	●		●	●	●	●	●
Devil Canyon Creek	1.40	+							○	●		●	●	●		●
Cold Spring Canyon	1.40	+							○	●		●	●	●		
San Mateo Canyon	1.40	+							○	●		●	●	●	●	●
Los Alamos Canyon	1.40	+							○	●		●	●	●		●
Wildhorse Canyon	1.40	+							○	●		●	●	●		
Tenaja Canyon	1.40	+							○	●		●	●	●		●
Bluewater Canyon	1.40	+							○	●		●	●	●		

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Mateo Creek Watershed – continued																
Nickel Canyon	1.40	+							○	●		●	●	●		
Christianitos Creek	1.40	+							○	●		●	●	●		
Gabino Canyon	1.40	+							○	●		●	●	●		
La Paz Canyon	1.40	+							○	●		●	●	●		
Blind Canyon	1.40	+							○	●		●	●	●		
Talega Canyon	1.40	+							○	●		●	●	●		
San Mateo Creek Mouth	1.40	See Coastal Waters – Table 2-3														
San Onofre Creek Watershed																
San Onofre Creek	1.51	+	●						●	●		●	●	●		●
San Onofre Canyon North Fork	1.51	+	●						●	●		●	●	●		●
Jardine Canyon	1.51	+	●						●	●		●	●	●		
San Onofre Canyon	1.51	+	●						●	●		●	●	●		●
San Onofre Canyon South Fork	1.51	+	●						●	●		●	●	●	●	
San Onofre Creek Mouth	1.51	See Coastal Waters – Table 2-3														
unnamed intermittent coastal streams	1.51	+	●						●	●		●		●		
Foley Canyon	1.51	+	●						●	●		●		●		
Horno Canyon	1.51	+	●						●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC 1	REC 2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Onofre Creek Watershed – continued																
Las Flores Creek	1.52	+	●						●	●		●	●	●	●	
Piedra de Lumbre Canyon	1.52	+	●						●	●		●	●	●	●	
unnamed intermittent coastal streams	1.52	+	●						●	●		●		●		
Aliso Canyon	1.53	+	●						●	●		●	●	●	●	
French Canyon	1.53	+	●						●	●		●		●	●	
Cockleburr Canyon	1.53	+	●						●	●		●		●		
Santa Margarita River Watershed																
Santa Margarita River	2.22	●	●	●					●	●		●	●	●	●	
Murrieta Creek	2.31	●	●	●	●				○	●		●		●		
Bundy Canyon	2.31	●	●	●	●				○	●		●		●		
Slaughterhouse Canyon	2.31	●	●	●	●				○	●		●		●		
Murrieta Creek	2.32	●	●	●	●				○	●		●		●		
Murrieta Creek	2.52	●	●	●	●	●			○	●		●		●		
Cole Canyon	2.32	●	●	●	●				○	●	●	●		●		
Miller Canyon	2.32	●	●	●	●				○	●		●		●		
Warm Springs Creek	2.36	●	●	●	●				○	●		●		●		
Diamond Valley	2.36	●	●	●	●				○	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Santa Margarita River Watershed - continued																
Goodhart Canyon	2.36	●	●	●	●				○	●		●		●		
Pixley Canyon	2.36	●	●	●	●				○	●		●		●		
Warm Springs Creek	2.35	●	●	●	●				○	●		●		●		
Domenigoni Valley	2.35	●	●	●	●				○	●		●		●		
Warm Springs Creek	2.34	●	●	●	●				○	●		●		●		
Warm Springs Creek	2.33	●	●	●	●				○	●		●		●		
French Valley	2.33	●	●	●	●				○	●		●		●		
Santa Gertrudis Creek	2.42	●	●	●	●	○			●	●		●		●		
Long Valley	2.42	●	●	●	●	○			●	●		●		●		
Glenoak Valley	2.42	●	●	●	●	○			●	●		●	●	●		
Tucalota Creek	2.43	●	●	●	●	○			●	●		●	●	●		
Willow Canyon	2.44	●	●	●	●	○			●	●		●	●	●		
Lake Skinner	2.41	See Reservoirs & Lakes – Table 2-4														
Tucalota Creek	2.41	●	●	●	●	○			●	●		●		●		
Crown Valley	2.41	●	●	●	●	○			●	●		●	●	●		
Rawson Canyon	2.41	●	●	●	●	○			●	●		●	●	●		
Tucalota Creek	2.42	●	●	●	●	○			●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Santa Margarita River Watershed - continued																
Santa Gertrudis Creek	2.32	●	●	●	●				○	●		●		●		
Long Canyon	2.32	●	●	●	●				○	●		●		●		
Temecula Creek	2.93	●	●	●	●	●			○	●		●		●		
Kohler Canyon	2.93	●	●	●	●	●			○	●		●	●	●		
Rattlesnake Creek	2.93	●	●	●	●	●			○	●		●	●	●		
Temecula Creek	2.92	●	●	●	●	●			○	●		●		●		
Chihuahua Creek	2.94	●	●	●	●	●			○	●		●		●		
Chihuahua Creek	2.92	●	●	●	●	●			○	●		●		●		
Cooper Canyon	2.92	●	●	●	●	●			○	●		●		●		
Iron Spring Canyon	2.92	●	●	●	●	●			○	●		●		●		
Temecula Creek	2.91	●	●	●	●	●			○	●		●		●		
Culp Valley	2.91	●	●	●	●	●			○	●		●		●		
Temecula Creek	2.84	●	●	●	●	●			●	●		●	●	●		●
Tule Creek	2.84	●	●	●	●	●			●	●		●	●	●		
Million Dollar Canyon	2.84	●	●	●	●	●			●	●		●	●	●		
Cottonwood Creek	2.84	●	●	●	●	●			●	●		●	●	●		●
Temecula Creek	2.83	●	●	●	●	●			●	●		●	●	●		●

● Existing Beneficial Use

○ Potential Beneficial Use

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[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Santa Margarita River Watershed - continued																
Long Canyon	2.83	●	●	●	●	●			●	●		●	●	●		●
Vail Lake	2.81	See Reservoirs & Lakes – Table 2-4														
Wilson Creek	2.63	●	●	●	●	●			○	●		●		●		
Wilson Creek	2.61	●	●	●	●	●			○	●		●		●		
Cahuilla Creek	2.73	●	●	●	●	●			○	●		●		●		
Hamilton Creek	2.74	●	●	●	●	●			○	●		●		●		
Hamilton Creek	2.73	●	●	●	●	●			○	●		●		●		
Cahuilla Creek	2.72	●	●	●	●	●			○	●		●		●		
Cahuilla Creek	2.71	●	●	●	●	●			○	●		●		●		
Elder Creek	2.71	●	●	●	●	●			○	●		●		●		
Cahuilla Creek	2.61	●	●	●	●	●			○	●		●		●		
Wilson Creek	2.81	●	●	●	●	●			●	●		●	●	●		
Lewis Valley	2.62	●	●	●	●	●			○	●		●		●		
Arroyo Seco Creek	2.81	●	●	●	●	●			●	●		●	●	●		
Arroyo Seco Creek	2.82	●	●	●	●	●			●	●		●	●	●		●
Kolb Creek	2.81	●	●	●	●	●			●	●		●	●	●		
Temecula Creek	2.81	●	●	●	●	●			●	●		●	●	●		●

● Existing Beneficial Use

○ Potential Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC 1	REC 2	BIOL	WARM	COLD	WILD	RARE	SPWN
Santa Margarita River Watershed - continued																
Temecula Creek	2.51	●	●	●	●	●			○	●		●		●		
Temecula Creek	2.52	●	●	●	●	●			○	●		●		●		
Pechanga Creek	2.52	●	●	●	●	●			○	●		●		●		
Rainbow Creek[3]	2.23	●	●	●					●	●		●	●	●		●
Rainbow Creek[3]	2.22	●	●	●					●	●		●	●	●		●
Sandia Canyon	2.22	●	●	●					●	●		●	●	●		●
Walker Basin	2.22	●	●	●					●	●		●	●	●		
Santa Margarita River	2.21	●	●	●					●	●		●	●	●	●	
DeLuz Creek	2.21	●	●	●					●	●		●	●	●	●	●
Cottonwood Creek	2.21	●	●	●					●	●		●	●	●		
Camps Creek	2.21	●	●	●					●	●		●	●	●		●
Fern Creek	2.21	●	●	●					●	●		●	●	●		●
Roblar Creek	2.21	●	●	●					●	●		●	●	●		
O'Neill Lake	2.13	See Reservoirs & Lakes – Table 2-4														
Santa Margarita River	2.13	●	●	●	●				●	●		●	●	●	●	
Wood Canyon	2.13	●	●	●	●				●	●		●		●		
Santa Margarita River	2.12	●	●	●	●				●	●		●	●	●	●	

● Existing Beneficial Use

○ Potential Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

[3] Rainbow Creek is designated as an impaired water body for total nitrogen and total phosphorus pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads (TMDLs) have been adopted to address these impairments. See Chapter 3, Water Quality Objectives for Biostimulatory Substances and Chapter 7, Total Maximum Daily Loads.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Santa Margarita River Watershed - continued																
Santa Margarita River	2.11	●	●	●	●				●	●		●	●	●	●	
Pueblitos Canyon	2.11	●	●	●	●				●	●		●		●	●	
Newton Canyon	2.11	●	●	●	●				●	●		●		●		
Santa Margarita Lagoon	2.11	See Coastal Waters – Table 2-3														
San Luis Rey River Watershed																
San Luis Rey River	3.32	●	●	●			●	●	●	●		●	●	●		
Johnson Canyon	3.32	●	●	●			●	●	●	●		●	●	●		
San Luis Rey River	3.31	●	●	●			●	●	●	●		●	●	●		
Canada Aguanga	3.31	●	●	●			●	●	●	●		●	●	●		
Dark Canyon	3.31	●	●	●			●	●	●	●		●	●	●		
Bear Canyon	3.31	●	●	●			●	●	●	●		●	●	●		
Cow Canyon	3.31	●	●	●			●	●	●	●		●	●	●		
Blue Canyon	3.31	●	●	●			●	●	●	●		●	●	●		
Rock Canyon	3.31	●	●	●			●	●	●	●		●	●	●		
Agua Caliente Creek	3.31	●	●	●			●	●	●	●		●	●	●		
unnamed Tributary	3.31	●	●	●			●	●	●	●		●	●	●		●
Canada Agua Caliente	3.31	●	●	●			●	●	●	●		●	●	●		

● Existing Beneficial Use

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[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Luis Rey River Watershed- continued																
Canada Verde	3.31	●	●	●			●	●	●	●		●	●	●		
Ward Canyon	3.31	●	●	●			●	●	●	●		●	●	●		
Lake Henshaw	3.31	See Reservoirs & Lakes – Table 2-4														
West Fork San Luis Rey River	3.31	●	●	●			●	●	●	●		●	●	●		●
Fry Creek	3.31	●	●	●			●	●	●	●		●	●	●		
Iron Springs Creek	3.31	●	●	●			●	●	●	●		●	●	●		●
Buena Vista Creek	3.31	●	●	●			●	●	●	●		●	●	●		
Cherry Canyon	3.31	●	●	●			●	●	●	●		●		●		
Bertha Canyon	3.31	●	●	●			●	●	●	●		●		●		
Hoover Canyon	3.31	●	●	●			●	●	●	●		●		●		
Buck Canyon	3.31	●	●	●			●	●	●	●		●		●		
Bergstrom Canyon	3.31	●	●	●			●	●	●	●		●		●		
San Ysidro Creek	3.31	●	●	●			●	●	●	●		●		●		
Matagual Creek	3.31	●	●	●			●	●	●	●		●	●	●		
Carrizo Creek	3.31	●	●	●			●	●	●	●		●	●	●		
Carrista Creek	3.31	●	●	●			●	●	●	●		●		●		
Kumpohui Creek	3.31	●	●	●			●	●	●	●		●		●		

● Existing Beneficial Use

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[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Luis Rey River Watershed - continued																
San Luis Rey River	3.31	●	●	●			●	●	●	●		●	●	●		
San Luis Rey River	3.23	●	●	●				●	●	●		●	●	●		●
Wigham Creek	3.23	●	●	●				●	●	●		●	●	●		
Prisoner Creek	3.23	●	●	●				●	●	●		●	●	●		
Lusardi Canyon	3.23	●	●	●				●	●	●		●	●	●		
Cedar Creek	3.23	●	●	●				●	●	●		●	●	●		
San Luis Rey River	3.22	●	●	●				●	●	●		●	●	●		
Bee Canyon	3.22	●	●	●				●	●	●		●	●	●		
Paradise Creek	3.22	●	●	●				●	●	●		●	●	●		
Hell Creek	3.22	●	●	●				●	●	●		●	●	●		
Horsethief Canyon	3.22	●	●	●				●	●	●		●	●	●		
Potrero Creek	3.22	●	●	●				●	●	●		●	●	●		
Plaisted Creek	3.22	●	●	●				●	●	●	●	●	●	●		
Yuima Creek	3.22	●	●	●				●	●	●		●	●	●		
Sycamore Canyon	3.22	●	●	●				●	●	●		●	●	●		
Pauma Creek	3.22	●	●	●				●	●	●		●	●	●		●
Doane Creek	3.22	●	●	●				●	●	●		●	●	●		●

● Existing Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Luis Rey River Watershed - continued																
Chimney Creek	3.22	●	●	●				●	●	●		●	●	●		
French Creek	3.22	●	●	●				●	●	●		●	●	●		●
Lion Creek	3.22	●	●	●				●	●	●		●	●	●		●
Harrison Canyon	3.22	●	●	●				●	●	●		●	●	●		
Jaybird Creek	3.22	●	●	●				●	●	●		●	●	●		
Frey Creek	3.22	●	●	●				●	●	●		●	●	●		
Agua Tibia Creek	3.22	●	●	●				●	●	●		●	●	●		●
San Luis Rey River	3.21	●	●	●					●	●		●	●	●		
Marion Canyon	3.21	●	●	●					●	●		●	●	●		
Magee Creek	3.21	●	●	●					●	●		●	●	●		
Castro Canyon	3.21	●	●	●					●	●		●	●	●		
Trujillo Creek	3.21	●	●	●					●	●		●	●	●		
Pala Creek	3.21	●	●	●					●	●		●	●	●		●
Gomez Creek	3.21	●	●	●					●	●		●	●	●		
Couser Canyon	3.21	●	●	●					●	●		●	●	●		
Double Canyon	3.21	●	●	●					●	●		●	●	●		
Rice Canyon	3.21	●	●	●					●	●		●	●	●		

● Existing Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Luis Rey River Watershed – continued																
San Luis Rey River	3.12	+	●	●					●	●	●	●		●	●	
Live Oak Creek	3.12	+	●	●					●	●		●		●	●	
Keys Creek	3.12	+	●	●					●	●		●		●		
Moosa Canyon	3.15	+	●	●					●	●		●		●		
unnamed intermittent streams	3.16	+	●	●					●	●		●		●		
Moosa Canyon	3.14	+	●	●					●	●		●		●		
Moosa Canyon	3.13	+	●	●					●	●		●		●		
Turner Lake	3.13	See Reservoirs & Lakes – Table 2-4														
South Fork Moosa Canyon	3.13	+	●	●					●	●		●		●		
Moosa Canyon	3.12	+	●	●					●	●		●		●		
Gopher Canyon	3.12	+	●	●					●	●		●		●		
South Fork Gopher Canyon	3.12	+	●	●					●	●		●		●		
San Luis Rey River	3.11	+	●	●					●	●		●		●	●	
Pilgrim Creek	3.11	+	●	●					●	●	●	●	●	●	●	
Windmill Canyon	3.11	+	●	●					●	●		●	●	●		
Tuley Canyon	3.11	+	●	●					●	●		●		●		
Lawerence Canyon	3.11	+	●	●					●	●		●		●		
Mouth of San Luis Rey River	3.11	See Coastal Waters – Table 2-3														

● Existing Beneficial Use

+ Excepted from MUN (See Text)

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[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Diego County Coastal Streams																
Loma Alta Creek	4.10	+							○	●		●		●		
Loma Alta Slough	4.10	See Coastal Waters – Table 2-3														
Buena Vista Lagoon	4.21	See Coastal Waters – Table 2-3														
Buena Vista Creek	4.22	+	●	●					●	●		●		●		
Buena Vista Creek	4.21	+	●	●					●	●		●		●	●	
Agua Hedionda	4.31	See Coastal Waters – Table 2-3														
Agua Hedionda Creek	4.32	●	●	●					●	●		●		●		
Buena Creek	4.32	●	●	●					●	●		●		●		
Agua Hedionda Creek	4.31	●	●	●					●	●	●	●		●		
Letterbox canyon	4.31	●	●	●					●	●		●		●		
Canyon de las Encinas	4.40	+							○	●		●		●		
Cottonwood Creek	4.51	+	●						●	●		●		●		
Moonlight Creek	4.51	+	●						●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Marcos Creek Watershed																
Batiquitos Lagoon	4.51	See Coastal Waters – Table 2-3														
San Marcos Creek	4.52	+	●						●	●		●		●		
unnamed intermittent streams	4.53	+	●						●	●		●		●		
San Marcos Creek	4.51	+	●						●	●		●		●		
Encinitas Creek	4.51	+	●						●	●		●		●		
Escondido Creek Watershed																
San Elijo Lagoon	4.61	See Coastal Waters – Table 2-3														
Escondido Creek	4.63	●	●	○				●	●	●		●	●	●		
Lake Wohlford	4.63	See Reservoirs & Lakes – Table 2-4														
Lake Dixon	4.62	See Reservoirs & Lakes – Table 2-4														
Escondido Creek	4.62	●	●	○					●	●		●	●	●		
Reidy Canyon	4.62	●	●	○					●	●		●	●	●		
Escondido Creek	4.61	●	●	○					●	●	●	●	●	●		

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Dieguito Creek Watershed																
Santa Ysabel Creek	5.54	●	●	●	●				●	●		●	●	●		●
Dan Price Creek	5.54	●	●	●	●				●	●		●	●	●		
Santa Ysabel Creek	5.53	●	●	●	●				●	●		●	●	●		
Witch Creek	5.53	●	●	●	●				●	●		●	●	●		●
Sutherland Lake	5.53	See Reservoirs & Lakes – Table 2-4														
Bloomdale Creek	5.53	●	●	●	●				●	●		●	●	●		
Santa Ysabel Creek	5.52	●	●	●	●				●	●		●	●	●	●	
Lake Poway	5.52	See Reservoirs & Lakes – Table 2-4														
Black Canyon	5.52	●	●	●	●				●	●		●	●	●		●
Scholder Creek	5.52	●	●	●	●				●	●		●	●	●		
Temescal Creek	5.52	●	●	●	●				●	●		●	●	●		
Bear Creek	5.52	●	●	●	●				●	●		●	●	●		
Quail Canyon	5.52	●	●	●	●				●	●		●	●	●		
Carney Canyon	5.52	●	●	●	●				●	●		●	●	●		
Santa Ysabel Creek	5.51	●	●	●	●				●	●	●	●	●	●		
Boden Canyon	5.51	●	●	●	●				●	●	●	●	●	●		
Clevenger Canyon	5.51	●	●	●	●				●	●	●	●	●	●		

● Existing Beneficial Use

○ Potential Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Dieguito River Watershed – continued																
Santa Ysabel Creek	5.32	●	●	●	●				○	●		●		●	●	
Tims Canyon	5.32	●	●	●	●				○	●		●		●		
Schoolhouse Canyon	5.32	●	●	●	●				○	●		●		●		
Rockwood Canyon	5.35	●	●	●	●				○	●		●		●		
Guejito Creek	5.35	●	●	●	●				○	●		●		●		
unnamed intermittent streams	5.36	●	●	●	●				○	●		●		●		
Rockwood Canyon	5.32	●	●	●	●				○	●		●		●		
Santa Maria Creek	5.41	●	●	●	●				●	●		●		●		
Hatfield Creek	5.45	●	●	●	●				●	●		●		●		
Hatfield Creek	5.44	●	●	●	●				●	●		●		●		
Wash Hollow Creek	5.43	●	●	●	●				●	●		●		●		
Wash Hollow Creek	5.44	●	●	●	●				●	●		●		●		
Hatfield Creek	5.42	●	●	●	●				●	●		●		●		
Santa Teresa Valley	5.46	●	●	●	●				●	●		●		●		
unnamed intermittent streams	5.47	●	●	●	●				●	●		●		●		
Hatfield Creek	5.41	●	●	●	●				●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC 1	REC 2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Dieguito River Watershed – continued																
Santa Maria Creek	5.32	●	●	●	●				○	●		●		●		
unnamed intermittent streams	5.33	●	●	●	●				○	●		●		●		
unnamed intermittent streams	5.34	●	●	●	●				○	●		●		●		
San Dieguito River	5.32	●	●	●	●				○	●		●		●	●	
Cloverdale Creek	5.32	●	●	●	●				○	●		●		●	●	
San Dieguito River	5.21	●	●	●	●				●	●	●	●	●	●	●	
Highland Valley	5.31	●	●	●	●				○	●		●		●		
Lake Hodges	5.21	See Reservoirs & Lakes – Table 2-4														
Kit Carson Creek	5.21	●	●	●	●	○			●	●		●		●	●	
West Branch Kit Carson Creek	5.24	●	●	●	●	○			●	●		●		●		
East Branch Kit Carson Creek	5.24	●	●	●	●	○			●	●		●		●		
Green Valley Creek	5.21	●	●	●	●	○			●	●		●		●		
Green Valley Creek	5.22	●	●	●	●	○			●	●		●		●		
Felicita Creek	5.23	●	●	●	●	○			●	●		●		●		
West Fork Felicita Creek	5.23	●	●	●	●	○			●	●		●		●		
East Fork Felicita Creek	5.23	●	●	●	●	○			●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Dieguito River Watershed - continued																
San Dieguito Reservoir	5.21	See Reservoirs & Lakes – Table 2-4														
Warren Canyon	5.21	●	●	●	●				●	●	●	●	●	●		
San Bernardo Valley	5.21	●	●	●	●				●	●		●		●	●	
unnamed intermittent streams	5.24	●	●	●	●				●	●		●		●		
unnamed intermittent streams	5.23	●	●	●	●				●	●		●		●		
unnamed intermittent streams	5.22	●	●	●	●				●	●		●		●		
San Dieguito River	5.11	+	○	○					●	●		●	●	●		●
Lusardi Creek	5.12	+	○	○					●	●		●		●		
Lusardi Creek	5.11	+	○	○					●	●		●		●		
La Zanja Canyon	5.11	+	○	○					●	●		●		●		
Gonzales Canyon	5.11	+	○	○					●	●		●		●		
San Dieguito Lagoon	5.11	See Coastal Waters – Table 2-3														
Los Penasquitos Creek Watershed																
Los Penasquitos Lagoon	6.10	See Coastal Waters – Table 2-3														
Soledad Canyon	6.10	+	●	●					○	●		●	●	●		
Carol Canyon	6.10	+	●	●					○	●		●	●	●	●	

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Los Penasquitos Creek Watershed – continued																
Miramar Reservoir	6.10	See Reservoirs & Lakes – Table 2-4														
Los Penasquitos Creek	6.20	+	●	○					●	●		●	●	●		
Rattlesnake Creek	6.20	+	●	○					●	●		●	●	●		
Poway Creek	6.20	+	●	○					●	●		●		●		
Beeler Creek	6.20	+	●	○					●	●		●		●		
Chicarita Creek	6.20	+	●	○					●	●		●		●		
Cypress Canyon	6.20	+	●	○					●	●		●		●		
Los Penasquitos Creek	6.10	+	●	●					○	●	●	●		●		
unnamed tributary	6.10	+	●	●					○	●		●		●	●	
Carmel Valley	6.10	+	●	●					○	●		●		●		
Deer Canyon	6.10	+	●	●					○	●		●		●		
McGonigle Canyon	6.10	+	●	●					○	●		●		●		
Bell Valley	6.10	+	●	●					○	●		●		●		
Shaw Valley	6.10	+	●	●					○	●		●		●		
San Diego County Coastal Streams																
unnamed intermittent coastal streams	6.30	+							○	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Rose Canyon Watershed																
Rose Canyon	6.40	+		○					●	●		●		●		
San Clemente Canyon	6.40	+		○					●	●		●	●	●	●	●
Tecolote Creek Watershed																
Tecolote Creek [3]	6.50	+							○	●		●		●		
San Diego River Watershed																
San Diego River	7.41	●	●	●	●				●	●		●	●	●		
Coleman Creek	7.42	●	●	●	●				●	●		●	●	●		
Eastwood Creek	7.42	●	●	●	●				●	●		●	●	●		
Jim Green Creek	7.42	●	●	●	●				●	●		●	●	●		
Mariette Creek	7.42	●	●	●	●				●	●		●	●	●		
Boring Creek	7.42	●	●	●	●				●	●		●	●	●		
Bailey Creek	7.42	●	●	●	●				●	●		●	●	●		
Coleman Creek	7.41	●	●	●	●				●	●		●	●	●		
Setenec Creek	7.42	●	●	●	●				●	●		●	●	●		
Setenec Creek	7.41	●	●	●	●				●	●		●	●	●		
Temescal Creek	7.41	●	●	●	●				●	●		●	●	●		
Paine Bottom	7.41	●	●	●	●				●	●		●	●	●		

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

[3] Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria -Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC 1	REC 2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Diego River Watershed – continued																
Orinoco Creek	7.41	●	●	●	●				●	●		●	●	●		
Iron Springs Canyon	7.41	●	●	●	●				●	●		●	●	●		
Dye Canyon	7.41	●	●	●	●				●	●		●	●	●		
Richie Creek	7.41	●	●	●	●				●	●		●	●	●		
Cedar Creek	7.41	●	●	●	●				●	●		●	●	●		●
Sandy Creek	7.41	●	●	●	●				●	●		●	●	●		
Dehr Creek	7.41	●	●	●	●				●	●		●	●	●		●
Kelly Creek	7.41	●	●	●	●				●	●		●	●	●		
Cuyamaca Reservoir	7.43	See Reservoirs & Lakes – Table 2-4														
Little Stonewall Creek	7.43	●	●	●	●				●	●		●	●	●		●
Boulder Creek	7.41	●	●	●	●				●	●		●	●	●		●
Azalea Creek	7.41	●	●	●	●				●	●		●	●	●		
Johnson Creek	7.41	●	●	●	●				●	●		●	●	●		
Sheep Camp Creek	7.41	●	●	●	●				●	●		●	●	●		
San Diego River	7.31	●	●	●	●				●	●		●	●	●		
El Capitan Reservoir	7.31	See Reservoirs & Lakes – Table 2-4														
Isham Creek	7.31	●	●	●	●				●	●		●	●	●		

● Existing Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Diego River Watershed – continued																
Sand Creek	7.31	●	●	●	●				●	●		●	●	●		
Conejos Creek	7.31	●	●	●	●				●	●		●	●	●		●
King Creek	7.31	●	●	●	●				●	●		●	●	●		
West Fork King Creek	7.31	●	●	●	●				●	●		●	●	●		
Echo Valley	7.31	●	●	●	●				●	●		●	●	●		
Peutz Valley	7.31	●	●	●	●				●	●		●	●	●		
Chocolate Canyon	7.32	●	●	●	●				●	●		●	●	●		
Alpine Creek	7.33	●	●	●	●				●	●		●	●	●		
Chocolate Canyon	7.31	●	●	●	●				●	●		●	●	●		
San Diego River	7.15	○		●					●	●		●		●	●	
San Diego River	7.12	○		●					●	●		●		●	●	
Lake Jennings	7.12	See Reservoirs & Lakes – Table 2-4														
Quail Canyon	7.12	○		●					●	●		●		●		
Wildcat Canyon	7.12	○		●					●	●		●		●		
San Vicente Creek	7.23	●	●	●	●				●	●		●		●		
Swartz Canyon	7.23	●	●	●	●				●	●		●		●		
Klondike Creek	7.23	●	●	●	●				●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Diego River Watershed – continued																
San Vicente Creek	7.22	●	●	●	●				●	●		●		●		
Darney Canyon	7.22	●	●	●	●				●	●		●		●		
Longs Gulch	7.22	●	●	●	●				●	●		●		●		
San Vicente Reservoir	7.21	See Reservoirs & Lakes – Table 2-4														
West Branch San Vicente Creek	7.21	●	●	●	●				●	●		●		●		
Aqueduct Arm Creek	7.21	●	●	●	●	○			●	●		●		●		
Padre Barona Creek	7.24	●	●	●	●				●	●		●		●		
Wright Canyon	7.24	●	●	●	●				●	●		●		●		
Featherstone Canyon	7.24	●	●	●	●				●	●		●		●		
Padre Barona Creek	7.12	○		●					●	●		●		●		
Foster Canyon	7.21	●	●	●	●				●	●		●		●		
San Vicente Creek	7.12	○		●					●	●		●		●		
Slaughterhouse Canyon	7.12	○		●					●	●		●		●		
Los Coches Creek	7.14	○		●					●	●		●		●		
Rios Canyon	7.14	○		●					●	●	●	●		●		
Los Coches Creek	7.12	○		●					●	●		●		●		
Forrester Creek [3]	7.13	○		●					●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

[3] Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria -Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC 1	REC 2	BIOL	WARM	COLD	WILD	RARE	SPWN
San Diego River Watershed - continued																
Forrester Creek [3]	7.12	○		●					●	●		●		●		
Sycamore Canyon	7.12	+	●	●					●	●		●		●	●	
unnamed tributary	7.12	+	●	●					●	●		●		●	●	
Clark Canyon	7.12	+	●	●					●	●		●		●	●	
West Sycamore Canyon	7.12	+	●	●					●	●		●		●		
Quail Canyon	7.12	+	●	●					●	●		●		●		
Little Sycamore Canyon	7.12	+	●	●					●	●		●		●		
Spring Canyon	7.12	+	●	●					●	●		●		●	●	
Oak Canyon	7.12	+	●	●					●	●		●		●		
San Diego River [3]	7.11	+	●	●					●	●	●	●		●	●	
unnamed tributary	7.11	+	●	●					●	●		●		●	●	
Alvarado Canyon	7.11	+	●	●					●	●		●		●		
Lake Murray	7.11	See Reservoirs & Lakes – Table 2-4														
Murphy Canyon	7.11	+	●	●					●	●		●		●	●	
Shepherd Canyon	7.11	+	●	●					●	●		●		●		
Murray Canyon	7.11	+	●	●					●	●		●		●		
Mouth of San Diego River	7.11	See Coastal Waters – Table 2-3														

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

[3] Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria -Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Pueblo San Diego Watershed																
unnamed intermittent coastal streams	8.10	+							○	●		●		●		
Powerhouse Canyon	8.21	+							○	●		●		●		
Chollas Creek [3,4]	8.22	+							○	●		●		●		
South Chollas Valley	8.22	+							○	●		●		●		
unnamed intermittent streams	8.31	+							○	●		●		●		
Paradise Creek	8.32	+							○	●		●		●		
Paradise Valley	8.32	+							○	●		●		●		
Sweetwater River Watershed																
Sweetwater River	9.35	●	●	●	●				●	●		●	●	●		●
Stonewall Creek	9.35	●	●	●	●				●	●		●	●	●		●
Harper Creek	9.35	●	●	●	●				●	●		●	●	●		●
Cold Stream	9.35	●	●	●	●				●	●		●	●	●		●
Japacha Creek	9.35	●	●	●	●				●	●		●	●	●		●
Juaquapin Creek	9.35	●	●	●	●				●	●		●	●	●		●
Arroyo Seco	9.35	●	●	●	●				●	●		●	●	●		
Sweetwater River	9.34	●	●	●	●				●	●		●	●	●		●

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

[3] Chollas Creek is designated as an impaired water body for copper, lead and zinc pursuant to Clean Water Act Section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapter 3, Water Quality Objectives for Toxicity and Toxic Pollutants and Chapter 7, Total Maximum Daily Loads

[4] Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria -Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1,2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Sweetwater River Watershed - continued																
Descanso Creek	9.34	●	●	●	●				●	●		●	●	●		
Samagatuma Creek	9.34	●	●	●	●				●	●		●	●	●		
Sweetwater River	9.31	●	●	●	●				●	●		●	●	●		●
Viejas Creek	9.33	●	●	●	●				●	●		●	●	●		
Viejas Creek	9.31	●	●	●	●				●	●		●	●	●		
Loveland Reservoir	9.31	See Reservoirs & Lakes – Table 2-4														
Taylor Creek	9.31	●	●	●	●				●	●		●		●		
Japatul Valley	9.32	●	●	●	●				●	●		●		●		
Sweetwater River	9.21	●	●	●	●				●	●	●	●		●	●	
unnamed tributary	9.21	●	●	●	●				●	●	●	●		●	●	
Lawson Creek	9.21	●	●	●	●				●	●	●	●		●		
Beaver Canyon	9.21	●	●	●	●				●	●		●		●		
Wood Valley	9.21	●	●	●	●				●	●		●		●		
Sycuan Creek	9.25	●	●	●	●				●	●		●		●		
North Fork Sycuan Creek	9.26	●	●	●	●				●	●		●		●		
North Fork Sycuan Creek	9.25	●	●	●	●				●	●		●		●		
Dehesa Valley	9.23	●	●	●	●				●	●		●		●		
Harbison Canyon	9.23	●	●	●	●				●	●		●		●		

● Existing Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Sweetwater River Watershed - continued																
Galloway Valley	9.24	●	●	●	●				●	●		●		●		
Mexican Canyon	9.21	●	●	●	●				●	●		●		●		
unnamed intermittent streams	9.22	●	●	●	●				●	●		●		●		
Steel Canyon	9.21	●	●	●	●				●	●		●		●		
Sweetwater Reservoir	9.21	See Reservoirs & Lakes – Table 2-4														
Coon Canyon	9.21	●	●	●	●				●	●		●		●		
Sweetwater River	9.12	+		●					○	●		●		●		
Spring Valley	9.12	+		●					○	●		●		●		
Wild Mans Canyon	9.12	+		●					○	●		●		●		
Long Canyon	9.12	+		●					○	●		●		●		
Rice Canyon	9.12	+		●					○	●		●		●		
Telegraph Canyon	9.11	+		●					○	●		●		●		
San Diego County Coastal Streams																
unnamed intermittent coastal streams	10.10	+							○			●				

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Otay River Watershed																
Jamul Creek	10.34	●	●	●	●				●	●		●		●		
Jamul Creek	10.33	●	●	●	●				●	●	●	●		●		
Jamul Creek	10.36	●	●	●	●				●	●	●	●		●		
Dulzura Creek	10.37	●	●	●	●				●	●		●		●		
Dulzura Creek	10.36	●	●	●	●				●	●	●	●		●	●	
Dutchman Canyon	10.36	●	●	●	●				●	●		●		●		
Pringle Canyon	10.36	●	●	●	●				●	●		●		●		
Sycamore Canyon	10.36	●	●	●	●				●	●	●	●		●		
Hollenbeck Canyon	10.36	●	●	●	●				●	●	●	●		●		
Lyons Valley	10.35	●	●	●	●				●	●		●		●		
Cedar Canyon	10.36	●	●	●	●				●	●	●	●	●	●		●
Little Cedar Canyon	10.36	●	●	●	●				●	●	●	●	●	●		
Jamul Creek	10.31	●	●	●	●				●	●		●		●	●	
Lower Otay Reservoir	10.31	See Reservoirs & Lakes – Table 2-4														
unnamed tributary	10.31	●	●	●	●				●	●	●	●		●	●	
Upper Otay Reservoir	10.32	See Reservoirs & Lakes – Table 2-4														
Proctor Valley	10.32	●	●	●	●				●	●	●	●		●		

● Existing Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC 1	REC 2	BIOL	WARM	COLD	WILD	RARE	SPWN
Otay River Watershed – continued																
Otay River	10.20	+	●	○					○	●		●		●	●	
O'Neal Canyon	10.20	+	●	○					○	●		●		●		
Salt Creek	10.20	+	●	○					○	●		●		●		
Johnson Canyon	10.20	+	●	○					○	●		●		●		
Wolf Canyon	10.20	+	●	○					○	●		●		●		
Dennery Canyon	10.20	+	●	○					○	●		●		●		
Poggi Canyon	10.20	+	●	○					○	●		●		●		
Tijuana River Watershed																
Tijuana River	11.11	+		○					○	●	●	●		●	●	
Moody Canyon	11.11	+		○					○	●		●		●		
Smugglers Gulch	11.11	+		○					○	●		●		●		
Goat Canyon	11.11	+		○					○	●		●		●		
Tijuana River Estuary	11.11	See Coastal Waters – Table 2-3														
Spring Canyon	11.12	+	●	○					○	●		●		●		
Dillon Canyon	11.12	+	●	○					○	●		●		●		
Finger Canyon	11.12	+	●	○					○	●		●		●		
Wruck Canyon	11.12	+	●	○					○	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Tijuana River Watershed - continued																
unnamed intermittent streams	11.12	+	●	○					○	●		●		●		
unnamed intermittent streams	11.21	+							●	●		●		●		
Tijuana River	11.21	+							●	●		●		●		
Tecate Creek	11.23	+							●	●		●		●		
Cottonwood Creek	11.60	●	●	●	●		●		○	●		●	●	●	●	
Kitchen Creek	11.60	●	●	●	●		●		○	●		●	●	●		●
Long Canyon	11.60	●	●	●	●		●		○	●		●	●	●		●
Troy Canyon	11.60	●	●	●	●		●		○	●		●	●	●		●
Fred Canyon	11.60	●	●	●	●		●		○	●		●	●	●		
Horse Canyon	11.60	●	●	●	●		●		○	●		●	●	●		
La Posta Creek	11.70	●	●	●	●		●		●	●		●	●	●		
Simmons Canyon	11.70	●	●	●	●		●		●	●		●	●	●		
La Posta Creek	11.60	●	●	●	●		●		○	●		●	●	●		
Morena Reservoir	11.50	See Reservoirs & Lakes – Table 2-4														
Morena Creek	11.50	●	●	●	●		●		●	●		●	●	●		●
Long Valley	11.50	●	●	●	●		●		●	●		●	●	●		
Bear Valley	11.50	●	●	●	●		●		●	●		●		●		

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	MUN	AGR	IND	PROC	GWR	FRSH	POW	REC 1	REC 2	BIOL	WARM	COLD	WILD	RARE	SPWN
		BENEFICIAL USE														
Tijuana River Watershed - continued																
Cottonwood Creek	11.30	●	●	●	●		●		●	●		●	●	●	●	●
Hauser Creek	11.30	●	●	●	●		●		●	●		●	●	●		●
Salazar Canyon	11.30	●	●	●	●		●		●	●		●	●	●		
Barrett Lake	11.30	See Reservoirs & Lakes – Table 2-4														
Boneyard Canyon	11.30	●	●	●	●		●		●	●		●	●	●		
Skye Valley	11.30	●	●	●	●		●		●	●		●	●	●		
Pine Valley Creek	11.41	●	●	●	●		●		●	●		●	●	●		●
Indian Creek	11.41	●	●	●	●		●		●	●		●	●	●		
Lucas Creek	11.41	●	●	●	●		●		●	●		●	●	●		
Noble Canyon	11.41	●	●	●	●		●		●	●		●	●	●		●
Los Rasalies Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Paloma Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Bonita Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Chico Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Madero Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Los Gatos Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Boiling Spring Ravine	11.42	●	●	●	●		●		●	●		●	●	●		

● Existing Beneficial Use

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC 1	REC 2	BIOL	WARM	COLD	WILD	RARE	SPWN
Tijuana River Watershed - continued																
Agua Dulce Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Escondido Ravine	11.42	●	●	●	●		●		●	●		●	●	●		
Scove Canyon	11.41	●	●	●	●		●		●	●		●	●	●		
Pine Valley Creek	11.30	●	●	●	●		●		●	●		●	●	●		●
Oak Valley	11.30	●	●	●	●		●		●	●		●	●	●		●
Nelson Canyon	11.30	●	●	●	●		●		●	●		●	●	●		
Secret Canyon	11.30	●	●	●	●		●		●	●		●	●	●		
Horsethief Canyon	11.30	●	●	●	●		●		●	●		●	●	●		
Espinosa Creek	11.30	●	●	●	●		●		●	●		●	●	●		
Wilson Creek	11.30	●	●	●	●		●		●	●		●	●	●		●
Pats Canyon	11.30	●	●	●	●		●		●	●		●	●	●		
Cottonwood Creek	11.23	+							●	●		●		●		
Dry Valley	11.23	+							●	●		●		●		
Bob Owens Canyon	11.23	+							●	●		●		●		
McAlmond Canyon	11.24	+							●	●		●		●		
McAlmond Canyon	11.23	+							●	●		●		●		

● Existing Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-2. BENEFICIAL USES OF INLAND SURFACE WATERS

Inland Surface Waters [1, 2]	Hydrologic Unit Basin Number	BENEFICIAL USE														
		MUN	AGR	IND	PROC	GWR	FRSH	POW	REC1	REC2	BIOL	WARM	COLD	WILD	RARE	SPWN
Tijuana River Watershed - continued																
Rattlesnake Canyon	11.23	+							●	●		●		●		
Potrero Creek	11.25	+							●	●		●		●		
Little Potrero Creek	11.25	+							●	●		●		●		
Potrero Creek	11.23	+							●	●		●		●		
Grapevine Creek	11.23	+							●	●		●		●		
Bee Canyon	11.22	+							●	●		●		●		
Bee Creek	11.23	+							●	●		●		●		
Mine Canyon	11.21	+							●	●		●		●		
unnamed intermittent streams	11.81	+							●	●		●		●		
unnamed intermittent streams	11.82	+							●	●		●		●		
Campo Creek	11.84	+							●	●		●	●	●		
Diablo Canyon	11.84	+							●	●		●		●		
Campo Creek	11.83	+							●	●		●		●		
Miller Creek	11.83	+							●	●		●		●		
Campo Creek	11.82	+							●	●		●		●		
Smith Canyon	11.82	+							●	●		●		●		
unnamed intermittent streams	11.85	+							●	●		●		●		

● Existing Beneficial Use

+ Excepted from MUN (See Text)

[1] Waterbodies are listed multiple times if they cross hydrologic area or sub area boundaries.

[2] Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

Table 2-3. BENEFICIAL USES OF COASTAL WATERS

Coastal Waters	Hydrologic Unit Basin Number	BENEFICIAL USE														
		IND	NAV	REC1	REC2	COMM	BIOL	EST	WILD	RARE	MAR	AQUA	MIGR	SPWN	WARM	SHELL
Pacific Ocean[1]		●	●	●	●	●	●		●	●	●	●	●	●		●
Dana Point Harbor[2]		●	●	●	●	●			●	●	●		●	●		●
Del Mar Boat Basin		●	●	●	●	●			●	●	●		●	●		●
Mission Bay		●		●	●	●		●	●	●	●		●	●		●
Oceanside Harbor		●	●	●	●	●			●	●	●		●	●		●
San Diego Bay [3,4,5]		●	●	●	●	●	●	●	●	●	●		●	●		●

[1] Certain Pacific Ocean shoreline segments of the following Hydrological Units, Areas, and Subareas are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d): San Joaquin Hills HSA 901.11 and Laguna Beach HAS 901.12, Aliso Creek HSA 901.13, Dana Point HSA 901.14, Lower San Juan HSA 901.27, San Clemente HA 901.30, San Luis Rey HU 903.00, San Marcos HA 904.50, San Dieguito HU 905.00, Miramar Reservoir HA 906.10, Scripps HA 906.30, and Mission San Diego HSA 907.11 and Santee HSA 907.12. Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total Coliform, Fecal Coliform, *E. Coli* and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

[2] The shoreline segment along Baby Beach within Dana Point Harbor is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 7, *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

[3] Includes the tidal prisms of the Otay and Sweetwater Rivers.

[4] The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapter 3, Water Quality Objectives for Pesticides, Toxicity and Toxic Pollutants and Chapter 7, Total Maximum Daily Loads.

[5] The shoreline segment along Shelter Island Shoreline Park within San Diego Bay is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 7, *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

● Existing Beneficial Use

Table 2-3. BENEFICIAL USES OF COASTAL WATERS

Coastal Waters	Hydrologic Unit Basin Number	BENEFICIAL USE														
		IND	NAV	REC1	REC2	COMM	BIOL	EST	WILD	RARE	MAR	AQUA	MIGR	SPWN	WARM	SHELL
Coastal Lagoons																
Tijuana River Estuary	11.11			●	●	●	●	●	●	●	●		●	●		●
Mouth of San Diego River[6]	7.11			●	●	●		●	●	●	●		●	●		●
Famosa Slough and Channel	7.11			●	●	●		●	●	●	●		●	●		●
Los Penasquitos Lagoon [7]	6.10			●	●		●	●	●	●	●		●	●		●
San Dieguito Lagoon	5.11			●	●		●	●	●	●	●		●	●		
Batiquitos Lagoon	4.51			●	●		●	●	●	●	●		●	●		
San Elijo Lagoon	4.61			●	●		●	●	●	●	●		●	●		
Agua Hedionda Lagoon	4.31	●		●	●	●	●	●	●	●	●	●	●	●		●

[6] The mouth of San Diego River is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)*.

[7] Fishing from shore or boat permitted, but other water contact recreational (REC-1) uses are prohibited.

● Existing Beneficial Use

○ Potential Beneficial Use

Table 2-3. BENEFICIAL USES OF COASTAL WATERS

Coastal Waters	Hydrologic Unit Basin Number	BENEFICIAL USE														
		IND	NAV	REC1	REC2	COMM	BIOL	EST	WILD	RARE	MAR	AQUA	MIGR	SPWN	WARM	SHELL
Coastal Lagoons – continued																
Buena Vista Lagoon[8]	4.21			●	●		●	○	●	●	●				●	
Loma Alta Slough	4.10			●	●			●	●	●	●					
Mouth of San Luis Rey River[9]	3.11			●	●				●	●	●		●			
Santa Margarita Lagoon	2.11			●	●			●	●	●	●		●	●		

[8] Fishing from shore or boat permitted, but other water contact recreational (REC-1) uses are prohibited.

[9] The mouth of San Luis Rey River is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

● Existing Beneficial Use

○ Potential Beneficial Use

Table 2-3. BENEFICIAL USES OF COASTAL WATERS

Coastal Waters	Hydrologic Unit Basin Number	BENEFICIAL USE														
		IND	NAV	REC1	REC2	COMM	BIOL	EST	WILD	RARE	MAR	AQUA	MIGR	SPWN	WARM	SHELL
Coastal Lagoons – continued																
Aliso Creek Mouth[10]	1.13			●	●				●	●	●					
San Juan Creek Mouth[11]	1.27			●	●				●	●	●		●			●
San Mateo Creek Mouth	1.40			●	●		●		●	●	●		●	●		
San Onofre Creek Mouth	1.51			●	●				●	●	●		●	●		

[10] The mouth of Aliso Creek is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

[11] The mouth of San Juan Creek is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 3, *Water Quality Objectives*, Bacteria - Total Coliform, Fecal Coliform, *E. Coli*, and Enterococci, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

● Existing Beneficial Use

○ Potential Beneficial Use

Table 2-4. BENEFICIAL USES OF RESERVOIRS AND LAKES

Reservoirs & Lakes	Hydrologic Unit Basin Number	BENEFICIAL USE												
		MUN	AGR	IND	PROC	GWR	FRSH	REC1	REC2	WARM	COLD	WILD	RARE	POW
O'Neill Lake	2.13	●	●	●	●			●	●	●	●	●	●	
Diamond Valley Lake	2.35 & 2.36	●	●	●	●	●		●[1]	●	●	●	●		●
Lake Skinner	2.42	●	●	●	●	○		●[1]	●	●		●		
Vail Lake	2.81	●	●	●	●	●		●[1]	●	●		●		
Turner Lake	3.13	●	●	●				○	●	●				
Lake Henshaw	3.31	●	●	●	●		●	●[1]	●	●		●	●	●
Olivenhain Reservoir	5.21	●		●				●[1]	●	●	●	●		●
San Dieguito Reservoir	5.21	●	●	○				●	●	●	●	●		
Lake Dixon	4.62	●	●	○				●[1]	●	●	●	●		
Lake Wohlford	4.63	●	●	○				●[1]	●	●	●	●		●
Lake Hodges	5.21	●	●	●	●			●[1]	●	●	●	●	●	
Lake Poway	5.52	●	●	●	●			●[1]	●	●	●	●		
Sutherland Lake	5.53	●	●	●	●			●[1]	●	●	●	●	●	
Miramar Reservoir	6.10	●		●				●[1]	●	●		●		●
Lake Murray	7.11	●		●				●[1]	●	●	●	●		●
Lake Jennings	7.12	●		●				●	●	●	●	●		

[1] Fishing from shore or boat permitted, but other water contact recreational (REC-1) uses are prohibited.

● Existing Beneficial Use

○ Potential Beneficial Use

Table 2-4. BENEFICIAL USES OF RESERVOIRS AND LAKES

Reservoirs & Lakes	Hydrologic Unit Basin Number	BENEFICIAL USE												
		MUN	AGR	IND	PROC	GWR	FRSH	REC1	REC2	WARM	COLD	WILD	RARE	POW
San Vicente Reservoir	7.21	●	●	●	●			●[1]	●	●	●	●		
El Capitan Reservoir	7.31	●	●	●	●			●[1]	●	●	●	●	●	
Cuyamaca Reservoir	7.43	●	●	●	●			●[1]	●	●	●	●	●	
Sweetwater Reservoir	9.21	●	●	●	●			●	●	●		●		
Loveland Reservoir	9.31	●	●	●	●			●	●	●	●	●		
Lower Otay Reservoir	10.31	●	●	●	●			●[1]	●	●	●	●		
Upper Otay Reservoir	10.32	●	●	●	●			●	●	●	●	●		
Lake Barrett	11.30	●	●	●	●		●	●	●	●	●	●	●	
Morena Reservoir	11.50	●	●	●	●		●	●[1]	●	●	●	●	●	

[1] Fishing from shore or boat permitted, but other water contact recreational (REC-1) uses are prohibited.

● Existing Beneficial Use

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water			Hydrologic Unit Basin Number	BENEFICIAL USE					
				MUN	AGR	IND	PROC	FRSH	GWR
SAN JUAN HYDROLOGIC UNIT			1.00						
Laguna	HA		1.10						
San Joaquin Hills	HSA	1	1.11	●	●				
Laguna Beach	HSA	1	1.12	●	●				
Aliso	HSA	2	1.13	●	●				
Dana Point	HSA	1	1.14	+	●				
Mission Viejo	HA		1.20						
Oso	HSA		1.21	●	●	●			
Upper Trabuco	HSA		1.22	●	●	●			
Middle Trabuco	HSA		1.23	●	●	●			
Gobernadora	HSA		1.24	●	●	●			
Upper San Juan	HSA		1.25	●	●	●			
Middle San Juan	HSA		1.26	●	●	●			

1 These beneficial uses do not apply to all lands on the coastal side of the inland boundary of the right-of-way of Pacific Coast Highway 1, and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of HA 1.10 are as shown.

2 These beneficial uses do not apply westerly of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

+ Excepted from MUN (see text)

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water			Hydrologic Unit Basin Number	BENEFICIAL USE					
				MUN	AGR	IND	PROC	FRSH	GWR
SAN JUAN HYDROLOGIC UNIT - continued			1.00						
Lower San Juan	HSA	3	1.27	●	●	●			
Ortega	HSA		1.28	●	●	●			
San Clemente	HA		1.30						
Prima Deshecha	HSA	2	1.31	●	●				
Segunda Deshecha	HSA		1.32	+					
San Mateo Canyon	HA	2	1.40	●	●	●			
San Onofre	HA	2	1.50	●	●				

2 These beneficial uses do not apply westerly of the easterly boundary of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

3 These beneficial uses do not apply to all lands on the coastal side of the inland boundary of the right-of-way of Pacific Coast Highway 1 west of the San Juan Creek channel and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of HA 1.20 are as shown.

● Existing Beneficial Use

\+ Excepted from MUN (see text)

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE					
			MUN	AGR	IND	PROC	FRSH	GWR
SANTA MARGARITA HYDROLOGIC UNIT		2.00						
Ysidora	HA [2]	2.10	●	●	●	●		
DeLuz	HA	2.20	●	●	●			
Murrieta	HA	2.30	●	●	●	●		
Auld	HA	2.40	●	●	●			
Pechanga	HA	2.50	●	●	●			
Wilson	HA	2.60	●	●	○			
Cave Rocks	HA	2.70	●	●				
Aguanga	HA	2.80	●	●	●			
Oakgrove	HA	2.90	●	●				

2 These beneficial uses do not apply westerly of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

○ Potential Beneficial Use

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE MUN	AGR	IND	PROC	FRSH	GWR
SAN LUIS REY HYDROLOGIC UNIT		3.00						
Lower San Luis	HA [2]	3.10	●	●	●			
Monserate	HA	3.20						
Pala	HSA	3.21	●	●	●			
Pauma	HSA	3.22	●	●	●			
La Jolla Amago	HSA	3.23	●	●	●	●		
Warner Valley	HA	3.30						
Warner	HSA	3.31	●	●	●		●	
Combs	HSA	3.32	●	●	●			

2 These beneficial uses do not apply westerly of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water			Hydrologic Unit Basin Number	BENEFICIAL USE					
				MUN	AGR	IND	PROC	FRSH	GWR
CARLSBAD HYDROLOGIC UNIT			4.00						
Loma Alta	HA	2	4.10	+		●			
Buena Vista Creek	HA		4.20						
El Salto	HSA	2	4.21	●	●	○			
Vista	HSA		4.22	●	●	●			
Agua Hedionda	HA		4.30						
Los Monos	HSA	2	4.31	●	●	●			
Los Monos	HSA	5	4.31	○	○	○			
Los Monos	HSA	6	4.31	○	●	○			
Buena	HSA		4.32	●	●	●			

2 These beneficial uses do not apply westerly of the easterly boundary of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

5 These beneficial uses designations apply to the portion of HSA 4.31 bounded on the west by the easterly boundary of Interstate Highway 5 right-of-way; on the east by the easterly boundary of El Camino Real; and on the north by a line extending along the southerly edge of Agua Hedionda Lagoon to the easterly end of the lagoon, thence in an easterly direction to Evans Point, thence easterly to El Camino Real along the ridge lines separating Letterbox Canyon and the area draining to the Marcario Canyon.

6 These beneficial uses apply to the portion of HSA 4.31 tributary to Agua Hedionda Creek downstream from the El Camino Real crossing, except lands tributary to Marcario Canyon (located directly southerly of Evans Point, land directly south of Agua Hedionda Lagoon, and areas west of Interstate Highway 5.

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (see text)

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water			Hydrologic Unit Basin Number	BENEFICIAL USE					
				MUN	AGR	IND	PROC	FRSH	GWR
CARLSBAD HYDROLOGIC UNIT - continued			4.00						
Encinas	HA		4.40	+					
San Marcos	HA		4.50						
Batiquitos	HSA	2,7	4.51	●	●	●			
Batiquitos	HSA	8	4.51	○	○	○			
Richland	HSA	2,7	4.52	●	●	●			
Twin Oaks	HSA	2,7	4.53	●	●	●			
Escondido	HA		4.60						
San Elijo	HSA	2	4.61	○	●	●			
Escondido	HSA		4.62	●	●	●			
Lake Wohlford	HSA		4.63	●	●	●			

2 These beneficial uses do not apply westerly of easterly boundary of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

7 These beneficial uses do not apply to HSA 4.51 and HSA 4.52 between Highway 78 and El Camino Real and to all lands which drain to Moonlight Creek, Cottonwood Creek and to Encinitas Creek and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the subarea are as shown.

8 These beneficial uses apply to the portion of HSA 4.51 bounded on the south by the north shore of Batiquitos Lagoon, on the west by the easterly boundary of the Interstate Highway 5 right-of-way, on the north by the subarea boundary and on the east by the easterly boundary of El Camino Real.

● Existing Beneficial Use

○ Potential Beneficial Use

\+ Excepted from MUN (see text)

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE					
			MUN	AGR	IND	PROC	FRSH	GWR
SAN DIEGUITO HYDROLOGIC UNIT		5.00						
Solana Beach	HA [2]	5.10	●	●	●			
Hodges	HA	5.20	●	●	●			
San Pasqual	HA	5.30	●	●	●			
Santa Maria Valley	HA	5.40						
Ramona	HSA	5.41	●	●	●	●		
Lower Hatfield	HSA	5.42	●	●	●			
Wash Hallow	HSA	5.43	●	●	●			
Upper Hatfield	HSA	5.44	●	●	●			
Ballena	HSA	5.45	●	●	●			
East Santa Teresa	HSA	5.46	●	●	●			
West Santa Teresa	HSA	5.47	●	●	●			
Santa Ysabel	HA	5.50	●	●				

2 These beneficial uses do not apply westerly of the easterly boundary of the right-of-way of Interstate Highway 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water			Hydrologic Unit Basin Number	BENEFICIAL USE					
				MUN	AGR	IND	PROC	FRSH	GWR
PENASQUITOS HYDROLOGIC UNIT			6.00						
Miramar Reservoir	HA	2, 9	6.10	●	●	●			
Poway	HA		6.20	●	●	○			
Scripps	HA		6.30	+					
Miramar	HA	10	6.40	+		○			
Tecolote	HA		6.50	+					

2 These beneficial uses do not apply westerly of the easterly boundary of the right-of-way of Interstate Highway 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

9 These beneficial uses do not apply to all lands which drain to Los Penasquitos Canyon from 1.5 miles west of Interstate Highway 15 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

10 These beneficial uses do not apply west of Interstate Highway 15. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (see text)

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE MUN	AGR	IND	PROC	FRSH	GWR
SAN DIEGO HYDROLOGIC UNIT		7.00						
Lower San Diego	HA	7.10						
Mission San Diego	HSA [2]	7.11	○	●	●	●		
Santee	HSA	7.12	●	●	●	●		
El Cajon	HSA	7.13	●	●	○	○		
Coches	HSA	7.14	●	●	●	○		
El Monte	HSA	7.15	●	●	●	○		
San Vicente	HA	7.20	●	●				
El Capitan	HA	7.30	●	●				
Boulder Creek	HA	7.40	●	●				

2 These beneficial uses do not apply westerly of the easterly boundary of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

○ Potential Beneficial Use

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE					
			MUN	AGR	IND	PROC	FRSH	GWR
PUEBLO SAN DIEGO HYDROLOGIC UNIT		8.00						
Point Loma	HA	8.10	+					
San Diego Mesa	HA	8.20	+					
National City	HA [2]	8.30	●					
SWEETWATER HYDROLOGIC UNIT		9.00						
Lower Sweetwater	HA	9.10						
Telegraph	HSA	9.11	○	●	○			
La Nacion	HSA	9.12	●	●	●			
Middle Sweetwater	HA	9.20	●	●	●			
Upper Sweetwater	HA	9.30	●	●				

2 These beneficial uses do not apply westerly of the easterly boundary of the right-of-way of Interstate 5 and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

○ Potential Beneficial Use

+ Excepted from MUN (see text)

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE					
			MUN	AGR	IND	PROC	FRSH	GWR
OTAY HYDROLOGIC UNIT		10.00						
Coronado	HA	10.10	+					
Otay Valley	HA	10.20	●	●	●			
Otay Valley	HA [11]	10.20	+		●			
Dulzura	HA	10.30	●	●	●			

11 This beneficial use designation applies to the portion of Otay HA (10.20), limited to lands within and tributary to Salt Creek on the east and Poggi Canyon on the west and including the several smaller drainage courses between these tributaries of the Otay River.

● Existing Beneficial Use

+ Excepted from MUN (see text)

Table 2-5. BENEFICIAL USES OF GROUND WATERS

Ground Water		Hydrologic Unit Basin Number	BENEFICIAL USE MUN	AGR	IND	PROC	FRSH	GWR
TIJUANA HYDROLOGIC UNIT		11.00						
Tijuana Valley	HA	11.10						
San Ysidro	HSA [12]	11.11	●	●	●			
Water Tanks	HSA	11.12	○	○	○			
Potrero	HA	11.20	●	●	●			
Barrett Lake	HA	11.30	●	●				
Monument	HA	11.40	●	●				
Morena	HA	11.50	●	●				
Cottonwood	HA	11.60	●	●				
Cameron	HA	11.70	●	●				
Campo	HA	11.80	●	●	●			

12 These beneficial uses do not apply west of Hollister Street and this area is excepted from the sources of drinking water policy. The beneficial uses for the remainder of the hydrologic area are as shown.

● Existing Beneficial Use

○ Potential Beneficial Use

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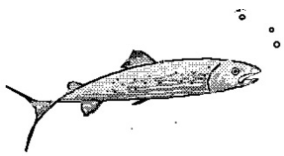
3. WATER QUALITY OBJECTIVES

INTRODUCTION



The purpose of this chapter is to designate the water quality objectives for all surface and ground waters in the Region. These water quality objectives are necessary to protect the beneficial uses designated in Chapter 2.

California Water Code (Water Code) section 13050(h) defines "water quality objectives" as follows:

"*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."*

By definition, water quality objectives must protect the most sensitive of the beneficial uses which have been designated for a water body. Water quality objectives may be numerical values for water quality constituents or narrative descriptions. Water quality objectives must be based upon sound scientific water quality criteria needed to protect the most sensitive of the beneficial uses which have been designated for a water body. Water quality objectives must be as stringent or more stringent than water quality criteria. Numerous key terms used throughout this chapter are defined in the Glossary which is included as Appendix A of this Basin Plan.

WATER QUALITY OBJECTIVES

Like the designation of beneficial uses, the designation of water quality objectives must satisfy all of the applicable requirements of the Water Code, Division 7 (Porter-Cologne Act) and the Clean Water Act. Water Code section 13241 provides that each Regional Water Quality Control Board shall establish water quality objectives for the waters of the state (i.e. ground and surface waters) which, in the Regional Board's judgment, are necessary for the reasonable protection of beneficial uses and for the prevention of nuisance. The Clean Water Act section 303 requires that the State adopt water quality objectives (called water quality criteria) for surface waters. The requirements of both Acts applicable to the designation of water quality objectives are summarized below.

WATER QUALITY OBJECTIVE DESIGNATION UNDER THE PORTER-COLOGNE WATER QUALITY CONTROL ACT

Significant points regarding the designation of water quality objectives for waters of the state under the Porter-Cologne Act are:

- Water quality objectives must ensure the reasonable protection of beneficial uses and the prevention of nuisance, recognizing that it may be possible for the quality of the water to be changed to some degree without unreasonably affecting beneficial uses. (Water Code section 13241)

- Protection of beneficial uses may not require that water quality objectives protect the existing quality of water. However, water quality objectives cannot be set at a level that would permit water quality to change to such a degree that the beneficial uses designated for protection are unreasonably affected. (Water Code section 13241)

- Water quality objectives must ensure that the water will be suitable for the beneficial uses which have been designated for protection. (Water Code section 13241)

- In establishing water quality objectives, the Regional Board must provide for the reasonable protection of all beneficial uses which are designated for protection, taking into account existing water quality, environmental and economic considerations. Water Code section 13241 provides that the Regional Board shall consider, but is not limited to, the following factors in establishing water quality objectives:

- Past, present, and probable future beneficial uses of water;
- Environmental characteristics of the hydrographic unit under consideration, including the quality of water available thereto;
- Water quality conditions that could reasonably be achieved through the coordinated control of all factors which affect water quality in the area;
- Economic considerations;
- The need for developing housing within the region; and
- The need to develop and use recycled water.

WATER QUALITY OBJECTIVE DESIGNATION UNDER THE CLEAN WATER ACT

Section 303 of the Clean Water Act requires the State to submit to the U.S. Environmental Protection Agency (USEPA) 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 Chapter 2 and the water quality objectives contained in this chapter. Significant points regarding the designation of water quality objectives for surface waters pursuant to the Clean Water Act are:

- Water quality objectives are called water quality criteria in the Clean Water Act.

- Water quality criteria (i.e., water quality objectives) are defined as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular surface water use. Water quality criteria are qualitative or quantitative estimates of the concentration of a water constituent which, when not exceeded, will ensure water quality sufficient to protect a designated beneficial use. Water quality criteria should reflect the latest scientific knowledge on the identifiable effects of pollutants on public health and welfare, aquatic life, and recreation [40 CFR 131.3(b)].

- States must adopt water quality criteria (i.e., water quality objectives) that protect designated surface water beneficial uses. For surface waters with multiple beneficial use designations, the water quality criteria shall support the most sensitive beneficial use [40 CFR 131.11(a)(1)].

- States must adopt water quality criteria (i.e., water quality objectives) for surface waters which are based upon USEPA guidance documents or other scientifically defensible methods. Economics are not considered in the development of water quality criteria for surface waters under the Clean Water Act [40 CFR 131.11(b)].

- Water quality criteria (i.e., water quality objectives) for surface waters can be either numeric or narrative specifications for water quality based on physical, chemical and toxicological data, and scientific judgment. Where numerical specifications cannot be established, narrative criteria must be established based upon biomonitoring methods [40 CFR 131.11(b)].

- The term "*water quality criteria*" has two meanings under the federal Clean Water Act. In one context, water quality criteria is equivalent to water quality objectives. In other words, water quality criteria is the standard that a state must impose to protect a surface water beneficial use. In another context, the term "*water quality criteria*" refers to scientific information USEPA has developed on the relationship that the effect of a constituent concentration has on human health, aquatic life, or other uses of water. USEPA has published information in documents such as the "*Gold Book*" (USEPA, 1986) and in various individual criteria documents.

STATE AND FEDERAL ANTIDEGRADATION POLICIES

Water quality objectives must also conform to USEPA regulations covering antidegradation [40 CFR section 131.12] and State Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California*. Application of the antidegradation provisions to the standard setting process requires supporting documentation and appropriate findings whenever a standard (water quality objective or beneficial use) is made less restrictive to accommodate the discharge of pollutants or other activities of man

FEDERAL ANTIDEGRADATION POLICY

Elegant tern

USEPA water quality standards regulations mandated under the Clean Water Act require that each state have an *"antidegradation*" policy for surface waters [40 CFR 131.6(d)]. Each state's policy must, at a minimum, be consistent with the following three principles (hereinafter referred to as the "*federal antidegradation policy*") set forth in 40 CFR 131.12(a):

(1) The first principle requires that all existing instream water uses shall be maintained and protected.

(2) The second principle protects waters whose quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water. For these waters, limited water quality degradation may be allowed if necessary to accommodate important economic or social development in the area in which the waters are located and if the water quality is adequate to protect existing uses fully.

(3) The third principle requires maintenance and protection of all high quality waters which constitute an outstanding national resource.

The federal antidegradation policy serves as a "*catchall*" water quality standard, to be applied where other water quality standards are not specific enough for a particular water body or where other water quality standards do not address a particular pollutant. The policy also serves to provide guidance for standard setting and for other regulatory decisions, to determine when additional control measures should be required to maintain instream beneficial uses or to maintain high quality surface waters. The federal antidegradation policy is not an absolute bar to reductions in surface water quality. Rather, the policy requires that reductions in water quality be justified as necessary to accommodate important social and economic development.

STATE ANTIDEGRADATION POLICY

Water quality objectives for waters of the state must conform to State Board Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California*. Under State Board Resolution No. 68-16, which applies to all waters of the State, the Regional Board and the State Board must have sufficient grounds to adopt findings which demonstrate that any water quality degradation will:

(1) Be consistent with the maximum benefit to the people of the State;

(2) Not unreasonably affect existing and potential beneficial uses of such water; and

(3) Not result in water quality less than described in the Basin Plan.

Resolution No. 68-16 establishes a general principle of nondegradation, with flexibility to allow some changes in water quality which is in the best interests of the State. Changes in water quality are allowed only where it is in the public interest and beneficial uses are not unreasonably affected. The State Board has interpreted Resolution No. 68-16 as incorporating the three part principles set forth in the federal antidegradation policy. The terms and conditions of Resolution No. 68-16 serve as a general narrative water quality objective in all state water quality control plans. A reprint of Resolution No. 68-16 is provided in the back of this Chapter on page 3-36.

DESIGNATED WATER QUALITY OBJECTIVES

The water quality objectives designated for the waters of the San Diego Region are listed below. These water quality objectives are necessary to protect existing and potential beneficial uses described in Chapter 2 and to protect existing high quality waters of the State.

The water quality objectives will be achieved primarily through the establishment of waste discharge requirements, and through the implementation of this water quality control plan.

The Regional Board, in establishing waste discharge requirements, will consider potential effects 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 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.

The water quality objectives are stated in italics and arranged first by the water body type to which they apply (e.g., all waters; all ocean waters; and all inland surface, enclosed bay and estuaries, coastal lagoons, and ground waters). Within each water body type, the water quality objectives are alphabetized by constituent.

In most cases the water quality objective is preceded by a general description of the constituent limited by the objective. The objectives vary in applicability and scope, reflecting the variety of beneficial uses of water which have been identified. Where numerical limits are specified, they represent the maximum levels of constituents that will allow the beneficial use to continue unimpaired. In other cases, an objective may tolerate natural or "*background*" levels of certain substances or characteristics but no increases over those values, or may express a limit in terms of not adversely affecting beneficial uses. An adverse effect or impact on a beneficial use occurs where there is an actual or threatened loss or impairment of that beneficial use.

GENERAL ANTIDEGRADATION OBJECTIVE

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

General Antidegradation Water Quality Objective

Wherever the existing quality of water is better than the quality of water established herein as objectives, 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, or the federal Antidegradation Policy, 40 CFR 131.12 (for surface waters only).

Pacific bonito

OCEAN WATERS

The following objectives shall apply to all ocean waters of the State within the Region.

OCEAN PLAN AND THERMAL PLAN

Ocean Plan and Thermal Plan Water Quality Objective

The terms and conditions of the State Board's "Water Quality Control Plan for Ocean Waters of California" (Ocean Plan), "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 are incorporated into this Basin Plan by reference. The terms and conditions of the Ocean Plan and Thermal Plan apply to the ocean waters within this Region.

The shoreline segment along Baby Beach within Dana Point Harbor is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-3, *Beneficial Uses of Coastal Waters*, Footnote 2, and Chapter 7, *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

Certain Pacific Ocean shoreline segments of the following Hydrological Units, Areas, and Subareas are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d): San Joaquin Hills HSA 901.11 and Laguna Beach HAS 901.12, Aliso Creek HSA 901.13, Dana Point HSA 901.14, Lower San Juan HSA 901.27, San Clemente HA 901.30, San Luis Rey HU 903.00, San Marcos HA 904.50, San Dieguito HU 905.00, Miramar Reservoir HA 906.10, Scripps HA 906.30, and Mission San Diego HSA 907.11 and Santee HSA 907.12. Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-3, *Beneficial uses of Coastal Waters*, Footnotes 1, 6, 9, 10, and 11, and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

Total Maximum Daily Load (TMDL) Implementation Provisions

For the purposes of a TMDL, the water quality objectives for total coliform, fecal coliform, and/or enterococcus bacteria in ocean waters designated for contact recreation may be implemented using a reference system and antidegradation approach or natural sources exclusion approach.

See Chapter 4 (Implementation) for further discussion of this implementation provision.

DISSOLVED OXYGEN

Adequate dissolved oxygen is vital for aquatic life. Depression of dissolved oxygen levels can lead to fish kills and odors resulting from anaerobic decomposition. Dissolved oxygen content in water is a function of water temperature and salinity.

Water Quality Objective for Dissolved Oxygen

The dissolved oxygen concentration in ocean waters shall not at any time be depressed more than 10 percent from that which occurs naturally, as the result of the discharge of oxygen demanding waste materials.

HYDROGEN ION CONCENTRATION (pH)

The hydrogen ion concentration of water is called "*pH*". The acidity or alkalinity of water is measured by the pH factor. The pH scale ranges from 1 to 14, with 1 to 6.9 being acid, 7.1 to 14 being alkaline, and 7.0 being neutral. Ranges (pH) of 6.5 to 9.0 are considered harmless. A change of one point on this scale represents a ten-fold increase in acidity or alkalinity. Many pollutants can alter the pH, raising or lowering it excessively. In some cases even small changes in pH can harm aquatic biota. The pH changes can alter the chemical form of certain constituents, thereby increasing their bioavailability and toxicity. For example a decrease in pH can result in an increase in dissolved metal concentrations. Ammonia, which is a major component of sewage discharges, can be completely safe at pH 7.0 and extremely toxic to fish at pH 8.5 for the same total ammonia concentration.

Water Quality Objective for pH

The pH value shall not be changed at any time more than 0.2 pH units from that which occurs naturally.

INLAND SURFACE WATERS, ENCLOSED BAYS AND ESTUARIES, COASTAL LAGOONS AND GROUND WATERS

The following objectives apply to all inland surface waters, enclosed bays and estuaries, coastal lagoons, and ground waters of the Region as specified below.

THERMAL PLAN

Thermal Plan Water Quality Objective

The terms and conditions of the State Board's "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 are incorporated into this Basin Plan by reference. The terms and conditions of the Thermal Plan apply to the Inland Surface Waters, Enclosed Bays and Estuaries, and Coastal Lagoons within this Region.

AGRICULTURAL SUPPLY BENEFICIAL USE

Water Quality Objective for Agricultural Supply

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

AMMONIA, UN-IONIZED

Ammonia is a pungent, colorless, gaseous alkaline compound of nitrogen and hydrogen that is highly soluble in water. Un-ionized ammonia (NH_3) is toxic to fish and other aquatic organisms. In water, NH_3 exists in equilibrium with ammonium (NH_{4+}) and hydroxide (OH-) ions. The proportions of each change as the temperature, pH, and salinity of the water change.

Water Quality Objective for Un-ionized Ammonia

The discharge of wastes shall not cause concentrations of un-ionized ammonia (NH_3) to exceed 0.025 mg/l (as N) in inland surface waters, enclosed bays and estuaries and coastal lagoons.

BACTERIA - TOTAL COLIFORM, FECAL COLIFORM, E.COLI, AND ENTEROCOCCI

Total coliform, fecal coliform, *Escherichia coli (E. coli*), and enterococci bacteria are used to indicate the likelihood of pathogens of fecal origin in surface waters. Fecal bacteria (e.g., fecal coliform, *E. coli*, and enterococci) are part of the intestinal biota of warm-blooded animals. Their presence in surface waters is an indicator of potential pollution. Total coliform numbers can include non-fecal bacteria, so additional testing is often done to confirm the presence and numbers of fecal bacteria. Water quality objectives for numbers of total coliform, fecal coliform, *E.coli*, and enterococci vary with the beneficial uses of the water, as described below. The water quality objectives for bacteria are expressed in units of organisms per 100 milliliters of water.

The shoreline segment along Shelter Island Shoreline Park within San Diego Bay is designated as a water quality limited segment for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-3, *Beneficial Uses of Coastal Waters*, Footnote 5, and Chapter 7, *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*.

Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, San Diego River (lower), and Chollas Creek are designated as water quality limited segments for indicator bacteria pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapter 2, Table 2-2, *Beneficial Uses of Inland Surface Waters*, Footnote 3 and Chapter 7, *Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

(1) Waters Designated for Contact Recreation (REC-1) Beneficial Use

Fecal Coliform Water Quality Objective for Contact Recreation

The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, shall not exceed a log mean of 200 organisms per 100 ml.

In addition, the fecal coliform concentration shall not exceed 400 organisms per 100 ml for more than 10 percent of the total samples during any 30-day period.

Surfer at Ocean Beach, San Diego County

Enterococci and E. Coli Water Quality Objectives for Contact Recreation

The USEPA published E. coli and enterococci bacteriological criteria applicable to waters designated for contact recreation (REC-1) in the Federal Register, Vol. 51, No. 45, Friday, March 7, 1986, 8012-8016.

USEPA BACTERIOLOGICAL CRITERIA FOR WATER CONTACT RECREATION [1,2]
(in colonies per 100 ml)

	Freshwater		*Saltwater*
	Enterococci	*E.coli*	*Enterococci*
Steady State			
All Areas	*33*	*126*	*35*
Maximum			
Designated Beach	*61*	*235*	*104*
Moderately or Lightly Used Area	*108*	*406*	*276*
Infrequently Used Area	*151*	*576*	*500*

Total Coliform Water Quality Objective for Contact Recreation for Bays and Estuaries

In bays and estuaries, the most probable number of total coliform organisms in the upper 60 feet of the water column shall be less than 1,000 organisms per 100 ml (10 organisms per ml); provided that not more than 20 percent of the samples at any sampling station, in any 30-day period, may exceed 1,000 organisms per 100 ml (10 per ml); and provided further that no single sample as described below is exceeded.

The most probable number of total coliform organisms in the upper 60 feet of the water column in no single sample when verified by a repeat sample taken within 48 hours shall exceed 10,000 organisms per 100 ml (100 organisms per ml).

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[1] *The criteria were published in the Federal Register, Vol. 51, No. 45/Friday, March 7, 1986/8012-8016. The criteria are based on:*

Cabelli, V. J. 1983. Health Effects Criteria for Marine Recreational Waters. U.S. Environmental Protection Agency, EPA 600/1-80-031, Cincinnati, Ohio.

Dufour, A. P. 1984. Health Effects Criteria for Fresh Recreational Waters. U.S. Environmental Protection Agency, EPA 600/1-84-004, Cincinnati, Ohio.

[2] *The EPA criteria apply to water contact recreation only. The criteria provide for a level of protection based on the frequency of usage of a given water contact recreation area. The criteria may be employed in special studies within this Region to differentiate between pollution sources or to supplement the current coliform objectives for water contact recreation.*

(2) Waters Designated for Non-Contact Recreation (REC-2) Beneficial Use

Fecal Coliform Water Quality Objective for Non-contact Recreation

In waters designated for non-contact recreation (REC-2) and not designated for contact recreation (REC-1), the average fecal coliform concentrations for any 30-day period, shall not exceed 2,000 organisms per 100 ml nor shall more than 10 percent of samples collected during any 30-day period exceed 4,000 organisms per 100 ml.

(3) Waters Where Shellfish May Be Harvested for Human Consumption (SHELL and COMM) Beneficial Use

Total Coliform Water Quality Objective for Shellfish Harvesting

In waters where shellfish harvesting for human consumption, commercial or sports purposes is designated (SHELL and COMM), the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70 organisms per 100 ml nor shall more than 10 percent of the samples collected during any 30-day period exceed 230 organisms per 100 ml for a five-tube decimal dilution test or 330 organisms per 100 ml when a three-tube decimal dilution test is used.

(4) San Diego Bay Waters Used for Whole Fish Handling

E. Coli Water Quality Objective for Whole Fish Handling for San Diego Bay

In San Diego Bay where bay waters are used for whole fish handling, the density of E. coli shall not exceed 7 organisms per ml in more than 20 percent of any 20 daily consecutive samples of bay water.

(5) Total Maximum Daily Load (TMDL) Implementation Provisions

For the purposes of a TMDL, the following provisions may be used to implement bacteria water quality objectives:

The water quality objectives for fecal coliform bacteria for contact recreation may be implemented using a reference system and antidegradation approach or natural sources exclusion approach.

The water quality objectives for enterococci and/or *E. coli* in freshwater and/or saltwater may be implemented using a reference system and antidegradation approach or natural sources exclusion approach.

The water quality objectives for coliform organisms in bays and estuaries may be implemented using a reference system and antidegradation approach or natural sources exclusion approach.

The water quality objectives for fecal coliform bacteria for non-contact recreation may be implemented using a reference system and antidegradation approach or natural sources exclusion approach.

See Chapter 4 (Implementation) for a further discussion of this implementation provision.

BIOSTIMULATORY SUBSTANCES

Excessive growth of algae and/or other aquatic plants can degrade water quality. Algal blooms sometimes occur naturally; however, they are often the result of waste discharges or nonpoint source pollutants. Algal blooms depress the dissolved oxygen content of water and can result in fish kills. Algal blooms can also lead to problems with taste, odors, color, and increased turbidity. Floating algal scum and algal mats are also an aesthetically unpleasant nuisance. This general condition is known as eutrophication.

Water Quality Objectives for Biostimulatory Substances

Inland surface waters, bays and estuaries and coastal lagoon waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growths cause nuisance or adversely affect beneficial uses.

Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth. Threshold total phosphorus (P) concentrations shall not exceed 0.05 milligrams per liter (mg/l) in any stream at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water. A desired goal in order to prevent plant nuisance in streams and other flowing waters appears to be 0.1 mg/l total P. These values are not to be exceeded more than 10% of the time unless studies of the specific water body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N:P = 10:1 , on a weight to weight basis shall be used.

Inland surface waters shall not contain biostimulatory substances in concentrations in excess of the numerical objectives described in Table 3-2.

Rainbow Creek is designated as an impaired water body for total nitrogen and total phosphorus pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads (TMDLs) have been adopted to address these impairments. See Chapter 2, *Beneficial Uses* Table 2-2. *Beneficial Uses of Inland Surface Waters*, Santa Margarita River Watershed, Rainbow Creek, Hydrologic Unit Basin Numbers 2.23 and 2.22, Footnote 3 and Chapter 7, *Total Maximum Daily Loads*.

Note - Certain exceptions to the above water quality objectives are described in Chapter 4 in the sections titled *Discharges to Coastal Lagoons from Pilot Water Reclamation Projects* and *Discharges to Inland Surface Waters*.

BORON

Boron occurs as sodium borate (borax) or as calcium borate (colemanite) in mineral deposits and natural waters of southern California. Boron is not considered harmful in drinking waters in concentrations up to 30 mg/l. Boron is an essential element for the growth of plants but there is no evidence that it is required by animals. Naturally occurring concentrations of boron should have no effect on aquatic life. Concentrations of boron in irrigation waters in excess of 0.75 mg/l may be deleterious to sensitive plants such as citrus. The maximum safe concentration of boron for even the most tolerant plants is about 4.0 mg/l. The United States Environmental Protection Agency (USEPA) has established a water quality criterion for boron of 0.75 mg/l for long term-term irrigation on sensitive crops. This criterion is found in *Quality Criteria for Water, 1986 - the "Gold Book".* Additional information regarding boron concentrations in irrigation waters is presented in Table 3-1.

Oranges

Water Quality Objectives for Boron

Inland surface waters shall not contain boron in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain boron in concentrations in excess of the numerical objectives described in Table 3-3.

Table 3-1. Guidelines for Interpretation of Water Quality for Irrigation[a]

Potential Irrigation Problem	Units	Degree or Restriction on use		
		None	Slight to Moderate	Severe
Salinity (affects crop water availability)				
Electrical Conductivity (EC_W[b])	ds/m or mmho/cm	< 0.7	0.7 - 3.0	> 3.0
TDS	mg/l	< 450	450 – 2,000	> 2,000
Permeability (affects infiltration rate of water into soil. Evaluate using EC_W and Sodium Adsorption Ratio (SAR) together) [c, d]				
SAR =		**and EC_W =**		
0 - 3		> 0.7	0.7 - 0.2	< 0.2
3 - 6		> 1.2	1.2 - 0.3	< 0.3
6 - 12		> 1.9	1.9 - 0.5	< 0.5
12 - 20		> 2.9	2.9 - 1.3	< 1.3
20 - 40		> 5.0	5.0 - 2.9	< 2.9
Specified ion toxicity (affects sensitive crops)				
Sodium (Na) [e,f]				
surface irrigation	SAR	< 3	3 - 9	> 9
sprinkler irrigation	mg/l	< 70	> 70	-----
Chloride (Cl) [e,f]				
surface irrigation	mg/l	< 140	140 - 350	> 350
sprinkler irrigation	mg/l	< 100	> 100	-----
Boron (B)	mg/l	< 0.7	0.7 - 3.0	> 3.0
Miscellaneous effects (affects susceptible crops)				
Nitrogen (Total-N) [g]	mg/l	< 5	5 - 30	> 30
Bicarbonate (HCO_3) overhead sprinkler only)	mg/l	< 90	90 - 500	> 500
pH	normal range	6.5 - 8.4		
Residual chlorine (overhead sprinkler only)	mg/l	< 1.0	1.0 - 5.0	> 5.0

Endnotes for Table 3-1

a. Interpretations are based on possible effects of constituents on crops and/or soils. Guidelines are flexible and should be modified when warranted by local experience or special conditions of crop, soil, and method of irrigation. Table 3-1 is based on Table 3-4 contained in "*Irrigation with Reclaimed Municipal Wastewater, A Guidance Manual,*" California State Water Resources Control Board, Report Number 84-1, July 1984.

b. EC_w means electrical conductivity of the irrigation water, reported in mmho/cm or ds/m.
TDS means total dissolved solids, reported in mg/l.

c. SAR means sodium adsorption ratio. SAR is sometimes reported as R_{Na}. At a given SAR, infiltration rate increases as salinity (EC_w) increases. Evaluate the potential permeability problem by SAR and EC_w in combination.

$$SAR = \frac{Na}{\sqrt{\frac{(Ca + Mg)}{2}}}$$

Where *Na, Ca,* and *Mg* are in milliequivalents per liter.

d. For wastewaters, it is recommended that the SAR be adjusted to include a more correct estimate of calcium in the soil water following an irrigation. The adjusted sodium adsorption ratio (adj RNa) calculated by this product is to be substituted for the SAR value.

$$SAR = \frac{Na}{\sqrt{\frac{(Ca_x + Mg)}{2}}}$$

Where *Na, Ca,* and *Mg* are in milliequivalents per liter.

Ca_x is a modified Ca value calculated using Table 3-2, contained in "*Irrigation with Reclaimed Municipal Wastewater, A Guidance Manual.*"

e. Most tree crops and woody ornamentals are sensitive to sodium and chloride; use the values shown. Most annual crops are not sensitive; use the salinity tolerance tables. For boron sensitivity, refer to boron tolerance tables.

f. With overhead sprinkler irrigation and low humidity (<30%), sodium or chloride greater than 70 or 100 mg/l, respectively, have resulted in excessive leaf absorption and crop damage to sensitive crops.

g. Total nitrogen should include nitrate-nitrogen, ammonia-nitrogen, and organic-nitrogen. Although forms of nitrogen in wastewater vary, the plant responds to the total nitrogen.

Table 3-2. Water Quality Objectives

Concentrations not to be exceeded more than 10% of the time during any one year period.

Inland Surface Waters			Hydrologic Unit Basin Number	Constituent (mg/L or as noted)												
				TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SAN JUAN HYDROLOGIC UNIT			**901.00**													
Laguna	HA		1.10	1,000	400	500	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Mission Viejo	HA		1.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Clemente	HA		1.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Mateo Canyon	HA		1.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Onofre	HA		1.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
SANTA MARGARITA HYDROLOGIC UNIT			**902.00**													
Ysidora	HA		2.10	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Deluz	HA		2.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Deluz Creek	HSA	b	2.21	750	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Gavilan	HSA	b	2.22	750	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Murrieta	HA		2.30	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Auld	HA		2.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Pechanga	HA		2.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Wolf	HSA	b	2.52	750	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Wilson	HA		2.60	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Cave Rocks	HA		2.70	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Aguanga	HA		2.80	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Oakgrove	HA		2.90	750	300	300	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0

HA - Hydrologic Area
HAS - Hydrologic Sub-Area (Lower case letters indicate endnotes following the table)

Table 3-2. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Inland Surface Waters		Hydrologic Unit Basin Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SAN LUIS REY HYDROLOGIC UNIT		**903.00**													
Lower San Luis	HA	3.10	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Monserat	HA	3.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Warner Valley	HA	3.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
CARLSBAD HYDROLOGIC UNIT		**904.00**													
Loma Alta	HA	4.10	-	-	-	-	-	-	-	-	-	none	20	20	1.0
Buena Vista Creek	HA	4.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Agua Hedionda	HA	4.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Encinas	HA	4.40	-	-	-	-	-	-	-	-	-	none	20	20	1.0
San Marcos	HA	4.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Escondido Creek	HA	4.60	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
SAN DIEGUITO HYDROLOGIC UNIT		**905.00**													
Solana Beach	HA	5.10	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Hodges	HA	5.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
San Pasqual	HA	5.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Santa Maria Valley	HA	5.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Santa Ysabel	HA	5.50	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0

HA - Hydrologic Area
HAS - Hydrologic Sub-Area (Lower case letters indicate endnotes following the table)

Table 3-2. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Inland Surface Waters		Hydrologic Unit Basin Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
PENASQUITOS HYDROLOGIC UNIT		**906.00**													
Miramar Reservoir	HA	6.10	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Poway	HA	6.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Scripps	HA	6.30	-	-	-	-	a	-	-	-	-	none	20	20	-
Miramar	HA	6.40	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Tecolote	HA	6.50	-	-	-	-	a	-	-	-	-	none	20	20	-
SAN DIEGO HYDROLOGIC UNIT		**907.00**													
Lower San Diego	HA	7.10	1,000	400	500	60	a	0.3	0.05	0.5	1.0	none	20	20	-
Mission San Diego	HSA	7.11	1,500	400	500	60	a	1.0	1.00	0.5	1.0	none	20	20	-
Santee	HSA c,	7.12	1,000	400	500	60	a	1.0	1.00	0.5	1.0	none	20	20	-
Santee	HSA d	7.12	1,500	400	500	60	a	1.0	1.00	0.5	1.0	none	20	20	-
San Vicente	HA	7.20	300	50	65	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
El Capitan	HA	7.30	300	50	65	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Boulder Creek	HA	7.40	300	50	65	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
PUEBLO SAN DIEGO HYDROLOGIC UNIT		**908.00**													
Point Loma	HA	8.10	-	-	-	-	-	-	-	-	-	none	20	20	-
San Diego Mesa	HA	8.20	-	-	-	-	-	-	-	-	-	none	20	20	-
National City	HA	8.30	-	-	-	-	-	-	-	-	-	none	20	20	-

HA - Hydrologic Area
HAS - Hydrologic Sub-Area (Lower case letters indicate endnotes following the table)

Table 3-2. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Inland Surface Waters		Hydrologic Unit Basin Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO_4	%Na	N&P	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SWEETWATER HYDROLOGIC UNIT		**909.00**													
Lower Sweetwater	HA	9.10	1,500	500	500	60	a	0.3	0.05	0.5	0.75	none	20	20	-
Middle Sweetwater	HA	9.20	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Upper Sweetwater	HA	9.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
OTAY HYDROLOGIC UNIT		**910.00**													
Coronado	HA	10.10	-	-	-	-	-	-	-	-	-	-	-	-	-
Otay Valley	HA	10.20	1,000	400	500	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
Dulzura	HA	10.30	500	250	250	60	a	0.3	0.05	0.5	0.75	none	20	20	1.0
TIJUANA HYDROLOGIC UNIT		**911.00**													
Tijuana Valley	HA	11.10	-	-	-	-	-	-	-	-	-	-	-	-	-
San Ysidro	HSA	11.11	2,100	-	-	-	a	-	-	-	-	none	20	20	-
Potrero	HA	11.20	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Barrett Lake	HA	11.30	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Monument	HA	11.40	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Morena	HA	11.50	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Cottonwood	HA	11.60	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Cameron	HA	11.70	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0
Campo	HA	11.80	500	250	250	60	a	0.3	0.05	0.5	1.0	none	20	20	1.0

HA - Hydrologic Area
HAS - Hydrologic Sub-Area (Lower case letters indicate endnotes following the table)

Endnotes for Table 3-2

a. Concentrations of nitrogen and phosphorus, by themselves or in combination with other nutrients, shall be maintained at levels below those which stimulate algae and emergent plant growth. Threshold total Phosphorus (P) concentrations shall not exceed 0.05 mg/l in any stream at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water. A desired goal in order to prevent plant nuisances in streams and other flowing waters appears to be 0.1 mg/l total P. These values are not to be exceeded more than 10% of the time unless studies of the specific body in question clearly show that water quality objective changes are permissible and changes are approved by the Regional Board. Analogous threshold values have not been set for nitrogen compounds; however, natural ratios of nitrogen to phosphorus are to be determined by surveillance and monitoring and upheld. If data are lacking, a ratio of N: P=10:1 shall be used. Note - Certain exceptions to the above water quality objectives are described in Chapter 4 in the sections titled Discharges to Coastal Lagoons from Pilot Water Reclamation Projects and Discharges to Surface Waters.

b. These objectives apply to the lower portion of Murrieta Creek in the Wolf HSA (2.52) and the Santa Margarita River from it's beginning at the confluence of Murrieta and Temecula Creeks, through the Gavilan HSA (2.22) and DeLuz HSA (2.21), to where it enters the Upper Ysidora HSA (2.13).

c. Sycamore Canyon Subarea, a portion of the Santee Hydrologic Subarea, includes the watersheds of the following north-south trending canyons: Oak Creek, Spring Canyon, Little Sycamore Canyon, Quail Canyon, and Sycamore Canyon. The Sycamore Canyon subarea extends eastward from the Mission San Diego HSA to the confluence of the San Diego River and Forester Creek, immediately south of the Santee Lakes.

d. These objectives apply to the Lower Sycamore Canyon portion of the Santee Hydrologic Subarea described as all of the Sycamore Canyon watershed except that part which drains north of the boundary between sections 28 and 33, Township 14 South, Range 1 West.

Table 3-3. Water Quality Objectives

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water		Hydrologic Basin Unit Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO_4	%Na	NO_3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SAN JUAN HYDROLOGIC UNIT		**901.00**													
Laguna	HA	1.10													
San Joaquin Hills	HSA	1.11	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Laguna Beach	HSA	1.12	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Aliso	HSA	1.13	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Dana Point	HSA	1.14	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Mission Viejo	HA	1.20													
Oso	HSA	1.21	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Upper Trabuco	HSA	1.22	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Middle Trabuco	HSA	1.23	750	375	375	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Gobernadora	HSA	1.24	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Upper San Juan	HSA	1.25	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Middle San Juan	HSA	1.26	750	375	375	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Lower San Juan	HSA	1.27	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Ortega	HSA	1.28	1,100	375	450	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
San Clemente	HA	1.30													
Prima Deshecha	HSA	1.31	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Segunda Deshecha	HSA	1.32	1,200	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
San Mateo Canyon	HA [a]	1.40	500 [b]	250	250 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
San Onofre	HA [a]	1.50	500 [b]	250	250 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0

HA - Hydrologic Area
HAS - Hydrologic Sub-Area (Lower case letters indicate endnotes following the table)

Table 3-3. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water		Hydrologic Basin Unit Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO4	%Na	NO3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SANTA MARGARITA HYDROLOGIC UNIT		**902.00**													
Ysidora	HA [a]	2.10	750 [c]	300 [c]	300 [c]	60	45 [c]	0.3 [c]	0.05 [c]	0.5	0.75 [c]	none	5	15	1.0
Deluz	HA	2.20	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Deluz Creek	HSA [m]	2.21	750	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Gavilan	HSA [m]	2.22	750	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Murrieta	HA	2.30	750 [c]	300 [c]	300 [c]	60	45 [c]	0.3 [c]	0.05 [c]	0.5	0.75 [c]	none	5	15	1.0
Domenigoni	HSA	2.35	2,000	-	-	-		-	-	-	-	-	-	-	-
Auld	HA	2.40	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Pechanga	HA	2.50	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Pauba	HSA [o]	2.51	750	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Wolf	HSA [p]	2.52	750	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Wilson	HA	2.60	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Cave Rocks	HA	2.70	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Aguanga	HA	2.80	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Oakgrove	HA	2.90	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
SAN LUIS REY HYDROLOGIC UNIT		**903.00**													
Lower San Luis	HA	3.10	800 [r]	300	400	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Mission	HSA [a]	3.11	1,500 [cd]	500 [cd]	500 [cd]	60	45 [cd]	0.85 [cd]	0.15 [cd]	0.5 [d]	0.75 [cd]	none	5	15 [d]	1.0 [d]
Bonsall	HSA	3.12	1,500 [cd]	500 [cd]	500 [cd]	60	45 [cd]	0.85 [cd]	0.15 [cd]	0.5 [d]	0.75 [cd]	none	5	15 [d]	1.0 [d]
Moosa	HSA	3.13	1,200 [r]	300	400	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Valley Center	HSA	3.14	1,100 [r]	300	400	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0

HA - Hydrologic Area
HAS - Hydrologic Sub-Area (Lower case letters indicate endnotes following the table)

Table 3-3. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water		Hydrologic Basin Unit Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO_4	%Na	NO_3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SAN LUIS REY HYDROLOGIC UNIT (continued)		**903.00**													
Monserate	HA	3.20													
Pala	HSA	3.21	900 [c]	300 [c]	500 [c]	60	45 [c]	0.3 [c]	0.05 [c]	0.5	0.75	none	5	15	1.0
Pauma	HSA	3.22	800 [c]	300 [c]	400 [c]	60	45 [c]	0.3 [c]	0.05 [c]	0.5	0.75	none	5	15	1.0
La Jolla Amago	HSA	3.23	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Warner Valley	HA	3.30	500	250	250	60	5	0.3	0.05	0.5	0.75	none	5	15	1.0
CARLSBAD HYDROLOGIC UNIT		**904.00**													
Loma Alta	HA	4.10	-	-	-	-	-	-	-	-	-	-	-	-	-
Buena Vista Creek	HA	4.20													
El Salto	HSA [a]	4.21	3,500	800	500	60	45	0.3	0.05	0.5	2.0	none	5	15	1.0
Vista	HSA [a]	4.22	1,000 [b]	400 [b]	500 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
Agua Hedionda	HA [a]	4.30	1,200	500	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Los Monos	HSA [a j]	4.31	3,500	800	500	60	45	0.3	0.05	0.5	2.0	none	5	15	1.0
Encinas	HA [a]	4.40	3,500 [b]	800 [b]	500 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	2.0 [b]	none	5	15	1.0
San Marcos	HA [a e]	4.50	1,000	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Batiquitos	HSA [a e k]	4.51	3,500	800	500	60	45	0.3	0.05	0.5	2.0	none	5	15	1.0
Escondido Creek	HA [a]	4.60	750	300	300	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
San Elijo	HSA [a]	4.61	2,800	700	600	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Escondido	HSA	4.62	1,000	300	400	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0

HA - Hydrologic Area
HAS - Hydrologic Sub-Area (Lower case letters indicate endnotes following the table)

Table 3-3. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water		Hydrologic Basin Unit Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO_4	%Na	NO_3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
SAN DIEGUITO HYDROLOGIC UNIT		**905.00**													
Solana Beach	HA [a]	5.10	1,500 [b]	500 [b]	500 [b]	60	45 [b]	0.85 [b]	0.15 [b]	0.5	0.75 [b]	none	5	15	1.0
Hodges	HA	5.20	1,000 [b]	400 [b]	500 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
San Pasqual	HA	5.30	1,000 [b]	400 [b]	500 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
Santa Maria Valley	HA	5.40	1,000	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Santa Ysabel	HA	5.50	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
PENASQUITOS HYDROLOGIC UNIT		**906.00**													
Miramar Reservoir	HA [a f]	6.10	1,200	500	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Poway	HA	6.20	750 [q]	300	300	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Scripps	HA	6.30	-	-	-	-	-	-	-	-	-	-	-	-	-
Miramar	HA [g]	6.40	750	300	300	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Tecolote	HA	6.50	-	-	-	-	-	-	-	-	-	-	-	-	-
SAN DIEGO HYDROLOGIC UNIT		**907.00**													
Lower San Diego	HA	7.10													
Mission San Diego	HSA [a]	7.11	3,000 [b]	800 [b]	600 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	2.0 [b]	none	5	15	1.0
Santee	HSA	7.12	1,000 [b]	400 [b]	500 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
Santee (alluvial aquifer for lower Sycamore Canyon)	HSA [n]	7.12	2,000 [b]	800 [b]	600 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	2.0 [b]	none	5	15	1.0
El Cajon	HSA	7.13	1,200 [b]	250 [b]	500 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
Coches	HSA	7.14	600 [b]	250 [b]	250 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
El Monte	HSA	7.15	600 [b]	250 [b]	250 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0

HA - Hydrologic Area
HAS - Hydrologic Sub-Area (Lower case letters indicate endnotes following the table)

Table 3-3. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water		Hydrologic Basin Unit Number	TDS	Cl	SO_4	%Na	NO_3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
			Constituent (mg/L or as noted)												
SAN DIEGO HYDROLOGIC UNIT (continued)		**907.00**													
San Vicente	HA	7.20	600	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
El Capitan	HA	7.30	1,000	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Conejos Creek	HSA	7.31	350	60	60	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Boulder Creek	HA	7.40	350	60	60	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
PUEBLO SAN DIEGO HYDROLOGIC UNIT		**908.0**													
Point Loma	HA [i]	8.10	-	-	-	-	-	-	-	-	-	-	-	-	-
San Diego Mesa	HA [i]	8.20	-	-	-	-	-	-	-	-	-	-	-	-	-
National City	HA [i]	8.30	750	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
SWEETWATER HYDROLOGIC UNIT		**909.00**													
Lower Sweetwater	HA	9.10													
Telegraph	HSA	9.11	3,000 [b]	750 [b]	500 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	2.0 [b]	none	5	15	1.0
La Nacion	HSA	9.12	1,500 [b]	500 [b]	500 [b]	60	45 [b]	0.3 [b]	0.15 [b]	0.5	0.75 [b]	none	5	15	1.0
Middle Sweetwater	HA	9.20	1,000	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
Upper Sweetwater	HA	9.30	500	250	250	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0
OTAY HYDROLOGIC UNIT		**910.00**													
Coronado	HA	10.10	-	-	-	-	-	-	-	-	-	-	-	-	-
Otay Valley	HA	10.20	1,500 [b]	500 [b]	500 [b]	60	45 [b]	0.3 [b]	0.05 [b]	0.5	0.75 [b]	none	5	15	1.0
Otay Valley	HA [l]	10.20	-	-	-	-	-	-	-	-	-	none	-	-	-
Dulzura	HA	10.30	1,000	400	500	60	45	0.3	0.05	0.5	0.75	none	5	15	1.0

HA - Hydrologic Area
HAS - Hydrologic Sub-Area (Lower case letters indicate endnotes following the table)

Table 3-3. Water Quality Objectives (continued)

Concentrations not to be exceeded more than 10% of the time during any one year period.

Ground Water		Hydrologic Basin Unit Number	Constituent (mg/L or as noted)												
			TDS	Cl	SO_4	%Na	NO_3	Fe	Mn	MBAS	B	ODOR	Turb NTU	Color Units	F
TIJUANA HYDROLOGIC UNIT		**911.00**													
Tijuana Valley	HA [h]	11.10	2,500 [b]	550 [b]	900 [b]	70	-	-	-	-	2.0 [b]	none	-	-	-
Potrero	HA	11.20	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Barrett Lake	HA	11.30	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Monument	HA	11.40	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Morena	HA	11.50	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Cottonwood	HA	11.60	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Cameron	HA	11.70	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0
Campo	HA	11.80	500	250	250	60	45	0.3	0.05	0.5	1.0	none	5	15	1.0

HA - Hydrologic Area
HAS - Hydrologic Sub-Area (Lower case letters indicate endnotes following the table)

Endnotes for Table 3-3

a. The water quality objectives do not apply westerly of the easterly boundary of Interstate Highway 5. The objectives for the remainder of the Hydrologic Area (Subarea) are as shown.

b. Detailed salt balance studies are recommended for this area to determine limiting mineral concentration levels for discharge. On the basis on existing data, the tabulated objectives would probably be maintained in most areas. Upon completion of the salt balance studies, significant water quality objective revisions may be necessary. In the interim period of time, projects of ground water recharge with water quality inferior to the tabulated numerical values may be permitted following individual review and approval by the Regional Board if such projects do not degrade existing ground water quality to the aquifers affected by the recharge.

c. The recommended plan would allow for measurable degradation of ground water in this basin to permit continued agricultural land use. Point sources, however, would be controlled to achieve effluent quality corresponding to the tabulated numerical values. In future years demineralization may be used to treat ground water to the desired quality prior to use.

Endnotes for Table 3-3 (continued)

d. A portion of the Upper Mission Basin is being considered as an underground potable water storage reservoir for treated imported water. The area is located north of Highway 76 an the boundary of hydrologic subareas 3.11 and 3.12. If this program is adopted, local objectives approaching the quality of the imported water would be set and rigorously pursued.

e. The water quality objectives do not apply to hydrologic subareas 4.51 and 4.52 between Highway 78 and El Camino Real and to all lands which drain to Moonlight Creek, Cottonwood Creek and Encinitas Creek. The objectives for the remainder of the Hydrologic Area are as shown.

f. The water quality objectives do not apply to all lands which drain to Los Penasquitos Canyon from 1.5 miles west of Interstate Highway 15. The objectives for the remainder of the Hydrologic Area are as shown.

g. The water quality objectives do not apply west of Interstate Highway 15. The objectives for the remainder of the Hydrologic Area are as shown.

h. The water quality objectives do not apply west of Hollister Street. The objectives for the remainder of the Hydrologic Area are as shown.

i. No significant amount of ground water in this unit.

j. The water quality objectives apply to the portion of Subarea 4.31 bounded on the west by the easterly boundary of the Interstate 5 right-of-way and on the east by the easterly boundary of El Camino Real.

k. The water quality objectives apply to the portion of Subarea 4.51 bounded on the south by the north shore of Batiquitos Lagoon, on the west by the easterly boundary of the Interstate 5 right-of-way and on the east by the easterly boundary of El Camino Real.

l. The water quality objectives apply to the portion of the Otay HA 10.20 limited to lands within and tributary to Salt Creek on the east and Poggi Canyon on the west and including the several smaller drainage courses between these tributaries of the Otay River.

m. These objectives apply to the alluvial ground water beneath the Santa Margarita River from the confluence of Murrieta and Temecula Creeks through the Gavilan and DeLuz HSAs to a depth of 100 feet and a lateral distance equal to the area of the floodplain covered by a 10 year flood event. These objectives do not apply to ground water in any of the basins beneath DeLuz, Sandia, and Rainbow Creeks and other unnamed creeks, which are tributaries of the Santa Margarita River.

n. These objectives apply for only the alluvial aquifer in the Lower Sycamore Canyon portion of the Santee Hydrologic Subarea described as all of the Sycamore Canyon watershed except that part which drains north of the boundary between sections 28 and 33, Township 14 South, Range 1 West.

Endnotes for Table 3-3 (continued)

o. These objectives apply to ground waters within 250 feet of the surface for the most downstream 4,200 acres of the Pauba HSA (2.51) which drain directly to the most downstream 2.7 mile segment of Temecula Creek. Excluded from this area are all lands upgradient from a point 0.5 miles east of the intersection of Butterfield Stage Road and Highway 79.

p. These objectives apply to ground waters within 250 feet of the surface for the most downstream 2,800 acres of the Wolf HSA (2.52) including those portions of the HSA which drain directly to the most downstream 1.5 mile segment of Pechanga Creek. Excluded from this area are all lands of HSA 2.52 which are upgradient of the intersection of Pala Road and Via Eduardo.

q. These objectives apply to ground waters of the Poway HSA (6.2) that lie east of the San Diego County Water Authority's (SDCWA) First Aqueduct. Ground water quality objectives west of the SDCWA First Aqueduct are 1,000 mg/l.

r. The total dissolved solids (TDS) objective for the alluvial aquifer in the Moosa Hydrologic Subarea (903.13) is 1,200 mg/l. The TDS objective for the alluvial aquifer in the Valley Center Hydrologic Subarea (903.14) is 1,100 mg/l.

CHLORIDES

Most waters contain chlorides because they are present in many rock types and are very soluble in water. Chlorides may be of natural mineral origin or derived from (a) seawater intrusion of ground water supplies, (b) salts spread on fields for agricultural purposes, (c) human or animal sewage or (d) industrial wastes. Chlorides may impart a salty taste to drinking water in concentrations between 100-700 mg/l. The secondary drinking water standard for chlorides is 500 mg/l. Elevated chloride concentrations in waters used for industrial process and supply can significantly increase the corrosion rate of steel and aluminum. High chloride concentrations can be toxic to plant life. A safe concentration of chloride for irrigation water is considered to be in the range of 100-140 mg/l. Irrigation with water containing 140-350 mg/l of chloride may cause slight to moderate plant injury. Additional information regarding chloride concentrations in irrigation waters is presented in Table 3-1.

Water Quality Objectives for Chlorides

Inland surface waters shall not contain chlorides in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain chlorides in concentrations in excess of the numerical objectives described in Table 3-3.

COLOR

Color in water may arise naturally, such as from minerals, plant matter, or algae, or may be caused by industrial pollutants. Color is primarily an aesthetic consideration, although it can discolor clothes and food. The secondary drinking water standard for color is 15 color units.

Water Quality Objectives for Color

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

The natural color of fish, shellfish or other resources in inland surface waters, coastal lagoon or bay and estuary shall not be impaired.

Inland surface waters shall not contain color in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain color in concentrations in excess of the numerical objectives described in Table 3-3.

DISSOLVED OXYGEN

Adequate dissolved oxygen levels are vital for aquatic life. Depression of dissolved oxygen levels can lead to fish kills and odors resulting from anaerobic decomposition. Dissolved oxygen content in water is a function of water temperature and salinity.

Water Quality Objective for Dissolved Oxygen

Dissolved oxygen levels shall not be less than 5.0 mg/l in inland surface waters with designated MAR or WARM beneficial uses or less than 6.0 mg/l in waters with designated COLD beneficial uses. The annual mean dissolved oxygen concentration shall not be less than 7 mg/l more than 10% of the time.

FLOATING MATERIAL

Floating material is an aesthetic nuisance as well as a substrate for algae and insect vectors.

Water Quality Objective for Floating Material

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

FLUORIDE

Fluoride does not naturally occur in high concentrations in surface waters, but may occur in detrimental concentrations in ground waters. Fluoride, in sufficient quantities, can adversely affect waters used as industrial process or supply in food, beverages, and pharmaceutical industries. The presence of optimal concentrations of fluoride in drinking water supplies can reduce dental decay, especially among children.

However, fluoride concentrations in excess of approximately 1.0 mg/l can increase the risk of mottled enamel in children and dental fluorosis in adults.

Water Quality Objectives for Fluoride

Inland surface waters shall not contain fluoride in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain fluoride in concentrations in excess of the numerical objectives described in Table 3-3.

HYDROGEN ION CONCENTRATION (pH)

The hydrogen ion concentration of water is called "pH". The acidity or alkalinity of water is measured by the pH factor. The pH scale ranges from 1 to 14, with 1 to 6.9 being acid, 7.1 to 14 being alkaline, and 7.0 being neutral. Ranges (pH) of 6.5 to 9.0 are considered harmless. A change of one point on this scale represents a ten-fold increase in acidity or alkalinity. Many pollutants can alter the pH, raising or lowering it excessively. In some cases even small changes in pH can harm aquatic biota. The pH changes can alter the chemical form of certain constituents, thereby increasing their bioavailability and toxicity. For example, a decrease in pH can result in an increase in dissolved metal concentrations. Ammonia, which is a major component of sewage discharges, can be completely safe at pH 7.0 and extremely toxic to fish at pH 8.5 for the same total ammonia concentration.

Water Quality Objectives for pH

Changes in normal ambient pH levels shall not exceed 0.2 units in waters with designated marine (MAR), or estuarine (EST), or saline (SAL) beneficial uses. Changes in normal ambient pH levels shall not exceed 0.5 units in fresh waters with designated cold freshwater habitat (COLD) or warm freshwater habitat (WARM) beneficial uses.

In bays and estuaries the pH shall not be depressed below 7.0 nor raised above 9.0.

In inland surface waters the pH shall not be depressed below 6.5 nor raised above 8.5.

INORGANIC CHEMICALS - PRIMARY STANDARDS

Water Quality Objective for Domestic or Municipal Supply

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of inorganic chemicals in excess of the maximum contaminant levels set forth in California Code of Regulations, Title 22, Table 64431-A of section 64431 (Inorganic Chemicals) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-4).

Table 3-4. Maximum Contaminant Levels for Inorganic Chemicals specified in Table 64431-A of section 64431 of Title 22 of the California Code of Regulations as amended June 12, 2003.

Chemical	Maximum Contaminant Level, mg/l
Aluminum	1.
Antimony	0.006
Arsenic	0.05
Asbestos	7 MFL*
Barium	1.
Beryllium	0.004
Cadmium	0.005
Chromium	0.05
Cyanide	0.15
Fluoride	2.0
Mercury	0.002
Nickel	0.1
Nitrate (as NO_3)	45.
Nitrate + Nitrite (sum as nitrogen)	10.
Nitrite (as nitrogen)	1.
Selenium	0.05
Thallium	0.002

*MFL = million fibers per liter, MCL for fibers exceeding 10 um in length.

IRON

Iron may be present in water due to natural origin, corrosion of metallic iron and its alloys by water in the presence of oxygen, and industrial waste discharges containing iron. Iron is undesirable in domestic water supplies because it causes unpleasant tastes, deposits on food during cooking, stains and discolors laundry and plumbing fixtures. The secondary drinking water standard for iron is 0.3 mg/l.

Water Quality Objectives for Iron

Inland surface waters shall not contain iron in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain iron in concentrations in excess of the numerical objectives described in Table 3-3.

MANGANESE

Manganese is undesirable in domestic water supplies because it causes unpleasant tastes, deposits on food during cooking, stains and discolors laundry and plumbing fixtures, and fosters the growth of some microorganisms in reservoirs, filters, and distribution systems. The secondary drinking water standard for manganese is 0.05 mg/l.

Water Quality Objectives for Manganese

Inland surface waters shall not contain manganese in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain manganese in concentrations in excess of the numerical objectives described in Table 3-3.

METHYLENE BLUE - ACTIVATED SUBSTANCES (MBAS)

The methylene blue-activated substances (MBAS) test measures the presence of anionic surfactant (commercial detergent) in water. Positive test results can be used to indicate the presence of domestic wastewater. The secondary drinking water standard for MBAS is 0.5 mg/l.

Water Quality Objectives for MBAS

Inland surface waters shall not contain MBAS in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain MBAS in concentrations in excess of the numerical objectives described in Table 3-3.

NITRATE

High nitrate (NO_3) concentrations in domestic water supplies can be toxic to human life. Infants are particularly susceptible and may develop methemoglobinemia (blue baby syndrome). The primary drinking water standard for nitrate as NO_3 is 45 mg/l.

Water Quality Objectives for Nitrate

Inland surface waters shall not contain nitrate (as NO_3) in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain nitrate (as NO_3) in concentrations in excess of the numerical objectives described in Table 3-3.

OIL AND GREASE

Oil and grease can be present in water as a result of the discharge of treated wastes and the accidental or intentional dumping of wastes into sinks and storm drains. Oils and related materials have a high surface tension and are not soluble in water, therefore forming a film on the water's surface. This film can result in nuisance conditions because of offensive odors and visual impacts. Oil and grease can coat birds and aquatic organisms, adversely affecting respiration and/or thermoregulation.

Water Quality Objective for Oils, Grease, Waxes or other Materials

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

ORGANIC CHEMICALS - PRIMARY STANDARDS

Water Quality Objectives:

Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).

Table 3-5. Maximum Contaminant Levels for Organic Chemicals specified in Table 64444-A of section 64444 of Title 22 of the California Code of Regulations as amended June 12, 2003.

Chemical	**Maximum Contaminant Level, mg/l**
(a) Volatile Organic Chemicals (VOCs)	
Benzene	0.001
Carbon Tetrachloride	0.0005
1,2-Dichlorobenzene	0.6
1,4-Dichlorobenzene	0.005
1,1-Dichloroethane	0.005
1,2-Dichloroethane	0.0005
1,1-Dichloroethylne	0.006
cis-1,2-Dichloroethylene	0.006
trans-1,2-Dichloroethylene	0.01
Dichloromethane	0.005
1,2-Dichloropropane	0.005
1,3-Dichloropropene	0.0005
Ethylbenzene	0.3
Methyl-*tert*-butyl ether	0.013
Monochlorobenzene	0.07
Styrene	0.1
1,1,2,2-Tetrachloroethane	0.001
Tetrachloroethylene	0.005
Toluene	0.15
1,2,4-Trichlorobenzene	0.005
1,1,1-Trichloroethane	0.200
1,1,2-Trichloroethane	0.005
Trichloroethylene	0.005
Trichlorofluoromethane	0.15
1,1,2-Trichloro-1,2,2-Trifluoroethane	1.2
Vinyl Chloride	0.0005
Xylenes	1.750*

Chemical	**Maximum Contaminant Level, mg/l**
(b) Non-Volatile Synthetic Organic Chemicals (SOCs)	
Alachlor	0.002
Atrazine	0.001
Bentazon	0.018
Benzo(a)pyrene	0.0002
Carbofuran	0.018
Chlordane	0.0001
2,4-D	0.07
Dalapon	0.2
Dibromochloropropane	0.0002
Di(2-ethylhexyl)adipate	0.4
Di(2-ethylhexyl)phthalate	0.004
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylene Dibromide	0.00005
Glyphosate	0.7
Heptachlor	0.00001
Heptachlor Epoxide	0.00001
Hexachlorobenezene	0.001
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.03
Molinate	0.02
Oxamyl	0.05
Pentachlorophenol	0.001
Picloram	0.5
Polychlorinated Biphenyls	0.0005
Simazine	0.004
Thiobencarb	0.07
Toxaphene	0.003
2,3,7,8-TCDD (Dioxin)	3×10^{-8}
2,3,5-TP (Silvex)	0.05

* MCL is for either a single isomer or the sum of the isomers.

PERCENT SODIUM AND ADJUSTED SODIUM ADSORPTION RATIO

Excess concentrations of sodium in irrigation water reduce soil permeability to water and air. The deterioration of sodium in irrigation water is cumulative and is accelerated by poor drainage.

Table 3-1 shows concentration guidelines for sodium, boron, chloride and other chemical constituents present in irrigation waters.

The specific water quality objective for sodium in the Basin Plan is expressed as percent sodium. Percent sodium is calculated as follows:

$$\% Na = \frac{Na}{Na + Ca + Mg + K} \text{ x } 100 \%$$

where sodium (*Na*), Calcium (*Ca*), Magnesium (*Mg*), and Potassium (*K*) are expressed in milliequivalent per liter (me/l).

The percent sodium objective was developed for the protection of agricultural uses from the potential hazard due to sodium in irrigation waters. The value of 60% sodium is based upon *Water Quality Criteria*, by McKee and Wolf, 1963.

McKee and Wolf note that because of all the variables involved, the classification of waters for irrigation use must be somewhat arbitrary and the limits set cannot be too rigid. The three general classifications of irrigation waters are:

CLASS	%SODIUM	DESCRIPTION
I	<30 - 60%	Excellent to good, or suitable for most plants under most conditions.
II	30 - 75%	Good to injurious, harmful to some plants under conditions of soil, climate and practices.
III	70 - 75%	Injurious to unsatisfactory, unsuitable under most conditions.

Since the publication of the percent sodium criteria, technical research has resulted in the development of more applicable criteria for addressing the potential sodium hazard in irrigation water.

The sodium adsorption ratio (*SAR*) and adjusted sodium adsorption ratios (*Adj. SAR*) are measures of the potential hazard in soils due to sodium. *SAR* and *Adj. SAR* are similar to percent sodium in that their calculated values provide an indication of a soil's potential for permeability and potential aeration problems. However, by taking into consideration the soil's sodicity and the exchange phases between *Ca*, *Na* and *Mg*, the *SAR* and *Adj. SAR* predict potential sodium build up in soils. The *Adj. SAR* calculation further takes into account the effects of carbonate and bicarbonate ion concentrations of a soil. *Adj. SAR* is the most common method for determining sodium hazard in irrigation water at the present time.

The calculation for *SAR* is as follows:

$$SAR = \frac{Na}{\sqrt{\frac{(Ca + Mg)}{2}}}$$

where *Na*, *Ca* and *Mg* are in me/l. The calculation for *Adj. SAR* is as follows:

$$Adj.\ SAR = \frac{Na}{\sqrt{\frac{(Ca_x + Mg)}{2}}}$$

where *Na* and *Mg* are in me/l.

Ca_x is a modified *Ca* value, calculated using the Suarez table (Table 3-3, contained in *Irrigation with Reclaimed Municipal Wastewater, A Guidance Manual,* California State Water Resources Control Board, Report Number 84-1, July 1984). Ca_x takes into account salinity (EC_w), the HCO_3/CO_3 ratio (me/l) and the estimated partial pressure of CO_2 in the top few millimeters of the soil ($P_{CO_2} = 0.0007$ atmospheres).

Water Quality Objectives for Sodium

Inland surface waters shall not contain percent sodium in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain percent sodium in excess of the numerical objectives described in Table 3-3.

In some cases, adjusted sodium adsorption ratio may be a better indicator of the potential sodium hazard in irrigation water than percent sodium. The Regional Board Executive Officer may authorize the use of adjusted sodium absorption ratio instead of percent sodium to indicate the potential sodium hazard. In such cases, the adjusted sodium adsorption ratio shall not exceed the slight to moderate range of values referenced in Table 3-1 "Guidelines for Interpretation of Water Quality for Irrigation".

PESTICIDES

Pesticides can enter surface and ground waters directly through industrial process discharges, agricultural discharge, spillage and illegal dumping. Pesticides can also enter surface and ground waters indirectly by drifting away from areas where pesticides are being sprayed, through surface runoff from treated fields, and by leaching or return flows from irrigation. Pesticides can concentrate in plant or animal tissues and many are considered to be carcinogenic to humans. Although many pesticides are designed to deteriorate rapidly when exposed to sunlight and air, they may persist for months or years in water.

California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) establishes maximum contaminant levels for pesticides in drinking water. (See water quality objective for Organic Chemicals).

Water Quality Objectives for Pesticides

No individual pesticide or combination of pesticides shall be present in the water column, sediments or biota at concentration(s) that adversely affect beneficial uses. Pesticides shall not be present at levels which will bioaccumulate in aquatic organisms to levels which are harmful to human health, wildlife or aquatic organisms.

Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the maximum contaminant levels specified in California Code of Regulations, Title 22, Table 64444-A of section 64444 (Organic Chemicals) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-5).

The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapters 2, Table 2-3, Beneficial Uses of Coastal Waters, San Diego Bay, footnote 3 and Chapter 7, Total Maximum Daily Loads.

PHENOLIC COMPOUNDS

Phenolic compounds are in widespread use as industrial and agricultural chemical intermediates for the preparation of other chemicals. These organic compounds are byproducts of petroleum refining, tanning, and textile, dye, and resin manufacturing. Low concentrations cause taste and odor problems in water, higher concentrations can kill aquatic life and humans. Phenol is occasionally referred to as "carbolic acid".

Water Quality Objectives for Phenolic Compounds

Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of phenolics in excess of 1.0 ug/l.

Should there be any conflict between this limit and those described under the Organic Chemicals objective the more stringent standards shall apply at all times.

RADIOACTIVITY

Water Quality Objective for Radioactivity

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

Water Quality Objective for Radionuclides

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the levels specified in section 64441 of Title 22 of the California Code of Regulations (Natural Radioactivity) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect.

SECONDARY DRINKING WATER STANDARDS

Water Quality Objective for Domestic or Municipal Supply Water

Water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels specified in Table 64449-A of section 64449 of Title 22 of the California Code of Regulations (Secondary Maximum Contaminant Levels, Consumer Acceptance Limits) which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-6).

Table 3-6. Secondary Maximum Contaminant Levels for Consumer Acceptance Limits specified in Table 64449-A of section 64449 of Title 22 of the California Code of Regulations as amended January 7, 1999.

Constituent	**Maximum Contaminant Levels**
Aluminum	0.2 mg/l
Color	15 units
Copper	1.0 mg/l
Corrosivity	Noncorrosive
Foaming Agents (MBAS)	0.5 mg/l
Iron	0.3 mg/l
Manganese	0.05 mg/l
Methyl-*tert*-butyl ether (MTBE)	0.005 mg/l
Odor Threshold	3 units
Silver	0.1 mg/l
Thiobencarb	0.001 mg/l
Turbidity	5 units
Zinc	5.0 mg/l

SEDIMENT

Suspended sediment in surface waters can cause harm to aquatic organisms by abrasion of surface membranes, interference with respiration, and sensory perception in aquatic fauna. Suspended sediment can reduce photosynthesis in and survival of aquatic flora by limiting the transmittance of light.

Water Quality Objective for 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.

SUSPENDED AND SETTLEABLE SOLIDS

Suspended and settleable solids are deleterious to benthic organisms and may cause the formation of anaerobic conditions. They can clog fish gills and interfere with respiration in aquatic fauna. They also screen out light, hindering photosynthesis and normal aquatic plant growth and development.

Water Quality Objective for Suspended and Settleable Solids

Waters shall not contain suspended and settleable solids in concentrations of solids that cause nuisance or adversely affect beneficial uses.

SULFATE

The most important sources of sulfate in native waters of the San Diego Region are the gypsiferous deposits and sulfide minerals associated with crystalline rocks. Excessive sulfate concentrations in drinking water can cause laxative effects to new users of the water supply. The recommended secondary drinking water standard for sulfate is 250 mg/l with a upper limit of 500 mg/l.

Water Quality Objectives for Sulfate

Inland surface waters shall not contain sulfate in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain sulfate in concentrations in excess of the numerical objectives described in Table 3-3.

TASTES AND ODORS

Undesirable tastes and odors in water may be a nuisance and may indicate the presence of pollutants. The secondary drinking water standard for odor (threshold) is 3 odor units.

Water Quality Objectives for Taste and Odor

Waters shall not contain taste or odor producing substances at concentrations which cause a nuisance or adversely affect beneficial uses.

The natural taste and odor of fish, shellfish or other Regional water resources used for human consumption shall not be impaired in inland surface waters and bays and estuaries.

Inland surface waters shall not contain odors in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain odors in concentrations in excess of the numerical objectives described in Table 3-3.

TEMPERATURE

Waste discharges can cause temperature changes in the receiving waters which adversely affect the aquatic biota. Discharges most likely to cause these temperature effects are cooling water discharges from power plants.

Water Quality Objectives for Temperature

The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional 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 more than 5°F above the natural receiving water temperature.

TOTAL DISSOLVED SOLIDS

Dissolved solids in natural waters may consist of carbonates, bicarbonates, chlorides, sulfates, phosphates, nitrates, magnesium, sodium, iron, manganese and other substances. The recommended secondary drinking water standard for total dissolved solids is 500 mg/l with a upper limit of 1000 mg/l due to taste considerations. High total dissolved solids concentrations in irrigation waters can be deleterious to plants directly, or indirectly through adverse effects on soil permeability. A classification of irrigation waters with respect to total dissolved solids concentration is described in Table 3-1.

Water Quality Objectives for Total Dissolved Solids

Inland surface waters shall not contain total dissolved solids in concentrations in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain total dissolved solids in concentrations in excess of the numerical objectives described in Table 3-3.

TOXICITY

Toxicity is the adverse response of organisms to chemicals or physical agents.

Water Quality Objectives for 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 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 requirements specified in USEPA, State Water Resources Control Board or other protocol authorized by the Regional Board. As a minimum, compliance with this objective as stated in the previous sentence shall be evaluated with a 96-hour acute 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.

The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapters 2, Table 2-3, Beneficial Uses of Coastal Waters, San Diego Bay, footnote 3 and Chapter 7, Total Maximum Daily Loads.

Chollas Creek is designated as a water quality limited segment for dissolved copper, lead, and zinc pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapters 2, Table 2-2, Beneficial Uses of Inland Surface Waters, Footnote 3 and Chapter 7, Total Maximum Daily Loads.

TOXIC POLLUTANTS

The USEPA promulgated a final rule prescribing water quality criteria for toxic pollutants in inland surface waters, enclosed bays, and estuaries in California on May 18, 2000 (The California Toxics Rule or “CTR;” [40 CFR 131.38]). CTR criteria constitute applicable water quality criteria in California. In addition to the CTR, certain criteria for toxic pollutants in the National Toxics Rule [40 CFR 131.36] constitute applicable water quality criteria in California as well.

The Shelter Island Yacht Basin portion of San Diego Bay is designated as an impaired water body for dissolved copper pursuant to Clean Water Act section 303(d). A Total Maximum Daily Load (TMDL) has been adopted to address this impairment. See Chapters 2, Table 2-3, Beneficial Uses of Coastal Waters, San Diego Bay, footnote 3 and Chapter 7, Total Maximum Daily Loads.

Chollas Creek is designated as a water quality limited segment for dissolved copper, lead, and zinc pursuant to Clean Water Act section 303(d). Total Maximum Daily Loads have been adopted to address these impairments. See Chapters 2, Table 2-2, Beneficial Uses of Inland Surface Waters, Footnote 3 and Chapter 7, Total Maximum Daily Loads.

TRIHALOMETHANES

Chlorine is the dominant chemical agent used to disinfect treated water and wastewater. Trihalomethanes are formed when chlorine reacts with aquatic organic material found in water and wastewater. Trihalomethanes are a group of light weight chlorinated hydrocarbons which are suspected carcinogens. The USEPA has established a maximum contaminant level for total trihalomethanes of 0.1 mg/l in Title 40, Code of Federal Regulations, Part 141.12, (40 CFR 141.12), EPA National Primary Drinking Water Regulations (§141.12 revised at 57 FR 31838, July 17, 1992). Total trihalomethanes are the sum of the concentrations of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform) and trichloromethane (chloroform). The federal regulations on trihalomethanes are incorporated by reference into CCR, Title 22, Chapter 15, Articles 4.5, sections 64439.

Water Quality Objective for Trihalomethanes

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of trihalomethanes in excess of the criteria set forth in California Code of Regulations, Title 22, section 64439 which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to section 64439 as the changes take effect.

TURBIDITY

The turbidity of water is attributable to suspended and colloidal matter, the effect of which is to disturb clearness and diminish the penetration of light. High turbidity levels can adversely affect the use of water for drinking. By interfering with the penetration of light, turbidity can adversely affect photosynthesis which aquatic organisms depend upon for survival. High concentrations of particulate matter that produce turbidity can be directly lethal to aquatic life.

Water Quality Objectives for Turbidity

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.

Inland surface waters shall not contain turbidity in excess of the numerical objectives described in Table 3-2.

Ground waters shall not contain turbidity in excess of the numerical objectives described in Table 3-3.

The transparency of waters in lagoons and estuaries shall not be less than 50% of the depth at locations where measurement is made by means of a standard Secchi disk, except where lesser transparency is caused by rainfall runoff from undisturbed natural areas and dredging projects conducted in conformance with waste discharge requirements of the Regional Board. With these two exceptions, increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

Natural Turbidity	Maximum Increase
0-50 NTU	20% over natural turbidity level
50-100 NTU	10 NTU
Greater than 100 NTU	10% over natural turbidity level

In addition, within San Diego Bay, the transparency of bay waters, insofar as it may be influenced by any controllable factor, either directly or through induced conditions, shall not be less than 8 feet in more than 20 percent of the readings in any zone, as measured by a standard Secchi disk. Wherever the water is less than 10 feet deep, the Secchi disk reading shall not be less than 80 percent of the depth in more than 20 percent of the readings in any zone.

WATER QUALITY OBJECTIVES OF INLAND SURFACE WATERS

Specific numerical water quality objectives for inland surface waters are presented by hydrologic area and subarea and watershed in Table 3-2.

The water quality objectives for inland surface water designations described in this table correspond with the beneficial use designations previously described in Chapter 2. Water Quality Objective variations occur in some of the hydrologic areas, subareas and stream reaches. Water quality variations from the objectives may also occur within a given hydrologic area subarea or stream reach. Such local variations will be evaluated when waste discharge requirements, NPDES permits, Cleanup and Abatement Orders, and Cease and Desist Orders are being developed for a given discharger.

The omission of mineral objectives for some areas corresponds to the lack of beneficial uses (AGR, MUN, IND) requiring such objectives.

WATER QUALITY OBJECTIVES OF GROUND WATERS

Specific numerical water quality objectives for ground waters are presented by hydrologic area and subarea in Table 3-3.

A footnote for some ground water basins is listed to show that some water quality objectives are considered tentative until detailed salt balance studies are conducted.

In 1978 the Regional Board, in Resolution No. 78-6, deleted water quality objectives and beneficial uses for certain portions of basins 1.10, 1.20, 1.30, 1.40, 1.50, 2.10, 3.10, 4.10, 4.20, 4.30, 4.40, 4.50, 4.60, 5.10, 6.10, 7.10, and 11.10. Table footnotes are included to identify these basins. The Regional Board elected to delete beneficial uses in portions of these basins, where the uses of ground water were marginal or nonexistent, to promote wastewater reclamation by sewage treatment plants. The deletion of beneficial uses in these areas was based upon a determination that the loss of ground water supplies was outweighed by the long-term increase in wastewater reclamation made possible by allowing reclaimed water discharges which are high in total dissolved solids. It is the Regional Board's intent to protect the water quality in these basins under the terms of State Board Resolution No. 68-16.

For purposes of intrusion barrier formation or ground water recharge, the water quality objective qualifications footnoted in Table 3-3 allow, with approval of the Regional Board, discharge of reclaimed water in areas of equal or poorer ground water quality. Relatively poor quality water could also be used for intrusion barrier formation along the coast.

WATER QUALITY CRITERIA

The literature contains many different water quality criteria designed to protect specific beneficial uses of water. A summary of the specific numerical water quality criteria considered by the Regional Board for designation as water quality objectives is described in Appendix C. The water quality criteria described in Appendix C are not enforceable water quality objectives. The purpose of presenting the information summarized in these tables is to allow interested persons to compare available water quality criteria to the specific water quality objectives designated by the Regional Board described earlier in this Chapter.

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REPRINT OF RESOLUTION NO. 68-16

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 68-16

STATEMENT OF POLICY WITH RESPECT TO MAINTAINING HIGH QUALITY OF WATERS IN CALIFORNIA

WHEREAS the California Legislature has declared that it is the policy of the State that the granting of permits and licenses for unappropriated water and the disposal of wastes into the waters of the State shall be so regulated as to achieve highest water quality consistent with maximum benefit to the people of the State and shall be controlled so as to promote the peace, health, safety and welfare of the people of the State; and

WHEREAS water quality control policies have been and are being adopted for waters of the State; and

WHEREAS the quality of some waters of the State is higher than that established by the adopted policies and it is the intent and purpose of this Board that such higher quality shall be maintained to the maximum extent possible consistent with the declaration of the Legislature;

NOW, THEREFORE, BE IT RESOLVED:

1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.

2. Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

3. In implementing this policy, the Secretary of the Interior will be kept advised and will be provided with such information as he will need to discharge his responsibilities under the Federal Water Pollution Control Act.

BE IT FURTHER RESOLVED that a copy of this resolution be forwarded to the Secretary of the Interior as part of California's water quality control policy submission.

CERTIFICATION

The undersigned, Executive Officer of the State Water Resources Control Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a meeting of the State Water Resources Control Board held on October 24, 1968.

Dated: October 28, 1968
Original signed by
Kerry W. Mulligan, Executive Officer
State Water Resources Control Board

CHAPTER 4

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4. IMPLEMENTATION

INTRODUCTION


Elegant tern

The purpose of this chapter is to describe actions that are necessary to protect the beneficial uses described in Chapter 2 and achieve the water quality objectives specified in Chapter 3. One of the elements in a Water Quality Control Plan as defined in California Water Code (Water Code) section 13050(j) is the implementation program for achieving water quality objectives. This chapter describes the Regional Board's implementation program.

Water Code section 13242 requires that the implementation program have the following elements:

- A description of the actions which are necessary to achieve water quality objectives. (This may include recommendations for appropriate action directed to any entity, public or private);

- A time schedule for the actions to be taken; and

- A description of surveillance to be undertaken to determine compliance with the water quality objectives.

The Regional Board's mission is to achieve and maintain water quality objectives that are necessary to protect all beneficial uses of the waters in the Region. Depending on the nature of the water quality problem, several different strategies, as outlined below, are employed to accomplish this mission.

This Chapter is divided into four sections, Control of Point Source Pollutants, Control of Nonpoint Source Pollutants, Remediation of Pollution, and Other Programs as shown below. Areas of overlap between the point and nonpoint source categories are described later in this Chapter.

★ *Control of Point Source Pollutants*

Pollutants from point sources are discharged to waterbodies from discrete conveyance systems (e.g., pipes and channels) in controlled flows at well-defined locations. Examples of point sources include waste discharges from municipal and industrial wastewater treatment facilities.

Programs that protect water quality from point source pollutants are primarily regulatory in nature. Waste discharge permitting programs such as California's Waste Discharge Requirements (WDRs) and the federal National Pollutant Discharge Elimination System (NPDES) are examples of key regulatory point source control programs. Significant progress toward the control of point source pollutants has been made through these permitting programs.

★ *Control of Nonpoint Source Pollutants*

Pollutants from nonpoint sources are diffuse, both in terms of their origin and mode of transport to surface and ground waters. Unlike pollutants from point sources, nonpoint source pollutants often enter waters in sudden episodic surges and large quantities. This occurs as rain, irrigation, and other types of runoff mobilizes and transports contaminants into surface and ground waters. Nationwide, pollutants from nonpoint sources represent the greatest threat to water quality. Examples of nonpoint sources in southern California include lawn and garden chemicals transported by storm water or water from irrigation sprinklers; household and automotive care products dumped or drained on streets and into storm drains; fertilizers and pesticides washed from agricultural fields by rain or irrigation waters; sediment that erodes from construction sites; and various pollutants deposited by atmospheric deposition.

Nonpoint source pollutants are more difficult to control than point source pollutants, and require different control strategies. For example, traditional permitting programs are neither a practical nor effective means of water quality protection from lawn and garden chemicals. Accordingly, the Regional Board integrates non-regulatory programs with regulatory programs in order to control pollutants from nonpoint sources. Through public outreach (an example of a non-regulatory program), residents are informed of threats to the quality of the waters in their communities and are encouraged to voluntarily implement Best Management Practices (BMPs) that eliminate or reduce nonpoint sources of pollution. Emphasis is placed on pollution prevention though careful management of resources, as opposed to cleaning up the waterbody after the fact. Local governments play a key role in the control of nonpoint sources by adopting and enforcing ordinances and by supplementing the Regional Board's public outreach efforts. This flexible approach can be an effective means of controlling pollutants from many nonpoint sources.

★ *Remediation of Pollution*

The Regional Board oversees remediation of both ground and surface waters through the investigation of polluted waters and enforcement of corrective actions needed to restore water quality. These activities are managed through the following programs, namely: Underground Storage Tanks; Site Cleanup Program (which includes above ground petroleum storage tanks); NPDES Program; Land Disposal and Waste Discharge Requirements (WDR) Regulatory Programs; and U.S. Department of Defense (DOD) and Department of Energy (DOE) Sites.

These programs are designed to return polluted sites to productive use by identifying and eliminating the sources of pollutants, preventing the spread of pollution, and restoring water quality.

★ *Other Programs*

The Regional Board is involved with the investigation, assessment and protection of water quality through other programs which are discussed in this Basin Plan. These include California's Clean Water Act section 303(d) process and California's water quality assessment program.

CONTROL OF POINT SOURCE POLLUTANTS

DEFINITION OF POINT SOURCE

Waste loads from point sources are those that are generally associated with pollutant discharges from an identifiable location to waters of the state. A point source is any discernable, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, landfill leachate collection system, vessel or other floating craft from which pollutants are or may be discharged. Point source wastes can be generated by residential, commercial, industrial, agricultural, certain recreational and solid waste disposal activities and/or practices. Other wastes are considered under the category of nonpoint source waste loads and are discussed in appropriate sections of this chapter. Many of the water quality problems in the San Diego region have been attributable to point source discharges.

The Regional Board regulates most point source discharges of waste through the issuance of waste discharge requirements and NPDES permits. Certain surface water discharges of waste described in 40 Code of Federal Regulations (CFR) 122.3 do not require NPDES permits. The need to obtain waste discharge requirements for certain categories of waste discharges to land may be waived by the Regional Board where such waiver is not against the public interest. The waste discharge requirements and the NPDES permits establish terms and conditions such as effluent limitations to ensure that point source waste discharges comply with applicable water quality objectives and ensure protection of beneficial uses.

EFFLUENT LIMITATIONS

Effluent limitations for discharge of treated point source wastes are developed for individual point sources and are included in the waste discharge requirements or NPDES permits. The effluent limitations are placed on the quality and quantity of the waste discharge or effluent and can be either numeric and/or narrative limitations. Effluent limitations are based on applicable water quality objectives, United States Environmental Protection Agency (USEPA) effluent guidelines and standards, beneficial uses for the area of effluent disposal, and applicable state and federal regulations and policies.

POINT SOURCE CONTROL CATEGORIES

Waste discharge requirements for waste discharges to land are issued for reclaimed water discharges, sanitary landfills, subsurface waste disposal by septic tank systems, dredge spoil disposal projects, sewage treatment plants and a variety of other activities which can affect ground water quality. NPDES permits are issued for waste discharges to surface waters from facilities such as power plants, sewage treatment plants, shipyards, boatyards, dewatering operations, ground water cleanups and a variety of other activities which can affect surface water quality.

Table 4-1(a) contains a summary listing of facility types regulated under NPDES permits as of July 1994. Table 4-1(b) contains a summary listing of facility types regulated under waste discharge requirements as of November 2014.

Table 4-2 contains examples of pollutants found in industrial and municipal point source discharges to surface and ground waters.

REGIONAL BOARD PERMITTING PROGRAMS

The Regional Board's primary means of protecting the Region's water resources is through the issuance of WDRs, Water Reclamation Requirements (WRRs), and Master Reclamation Permits (MRPs) for each individual discharger. The WDRs impose conditions which protect water quality, implement the Water Quality Control Plan, and when the discharge is to waters of the United States, meet the requirements of the Clean Water Act. The WDRs impose limits on the quality and quantity of waste discharges and specify conditions to be maintained in the receiving waters. WRRs impose conditions for all reuses of treated wastewater. In addition, because the USEPA has delegated responsibility to the State and regional boards for implementation of the federal NPDES program, WDRs for discharges to surface waters also serve as NPDES permits. These programs are the legal means to regulate controllable discharges. It is illegal to discharge wastes into any waters of the State and to reuse treated wastewater without obtaining appropriate WDRs, WRRs, or NPDES permits.

Any person who discharges or proposes to discharge wastes to waters in the Region (other than into a community sanitary sewage system) must describe the quantity and nature of the proposed discharge in a report of waste discharge (RWD) or an NPDES permit application. The RWD must contain information required by the Regional Board. The filing of the RWD with the Regional Board is mandatory unless waived by the Board on the grounds that the waiver is not against the public interest. Such waivers are conditional and can be revoked by the Regional Board at any time. Upon review of the RWD or NPDES permit application and all other pertinent information (including comments received at a public hearing), the Regional Board will hold a public hearing to consider issuance of WDRs containing appropriate measures and limitations to protect public health and water quality. The basic elements of WDRs or NPDES permits include:

Table 4-1(a). National Pollutant Discharge Elimination System Permitted Facilities In the San Diego Region (as of July 28, 1994)[1]

Facility Type	Number Regulated
Above Ground Tanks	2
Boatyards	7
Ground Water Cleanup	7
Ground Water Dewatering	9
Industrial	8
Military	13
Power Plants	7
Sewage Treatment Plants	24
Shipyards	4
Storm Water (Construction)	542
Storm Water (Industrial)	619
Storm Water (Municipal)	34
Water Softener / Brine Treatment	6
Total	**1283**

Table 4-1(b). Waste Discharge Requirement Permitted Facilities in the San Diego Region (as of November 2014)[2]

Facility Type	Number Regulated
Campgrounds	59
Dairy	4
Dredging	5
Ground Water Cleanup	3
Industrial	4
Landfills	51
Miscellaneous	5
Nursery	1
Private Sewage Treatment Plants	7
Sand and Gravel	14
Sewage Treatment Plants	42
Sludge Treatment	1
Water Reclamation Requirements	22
Water Softener / Brine Treatment	1
Winery	3
Total	**227**

[1] The list of regulated facilities under NPDES permits is updated periodically and is available at the Regional Board office.
[2] The list of regulated facilities under WDR permits is updated periodically and is available at the Regional Board office.

Table 4-2. Examples of Industrial and Municipal Point Source Discharges to Surface and Ground Waters.

Discrete Discharge	Examples of Pollutants	Examples of Affected Waterbodies
Municipal wastewater treatment plants	Biological oxygen demand (BOD), chemical oxygen demand (COD), TDS, chlorides, sulfates, nutrients, ammonia (NH_3), residual chlorine, metals, organic chemicals	Most inland waters, Pacific Ocean, various ground water basins
Power generation plants	Temperature, chemical additives, minerals	San Diego Bay, Pacific Ocean
Waste water discharge from remediation or construction de-watering projects	TDS; chlorides; sulfates; volatile organic chemicals (VOCs); BTEX (e.g., benzene, toulene, ethylbenzene, xylene) and other petroleum hydrocarbons	Surface waters region-wide
Underground Storage Tanks	TDS; chlorides; sulfates; VOC's; BTEX and other petroleum hydrocarbons	Ground waters region-wide
Shipyard, boatyard wastes	Oil and grease, metals [lead (Pb), chromium (Cr), copper (Cu) and zinc (Zn)], suspended solids, settleable solids, tributyltin (TBT), temperature, chemical additives	San Diego Bay, Mission Bay, Dana Point, Oceanside Harbor
Sand and gravel	TDS, turbidity, sedimentation	San Diego River, Otay River, San Luis Rey River, Temecula Creek, San Dieguito River, Aliso Creek, San Clemente Canyon Creek, San Vicente Creek, Trabuco Canyon Creek, El Toro Creek, Carroll Canyon Creek or their tributaries.
Dairies	BOD, TDS, bacteria, nutrients	Various ground water basins
Dredging	Suspended solids, turbidity	San Diego Bay, Mission Bay, Oceanside Harbor, Dana Point
Landfills	Metals; TDS; chlorides; sulfates; VOC's; BTEX and other petroleum hydrocarbons	Various ground water basins
Recreational Vehicle (RV) Campgrounds	Formaldehyde, phenols, zinc, chlorides, aluminum sulfates	Various ground water basins

- Effluent limitations on the quality and quantity of the waste discharge. The effluent standards or limitations are designed to implement water quality control plans, protect beneficial uses, and prevent nuisance;

- Standard terms and conditions and discharge prohibitions to ensure compliance with applicable provisions of state and federal law; and

- A monitoring and reporting program requiring the discharger to collect and analyze samples and submit monitoring reports to the Regional Board on a prescribed schedule.

Water Code section 13263 provides that in prescribing WDRs the Regional Board need not authorize the utilization of the waste assimilation capacities of the receiving waters. No discharge of waste into waters of the state creates a vested right to continue the discharge. All discharges of waste into waters of the state are privileges, not rights.

Waste discharges are categorized according to their threat to water quality and operational complexity (Table 4-3). Additionally, discharges to surface waters are categorized as major or minor discharges. Filing and annual fees are based on these categories. WDRs or WRRs do not have an expiration date but are reviewed periodically on a schedule based on the level of threat to water quality. NPDES permits are adopted for a five-year period.

Most WDRs and NPDES permits establish conditions tailored to specific discharges. In some cases, discharges can be regulated under general WDRs or NPDES permits (General Permits) which simplify the permit process for certain types of discharges. These General Permits are issued administratively to the discharger after a completed Notice of Intent or appropriate application has been filed and, if necessary, the Regional Board Executive Officer has determined that the discharger meets the conditions specified in the General Permit. The Regional Board plans to increase the use of General Permits for regulating similar categories of waste discharges in the future. The use of General Permits is a step towards permit streamlining and the reduction of permitting delays. The Regional Board will use the following principles in issuing or reviewing General Permits:

- The General Permit will have a streamlined process for obtaining coverage with adequate protective measures to assure compliance.

- The General Permit will focus on constituents of environmental concern for which there is a reasonable likelihood the constituent is, or may be, present in the discharge.

- The General Permits should be flexible to the extent practicable, and should allow for different testing, monitoring, and reporting requirements recognizing various significance levels of discharges.

- Duration, volume, and dilution of discharge should be considered in determining the significance of a discharge.

WASTE DISCHARGE REQUIREMENTS

WDRs are permits for waste discharges to land which could primarily affect ground water quality and beneficial uses. All waste discharges, whether to land or water, are subject to Water Code section 13263. Furthermore unless exempt, discharges to land (e.g., landfills) are also subject to requirements of California Code of Regulations (CCR) Title 27 and Title 23, Chapter 15. Examples of such waste discharges include:

- Sewage treatment plants with discharges to land;

- On-site wastewater treatment systems, or “OWTS” (septic tanks and advanced treatment systems);

- Class III (nonhazardous waste) and Class I (hazardous waste) landfills;

- Industrial discharges;

- Land treatment units (bioremediation);

Table 4-3. "Threat to Water Quality" and "Complexity" Definition.

CATEGORY & THREAT TO WATER QUALITY	DEFINITION	EXAMPLE
Category I (Major threat)	Those discharges which could cause the long-term loss of a designated beneficial use of the receiving water, render unusable a ground water or surface water resource used as a significant drinking water supply, require closure to an area used for contact recreation, result in long-term deleterious effects on shellfish spawning or growth areas of aquatic resources, or directly expose the public to toxic substances.	Loss of a drinking water supply
Category II (Moderate threat)	Those discharges of waste which could cause short-term violations of water quality objective, cause secondary drinking water standards to be violated, or cause a nuisance. The discharge could have a major adverse impact on receiving biota, cause aesthetic impairment to a significant human population, or render unusable a potential domestic or municipal supply.	Aesthetic impairment from nuisance from a waste treatment facility.
Category III (Minor threat)	Those discharges of waste which could degrade water quality without violating water quality objectives, or cause a minor impairment of designated beneficial uses compared with Category I and Category II.	Small pulses of water from low volume discharges.
COMPLEXITY		
Category "a"	Any major NPDES discharger, and any discharge of toxic wastes; any small volume discharge containing toxic waste or having numerous discharge points or ground water monitoring; any Class I waste management unit.	Small volume complex discharger with numerous discharge points, leak detection systems or ground water monitoring wells.
Category "b"	Any discharger not include above which has a physical, chemical, or biological treatment system (except for septic systems with subsurface disposal), or any Class II or Class III waste management unit.	Marinas with petroleum products, solid wastes or sewage pump-out facilities.
Category "c"	Any discharger for whom WDRs have been or would be prescribed pursuant to section 13263 of the Water Code not included as a Category "a" or Category "b" as described above.	Discharges having no waste treatment systems or that must comply with BMPs, discharges having passive treatment and disposal systems, or discharges having waste storage system with land disposal such as dairy waste ponds.
NPDES		
Major	Publicly owned treatment works with a yearly average flow of over 0.5 million gallons per day (MGD) or an industrial source with a yearly average flow of over 0.1 MGD and those with lesser flows but with acute or potential adverse environmental impacts.	
Minor	All other dischargers that are not categorized as a major.	

- Dairies; and

- A variety of other activities which can affect ground water quality.

Some types of dredging operations in surface waters are also regulated under WDRs. WDRs may also protect surface waters in those instances where surfacing ground water may adversely affect surface water quality or beneficial uses. As discussed in the following subsection, operations that contribute nitrate loading to ground water are of particular concern for interconnected surface water. This is because the water quality objective for nitrate in ground water is an order of magnitude higher than the biostimulatory substances water quality objective for total nitrogen in surface water.

A standard WDR permit typically includes the following elements:

Findings
Official description of the facility, processes, type and quantity of wastes, existing WDRs, enforcement actions, public notice and applicable Water Quality Control Plans, beneficial uses and water quality objectives;

Effluent Limitations
Narrative and numerical limits for effluent and discharge prohibitions;

Receiving Water Limitations
Narrative and numerical objectives for the receiving waters;

Provisions
Standard provisions required by the Regional Board and by state and federal law;

Compliance Schedules
Time schedules for completion of activities to achieve compliance with permit conditions;

Sludge Requirements
Sludge monitoring and control requirements, if necessary; and a

Monitoring and Reporting Program
Specific locations of monitoring stations and sampling frequency for all constituents limited in the permit, including flow, and other constituents that may be required by the Board.

Any person proposing to discharge waste, other than to a community sanitary sewage system, must file a report of waste discharge (application) to obtain WDRs at least 120-days prior to commencing the discharge.

The Water Code, Division 7, Chapter 4, Article 4 authorizes the Regional Board to issue WDRs, review self-monitoring reports submitted by the discharger, and perform independent compliance checking. The Regional Board is authorized to take a variety of enforcement actions to obtain compliance with WDRs. Enforcement of WDRs is done through the issuance of cleanup and abatement orders, cease and desist orders, administrative civil liability orders and court action. The Regional Board is also authorized to update and review WDRs periodically.

NITROGEN IN INTERCONNECTED GROUND WATERS AND SURFACE WATERS

Ground water and surface waters interact with one another, thus, discharges to one may result in impacts to the other (USGS, 1998). Understanding this interaction is important in establishing appropriate discharge specifications for total nitrogen in WDRs because ground water can be a significant source of the total nitrogen load in interconnected surface water bodies. High total nitrogen loads in surface water bodies can cause nuisance algal blooms and low dissolved oxygen leading to fish kills.

Nitrogen is not present in waste streams in its elemental form. It typically occurs in one or more of the following compounds: nitrate (NO_3), nitrite (NO_2), ammonia (NH_3), ammonium (NH_4), and organic nitrogen.

The term “total nitrogen” refers to the sum of all forms of nitrogen compounds. The majority of the total nitrogen load in both surface waters and ground waters is in the form of nitrate (NO_3).

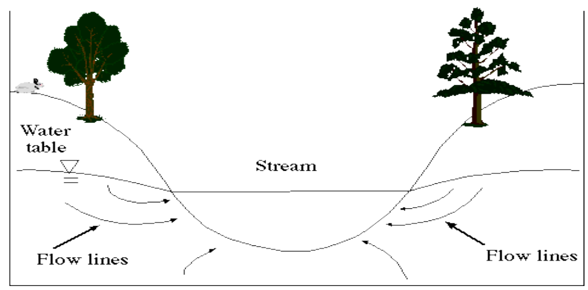
The USGS (2010) concluded that, nationwide 66 percent of streams evaluated had more than 37 percent of their total nitrate load contributed by base flow from ground water seepage (Figure 4-1). The USGS report also stated that the proportion of the nitrate load in streams attributed to nitrate in base flow was significantly higher in areas with permeable soils or bedrock similar to conditions found in the San Diego Region.

For discharges of waste with significant total nitrogen loads, the biostimulatory substances surface water quality objective may limit the discharge specification for total nitrogen in WDRs for projects or facilities that discharge to land near surface water bodies. Discharges with significant total nitrogen loads include:

- Discharges to land from Onsite Wastewater Treatment Systems (OWTS) and wastewater treatment plants.
- Deep percolation of rainfall or irrigation water from agricultural and nursery operations where nitrogen fertilizers have been applied.
- Deep percolation of rainfall or irrigation water from urban landscapes where nitrogen fertilizers have been applied.
- Deep percolation of recycled water applied for irrigation of agricultural and nursery lands, and urban landscapes.

Natural processes, including physical, chemical, and biological, can affect nitrogen exchanges between ground water and surface water bodies. Total nitrogen concentrations in effluent plumes discharged from OWTS will lose strength through dispersion and dilution as the plumes migrate along ground-water flow paths through an aquifer. In stream settings containing organic-rich sediments and low dissolved-oxygen concentrations, bacteria convert dissolved nitrate in ground water to innocuous nitrogen gas through the process of denitrification and reduce the total nitrogen load entering the stream. Nitrate can also be removed from the ground water as it moves through streamside riparian zones. Nitrate can be removed from stream water that flows through sediments in the streambed. Vegetation in riparian buffer zones can also take up nitrate. All of these processes could be very effective at reducing total nitrogen concentrations in some settings and not in others.

Figure 4-1. Interconnected Surface and Groundwater



Loading of nitrogen through the groundwater pathway includes transport through the unsaturated (or vadose) zone, into a shallow water table and through a deeper saturated zone, which may include confined and unconfined aquifer systems.

Discharges of wastes with significant total nitrogen loads to ground waters that are located in proximity to surface waters, or where ground water is connected to surface waters require additional evaluation to ensure the protection of water quality and beneficial uses.

Where potential discharges of total nitrogen to surface waters are determined to exist via the ground water pathway, the Regional Board may and most likely will adopt WDRs that require a reduced concentration in the proposed discharge effluents, reduction in total nitrogen loads, and or compliance with more stringent water quality objectives in receiving surface waters for the protection of beneficial uses of water resources.

Discharges to Land from Wastewater Treatment Systems

Discharges from wastewater treatment systems that are located in ground water basins interconnected with surface waters could adversely affect surface water quality. The State *Water Quality Control Policy for Siting, Design, and Maintenance of Onsite Wastewater Treatment Systems* (OWTS Policy) includes a waiver of WDRs for smaller systems that meet design and siting conditions specified in the Policy. The OWTS Policy includes setback distances that are to be maintained from various types of surface water bodies. Setbacks allow for diffusion, dilution, and dispersion of an effluent plume before the affected ground water discharges to a surface stream. Denitrification of the effluent plume can also occur along the flow path between the wastewater treatment system disposal area to the surface-water body. Denitrification can occur due to site specific processes including: plant uptake of nutrients within the dispersal area, denitrification in the soil column as the effluent percolates to the water table, and denitrification in the riparian zone bordering the surface-water body.

Systems that do not qualify for the waiver must be regulated with WDRs. These systems are typically located at rural parks, schools, campgrounds, mobile home parks, roadside rest stops, small commercial or residential subdivisions, restaurants, resort hotels/lodges, small correctional facilities, temporary fire-fighting camps, and recreational vehicle (RV) dump locations, including RV parks. WDRs for these systems require some combination of setbacks from surface waters, higher levels of treatment, or dispersal systems with nitrogen uptake to protect interconnected surface water quality.

For systems that pose a potential threat to surface water quality due to their size or proximity to a surface water body, the Regional Board can and most likely will require the Report of Waste Discharge (RWD) to include a nitrate study. The purpose of the nitrate study is to provide the Regional Board with the information needed to establish discharge specifications for total nitrogen in effluent that will not cause the water quality objective for total nitrogen to be exceeded in any surface water body interconnected with receiving ground water. The nitrate study must utilize an acceptable mass balance method to evaluate if the proposed discharge will cause the water quality objectives for nitrate to be exceeded in ground water, and determine if the proposed discharge will adversely affect surface water quality. The nitrate study may also include, but not be limited to, an evaluation of following nitrogen fate and transport factors.

- Nitrogen uptake, if any, in the discharge area.
- Denitrification in the soil column of the discharge area.
- Concentration of nitrogen in the effluent when it reaches the ground water table.
- Effects of dilution of the effluent along the flow path to the surface water body.
- Effects of diffusion of the effluent along the flow path to the surface water body.
- Effects of nitrogen uptake/reduction by vegetation (e.g., within the root zone and by riparian vegetation) along the flow path to the surface water body.
- Travel time and distance from the point of discharge to the surface water body and riparian zone.
- Assimilative capacity, if any, in the ground water and surface water body.

Discharges to Ground Water from Agricultural and Nursery Operations

Use of fertilizer at agricultural operations can be a significant contributor of total nitrogen to surface waters via both shallow and deep groundwater pathways. The State Water Board convened an Agricultural Expert Panel to assess agricultural nitrate control programs and develop recommendations for its Irrigated Lands Regulatory Program to ensure protection of ground water quality. The Agricultural Expert Panel proposed a comprehensive regulatory program that focuses on minimizing loads of nitrates to ground water (ITRC, 2014). Key elements of the Agricultural Expert Panel’s recommendations include: creation and implementation of customized nitrogen/water management plans; trend monitoring of ground water nitrate concentrations; and development of a comprehensive educational and outreach program for different audiences (such as individuals who may need certification, managers of irrigation/nutrient plans, irrigators, and farmers/managers, etc).

WDRs for agricultural and nursery operations in the San Diego Region should require dischargers to implement appropriate management measures to ensure that their operations do not adversely affect ground water or surface water quality. Management measures may include but are not limited to the following:

- Develop and implement an effective irrigation water and nitrogen management plan that includes: an estimate of nitrogen required, agronomic rate of fertilizer application considering soil properties and crops nutrient requirements, estimate of nitrogen uptake/removal, the distribution and uniformity of the irrigation system, volume of water infiltration in a field, and actions taken to periodically assess and improve performance of the system. Increasing the water use efficiency will typically reduce the discharge volume and the total pollutant discharge loading to ground water. Discharges need to regularly inspect irrigation systems for leaks to ensure that excessive infiltration of runoff is not occurring.

- Convert paved or bare soil areas to vegetation that will retard runoff and increase storm water infiltration (wherever possible). The increased infiltration will help dilute total nitrogen concentrations in ground water.

- Group plants with similar water needs together to improve irrigation efficiency.

- Establish plant buffer zones between production areas and surface water bodies to effectively reduce nitrate in interconnected surface water.

- Install and use moisture sensors and automatic sprinklers for more accurate scheduling of irrigation.

- Improve efficiency of irrigation return flow conveyance systems and prevent leaks.

- Train employees on management measures, stormwater discharge prohibitions, WDR requirements, and appropriate irrigation and fertilizer application practices.

Discharges to Ground Water from Animal Feeding Operations

Discharges from animal feeding operations contain nitrogen compounds and other pollutants that can percolate to ground water and affect interconnected surface waters. Discharges from animal feeding operations may include wash water and waste from animal activities, and storm water runoff which can also transport pollutants from animal operations to ground water.

There are statewide minimum standards for discharges of animal wastes established in the California Code of Regulations[3]. These minimum standards are included in waivers and WDRs for animal feeding operation. If needed, the Regional Board will also prescribe more stringent requirements in individual WDRs for discharges from animal feeding operations that potentially pose a higher threat to surface water quality.

Landscape Irrigation with Recycled Water

Irrigating landscapes with recycled water is critical to developing a local, sustainable water supply for the Region. Recycled water that percolates past the landscape root zone, however, can be a source of nitrate to ground water and interconnected surface water. Applying recycled water and fertilizer in amounts and at rates needed by the landscape in end use areas will protect groundwater and interconnected surface water from excessive nitrogen loading.

Permits issued by the Regional Board for projects that include landscape irrigation with recycled water typically require the recycled water producer to develop rules and

[3] Title 27, Division 2, Subdivision 1, Chapter 7, Subchapter 2, Article 1.

regulations that must be implemented in the end use areas for the protection of public health and the environment. The permits also stipulate minimum requirements for the rules and regulations. Practices to ensure that recycled water and fertilizer are applied at agronomic rates in end use areas should be included in these minimum requirements for the rules and regulations. Below are some example practices that lead to the application of recycled water and fertilizer at agronomic rates.

- Monitor nutrient levels in recycled water supplies and notify end users of the nutrient value of recycled water.
- Use fertilizers appropriately taking into account the nutrient levels in the recycled water.
- Avoid overwatering of landscapes and runoff.
- Educate and train site supervisors on how to (1) minimize the potential for runoff or over-irrigation; and (2) take into account the nutrient value of the recycled water.
- Conduct periodic inspections of end use areas.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

Waste Discharge Requirements that implement federal National Pollutant Discharge Elimination System (NPDES) regulations ("NPDES requirements" or "NPDES permits") are issued to regulate discharges of "pollutants" from point sources to "waters of the United States" to ensure that the quality and quantity of such discharges does not adversely affect surface water quality or beneficial uses. The phrase "waters of the United States" is defined in Title 40, CFR, Parts 122.2, 230.3 and 232.3. The definition of "waters of the United States" emphasizes protection of a broad range of surface waters, including interstate and intrastate lakes, creeks, streams, wetlands, rivers, bays, and ocean waters. Ephemeral creeks, and streams are considered to be "waters of the United States" for the purpose of issuing NPDES permits. In this Basin Plan the term "waters of the United States" is used interchangeably with the term "surface waters".

NPDES permits are authorized by section 402 of the Clean Water Act and section 13370 of the Water Code. Permit conditions and the issuance process are described in Title 40, CFR, Part 122 (40 CFR 122) and CCR, Title 23, Chapters 3 and 4. The responsibility for issuing NPDES permits in California has been delegated to the regional boards, subject to review and approval by the Regional Administrator (USEPA Region IX, San Francisco). NPDES permits issued by the Regional Board are also "waste discharge requirements" issued under the authority of the Water Code, Chapter 5.5.

A standard NPDES permit typically includes the following elements:

Findings
Official description of the facility, processes, type and quantity of wastes, existing NPDES permits, enforcement actions, public notice and applicable USEPA effluent guidelines and standards, Water Quality Control Plans, beneficial uses and water quality objectives;

Effluent Limitations
Narrative and numerical limits for effluent and discharge prohibitions;

Receiving Water Limitations
Narrative and numerical objectives for the receiving waters;

Provisions
Standard provisions required by the Regional Board and by state and federal law, expiration date of permit;

Compliance Schedules
Time schedules for completion of activities to achieve compliance with permit conditions;

Pretreatment Requirements
Standard pretreatment requirements for municipal facilities (see below);

Sludge Requirements
Sludge monitoring and control requirements, if necessary; and a

Monitoring and Reporting Program
Specific locations of monitoring stations and sampling frequency for all constituents limited in the permit, including flow, and other constituents that may be required by the Regional Board.

The NPDES permit regulates discharges of wastes for the purpose of limiting the quantity of pollutants and volume of waste discharged to surface waters. NPDES permits contain prerequisite conditions which must be met by dischargers to ensure protection of beneficial uses of the receiving water as described in the Regional Board's Water Quality Control Plan, Statewide Water Quality Control Plans, and other water quality control policies.

Any person proposing to discharge pollutants into surface waters must submit a report of waste discharge in application for an NPDES permit at least 180-days in advance of the date on which it is desired to commence the proposed discharge. Certain discharges do not require an NPDES permit. The following discharges are exempt from the requirements for NPDES coverage pursuant to 40 CFR 122.3:

- Any discharge of sewage from vessels, effluent from properly functioning marine engines, laundry, shower, and galley sink wastes, or any other discharge incidental to the normal operation of a vessel;

- Discharges of dredged or fill material into waters of the United States which are regulated under the Clean Water Act, section 404;

- The introduction of sewage, industrial wastes, or other pollutants into publicly owned treatment, any discharge in compliance with the instructions of an On-Scene Coordinator pursuant to 40 CFR 300 (The National Oil and Hazardous Substances Pollution Contingency Plan) or 33 CFR 153.10(e) (Pollution by Oil and Hazardous Substances);

- Any introduction of pollutants from nonpoint source agricultural and silvicultural activities, including storm water runoff from orchards, cultivated crops, pastures, range lands, and forest lands;

- Return flows from irrigated agriculture; and

- Discharges into a privately owned treatment works.

NPDES permits are issued for a term of five years or less. The terms and conditions of the permit are regularly updated as necessary. NPDES permits can be revoked for cause by the Regional Board.

The Water Code, Division 7, Chapter 5.5, Article 6 authorizes the Regional Board to issue NPDES permits, review self-monitoring reports submitted by the discharger, and perform independent compliance checking. The Regional Board is authorized to take a variety of enforcement actions to obtain compliance with an NPDES permit. Enforcement of NPDES permits is done through the issuance of cleanup and abatement orders, cease and desist orders, administrative civil liability orders, and court action.

The Regional Board will consider the establishment of mixing zones for inland surface waters and enclosed bays and estuaries on a case-by-case basis. Criteria to be established for mixing zones will be specified in the waste discharge requirements established for the discharge.

In addition to regulating discharges of wastewater to surface waters, NPDES permits also require municipal sewage treatment plants having a design capacity greater than 5 MGD to conduct pretreatment programs. Smaller municipal treatment systems may be required to conduct pretreatment programs if there are significant industrial users of their systems. Pretreatment is discussed in more detail later in this chapter.

COMPLIANCE TIME SCHEDULES

The Regional Board may establish compliance time schedules in NPDES requirements where the Regional Board determines that, for an existing discharger[4], achieving immediate compliance in a discharge with new or more stringent water quality based effluent limitations or receiving water limitations that implement new, revised, or newly interpreted water quality objectives[5], and/or that resulted from new knowledge on the characteristics and impacts of the discharge is infeasible[6]. New knowledge about the characteristics and impacts of the discharge that can result in new or more stringent WQBELs or receiving water limitations include, but are not limited to, the following situations:

- Pollutants previously unregulated in an existing discharge are newly regulated because the new information indicates a reasonable potential for the discharge to exceed an applicable water quality objective in the receiving water;

- Pollutants are newly detected in an existing discharge due to improved analytical techniques;

- The point of compliance for a receiving water limitation is changed; and

- The dilution allowance for an existing discharge is changed.

Compliance time schedules are authorized by this provision only for new or more stringent effluent and/or receiving water limitations that implement water quality objectives issued, revised, or newly interpreted after November 9, 2005, or that resulted from new knowledge on the characteristics and impacts of the discharge for any pollutant for which a water quality objective was issued, revised, or newly interpreted after July 1, 1977.

The compliance time schedule shall include a time schedule for completing or achieving specific actions (including interim effluent limitations) that demonstrate reasonable progress toward compliance with water quality based effluent limitations or receiving water limitations and, thereby, attainment of water quality objectives. The compliance time schedule shall contain a final compliance date, based on the shortest practicable time (determined by the Regional Board at a public hearing after considering the factors identified below) required to achieve compliance. In addition, in all cases, the findings of the NPDES requirements shall specify the final effluent limitations.

Compliance time schedules in NPDES requirements shall be as short as practicable but in no case exceed five years from the date of order issuance, reissuance, or modification. The Regional Board may grant an additional extension of up to five years, but only where the discharger has demonstrated satisfactory progress toward achieving compliance with applicable water quality based effluent limitations and receiving water limitations and the Regional Board concurs with the demonstration. In no case, shall a compliance time schedule for these discharges exceed ten years from the date of adoption, revision, or interpretation of the applicable water quality objective, whichever is the shorter period of time.

Nothing in this provision limits the Regional Board's authority (1) to develop alternate implementation provisions for water quality objectives adopted or revised in the future, or (2) to rely on alternate implementation provisions authorized pursuant to State Board policies for water quality control, State

[4] "Existing discharger" means any discharger that is not a new discharger. An existing discharger includes an increasing discharger (i.e., an existing facility with treatment systems in place for its current discharge that is or will be expanding, upgrading, or modifying its existing permitted discharge after a new, revised, or newly interpreted water quality objective becomes applicable). A "new discharger" is defined as any building, structure, facility or installation from which there is or may be a "discharge of pollutants" (as defined in 40 CFR section 122.2) to surface water of the San Diego Region, the construction of which commences after a new, revised, or newly interpreted water quality objective becomes applicable.

[5] "New, revised, or newly interpreted water quality objectives" means objectives as defined in section 13050(h) of Porter-Cologne, issued, revised or newly interpreted after November 9, 2005. Objectives may be narrative or numeric.

[6] "Infeasible" means that discharger compliance cannot be accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors.

regulations, or federal regulations. Compliance time schedules to meet WQBELs and receiving water limitations that implement California Toxics Rule criteria will be limited by the provisions of the State Board "*Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*."

To document the need for and justify the duration of any such compliance time schedule, a discharger must submit the following information, at a minimum: (1) the results of a diligent effort to quantify pollutant levels in the discharge and the sources of the pollutant(s) in the waste stream; (2) identification of the sources of the pollutant in the waste stream, documentation of source control efforts currently underway or completed, including compliance with any pollution prevention programs that have been established, and a proposed schedule for additional source control measures or waste treatment needed to meet the WQBELs and/or receiving water limitations; (3) evidence that the discharge quality is the highest that can reasonably be achieved until final compliance is attained; and (4) a demonstration that the proposed schedule is as short as practicable, taking into account economic, technical and other relevant factors. The need for additional information and analyses will be determined by the Regional Board on a case-by-case basis. The need for and justification of the duration of any such compliance time schedule will be subject to Regional Board review and approval.

CONDITIONAL WAIVERS OF WASTE DISCHARGE REQUIREMENTS

The Regional Board may waive issuance of waste discharge requirements and/or the requirement to file reports of waste discharge for a specific discharge or specific types of discharge pursuant to Water Code section 13269 if such waiver is determined to be consistent with the Basin Plan and in the public interest.

The waiver of adoption of waste discharge requirements is not applicable to discharges subject to federal NPDES regulations. The federal Clean Water Act does not provide for a waiver of the need to obtain an NPDES permit for point source discharges of pollutants to surface waters.

Amendments to Water Code section 13269, effective January 1, 2003 provided that waivers may not exceed five years duration and must be conditional. Under these amendments the Regional Boards were required to:

- Renew waivers every five years;
- Review the terms, conditions, and effectiveness of each waiver at a public hearing;
- Determine if general or individual waste discharge requirements should be issued for ongoing discharges where waivers have been terminated; and
- Require compliance with waiver conditions.

A waiver of waste discharge requirements is conditional and may be terminated at any time by the Regional Board for any specific discharge or any specific type of discharge. A conditional waiver is not required to be used by the Regional Board. Even if a discharger complies with all the conditions of a conditional waiver, the Regional Board may still choose to regulate any specific discharge with waste discharge requirements.

The Regional Board has determined that a waiver of adoption of waste discharge requirements for a specific type of discharge would not be against the public interest under one or more of the following circumstances:

- The type of discharge is effectively regulated by other public agencies; or
- The type of discharge does not adversely affect the quality or the beneficial uses of the waters of the state; or

- The type of discharge is not readily amenable to regulation through adoption of waste discharge requirements but warrants Regional Board oversight to insure compliance with mandated conditions.

The Regional Board conditionally waives the adoption of waste discharge requirements for certain specific types of discharges through the issuance of an Order. The Waiver Order describes the specific types of discharges subject to a waiver, and the conditions the discharge must meet to be eligible for the waiver. The Regional Board's current Waiver Order may be viewed or downloaded by visiting the conditional waiver website (http://www.waterboards.ca.gov/sandiego/), or contacting Regional Board Staff.

In general the discharges eligible for a waiver must comply with the following conditions:

- The discharge shall not create a nuisance or pollution as defined in the Water Code; and

- The discharge shall not cause a violation of any applicable water quality standard for the receiving waters adopted by the Regional Board, or the State Water Resources Control Board, as required by the Clean Water Act; and

- The discharge of any substance in concentrations toxic to animal or plant life is prohibited.

In addition, the discharges must satisfy the general and specific conditions described in each conditional waiver.

WATER RECLAMATION REQUIREMENTS

Reclaimed water is water that, as a result of treatment, is suitable for a direct beneficial use or a controlled use that would otherwise not occur. Reclaimed water uses in the Region include, but are not limited to, landscape irrigation, crop irrigation, freeway landscape irrigation, ground water recharge, soil compaction at construction sites, and for recreational lakes.

The Regional Board may prescribe water reclamation requirements to reclaimed water producers and those governing the use of reclaimed water, which the Regional Board has determined are necessary to protect public health, safety, and welfare pursuant to Water Code, Division 7, Chapter 7, sections 13500-13556 "Water Reclamation Law". Water Reclamation Law provides that no person shall reclaim water or use reclaimed water for any purpose subject to Title 22 criteria until water reclamation requirements have been established or the Regional Board determines no requirements are necessary. The Regional Board may not deny issuance of water reclamation requirements to a project which violates only a salinity standard in the Basin Plan.

In lieu of issuing water reclamation requirements pursuant to Water Code, section 13523, for each user of reclaimed water, the Regional Board establishes master reclamation requirements as part of the waste discharge requirements which are issued to a supplier or distributor, or both, of reclaimed water. Reclamation requirements must include the following components:

- A requirement that the permittee comply with the uniform statewide reclamation criteria established pursuant to section 13521. Permit conditions for a use of reclaimed water not addressed by the uniform statewide reclamation criteria shall be considered on a case-by-case basis;

- A requirement that the permittee establish and enforce rules or regulations for reclaimed water users, governing the design and construction of reclaimed water use facilities and the use of reclaimed water, in accordance with the uniform statewide reclamation criteria established pursuant to section 13521;

- A requirement that the permittee submit a quarterly report summarizing reclaimed water use, including the total amount of reclaimed water supplied, the total number of reclaimed water use sites, and the locations of those sites, including the names of the hydrologic areas underlying the reclaimed water use sites;

- A requirement that the permittee conduct periodic inspections of the facilities of the reclaimed water users to monitor compliance by users with the uniform statewide reclamation criteria and the requirements of the master reclamation permit; and

- Any other requirements determined to be appropriate by the Regional Board.

The "Rules and Regulations for Reclaimed Water Users" that must be issued and enforced by the permittee govern the design and construction of reclaimed water use facilities and the use of reclaimed water. The rules and regulations must have the following elements:

- Provisions implementing Title 22, Division 4, Chapter 3, Wastewater Reclamation Criteria; and Title 17, Division 1, Chapter 5, Group 4, Articles 1 & 2, of the CCR;

- Provisions implementing the State Board Division of Drinking Water (State Board DDW) "Guidelines For Use of Reclaimed Water and Guidelines for Use of Reclaimed Water for Construction Purposes" and measures that are deemed necessary for protection of public health, such as the "American Water Works Association (AWWA) California/Nevada Section, Guidelines for the Distribution of Non-Potable Water" or alternate measures, acceptable to State Board DDW, providing equivalent protection of public health;

- Provisions authorizing the Regional Board, the discharger/producer, or an authorized representative of these parties, upon presentation of proper credentials, to inspect the facilities of any reclaimed water user to ascertain whether the user is complying with the discharger/producer's rules and regulations;

- Provision for written notification, in a timely manner, to the discharger/producer by the reclaimed water user of any material change or proposed change in the character of the use of reclaimed water;

- Provision for submission of a preconstruction report to the discharger/producer by the reclaimed water user in order to enable the discharger/producer to determine whether the user will be in compliance with the discharger/producer's rules and regulations;

- Provision requiring reclaimed water users to designate a reclaimed water supervisor responsible for the reclaimed water system at each use area under the user's control. Reclaimed water supervisors should be responsible for the installation, operation, and maintenance of the irrigation system, enforcement of the discharger/producer's reclaimed water user rules and regulations, prevention of potential hazards, and maintenance of the reclaimed water distribution system plans in "as built" form;

- Provision authorizing the discharger/producer to cease supplying reclaimed water to any person who uses, transports, or stores such water in violation of the discharger/producer's rules and regulations;

- Provision requiring notification and concurrence of the State Board DDW and the local county health department for new reclaimed water users. The notification of the county health department shall include a site distribution plan for new and retrofit facilities and a cross-connection control inspection plan for sites containing both potable and reclaimed water distribution lines;

- Provision requiring all windblown spray and surface runoff of reclaimed water applied for irrigation onto property not owned or controlled by the discharger or reclaimed water user to be prevented by implementation of BMPs;

- Provision requiring all reclaimed water storage facilities owned and/or operated by reclaimed water users to be protected against erosion, overland runoff, and other impacts resulting from a 100-year frequency storm, 24 hour storm. This requirement may be waived if the discharger submits information demonstrating that releases from the storage facilities caused by storm events of less than 100-year frequency will not cause violation of the Basin Plan water quality standards;

- Provision requiring all reclaimed water storage facilities owned and/or operated by reclaimed water users to be protected against 100-year frequency peak stream flows as defined by the local flood control agency. However, if information is made available to the Regional Board which shows that a reclaimed water storage facility presents no potential impairment to the beneficial uses, the Regional Board may exempt requirements for 100-year flood protection on a case-by-case basis;

- Provision for notification to reclaimed water users that the Regional Board may initiate enforcement action against any reclaimed water user who discharges reclaimed water in violation of any applicable discharge prohibitions prescribed by the Regional Board or in a manner which creates, or threatens to create conditions of pollution, contamination, or nuisance, as defined in Water Code section 13050; and

- Provision for notification to reclaimed water users that the Regional Board may initiate enforcement action against the discharger/producer, which may result in the termination of the reclaimed water supply, if any person uses, transports, or stores such water in violation of the discharger/ producer's rules and regulations or in a manner which creates, or threatens to create conditions of pollution, contamination, or nuisance, as defined in Water Code section 13050.

WASTE DISCHARGE PROHIBITIONS

Water Code section 13243 provides that a Regional Board, in a water quality control plan, may specify certain conditions or areas where the discharge of waste, or certain types of waste is not permitted. The following discharge prohibitions are applicable to any person, as defined by section 13050(c) of the Water Code, who is a citizen, domiciliary, or political agency or entity of California whose activities in California could affect the quality of waters of the state within the boundaries of the San Diego Region.

(1) The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in Water Code section 13050, is prohibited.

(2) The discharge of waste to land, except as authorized by WDRs or the terms described in Water Code section 13264 is prohibited.

(3) The discharge of pollutants or dredged or fill material to waters of the United States except as authorized by an NPDES permit or a dredged or fill material permit (subject to the exemption described in Water Code section 13376) is prohibited.

(4) Discharges of recycled water to lakes or reservoirs used for municipal water supply or to inland surface water tributaries thereto are prohibited, unless this Regional Board issues a NPDES permit authorizing such a discharge; the proposed discharge has been approved by the State Board DDW and the operating agency of the impacted reservoir; and the discharger has an approved fail-safe long-term disposal alternative.

(5) The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the Regional Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

(6) The discharge of waste in a manner causing flow, ponding, or surfacing on lands not owned or under the control of the discharger is prohibited, unless the discharge is authorized by the Regional Board.

(7) The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the Regional Board.

(8) Any discharge to a storm water conveyance system that is not composed entirely of "storm water" is prohibited unless authorized by the Regional Board. [The federal regulations, 40 CFR 122.26 (b) (13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26 (b) (2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [Section 122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

(9) The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

(10) The discharge of industrial wastes to conventional septic tank/subsurface disposal systems, except as authorized by the terms described in Water Code section 13264, is prohibited.

(11) The discharge of radioactive wastes amenable to alternative methods of disposal into the waters of the state is prohibited.

(12) The discharge of any radiological, chemical, or biological warfare agent into waters of the state is prohibited.

(13) The discharge of waste into a natural or excavated site below historic water levels is prohibited unless the discharge is authorized by the Regional Board.

(14) The discharge of sand, silt, clay, or other earthen materials from any activity, including land grading and construction, in quantities which cause deleterious bottom deposits, turbidity or discoloration in waters of the state or which unreasonably affect, or threaten to affect, beneficial uses of such waters is prohibited.

(15) The discharge of treated or untreated sewage from vessels to Mission Bay, Oceanside Harbor, Dana Point Harbor, or other small boat harbors is prohibited.

(16) The discharge of untreated sewage from vessels to San Diego Bay is prohibited.

(17) The discharge of treated sewage from vessels to portions of San Diego Bay that are less than 30 feet deep at MLLW is prohibited.

(18) The discharge of treated sewage from vessels, which do not have a properly functioning USCG certified Type I or Type II marine sanitation device, to portions of San Diego Bay that are greater than 30 feet deep at MLLW is prohibited.

WATER QUALITY CERTIFICATION (SECTION 401)

In addition to the issuance of NPDES permits or WDRs, the Regional Board acts to protect the quality of surface waters through water quality certification pursuant to section 401 of the Clean Water Act. Section 401 requires that any person applying for a federal permit or license which may result in a discharge of pollutants into waters of the United States, must obtain a state water quality certification that the activity complies with all applicable water quality standards, limitations, and restrictions.

No license or permit may be issued by a federal agency until certification required by section 401 has been granted or waived by the state. Further, no license or permit may be issued if certification has been denied by the state. The activity must also meet the requirements of the Coastal Nonpoint Pollution Control Program required under the Coastal Zone Act Reauthorization Amendments (CZARA).

The following permits or licenses are subject to section 401 of the Clean Water Act:

- NPDES permits issued by the USEPA under section 402 of the Clean Water Act;
- Clean Water Act, section 404 permits issued by the United States Army Corps of Engineers (USACOE);
- Permits issued under sections 9 and 10 of the Rivers and Harbors Act (for activities which may affect navigation);
- Licenses for hydroelectric power plants issued by the federal Energy Regulatory Commission under the Federal Power Act; and
- Licenses issued by the Nuclear Regulatory Commission.

The Regional Board's water quality certification activities have focused on applications for permits for the discharge of dredged or fill material to surface waters. These permits are issued by the USACOE (Clean Water Act, section 404 permits) subject to any conditions imposed by the Regional Board pursuant to section 401.

The section 404 program is administered at the federal level by the USACOE and the USEPA. The US Fish and Wildlife Service and the National Marine Fisheries Service have important advisory roles. The USACOE has the primary responsibility for the permit program and is authorized, after notice and opportunity for a public hearing, to issue permits for the discharge of dredged or fill material. USEPA develops the regulations under which permits may be granted.

The Regional Board evaluates the projects for which section 404 permits are requested and determines whether to deny water quality certification, issue a certification with or without conditions, or waive the certification pursuant to regulations in Article 4, Title 23. Regional Board certification is dependent upon assurance that the project will not reduce water quality below applicable standards as defined in the Clean Water Act (i.e., the water quality objectives established and the beneficial uses which have been designated for the surface waters). A certification is usually denied if the proposed activity does not meet water quality standards. If the activity may violate standards, a conditional certification is given. If the activity does not violate any standards, a section 401 waiver may be given. The Executive Director of the State Board may issue a water quality certification after review of the application, all relevant data, and taking into consideration any recommendations from the Regional Board.

SELF MONITORING, COMPLIANCE MONITORING, AND INSPECTIONS

Compliance with NPDES permits and WDRs is generally self-monitored by each individual discharger, with oversight by the Regional Board. Dischargers are required to report and take necessary corrective actions when they discover that they are not in compliance with the permit effluent limits. The Regional Board conducts periodic inspections and compliance monitoring and, as necessary, will take enforcement actions to ensure compliance.

Self Monitoring Program

WDRs and NPDES permits issued by the Regional Board include requirements for the discharger to collect samples of the waste discharge. In some cases, the receiving waters must also be monitored by the dischargers. The results of the "self monitoring" programs are reported to the Board and are used to determine compliance with the WDRs. (Additional information on this topic is presented in Chapter 6, Surveillance and Monitoring).

Compliance Monitoring and Inspections

Regional Board staff can conduct unannounced inspections (including collection of samples) to determine the status of compliance with NPDES permit or WDRs / WRRs requirements. All major dischargers are inspected at least once a year. (Additional information on this topic is presented in Chapter 6, Surveillance and Monitoring).

ENFORCEMENT

The Regional Board is committed to the maintenance of a strong and uniform enforcement program. Appropriate and timely response to instances of noncompliance with Regional Board NPDES permits, WDRs, waste discharge prohibitions and enforcement orders is necessary to ensure protection of the quality of surface and ground waters in the Region.

Regional Board response to noncompliance incidents include the establishment of a specific time frame for compliance and or correction. All dischargers are expected to correct violations in the shortest time frame possible. With the exception of special circumstances, failure to terminate, comply, or complete corrective actions on a noncompliance incident in a specified time frame will result in the escalation of the matter to a higher level enforcement action.

Regional Board responses to instances of violation correspond to the following enforcement action level sequence, unless circumstances warrant a more expeditious escalation to a higher level.

LEVEL A ENFORCEMENT ACTION

In this action level the Regional Board staff requests the discharger, by telephone or letter, to correct the problem and prevent recurrence. Regional Board staff may also request the discharger to correct the problem during routine compliance inspections.

LEVEL B ENFORCEMENT ACTION

In this action level the Regional Board Executive Officer issues a notice of violation to the discharger for failure to comply with a compliance schedule for corrective action.

LEVEL C ENFORCEMENT ACTION

In this action level the Regional Board may take a variety of formal higher level enforcement actions. The Water Code provides the Regional Board with a number of enforcement remedies for violations of requirements. These remedies include time schedules, cease and desist orders, cleanup and abatement orders, and administrative civil liability orders.

Time Schedule Orders

When a discharge is taking place or threatening to occur that will cause a violation of a Regional or State Board requirement, a discharger may be required to submit a detailed list of specific actions the discharger will take to correct or prevent the violation. (Water Code section 13300). These schedules may also be required when the waste collection, treatment, or disposal facility of a discharger are approaching capacity. Time schedule orders are adopted by the Board after a public hearing or issued by the Executive Officer pursuant to authority delegated by the Regional Board.

Cleanup and Abatement Orders

The Regional Board may issue a cleanup and abatement order to any person who has discharged, is discharging or is threatening to discharge wastes that will result in a violation of WDRs or other order or prohibition of the State or Regional Board. The Regional Board may also issue a cleanup and abatement order to any person who discharges or has discharged waste to waters of the state and causes, or threatens to cause, a condition of pollution or nuisance. The cleanup and abatement order may require the waste discharger(s) to cleanup and abate the effects of the discharge or to take other appropriate remedial action (Water Code section 13304). A cleanup and abatement order is issued if a pollutant can actually be cleaned up or the pollutant effects abated. The Regional Board has delegated issuance of these orders to the Executive Officer. Cleanup and abatement orders do not require Board adoption, but may be brought before the Regional Board for consideration at the request of the discharger.

Cease and Desist Orders

If discharge prohibitions or requirements of the State Board or Regional Board are violated or threatened, the Regional Board may adopt a cease and desist order (Water Code section 13301) requiring the discharger to comply forthwith, to comply in accordance with a time schedule, or if the violation is threatened, to take appropriate remedial or preventive action. Cease and desist orders may restrict or prohibit the volume, type or concentration of waste added to community sewer systems, if existing or threatened violations of waste discharge requirements occur. Cease and desist orders may specify interim time schedules as well as limitations that must be complied with until full compliance is achieved. Cease and desist orders are adopted by the Regional Board after a public hearing.

Administrative Civil Liability

Administrative civil liability complaints and orders may be issued by the Regional Board for certain categories of violations. In this process the Regional Board may impose monetary penalties on dischargers. The Regional Board (or the Executive Officer) may issue Administrative Civil Liability complaints (ACLs) to persons who intentionally or negligently violate enforcement orders of the Board, or who intentionally or negligently discharge wastes in violation of any order, prohibition, or requirement of the Board where the discharge causes conditions of pollution or nuisance (Water Code section 13350). ACLs may also be issued in cases where a person fails to submit reports requested by the Board (Water Code sections 13261 and 13268) or when a person discharges waste without first having filed the appropriate RWD (Water Code section 13265). ACLs may be issued pursuant to Water Code section 13385 for violations of any Regional Board prohibition or requirement implementing specified sections of the Clean Water Act, or any requirement in an approved pretreatment program. Amounts of administrative civil liability that the Board can impose range up to $10,000 per day of violation. The Water Code also provides that a superior court may impose civil liability assessments in substantially higher amounts. The Regional Board may conduct a hearing if a discharger contests the imposition of the Administrative Civil Liability.

LEVEL D ENFORCEMENT ACTION

Referral to the Attorney General or District Attorney

Judicial Civil Liability

The Water Code provides that a Regional Board may request the State Attorney General to petition a superior court to enforce orders and complaints issued by the Board and impose civil monetary remedies. The monetary remedies may be in excess of the administrative civil liability penalties that the Regional Board is authorized to impose. The court imposed fines and or imprisonment vary depending upon the seriousness of the violation.

Injunctive Relief

The Regional Board may also request that the Attorney General seek injunctive relief in specific situations, such as violations of cease and desist orders or discharges which cause or threaten to cause a nuisance or pollution that could result in a public health emergency (Water Code section 13331 and section 13340).

Criminal Penalties

The Regional Board may also refer violations to the District Attorney to seek criminal penalties by judicial action in the county where the discharge occurred. The court imposed fines and or imprisonment vary depending upon the seriousness of the violation.

SELECTION OF APPROPRIATE ENFORCEMENT ACTION

The following criteria are considered by the Regional Board in selecting the appropriate enforcement action in response to an incident of noncompliance:

- Degree of water quality impairment and/or threat to the public health including the degree of toxicity of the discharge;
- Past history of discharge violations;
- Degree of cooperation or recalcitrance shown by the discharger;
- Culpability of the discharger;
- Financial resources of the discharger;
- Whether the circumstances leading to the noncompliance have been corrected;
- Whether the discharge violations are likely to continue in the future;
- Whether the discharge can be cleaned up;
- The need to take immediate cleanup action;
- Any economic benefit realized by the discharger as a result of the noncompliance; and
- Other actions as justice may require.

STATE WATER RESOURCES CONTROL BOARD PLANS AND POLICIES

The State Water Resources Control Board (State Board) has adopted a number of plans and policies for statewide water quality management. The Regional Board implements these plans through WDRs, NPDES permits, and any necessary enforcement actions. These policies are explained in more detail in Chapter 5, Plans and Policies.

HAZARDOUS WASTE SOURCE REDUCTION

The Department of Toxic Substance Control (DTSC) has adopted regulations regarding hazardous waste source reduction pursuant to the Hazardous Waste Source Reduction and Management Review Act of 1989 (Article 11.9, starting with section 25244.12 of the Health and Safety Code). These regulations are contained in sections 67100.1 through sections 67100.14 of Title 22 of the CCR. These regulations require that each generator of hazardous or extremely hazardous waste within the limits set by the regulations conduct a source reduction evaluation review and plan, plan summary, hazardous waste management performance report, and report summary on or before September 1, 1991 and every four years thereafter. Every generator is required to retain a copy of the current review and plan, plan summary, report, report summary, progress report, and compliance checklist at each site, at a public library, or at a local governmental agency. The Regional Board supports these efforts of hazardous waste source reduction because any successes achieved will mean less hazardous waste which could pollute California's waters.

MUNICIPAL AND DOMESTIC WASTEWATER

Municipal wastewater in the San Diego Region consists primarily of domestic sewage and minor quantities of industrial wastes in some of the more highly urbanized and industrialized areas. Facilities to control municipal wastewater include wastewater collection systems, pumping stations, transport pipelines, treatment plants, storage ponds and ocean outfalls. These facilities are sometimes collectively referred to by the term Publicly Owned Treatment Works (POTW).

Municipal wastewater treatment in the San Diego Region is generally at the secondary treatment level. Secondary treatment results in the removal of more than 85 percent of the biochemical oxygen demand and suspended solids found in municipal wastewater. Tertiary (advanced) wastewater treatment is used at some treatment plants for additional removal of pollutants to reclaim wastewater for beneficial reuse. Effluent from the wastewater treatment plants is disposed of by various means including:

- Discharge to the Pacific Ocean via long deep ocean outfalls;
- Percolation into the soil; and
- Reclamation and reuse in conformance with uniform reclamation criteria (CCR, Title 22, Division 4, Chapter 3).

Sludge disposal at most major municipal wastewater treatment plants in the Region consists of aerobic or anaerobic digestion and land disposal. Dried sludge is either disposed of at landfills or made available to the public as a soil conditioner. Some treatment plants, located upstream of major regional wastewater treatment plants discharge sludge to the sewage collection system for treatment at a "downstream" regional wastewater plant. The term municipal sewage treatment plant and Publicly Owned Treatment Works are used interchangeably in the Basin Plan.

The Regional Board regulates wastewater discharges from municipal wastewater treatment plants through either the issuance of NPDES permits where the discharge is to surface waters or through WDRs where the discharge is to land.

Discharges of wastewater to surface water must meet the effluent limitations prescribed in the NPDES permit issued by the Regional Board. Effluent limitations are based on the following criteria:

- Secondary treatment effluent limitations defined by USEPA contained in 40 CFR 133, unless a waiver to the secondary treatment standards is obtained (more stringent effluent limitations than secondary treatment may be imposed by the Regional Board if necessary);
- Applicable water quality objectives and beneficial uses contained in the Basin Plan and State Board Water Quality Control Plans;
- Applicable public health protection standards for total and fecal coliform;
- Assimilative capacity of the receiving water;
- The terms and conditions of the federal Antidegradation Policy (40 CFR 131.12) and the State Antidegradation Policy (Resolution No. 68-16) (See Chapter 3);
- Anti-backsliding provisions described in Clean Water Act section 404; and
- Land disposal or recycling of sludge as a soil amendment.

Discharges of wastewater onto land must meet the effluent limitations in the waste discharge requirements prescribed by the Regional Board through the issuance of WDRs. The WDRs contain effluent limitations based on the following criteria:

- The treatment capability of the treatment process employed by the dischargers;
- Applicable water quality objectives and beneficial uses contained in the Basin Plan;
- Applicable public health protection standards for total and fecal coliform;
- Assimilative capacity of the receiving water;
- The terms and conditions of the State Antidegradation Policy - Resolution No. 68-16 (See Chapter 3); and
- Land disposal or recycling of sludge as a soil amendment.

CLEAN WATER GRANTS AND LOANS

From 1972 until 1988 the State Board assisted the USEPA in administering the multibillion dollar Clean Water Grants Program in California to finance the construction of municipal wastewater treatment facilities. This program ended in 1988. The Clean Water Act provides for the creation of a State Revolving Fund (SRF) Loan Program capitalized in part by federal funds. The Clean Water Act authorizes loan funding for construction of Publicly Owned Treatment Works (POTWs), for implementation of a nonpoint source pollution control management program, and for the development and implementation of an estuary conservation and management program. The State Board converted the Clean Water Grant Program to a Grants and Loans program on October 1, 1988, and ultimately replaced this completely with the State Revolving Fund Loan Program on June 30, 1989.

ONSITE WASTEWATER TREATMENT SYSTEMS

Some areas in the Region rely on onsite wastewater treatment systems (OWTS) for subsurface disposal of domestic sewage. OWTS are used to treat domestic wastewater from residences and commercial and industrial establishments that are not connected to community sewer systems or municipal wastewater treatment plants. Although, OWTS typically serve individual residences, larger systems are suitable for commercial facilities or communities. When properly designed, sited, operated, and maintained, OWTS treat domestic wastewater to reduce its polluting impacts on the environment and to protect public health. The most common type of OWTS is the septic tank-leach field disposal system. Seepage pits are sometimes used when site conditions are not suitable for leachfields.

The purpose of a septic tank system is to treat household wastes so that the treated effluent will readily percolate into the soil for final treatment. Treatment of the waste is initially achieved by the removal of solids through settling and decomposition of some of the soluble organic chemicals in the tank portion of the system. Further treatment of organic chemicals, nutrients, and bacteria occurs as the effluent released from the tank percolates through the soil. Proper construction of septic systems is imperative. Poorly designed and constructed septic systems will not function properly and can result in pollution of surface or ground waters. Septic tank systems used in undersized lots or unsuitable soils are subject to failure, and can lead to untreated or poorly treated sewage surfacing into yards, roadside ditches, and surface waters, or seeping into ground water, thus creating a public nuisance and health hazard. Even well-functioning septic systems can pollute ground water under adverse conditions.

Conventional septic tank-leach field or seepage pit systems may be infeasible in some sites due to unfavorable site-specific soil or ground water conditions, such as, shallow soils, high ground water elevation, steep slopes, rocky soils, etc. In such instances, advanced or alternative OWTS may be appropriate. Examples of advanced or alternative OWTS include mound systems, evapotranspiration systems, evapotranspiration/infiltration systems, small in-house package treatment facilities, media filters, aerobic treatment units, disinfection units, and other innovative approaches.

Advanced or alternative OWTS provide additional removal of pollutants such as pathogens, organics, suspended solids, oil and grease, and nitrogen found in wastewater. Several of these treatment systems have been certified by the National Science Foundation as being able to achieve federal treatment standards for removal of biodegradable organics and total suspended solids. Some have also been certified to achieve at least a fifty percent removal rate for nitrogen. Subsurface drip dispersal systems are often used for dispersal of effluent from advanced or alternative OWTS. Subsurface drip dispersal systems are a pressure-dosed method of effluent dispersal capable of delivering small, precise volumes of wastewater effluent to the soil. The drip lines are normally flexible polyethylene tubes that are about one-half inch in diameter. The drip lines are typically installed in shallow trenches about 2 feet apart and buried 6-12 inches beneath the soil. Because of the unique construction of subsurface drip dispersal systems, they may cause less site disruption during installation, and are adaptable to irregularly shaped lots, or lots with other difficult site constraints. Subsurface drip dispersal systems apply wastewater at the root zone of the soil, which allows for maximum uptake of nutrients in the treated wastewater by vegetation in the disposal area.

Nitrogen compounds, which are typically present in treated effluent from septic systems, are highly soluble and stable in aqueous environments. When not denitrified by bacteria or assimilated into organic growth in the unsaturated zone, these nitrogen compounds are easily transported to ground water. Although there is controversy about the possible health effects of nitrate on adults, it has been shown that high levels of nitrate cause methemoglobinemia (blue-baby syndrome) in infants. Both the federal drinking water standard of 10 mg/l nitrogen (or nitrate + nitrite) and the equivalent state drinking water standard of 45 mg/l nitrate (expressed as NO_3) is based on this relationship.

Management Principles for OWTS

The following management principles are designed to ensure that the goals of the Basin Plan are implemented.

- OWTS must be designed, constructed, and installed so as to be capable of preventing pollution or contamination of the waters of the State or creating nuisance for the duration of the development.

- OWTS must be operated, maintained and monitored so as to continually prevent pollution or contamination of the waters of the State and the creation of a nuisance.

- The responsibility for both of the above must be clearly and legally assumed by an entity with the financial and legal capability to assure that the system provides protection to the quality of the waters of the State for the duration of the development.

Guidelines for New or Replacement OWTS

The purpose of the guidelines below is to provide guidance to proponents of projects involving new discharges of waste from community or individual OWTS. However, the Regional Board may exercise discretion and approve exceptions to these guidelines if it is demonstrated that conformance with the above principles will be achieved. The Regional Board recognizes that there are certain actions which are best undertaken by local agencies to minimize the potential water quality problems resulting from new OWTS. The guidelines are based on the assumption that it is desirable that local agencies:

- Prohibit the use of new community and individual OWTS where existing community sewerage collection systems are reasonably available. The determination of whether or not existing systems are reasonably available should be the responsibility of the local agency or agencies having jurisdiction over the project.

- Prohibit the use of new individual OWTS for any subdivision of land unless the governing body having jurisdiction determines that the use of individual disposal systems will be in the best public interest.

- Assure that individual OWTS are maintained to the satisfaction of the responsible health officer. This could be accomplished through establishment of special maintenance districts, by the amendment of existing ordinances to assure adequate maintenance documented through periodic inspections, or other alternatives as deemed appropriate by the local health officer.

- Consider the cumulative impacts of individual OWTS discharges as a part of the approval process for development.

Community Sewerage Systems

The Regional Board will regulate all discharges of wastes from community sewerage systems. The Regional Board will require a RWD to be filed for all proposed waste discharges which involve the use of new community sewerage systems.

The RWD must include the following:

- A final Environmental Impact Report or Negative Declaration covering the total project, unless categorically exempt, prepared and approved by the local lead agency pursuant to the California Environmental Quality Act (CEQA) of 1970 (as amended) and Chapter 3, Division 6, Title 14, of the CCR (as amended). In the approval process the Environmental Impact Report or Negative Declaration must be circulated through the State Clearinghouse; and

- Operation, maintenance, revenue and contingency plans for the wastewater treatment and disposal facilities or a commitment by the project proponent to prepare such plans and submit them to the Regional Board at least 60-days prior to the initiation of discharge.

The Regional Board strongly prefers that a public entity assume legal authority and responsibility for the ownership, operation, and maintenance of the proposed wastewater treatment and disposal system. This is because public entities provide permanency, expertise, and financial solvency.

In the absence of a satisfactory RWD, the discharge will be prohibited.

State OWTS Policy

The purpose of the State Water Quality Control Policy for Siting, Design, and Maintenance of Onsite Wastewater Treatment Systems[7] (OWTS Policy) is to allow the continued use of OWTS, while protecting water quality and public health. The State Board adopted the OWTS Policy on June 19, 2012. The OWTS Policy recognizes that responsible local agencies can provide the most effective means to routinely manage OWTS. Therefore, it is the intent of the OWTS Policy to efficiently utilize and improve upon where necessary existing local programs through coordination between the State and local agencies. For this purpose, the OWTS Policy establishes a statewide, risk-based, tiered approach for the regulation and management of OWTS installations and replacements, and establishes the level of performance and protection expected from OWTS.

Waiver of Waste Discharge Requirements for Qualifying OWTS

The OWTS Policy also waives the Water Code requirement that dischargers obtain Waste Discharge Requirements (WDRs) for OWTS that meet requirements specified in the OWTS Policy.

The Policy organizes OWTS into five separate implementation tiers (as outlined below). An OWTS that meets the criteria of one of the five tiers is eligible for the conditional waiver of WDRs, with regulation of the qualifying OWTS deferred to the approved local agency. In addition, to qualify for the waiver, owners of OWTS must comply with conditions specified in Section 12.0 of the OWTS Policy.

[7] The OWTS Policy can be found at http://www.waterboards.ca.gov/

Tier 0

This tier applies to existing OWTS that are functioning as designed without surfacing effluent, and not located near surface water bodies known to be impaired for nitrogen or pathogens. These OWTS are automatically included in Tier 0, provided they meet requirements specified in Section 6.0 of the OWTS Policy. No action is required on the part of the owner, except maintaining the OWTS in good operating condition. An OWTS must have a projected flow of 10,000 gallons per day (gpd) or less to be included in Tier 0 of the OWTS Policy.

Tier 1

This tier applies to new and replacement OWTS that meet the siting and design criteria specified in Sections 7.0 and 8.0 of the OWTS Policy. An OWTS must have a projected flow of 3,500 gpd or less to be included in Tier 1.

Tier 2

This tier applies to new and replacement OWTS operating under an approved Local Agency Management Plan (LAMP). LAMPs allow local agencies to establish jurisdiction specific requirements and alternative design and siting criteria that may differ from those specified in the Tier 1 section of the OWTS Policy, and manage the installation of new and replacement OWTS under the LAMP. The alternative criteria can include local modifications of: system design requirements, siting controls such as system density and setback requirements, additional monitoring and maintenance requirements, design criteria for use of alternative or advanced OWTS, etc. Local agencies must consider the factors listed in Section 9.1 of the Policy in developing their LAMPs. OWTS meeting the requirements of a LAMP need not be regulated under WDRs issued by the Regional Board.

The OWTS Policy identifies the Regional Board designated to review and approve LAMPs for each County in the State, and requires the designated Regional Board to coordinate with other Regional Boards that have overlapping jurisdiction within the County[8]. San Diego County falls within the jurisdiction of both the San Diego Regional Board (Region 9) and the Colorado River Basin Regional Water Board (Region 7). The OWTS Policy designates the San Diego Regional Board as being responsible for review and approval of the LAMP for San Diego County. Riverside County falls within the jurisdiction of the San Diego (Region 9), Colorado River Basin (Region 7), and Santa Ana (Region 8) Regional Boards, while Orange County falls within the jurisdiction of the San Diego and Santa Ana Regional Boards. The OWTS Policy designates the Colorado River Basin and the Santa Ana Regional Boards as the lead Regional Water Boards responsible for review and approval of the LAMPs for Riverside and Orange Counties, respectively.

The San Diego Water Board authorizes the Executive Officer to review and administratively approve future modifications to the San Diego Department of Environmental Health (DEH) LAMP or decide to schedule an agenda item for further consideration of the San Diego DEH LAMP by the San Diego Water Board.

Tier 3

This tier applies to existing, new, and replacement OWTS located within 600 feet of surface water bodies identified as impaired for nitrogen or pathogens due to possible contributions from OWTS discharges. The specific impaired water bodies are identified in Attachment 2 of the OWTS Policy. New or replacement OWTS near impaired water bodies must comply with any applicable TMDL or special provisions identified in a LAMP. New or replacement OWTS not located within 600 feet of water bodies listed in the OWTS Policy must meet the standards for supplemental treatment and other requirements specified in Tier 3. The OWTS Policy does not identify any qualifying impaired water bodies in the San Diego Region.

[8] See Attachment 3 of the OWTS Policy.

Tier 4

This tier applies to any OWTS that require corrective action. OWTS included under Tier 4 are failing systems with:

- Surfacing effluent, failing septic tank systems or structural failure of septic tank leading to infiltrating ground water or exfiltrating wastewater; and

- Any OWTS that has affected or affects surface or ground water to a degree that creates a condition of pollution, makes surface or ground water unfit for drinking or other beneficial uses, or creates a condition of public nuisance.

These OWTS are required to be replaced or repaired to bring them under compliance with the OWTS Policy in a timely manner.

Report of Waste Discharge Submission for OWTS not Meeting Waiver Conditions

The Regional Board will review specific proposals for OWTS that do not meet waiver conditions specified in the OWTS Policy or conditions specified in the applicable LAMP at the request of the appropriate local agency. For such proposals, a RWD must be filed with the Regional Board and WDRs must be obtained or waived by the Regional Board prior to recordation of the final map and/or issuance of a building permit. Before the Regional Board considers the RWD to be complete, the following technical information must be submitted:

- A hydrogeologic study which will, using accepted ground water hydrologic techniques and practices, assess the probable rise in the water table associated with the project, including effects of OWTS recharge, landscape irrigation, and ground water pumpage. The study will additionally address the impact of the projected water table rise or fall on the operation of new and existing septic systems.

- A nitrate study which will, using an acceptable mass balance method, demonstrate that the proposed project will not cause the concentrations of wastewater constituents in ground water to exceed applicable ground water quality objectives, particularly for nitrate. The study must also show that the project will not cause wastewater constituents in interconnected surface water to exceed applicable surface water quality objectives, particularly for total nitrogen.

In addition to the technical information submitted, the following conditions must be met:

- In most instances a public entity must assume legal authority and responsibility for the operation and maintenance of the proposed individual wastewater treatment and disposal systems;

- In some instances, such as commercial/industrial establishments, or projects involving only a single homesite, or special extenuating circumstances, the public entity condition may be set aside;

- A final Environmental Impact Report or Negative Declaration must be included covering the total project, unless categorically exempt, prepared and approved by the local lead agency pursuant to the California Environmental Quality Act of 1970 (as amended) and Chapter 3, Division 6, Title 14, of the California Administrative Code (as amended). In the approval process the Environmental Impact Report or Negative Declaration must be circulated through the State Clearinghouse;

- Operation, maintenance, revenue, and contingency plans must be submitted for the wastewater treatment and disposal facilities or a commitment must be made by the public entity to prepare such plans and submit them to the Regional Board at least 60-days prior to the initiation of discharge; and

- In the absence of a satisfactory Report of Waste Discharge, the discharge will be prohibited without prejudice.

WATER RECLAMATION AND REUSE

Water reclamation is a process consisting of the following elements:

- Treatment of wastewater to a level of quality suitable for reuse;
- Transportation of reclaimed water to reuse areas; and
- Application of reclaimed water to an actual use.

Reclaimed water use typically falls into the following seven broad categories:

- Agricultural irrigation;
- Landscape irrigation (including highway landscape and golf courses);
- Impoundments for landscape, recreational or wildlife uses, wetland and wildlife enhancement;
- Industrial and Construction processes (e.g., cooling water, process water, washdown water or for dust control);
- Ground water recharge;
- Flushing of toilet and urinals in non-residential buildings; and
- Stream enhancement.

The State of California has a strong interest in promoting the conservation and efficient use of water through water reclamation. The California Constitution, Article X, section 2 provides that:

> "...Water resources of the state be put to beneficial use to the fullest extent of which they are capable, and that waste or unreasonable use of water be prevented, and that conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare..."

The State interest in the conservation and efficient use of its waters is further emphasized by Water Code section 13510 which deals specifically with water reclamation. Section 13510 provides that:

> "It is hereby declared that the people of the state have a primary interest in the development of facilities to reclaim water containing waste to supplement existing surface water and underground water supplies and to assist in meeting the future water requirements of the state."

In addition, Water Code section 13241 provides that the Regional Board consider the need to develop and use reclaimed water when establishing water quality objectives.

The State Board adopted the "*Policy with Respect to Water Reclamation In California*" and the related "*Action Plan for Water Reclamation in California*" in 1977 (State Board Resolution No. 77-1). The policy directs the State Board and Regional Boards to encourage reclamation and reuse of water, and to promote water reclamation projects which preserve, restore, or enhance instream beneficial uses. The policy also states that the State and Regional Boards recognize the need to protect public health and the environment in the implementation of reclamation projects.

The Porter-Cologne Water Quality Control Act also requires the State Board DDW to establish statewide reclamation criteria (see Table 4-4) for each type of reclaimed water use to protect public health. Any person proposing to discharge reclaimed water must file a report of waste discharge containing appropriate information related to the discharge with the Regional Board. The Regional Board, after consultation with State Board DDW, may adopt waste discharge requirements for the reclaimed water discharge.

Table 4 - 4. Permitted Uses and California Title 22 Health Requirements for Reclaimed Water.

Permitted Use of Reclaimed Water	Summary of Title 22 (sections 60303 et. seq.) Health Requirements
Spray irrigation of food crops	Reclaimed water used for spray irrigation of food crops shall be at all times adequately disinfected, oxidized, coagulated, clarified, filtered wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process, the median number of coliform organisms does not exceed 23 per 100 milliliters (ml) in more than one sample within any 30-day period. The median value shall be determined from the bacteriological results of the last 7 days for which analyses have been completed.
Surface irrigation of food crops	Reclaimed water used for surface irrigation of food crops shall be at all times an adequately disinfected, oxidized wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process, the median number of coliform organisms does not exceed 2.2 per 100 ml as determined from the bacteriological results of the last 7-days for which analyses have been completed. Orchards and vineyards may be surface irrigated with reclaimed water that has the quality at least equivalent to that of primary effluent provided that no fruit is harvested that has come in contact with the irrigating water or the ground. Exceptions to the quality requirements for reclaimed water used for irrigation of food crops may be considered by the State Department of Health on an individual basis where the reclaimed water is to be used to irrigate a food crop which must undergo extensive commercial, physical or chemical processing sufficient to destroy pathogenic agents before it is suitable for human consumption.
Irrigation of fodder, fiber and seed crops	Reclaimed water used for the surface or spray irrigation of fodder, fiber, and seed crops shall have a level of quality no less than that of primary effluent.
Irrigation of pasture for milking animals	Reclaimed water used for the irrigation of pasture to which milking cows or goats have access shall be at all times an adequately disinfected, oxidized wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process the median number of coliform organisms does not exceed 23 per 100 ml, as determined from the bacteriological results of the last 7-days for which analyses have been completed.
Landscape irrigation of golf courses, cemeteries, freeway landscapes and similar areas	Reclaimed water used for the irrigation of golf courses, cemeteries, freeway landscapes, and landscapes in other areas where the public has similar access or exposure shall be at all times adequately disinfected oxidized wastewater. The wastewater shall be considered adequately disinfected if the median number of coliform organisms in the effluent does not exceed 23 per 100 ml as determined from the bacteriological results of the last 7-days for which analyses have been completed, and the number of coliform organisms does not exceed 240 per 100 ml in any two consecutive samples.
Permitted Use of Reclaimed Water	Summary of Title 22 (sections 60303 et. seq.) Health Requirements

Table 4 - 4 (continued). Permitted Uses and California Title 22 Health Requirements for Reclaimed Water.

Permitted Use of Reclaimed Water	Summary of Title 22 (sections 60303 et. seq.) Health Requirements
Irrigation of parks, playgrounds, schoolyards and similar areas	Reclaimed water used for irrigation of parks, playgrounds, schoolyards, and other areas where the public has similar access or exposure shall be at all times adequately disinfected, oxidized, coagulated, clarified, filtered wastewater or a wastewater treated by sequence of unit processes that will assure an equivalent degree of treatment and reliability. The wastewater shall be considered adequately disinfected if the median number of coliform organisms in the effluent does not exceed 2.2 per 100 ml, as determined from the bacteriological results of the last 7-days for which analyses have been completed.
Nonrestricted recreational impoundment (no limitations are imposed on body-contact sport activities)	Reclaimed water used as a source of supply in a nonrestricted recreational impoundment shall be at all times adequately disinfected, oxidized, coagulated, clarified, filtered wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process, the median number of coliform organisms in the effluent does not exceed 23 per 100 ml in more than one sample within any 30 day period. The median value shall be determined from the bacteriological results of the last 7-days for which analyses have been completed.
Restricted recreation impoundment (recreation is limited to fishing, boating, and other non-body-contact water recreation activities)	Reclaimed water used as a source of supply in a restricted recreational impoundment shall be at all times an adequately disinfected, oxidized wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process the median number of coliform organisms does not exceed 23 per 100 ml, as determined from the bacteriological results of the last 7-days for which analyses have been completed.
Landscape impoundment (aesthetic enjoyment or other function but no body-contact is allowed)	Reclaimed water used as a source of supply in a landscape impoundment shall be at all times an adequately disinfected, oxidized wastewater The wastewater shall be considered adequately disinfected if at some location in the treatment process the median number of coliform organisms does not exceed 23 per 100 ml, as determined from the bacteriological results of the last 7-days for which analyses have been completed.
Ground water recharge of domestic water supply aquifers	Recharge water requirements are made on a case-by-case basis to ensure that the water is of such quality that fully protects public health at all times. Factors considered include treatment provided, effluent quality and quantity, spreading operations, soil characteristics, hydrogeology, residence time, receiving water quality and distance to withdrawal.
Other uses (toilet flush, industrial cooling water, process water, seawater intrusion barrier)	User must demonstrate that methods of treatment and reliability features will assure an equal degree of treatment and reliability.

When reviewing potential reclamation projects, the Regional Board must also consider potential impacts from reclamation on ground and surface water quality. It is common for the use of reclaimed water to cause an increase in total dissolved solids concentration in the receiving ground waters due to the effects of evapotranspiration. A variety of techniques can be employed to protect the beneficial uses of the receiving waters. Where well controlled irrigation is practiced, nitrate problems in the dry season will be controlled. Vegetative uptake will utilize soluble nitrates which could otherwise migrate into ground water. Demineralization techniques or source control of total dissolved solids may be necessary in some inland areas where ground waters have been or may be degraded. Presence of excessive salts, boron, or sodium could be the basis for rejection of proposals to irrigate cropland with effluent.

WATER RECLAMATION PROJECTS IN THE SAN DIEGO REGION

The water supply in the San Diego Region is largely dependent upon water imported from northern California and the Colorado River. Future increases from these sources may be limited due to environmental concerns, contractual agreements, and over all capital costs. In light of the limited possibilities for future water sources, the need to develop water supply alternatives is important. For many water uses, reclaimed water is a viable alternative water supply.

The status of water reclamation projects in the San Diego Region during March 1993 is shown is shown in Table 4-5. For each water reclamation agency and/or facility in the San Diego Region, the table shows the permitted flow in MGD, the average effluent flow (in MGD), the average effluent flow reused (in MGD), the annual volume reused in million of gallons (MG) and acre-feet (AC-FT), the treatment process and disposal method, the type of use for the reclaimed water, the reclaimed water user and the status of the project. In the San Diego Region, a total of about 175 MGD of reclaimed water flow is permitted. About 16 MGD is reused from an average effluent flow of about 79 MGD. The annual volume reused is about 5,859 MG (18,597 AC-FT).

REGIONAL BOARD ACTION PLAN ON WATER RECLAMATION

The Regional Board supports water reclamation and reuse to the maximum extent feasible to help meet the growing water needs of the Region. It has long been a policy of the Regional Board to encourage and promote water reclamation while taking into consideration the need to protect beneficial uses of surface and ground waters and protect the public health.

On March 24, 1986 the Regional Board adopted Resolution No. 86-06 which amended the Basin Plan to include an action plan for water reclamation. The policy described below updates and supersedes Resolution No. 86-06:

(1) The Regional Board will consider special amendments to the Basin Plan to encourage water reclamation.

(2) The Regional Board will consider comprehensive water quality monitoring programs for confirmation of original hydrogeological predictions, and an accurate measure of adverse ground water quality effects. These monitoring programs will be considered where water reclamation is not expected to result in adverse ground water quality impacts, and where ground water quality impacts are very difficult to predict.

(3) The Regional Board will consider projects involving stream and lagoon replenishment with reclaimed water where, as a minimum, a water quality management plan would be implemented and conformance with the State Board DDW wastewater reclamation criteria for nonrestricted recreational use would be achieved.

(4) The Regional Board will encourage use of ephemeral streams that are not used for domestic water supply, for the conveyance of reclaimed water for beneficial uses during periods of need.

Table 4-5. Water Reclamation Projects as of March 1993.

Name of Agency/ Facility	Hydro-logic Unit	Permit Flow MGD	Average Effluent Flow MGD	Average Effluent Flow Reused MGD	Annual Volume Reused MG	Annual Volume Reused AC-FT	Treatment Process and Disposal	Type of Use	Reclaimed Water User	Status
ORANGE COUNTY										
Joplin Youth Center	1.20	0.0075	0.0067	0.0067	2.45	7.50	AS, PB	Landscape Irrigation, Ground Water Recharge		Operating
San Clemente, City of San Clemente WRP	1.20 1.30	7.00	3.996	0.610	222.65	683.28	AS, PB, CH, SF, OF	Golf Course Irrigation, Construction	Municipal GC, Arvida Co, Talega, Pacific GC	Operating
SOUTH ORANGE COUNTY RECLAMATION AUTHORITY SERVICE AREA										
El Toro WD	1.13	5.50	0.000	0.000	0.00	0.00	AS, OF	Landscape Irrigation		Proposed
Los Alisos WD	1.13	5.50	0.000	0.000	0.00	0.00	AS, OF	Landscape Irrigation		Proposed
Moulton Niguel WD Plant 3A STP	1.20	2.40	0.484	0.484	176.66	542.15	AS, CH	Golf Course & Landscape Irrigation	Mission Viejo Country Club	Operating
Laguna Niguel (AWMA/MNWD) Joint Regional WRF	1.13 1.14	12.00	5.191	0.278	100.67	308.93	AS, F, CL, OF	Landscape Irrigation	El Niguel Country Club	Operating
Santa Margarita WD Oso Creek STP	1.13 1.20	3.00	1.693	1.693	617.95	1896.39	AT, F, CH, Of	Landscape Irrigation	Oso Valley Asn. CALTRANS	Operating
Nichols Institute	1.20	0.04	0.032	0.025	9.13	28.00		Property landscaping	Nichols Inst.	Operating
Chiquita WRF	1.20 1.30	3.50	2.103	0.016	5.92	18.18	CH,F	Nursery, Construction, Dust Control	SeaTree Nursery Los Flores Dev. Desecha Landfill	Operating
South Coast County WD	1.12 1.13 1.14	2.61	0.738	0.738	269.19	826.10	AS, F, CH, OF	Irrigation of parks, greenbelt, golf course	AVCO Community De Ben Brown GC Orange County Parks	Operating
Trabuco Canyon WD Trabuco WRP	1.13 1.20	0.25	0.459	0.561	204.77	628.40	OD, F, CH, PB	Golf Course Irrigation	Dove Canyon GC	Operating
RIVERSIDE COUNTY										
Eastern Municipal WD Rancho Calif. STP	2.51	5.00	4.800	1.210	441.65	1355.4	AS, PB	Irrigation Sod Farm	Ralph Daily Sod Farm	Operating
Rancho California WD Joaquin Ranch STP	2.31	0.60	0.575	0.376	137.24	421.2	OD, F, CH, PB	Golf Course Irrigation	Bear Creek Golf Course	Operating
Santa Rosa SBR WRF	2.51	1.00	0.345	0.345	125.93	386.4	F, CH	Ground Water Recharge		Operating

TREATMENT PROCESS: AQ=aquaculture, AS=activated sludge, CH=chlorination, EA=extended aeration, F=filtration, MS=microscreen, OD=oxidation ditch, OF=ocean outfall, OP=oxidation pond, PB=percolation pond or bed, PS=primary sedimentation, RBC=rotating biological contactor, RO=reverse osmosis, TF=trickling filter

Table 4-5 (continued). Water Reclamation Projects as of March 1993.

Name of Agency/ Facility	Hydro-logic Unit	Permit Flow MGD	Average Effluent Flow MGD	Average Effluent Flow Reused MGD	Annual Volume Reused MG	Annual Volume Reused AC-FT	Treatment Process and Disposal	Type of Use	Reclaimed Water User	Status
SAN DIEGO COUNTY										
Buena Sanitation Dist. Shadow Ridge WRP	4.32	1.10	0.809	0.062	22.63	69.4	MS, RBC, F, RO, CH, OF	Irrigation	Shadow Ridge Golf Course	Operating
Encina	4.40	22.50	19.000	0.001	0.37	1.1	AS, CH, OP	Landscape Irrigation	Caltrans	Operating
Escondido WRP	4.52 5.21	5.00	0.003	0.003	1.10	3.4	AS, CH	Internal Use, Landscape Irrigation, Golf Course	Escondido San Marcos	Operating
Fairbanks Ranch WRP	5.12	0.28	0.180	0.180	65.70	201.6	EA, PB	Ground Water Recharge		Operating
Fallbrook WD Plants 1 & 2	2.13	3.10	1.720	0.160	58.40	179.2	PS, EA, CH, OF	Landscape Irrigation (I-5 Freeway)	Caltrans Nurseries	Operating
4-S Ranch 4-S Ranch WRP	9.31	0.60	0.062	0.038	13.69	42.0	CH	Compaction Irrigation	Construction Pasture	Operating
Leucadia Water Dist. F.R. Gafner WRF	4.51	0.75	0.000	0.000	0.00	0.0	TF, PS, CH, OF	Aviara and La Costa Country Club Irrigation	La Costa & Aviara Country Clubs	Operating
Oceanside, City of N. San Luis Rey STP	3.12	10.50	8.700	0.020	7.30	22.4	AS, CL, OF, PB	Golf Course Irrigation, Ground Water Recharge	Oceanside Golf Course	Operating
La Salina	4.10	0.50	0.000	0.000	0.00	0.00	EA, AS, CH	Landscape Irrigation	Oceanside	Operating
Otay Municipal WD Ralph W Chapman WRF	9.21	1.30	0.900	0.900	328.50	1008.1	EA, F, RO, CH, OF	Landscape Irrigation	Eastlake Development	Operating
Otay Estates Hidden Valley Estates	9.11	0.15	0.000	0.000	0.00	0.0	AS, CH	Landscape Irrigation		Operating
Padre Dam Municipal WD Water Reclamation Pl	7.12	1.00	0.521	0.521	190.17	583.6	AS, PS, OP, CH, OF	Recreational Lakes & Park Irrigation	Santee Lakes	Operating
Pauma Valley	4.63	0.00	0.000	0.000	0.00	0.0	EA, CH	Ground Water Recharge		Proposed
Ramona Municipal WD Santa Maria WWTP	5.41	1.00	0.600	0.600	219.00	672.1	EA, PB	Irrigation, Pasture Ground Water Recharge	Ramona WD site	Operating
San Vicente STP	7.23	0.60	0.541	0.541	197.47	606.0	OD, CH, F, RO, PB	Avocado Grove Irrig. Ground Water Recharge	Solk Ranch	Operating
Rancho Santa Fe	4.61	0.45	0.220	0.220	80.30	246.4	AS, EA, CH, PB	Golf Course Irrigation	Rancho Santa Fe Golf Course	Operating
San Diego, County of Descanso STP	9.31	0.04	0.026	0.026	9.56	29.3	AS, PB	Landscape Irrigation	Descanso Facil.	Operating
Julian	7.43	0.04	0.035	0.035	12.78	39.20	OP	Irrigation (cattle feed)		Operating
Mount Woodson SD	5.11	0.08	0.000	0.000	0.00	0.0	CH	Irrigation	Golf Course	Operating
Rancho Cielo SD	5.11	0.20	0.000	0.000	0.00	0.0		Landscape Irrigation		Operating
Whispering Palms CSD	5.11	0.40	0.175	0.175	63.88	196.0	EA, CH, PB	Ground Water Recharge	Del Rayo Prop.	Operating
San Diego, City of Water Utilities Dept San Pasqual WAP STP	5.31	1.00	0.0190	0.0190	6.94	21.3	AS, CH, PB	Irrigation & Animal Stock Watering	Wild Animal Park	Operating

***TREATMENT PROCESS:* AQ=aquaculture, AS=activated sludge, CH=chlorination, EA=extended aeration, F=filtration, MS=microscreen, OD=oxidation ditch, OF=ocean outfall, OP=oxidation pond, PB=percolation pond or bed, PS=primary sedimentation, RBC=rotating biological contactor, RO=reverse osmosis, TF=trickling filter**

Table 4-5 (continued). Water Reclamation Projects as of March 1993.

Name of Agency/ Facility	Hydro-logic Unit	Permit Flow MGD	Average Effluent Flow MGD	Average Effluent Flow Reused MGD	Annual Volume Reused MG	Annual Volume Reused AC-FT	Treatment Process and Disposal	Type of Use	Reclaimed Water User	Status
SAN DIEGO COUNTY CONTINUED										
Mission Valley Pilot Aquaculture Project	7.11	1.00	0.026	0.025	9.13	28.0	AQ, QF	Freeway Landscaping (I-15 & I-8)	Caltrans	Operating
North City	6.10	30.00	0.000	0.000	0.00	0.0		Landscape Irrigation	Caltrans	Operating
San Elijo JPA	4.51	3.68	0.000	0.000	0.00	0.0	CH, AS	Landscape Irrigation	Encinitas, Del Mar	Operating
US Marine Corps Base, Camp Pendleton Plant No. 1	2.13	1.50	0.429	0.687	247.54	759.7	TF, CH, PB	Ground Water Recharge	Camp Pendleton	Operating
Plant No. 2	2.11	0.92	0.309	0.694	253.13	776.8	TF, CH, PB	Golf Course Irrigation	Camp Pendleton	Operating
Plant No. 3	2.12	1.10	0.492	0.753	274.66	842.9	TF, CH, PB	Ground Water Recharge	Camp Pendleton	Operating
Plant No. 8	1.51	0.59	0.074	0.296	107.86	331.0	TF, CH, PB	Ground Water Recharge	Camp Pendleton	Operating
Plant No. 9	1.52	1.10	0.142	0.357	130.34	400.0	TF, CH, PB	Ground Water Recharge	Camp Pendleton	Operating
Plant No. 10	1.51	0.85	0.325	0.378	138.08	423.7	TF, CH, PB	Ground Water Recharge	Camp Pendleton	Operating
Plant No. 11	1.51	0.85	0.836	1.088	397.01	1218.4	TF, CH, PB	Ground Water Recharge	Camp Pendleton	Operating
Plant No.12	1.40	0.85	0.142	0.420	153.37	470.7	TF, CH, PB	Ground Water Recharge	Camp Pendleton	Operating
Plant No. 13	2.11	2.50	1.397	1.225	447.16	1372.3	TF, CH, PB	Ground Water Recharge	Camp Pendleton	Operating
Plant No. 16	1.53	0.03	0.008	0.008	2.74	8.4	EA, PB	Ground Water Recharge	Camp Pendleton	Operating
Vallecitos WD Meadowlark WRP	4.51	2.00	0.995	0.525	191.63	588.1	MS, RBC, F, CH, OF	Golf Course Irrigation	La Costa GC Carlsbad City	Operating
Valley Center MWD Lower Moosa Canyon WRP	3.13	0.50	0.250	0.250	91.25	280.0	AS, CH, PB	Golf Course Irrigation Ground Water Recharge	Circle R GC Valley Center MWD	Operating

TREATMENT PROCESS: AQ=aquaculture, AS=activated sludge, CH=chlorination, EA=extended aeration, F=filtration, MS=microscreen, OD=oxidation ditch, OF=ocean outfall, OP=oxidation pond, PB=percolation pond or bed, PS=primary sedimentation, RBC=rotating biological contactor, RO=reverse osmosis, TF=trickling filter

Summary of San Diego Region Water Reclamation Projects as of March 1993

COUNTY SUBTOTALS	PERMIT FLOW (MGD)	AVERAGE EFFLUENT FLOW GENERATED (MGD)	AVERAGE EFFLUENT FLOW REUSED (MGD)	ANNUAL VOLUME REUSED (MG)	ANNUAL VOLUME REUSED (AC-FT)
Orange	41.81	14.70	4.41	1,609.37	4,938.94
Riverside	35.20	25.532	1.997	728.91	2,236.9
San Diego	98.05	38.94	10.20	3,721.65	11,421.24
REGION TOTALS	175.06	79.171	16.603	6,059.9	18,597

(5) The Regional Board will consider the possibilities for the buyout of a beneficial use that is only minimally realized, and that if protected, would stand in the way of a water reclamation project.

(6) The Regional Board will continue efforts to seek the most recent and accurate environmental and technical information for the purpose of reviewing Basin Plan standards pertaining to the discharge of reclaimed water.

(7) The Regional Board will require all ocean and inland dischargers, having the potential to produce reclaimed water, to develop water reclamation plans.

(8) The Regional Board will encourage economic incentives for using reclaimed water, such as rebates by the San Diego County Water Authority and the Metropolitan Water District of Southern California to water suppliers engaged in water reclamation.

(9) The Regional Board will seek funding for studies to evaluate the potential of water reclamation in various areas of the Region including streams and coastal lagoons.

(10) The Regional Board will take appropriate actions, recommend legislation, and recommend actions by other planning agencies (county, federal, etc.) in the areas of (1) planning, (2) project funding, (3) regulation and enforcement, (4) research and demonstration, and (5) public involvement and information.

(11) The Regional Board will encourage and support measures which conserve the water resources of the San Diego Region.

(12) The Regional Board will encourage other agencies to assist in implementing this policy.

(13) As mitigation against potential nuisance odors and health hazards resulting from reclaimed water use, the Regional Board will continue to adopt and enforce waste discharge requirements containing prohibitions against nuisance odors and implementing the State Board DDW Wastewater Reclamation Criteria.

(14) The Regional Board will prepare Basin Plan amendments necessary for implementation of water reclamation projects in compliance with state policy for water quality control and, to the extent surface waters will be affected, with Environmental Protection Agency water quality standards regulations. Site specific environmental impacts will be evaluated in conformance with the California Environmental Quality Act (CEQA) for specific Basin Plan amendments.

FACTORING WATER SUPPLY CONSIDERATIONS INTO THE REGIONAL BOARD REGULATION OF WATER RECLAMATION PROJECTS

Conventional reclamation facilities are not designed to reduce mineral constituents. Consequently, the mineral effluent quality is dependent on the composition of the water supply plus the mineral pickup during its use. Historically, water supply TDS concentrations have varied significantly. For example, concentrations of TDS of the blended water stored in Lake Skinner ranged from below 400 milligrams per liter (mg/l) to above 700 mg/l between 1985 and 1995.

Residential wastewater discharges will typically be 250 to 300 mg/l higher in TDS than their water supply source. Self-regenerating water softeners, brine from industrial dischargers, and ground water infiltration can further increase TDS concentrations in wastewater effluent. Many wastewater management agencies within the region are implementing programs to minimize the incremental pickup of minerals from these sources. These programs have had varying degrees of success.

Effective water conservation measures that are being implemented within the region may result in higher mineral and other constituent concentrations in wastewater effluent. Although the volume of wastewater is reduced by water conservation, the mineral and organic loading from its use remains nearly constant. As a result, the strength of the wastewater influent becomes stronger. In some cases, the characteristics of the wastewater influent may range briefly above the design parameters of the treatment plant.

In recognition of the variables in wastewater quality that are beyond the control of the discharger, the Regional Board authorizes the Executive Officer to suspend formal enforcement action, when a discharger submits an initial technical report with subsequent quarterly updates, that demonstrate to the satisfaction of the Executive Officer, compliance with the following conditions:

(1) The discharge is not subject to regulation by means of a NPDES Permit; and

(2) The enforcement action is only for violations of discharge specifications for mineral constituents, total suspended solids (TSS), biological oxygen demand (BOD) or carbonaceous biological oxygen demand (CBOD); and

(3) The effluent violations are due solely to changes in the quality of the imported water supply and/or to water conservation measures being implemented within the service area tributary to the treatment plant; and

(4) The discharge does not result in a mass loading of TSS, BOD and CBOD that exceeds the loading prior to implementation of water conservation measures; and

(5) The discharge will not cause Basin Plan water quality objectives to be exceeded, in the long term; and

(6) The discharge will not cause a violation of any applicable section from Title 22 of the CCR or any requirement specified by either the State Board DDW or the appropriate county health officer for the protection of public health; and

(7) The discharge does not contain a concentration of TDS exceeding 1,500 mg/l, or the concentration in the water supply plus 500 mg/l, whichever is less, with comparable adjustments for other mineral constituents; and

(8) The discharger implements a program to identify major sources of the mineral constituents of concern in the discharge, including but not limited to water softener regeneration brine; and to determine the average contribution of each major source and the best available options for reducing levels in the discharge; and to identify any negative effects on the potential for water reclamation caused by the failure to control the constituents of concern in the discharge. The program should include a time schedule to reduce mineral constituents in the discharge as necessary to assure that the potential for water reclamation will be realized to the maximum extent practicable.

RECLAIMED WATER CONFORMANCE WITH WATER QUALITY OBJECTIVES

The Regional Board has established various policies concerning the compliance of reclaimed water discharges with applicable Basin Plan water quality objectives. These policies are described below.

DISCHARGES TO COASTAL LAGOONS FROM PILOT WATER RECLAMATION PROJECTS

The Regional Board may grant an exception to the "Biostimulatory Substances" water quality objective described in Chapter 3 to provide for discharges to coastal lagoons from pilot water reclamation projects. The project proponent must demonstrate that the pilot water reclamation project is consistent with the conditions described in the Principles of the State Water Resources Control Board's Policy and Action Plan for Water Reclamation in California. The Policy and Action Plan for Water Reclamation in California was adopted by the State Board in January 1977 and is summarized below. In addition, the proponent must demonstrate that the threat of eutrophication as a result of the addition of nitrogen and/or phosphorus is reduced as a consequence of one or more of the following factors:

- Waters of the coastal lagoon are highly laden with natural silts or colors which reduce the penetration of sunlight needed for photosynthesis;

- The coastal lagoon is characterized by morphometric features of steep banks, great depths, and substantial flows which have contributed to a history of no plant problems;

- The coastal lagoon is managed primarily for waterfowl or other wildlife;

- An identified element other than nitrogen or phosphorus is limiting to plant growth in the coastal lagoon, and the level and nature of the limiting element would not be expected to increase to an extent that would influence eutrophication; or

- Control of nitrogen and/or phosphorus in the coastal lagoon cannot be sufficiently effective under present technology to make phosphorus or nitrogen the limiting nutrient.

The Principles of the Policy and Action Plan for Water Reclamation in California provide, in part, that water reclamation projects shall be encouraged which do not adversely impact vested water rights or unreasonably impair instream beneficial uses or place an unreasonable burden on present water supply systems, and which meet the following additional conditions:

- Beneficial use will be made of wastewaters that would otherwise be discharged to marine or brackish receiving waters or evaporation ponds;

- Reclaimed water will replace or supplement the use of fresh water or better quality water; or

- Reclaimed water will be used to preserve, restore, or enhance instream beneficial uses which include, but are not limited to, fish, wildlife, recreation, and aesthetics associated with any surface water or wetlands.

Exceptions to the numerical water quality objectives will be made only when a pilot reclamation project meets the following criteria:

- Need for the reclaimed water is demonstrated;

- Alternative disposal facilities are available in the event discharge to a coastal lagoon proves unfeasible;

- Conformance with the State Board's Water Quality Control Policy for the Enclosed Bays and Estuaries of California is demonstrated;

- Data will be generated that will be useful and timely for Regional Board review of water quality objectives for nutrients; and

- The project will include a lagoon management plan addressing the proposed methods of identifying and eliminating any pollution, contamination, or nuisance problems resulting from the proposed discharge and clearly identifying management responsibilities and capabilities.

DISCHARGES TO INLAND SURFACE WATERS

Regional Board Resolutions Nos. 90-53 and 91-23 established an alternate method of conformance with the biostimulatory substances water quality objectives for portions of the San Diego River and Santa Margarita River. The Policy presented below supersedes Resolutions Nos. 90-53 and 91-23 and is applicable to all inland surface waters of the San Diego Region at a point downstream of lakes or reservoirs used for municipal water supply.

The Regional Board has developed an alternate method of showing compliance with the biostimulatory substances water quality objective contained in Chapter 3 to:

- Promote water reclamation;

- Enhance opportunities for reclaimed water discharges to inland surface waters; and

- Protect and enhance existing inland surface water beneficial uses through the greater use of reclaimed water.

The alternate method of compliance described below is applicable to reclaimed water discharges to inland surface waters at a point downstream of lakes or reservoirs used for municipal water supply. The alternate method of compliance is meant to encourage reclaimed water discharges into inland surface waters without degradation of the ambient water quality or adverse effects on beneficial uses.

Compliance Methods

The Regional Board will establish appropriate effluent limitations for nitrogen and phosphorus in waste discharge requirements for discharges of reclaimed water to surface waters using one of the following methodologies:

- The Regional Board may use the goal for phosphorus concentration in flowing water contained in the Biostimulatory Substances objective as guidance in establishing appropriate effluent limitations; or

- Alternatively, the Regional Board may determine compliance with the narrative objective based upon the following four factors:

  - ✓ Measurement of ambient concentrations of nitrogen and phosphorus;

  - ✓ The dissolved oxygen requirements of downstream beneficial uses;

  - ✓ Use of best available technology (BAT) economically feasible for the removal of nutrients; and

  - ✓ The development and implementation of a watercourse monitoring and management plan.

Best available technology for the removal of nutrients includes biological and chemical removal. The extent to which the Regional Board may require additional removal of nutrients through chemical addition processes will be based upon an evaluation of the economic feasibility of this additional treatment in concert with an evaluation of the effectiveness of the watercourse monitoring management plan.

The watercourse monitoring and management plan shall include:

- A comprehensive program for chemical monitoring in receiving waters and effluent that will generate adequate data on ammonia nitrogen, nitrate nitrogen, nitrite nitrogen, organic nitrogen, total phosphate, ortho phosphate, dissolved oxygen (including vertical and diurnal dissolved oxygen profiles), pH, turbidity, biochemical oxygen demand (BOD) and other appropriate constituents and properties which may contribute to, or result from, nutrient related problems and impact beneficial uses.

- A comprehensive program for physical and biological monitoring in the receiving waters that will generate adequate data on chlorophyll 'a', corrected chlorophyll 'a', pheophyton 'a'; temperature (including diurnal and vertical temperature profiles); acute and chronic toxicity; the diversity and numbers of microinvertebrates, macroinvertebrates, and fish; the dynamics of the aquatic flora (macroalgae, phytoplankton, and emergent vegetation) and the related dissolved oxygen regime; substrate composition; frequency of nuisance conditions; flow rate; and other appropriate constituents and properties which may contribute to nutrient related problems and impact beneficial uses.

- A comprehensive program for physical and biological monitoring of the effluent that will generate adequate data on flow, temperature, chronic and acute toxicity, and other appropriate constituents which may contribute to nutrient related problems and impact beneficial uses.

- A procedure for evaluating the data collected under items (1), (2), and (3) above and determining the potential for nutrient related problems that may impact beneficial uses.

- Development and implementation of preventive and corrective actions that will ensure that a discharge containing nutrients will not adversely impact beneficial uses. These preventative and corrective actions may include, but are not limited to, the following:

  ✓ Achievement of more stringent effluent limits for nutrient constituents discharged to the watercourse, through additional chemical treatment methods at the treatment facility, to further reduce nutrient loading to the river;

  ✓ Maintenance of minimum reclaimed water flows discharged to the watercourse to prevent stagnant areas subject to nutrient related problems and to maintain the aquatic and riparian habitat beneficial uses that have been enhanced and/or created by such a discharge;

  ✓ Effective measures for the instream chemical treatment of surface waters to prevent nutrient and stagnant water related nuisance problems that can adversely impact aquatic habitat beneficial uses, where this instream treatment will not adversely impact beneficial uses;

  ✓ Effective measures for the physical management of the watercourse channel and vegetation;

  ✓ Effective source control measures to reduce the amount of nutrient constituents in the reclaimed water; and

  ✓ Other measures deemed appropriate and necessary by the Regional Board to ensure compliance with the Basin Plan narrative objective for nutrients and for the protection of beneficial uses.

Additional Mitigation

As mitigation against adverse impacts of nuisance odors and health hazards resulting from use of reclaimed water, the Regional Board will continue to adopt and enforce waste discharge requirements containing prohibitions against creation of nuisance odors and implementing the State Board DDW Water Reclamation Criteria.

Additionally, as mitigation measures against degradation of ground and surface water quality resulting from an inland reclaimed water discharge, the Regional Board will require well head treatment or treatment at the point of use, or other appropriate measures acceptable to the Board, adequate to maintain the existing quality of ground and surface waters and the beneficial uses for all ground and surface waters adversely impacted by a discharge. The Regional Board will require monitoring of all ground water wells and legal direct diversions of surface water prior to permitting a discharge in order to establish the baseline quality that must be maintained.

As mitigation against any adverse effects to instream or downstream surface or ground water quality and the environment resulting from the discharge of reclaimed water, the Regional Board will require the discharger to establish and implement a comprehensive river monitoring and management program. The implementation of the watercourse monitoring and management plan will often require close coordination between many different public and private entities. The Regional Board shall recognize an agency to implement the watercourse monitoring and management plan and such recognition shall be made part of the provisions of appropriate waste discharge requirements for the discharge.

The watercourse monitoring and management plan, and all the associated requirements, shall apply to all downstream waters, including rivers, lagoons, estuaries, and bays, which may be impacted by the reclaimed water discharge. The Regional Board will regulate the volume of reclaimed water discharged into all inland surface waters to those levels which do not significantly and adversely alter the salinity regimes of downstream lagoons, estuaries, or bays. This regulation of flows will include a prohibition of fresh water flows that could result in the conversion of a lagoon, estuary, or bay from a saline environment to a fresh water environment. Salt marsh habitats are to be considered an integral part of the lagoon, estuary, or bay to which they are associated, and therefore shall be fully protected from conversion.

Implementation of Ground Water Quality Objectives for Reclaimed Water Discharges

In order to facilitate water reclamation in the Region, the Regional Board, adopted Resolution No. 90-61 on November 5, 1990. Resolution No. 90-61 established a methodology for determining reclaimed water effluent limits. The policy described below updates and supersedes Resolution No. 90 61.

The Regional Board shall regulate discharges of reclaimed water by establishing effluent limitations designed to protect beneficial uses and ensure compliance with State Board Resolution No. 68-16. Use of adequately treated reclaimed water for irrigation or ground water recharge shall be encouraged in basins where reuse is clearly beneficial. Regulation of discharges of reclaimed water, where the reclaimed water displaces the use of imported water, or ground water having a quality exceeding the ground water quality objective, shall be in the following manner:

- For discharges upgradient of municipal water supply reservoirs the Regional Board shall adopt numerical effluent limitations for constituents at levels no lower than the quality of the basin's water supply but no higher than the Basin Plan ground water quality objective.

- In ground water basins not upgradient of municipal water supply reservoirs the Regional Board shall adopt numerical effluent limitations for constituents at levels no lower than the quality of the basin's water supply concentration plus an incremental increase equal to the typical incremental increase added to the water supply as a result of domestic use. The effluent limitations shall be no higher than the Basin Plan ground water quality objective.

- For discharges where the discharger has demonstrated sufficient assimilative capacity exists and ground water quality objectives will not be exceeded, the Regional Board may consider adoption of numerical effluent limitations for constituents based on the discharge quality and assimilative capacity analysis results.

- The Regional Board shall also require the implementation of effective salinity source control measures to ensure a reclaimed water quality that is suitable for long-term agricultural and landscape irrigation.

WATER RECLAMATION UNDER RESOLUTION NO. 81-16

On March 23, 1981, the Regional Board adopted Resolution No. 81-16 which modified the water quality standards by relaxing the ground water objectives and modifying the beneficial use designations for portions of the Aliso Hydrologic Subarea (HSA) 901.13, Carlsbad HSA 904.21, Agua Hedionda HSA 904.31, Batiquitos HSA 904.51, and Telegraph HSA 909.11. These areas are described in Table 3-3. The terms and conditions of Resolution No. 81-16 are incorporated in this Basin Plan; accordingly Resolution No. 81-16 is superseded. The use of reclaimed water in these areas is subject to the following provisions:

- Notwithstanding the water quality objectives, the Regional Board will regulate waste discharges in the affected portions of Hydrologic Subareas 904.21 and 904.31 in a manner that will protect the waters produced by the existing operating wells. A presently existing ground water use will be considered terminated when the well has been abandoned pursuant to County of San Diego Water Well Standards.

- In applying the modified standards, the Regional Board will condition waste discharge requirements for discharges of domestic and municipal wastewater to require that the wastewater be reclaimed and reused in a manner that will displace the need for approximately equal volumes of imported potable water.

WATER RECLAMATION AS AN ALTERNATIVE TO OCEAN DISPOSAL

The State Board in Order No. WQ 84-7 concluded that water reclamation should be carefully considered by persons proposing to discharge substantial quantities of once-used wastewater to the ocean particularly in a water short area where water is imported. Order No. WQ 84-7 directs the regional boards to require persons applying for permits to discharge once-used wastewater to the ocean in water-short areas to justify as part of each report of waste discharge why the wastewater is not being reclaimed.

The San Diego Region water supply is primarily imported water and the Region is clearly a water short area. Pursuant to State Board Order No. 84 7, the Regional Board will require persons proposing a discharge of once-used wastewater into the ocean to:

- Carefully analyze as an alternative, or partial alternative, the feasibility of reclaiming the wastewater for a beneficial use in lieu of ocean disposal.

- Submit, with the report of waste discharge in application for waste discharge requirements, sufficient information to justify why any wastewater proposed for discharge to the ocean after a single use is not being reclaimed for a beneficial use.

Reports of waste discharge which do not contain the water reclamation feasibility analysis described above, to the satisfaction of the Regional Board Executive Officer, will be considered incomplete and the Regional Board will not issue waste discharge requirements for the proposed discharge.

RECLAIMED WATER STORAGE REQUIREMENTS

During the winter season, wet weather, and other periods when there is little or no demand, treatment plants continue to operate at normal flows and the excess treated effluent must either be: (1) discharged to storage facilities until such time as the irrigation demand requires the use of the stored water; (2) discharged through a fail-safe land outfall connection to an ocean outfall under the terms of an NPDES permit; or (3) discharged to inland surface waters for ground water recharge and/or stream replenishment under the terms of an NPDES permit. Theoretical water balance calculations for disposal of reclaimed water at golf courses and other reuse sites in the Region indicate that storage facilities should be sized for 84-days of storage. (1975 Comprehensive Water Quality Control Plan Report, Page II-16-32). In situations where reclaimed water storage ponds are necessary, the Regional Board will require reclaimed water producers to:

- Provide 84-days of storage capacity; or

Provide storage capacity based upon water balance calculation procedures such as described in:

- USEPA. 1981. Process Design Manual for Land Treatment of Municipal Wastewater. Center for Environmental Research Information. Cincinnati, OH. EPA 625/1-81-013 (COE EM1110-1-501).

INDUSTRIAL WASTE

PRETREATMENT PROGRAM FOR INDUSTRIES

It is generally recognized that the discharge of industrial pollutants can be controlled most economically at their source. This is particularly true for industries discharging waste to municipal wastewater treatment plants (commonly called "POTWs" for "publicly owned treatment works"). On that basis USEPA has developed pretreatment requirements (40 CFR 403) for many industries and has developed minimum standards for POTW pretreatment programs. A POTW is required to implement a pretreatment program as a condition of its NPDES permit if its design flow is greater than five MGD or there are significant industrial users discharging to the POTW. POTWs with design flows less than 5 MGD may also be required to establish a pretreatment program if nondomestic waste causes upsets, sludge contamination, or violations of NPDES permit conditions, or if industrial users are subject to national pretreatment standards.

The goal of the USEPA's National Pretreatment Program is to protect municipal treatment plants and the environment from the adverse impact that may occur when hazardous or toxic wastes are discharged into a sewer system. This protection is achieved mainly by regulating nondomestic users of POTWs that discharge toxic wastes or unusually strong conventional wastes. Local pretreatment programs are required to fulfill the following objectives:

- Prevent the introduction of pollutants into POTWs which will interfere with the operation of a POTW, including interference with its use or disposal of municipal sludge;

- Prevent the introduction of pollutants into POTWs which will pass through the treatment works or otherwise be incompatible with such works;

- Improve opportunities to recycle and reclaim municipal and industrial wastewaters and sludges; and

- Prevent exposure of POTW personnel from chemical hazards and poisonous gases.

The general pretreatment regulations establish industrial pretreatment standards to control industrial pollutant discharges into wastewater collection systems and treatment plants. The discharge standards apply to all industrial and commercial establishments discharging waste to wastewater collection systems tributary to POTWs. The standards prohibit the discharge of pollutants that may damage the POTW's facilities, disrupt operations or expose workers to hazards. Categorical pretreatment standards are numerical effluent limits which apply to industrial and commercial discharges in 25 specific industrial categories determined to be the most significant sources of toxic pollutants. All firms regulated by a particular pretreatment standard are required to comply with these standards. One hundred and twenty-six toxic pollutants are regulated in the 25 categorical standards. Prohibited discharges into POTW plants, besides toxic substances, include:

- Substances that create a fire or explosion hazard in the plant or sewer system;
- Discharges that are corrosive (have a pH < 5.0);
- Discharges that obstruct flow in the sewer system or interfere with plant operation;
- Discharges that upset the treatment process or cause a violation of the POTW's permit;
- Discharges that increase the temperature of the wastewater entering the treatment plant to above 104º F (40º C);
- Oil based products in amounts that will cause interference or pass through;
- Substances which cause toxic gases, vapors or fumes in a quantity which may cause worker health or safety problem(s); and
- Trucked or hauled pollutants, except at discharge points designated by the POTW.

Municipalities are required to use and enforce these standards as well as locally developed standards, to control nondomestic users discharging to their wastewater collection and treatment systems. The federal regulations require all states that administer NPDES programs to POTW operators to develop local pretreatment programs. The California pretreatment program includes the same general elements which parallel the pretreatment compliance schedule activities specified in most POTWs' NPDES permits. Pretreatment programs are required to contain the following elements:

- Identification and evaluation of the nondomestic discharges to a treatment system.
- The POTW must operate under a legal authority that will enable it to apply and enforce the requirements of pretreatment regulations and other state and local rules needed to control nondomestic discharges.
- The POTW must establish local industrial effluent limits to protect treatment plant operation, receiving water quality and sludge quality.
- The POTW must develop procedures for monitoring its industrial users to determine compliance and non-compliance.
- The POTW must develop administrative procedures to implement its pretreatment program.
- The POTW must have sufficient resources (funds, equipment, personnel) to operate an effective and ongoing program.

STEAM ELECTRIC POWER PLANTS

The Region has five steam electric power plants, four are operated by San Diego Gas and Electric Company (SDG&E) and one by Southern California Edison (SCE). Each of the SDG&E plants has one cooling water intake and one outfall structure. A separate NPDES permit has been issued for each SDG&E plant. The SCE plant, called the San Onofre Nuclear Generation Station (SONGS) has three power generating units, each with its own cooling water intake and outfall structure, and a separate NPDES permit has been issued for each of the three power generating units. All of these plants obtain cooling water from the ocean or San Diego Bay.

The SDG&E power plants are conventional fossil-fuel burning electrical generating facilities. The SDG&E plants are located in San Diego County, three of them are adjacent to San Diego Bay and one is adjacent to the Pacific Ocean. The San Onofre Nuclear Generating Station is located adjacent to the

Pacific Ocean in northern San Diego County and consists of three nuclear fueled electrical generating units.

The cooling water discharges from the power plants are regulated under the provisions of the Thermal Plan, which incorporates provisions of Section 316(a) of the Clean Water Act. All of the plants employ a once-through cooling water system. Seawater is pumped into the facility and used to cool the condensers, which results in an increase in the cooling water temperature of approximately 20 degrees Fahrenheit above the ambient seawater temperature. The cooling water is then discharged to marine waters, where the heat accumulated in the cooling water is dissipated.

The power plant NPDES permits establish effluent limitations for the discharge of cooling water and other wastes generated at the facilities. The effluent limitations are based upon applicable state water quality objectives and USEPA effluent guidelines and standards for steam electric power plants contained in 40 CFR 423. Each facility has a unique arrangement and thus a unique set of waste streams. Other wastewater discharges regulated by power plant NPDES permits, in addition to the cooling water discharge, include boiler blowdown, evaporator blowdown, floor drain discharges, chemical cleaning wastes and boiler wash.

Each power plant is required under the terms and conditions of its NPDES permit to comply with federal Clean Water Act sections 316 (a) and (b). Section 316(a) addresses the control of the thermal component of a discharge and its effects on fish population and wildlife. Section 316(b) requires that the location, design, construction, and capacity of cooling water intake structures reflect the best available technology for minimizing adverse impacts to the environment.

SUBSURFACE DISPOSAL FROM CAMPGROUNDS AND RECREATIONAL VEHICLE PARKS

Since the early 1970's, the Regional Board has been issuing waste discharge requirements to campgrounds and/or recreational vehicle (RV) parks that discharge wastewater to subsurface disposal systems. Chemical preservatives in RV holding tanks increase the threat to ground water quality from these facilities. At one time, the WDRs specified that wastes other than domestic sewage shall be excluded from the discharge. Consequently, the requirements prohibited the discharge of water softener regeneration brine and RV holding tank waste to the septic tank and leach line systems and required the discharger to provide impervious storage tanks for RV holding tank wastes. In order to comply with the WDRs adopted by the Regional Board prior to 1978, the RV campground managers required RVs to empty their holding tank wastes into the campground's dump station if the RV would be provided with sewer hookups. WDRs adopted after 1978 do not require the installation of impervious holding tanks at RV parks nor are RVs required to dispose of RV holding tank wastes to impervious tanks. Currently, most campgrounds and/or RV parks in the Region do not have impervious storage tanks for RV holding tank wastes.

In 1978, the Regional Board adopted Resolution No. 78-24, suspending all ground water monitoring requirements at the campgrounds until such time as a study by the State Board on RV waste disposal was completed and reviewed by the Regional Board staff. In June 1980, the Sanitary Engineering Research Laboratory at University of California, Berkeley published a report for the State Board entitled, "*Recreational Vehicle Waste Disposal in Roadside Rest Septic Tank Systems*". This report however, did not address the requirements for ground water monitoring.

A common problem with community systems is that individual property owners and homeowners associations often deny responsibility for system failure and necessary repairs. Additional problems result when private entities operate community systems and do not have sufficient funds available to correct problems. Consequently, prior to approval of projects proposing community subsurface disposal systems, the Regional Board requires as part of the Report of Waste Discharge, documentation from the proponent that demonstrates that adequate funding is available to operate and maintain the disposal systems.

VESSELS (RECREATIONAL, COMMERCIAL, AND NAVAL) AND MARINAS

Vessels of all types and sizes including recreational, commercial, and Naval craft, and the marinas (or other facilities) in which they berth can have serious impacts on water quality. This section will describe the most important waste categories, pollutants, and other water quality problems associated with vessels and marinas. A description of BMPs and applicable regulations is also included. Although presented below, it should be noted that vessels and marinas are typically considered a nonpoint source category.

San Diego Bay sailboat

VESSELS AND MARINAS IN THE SAN DIEGO REGION

There are approximately 8,400 boat slips in San Diego Bay, 2,400 in Mission Bay, over 1,000 in Oceanside Harbor, and over 1,500 in Dana Point Harbor. In addition to boats with assigned slips, there are several hundred additional boats moored at a variety of "free" anchorages. In San Diego Bay, the San Diego Unified Port District has organized two of its free anchorages into formal anchorages which have shoreside showers, rest rooms, and docking facilities. Boat owners are required to pay fees for these services.

In 1986, the San Diego Unified Port District was granted permission by the Coast Guard to establish additional formal anchorages in San Diego Bay. Because of the reluctance of some boat owners to pay fees for mooring in the bay, many have elected to move their boats to new free anchorages. Such anchorages can be especially important sources of human pathogens from vessel sewage releases. In addition to the vessels normally maintained in the water, there are several thousand additional "trailer" boats using San Diego's boat harbors. In total, approximately 55,000 vessels are registered in San Diego County.

NAVY VESSELS IN THE SAN DIEGO REGION

Home port to approximately one hundred US Navy vessels, San Diego Bay is one of the largest Naval ports on the west coast of the United States. As described above, Navy vessels are responsible for the same types of water quality impacts as other vessels. They are also subject to the same regulations and requirements as other vessels except that discharges from Naval vessels under certain circumstances are not subject to NPDES permits. A description of this exclusion (as found in Title 40, CFR, Part 122.3) was discussed earlier in this Chapter.

If enforcement action is necessary, operators of Naval vessels are subject to all of the same enforcement mechanisms outlined previously in this Chapter with one exception; the Navy is not subject to Administrative Civil Liability.

VESSEL WASTES

The most significant waste categories associated with vessels include:

- Hull maintenance related wastes;
- Sewage;
- Marine engine related wastes; and
- Trash.

Of these categories, hull maintenance related wastes, and particularly antifouling paint, is believed to pose the greatest potential threat to water quality. This is because of its high degree of toxicity. Antifouling paint, which is applied to vessel hulls, is specifically designed to prevent the growth and attachment of marine organisms by continuously releasing toxic substances into the surrounding water. Cuprous oxide and tributyltin fluoride or tributyltin oxide are the principal toxicants in copper-based and organotin-based paints, respectively. Although the use of TBT is now significantly limited, leaching pollutants from antifouling paints remains a widespread and serious concern especially in areas of high vessel density and low hydrologic flushing.

Antifouling paint may pose an even greater water quality threat during and after its removal from vessel hulls since the pollutants in the paint chip wastes may continue to leach into receiving waters. In most cases, because paint removal activities on ships are conducted in ship repair yards, responsibility for the paint chip wastes is transferred from the vessel owner to the shipyard. (See shipyards and boatyards discussion). The same is generally true for recreational craft serviced at boatyards. However, small craft can also obtain some hull maintenance services directly in the water by underwater hull cleaners. In addition to paint, other examples of hull maintenance wastes include strippers, cleaners, and cathodic protection products. Although a variety of pollutants can be released during hull maintenance activities, metals are the pollutants of greatest concern.

Sewage is often intentionally discharged directly into receiving waters due to the lack of pumpout stations, inconvenience or inoperation of pumpout stations, or the irresponsibility or ignorance of vessel operators. Human pathogens present in sewage include a variety of fecal bacteria and viruses. Today sewage discharges in recreational marinas are believed to be more significant than at Naval berthing areas. This is because all US Navy vessels are currently equipped to connect to pumpout facilities while in port.

Marine engine related wastes such as fuels, oils, lubricants, antifreeze, solvents, and polluted bilge water are commonly released from vessels into receiving waters. The pollutants of greatest concern for marine engine wastes are metals and petroleum hydrocarbons. PAHs are a particular concern because they tend to accumulate and persist in aquatic sediments for years, poisoning benthic organisms. Garbage and trash are also discharged from vessels.

Each of the above waste categories can be, and frequently are, washed, spilled, scraped, dumped, and pumped directly into receiving waters. As a result, each of the wastes can take a major toll on water quality and beneficial uses. The marine habitat and shellfish harvesting beneficial uses are particularly sensitive to vessel wastes.

Furthermore, each of the waste categories is relevant to all vessel types and sizes including recreational boats as well as commercial and Naval ships. However, because of a ship's greater size and corresponding greater magnitude, variety, and toxicity of wastes generated, ships (particularly Navy ships) are generally believed to pose a greater threat to water quality than boats. For example, Navy vessels are typically drydocked for hull maintenance only once every five or more years and spend more time in port or at anchor than underway. Fouling organisms attach more readily when a ship is stationary. For these reasons, Navy coating systems are required to be effective for longer periods of time than those applied to commercial and recreational vessels. Accordingly, Navy vessels are blasted to "white metal" meaning all paint is removed to bare metal and the surface is abraded in preparation for adherence of a complete new coating system. Additionally antifouling paints used on Navy vessels contain higher levels of toxicants than those used on commercial and recreational vessels.

Nevertheless there is a formidable set of water quality impacts associated with small craft and small craft marinas as described below.

MARINAS

Marinas and other boat berthing facilities typically have high boat densities and low hydrologic flushing. As a consequence of these characteristics, the following significant water quality problems often result within marinas:

- Increased pollutants in the water column;
- Decreased dissolved oxygen in the water column;
- Increased pollutants in aquatic sediment;
- Increased toxicity in the water column and sediments;
- Increased pollutants in the tissues of aquatic organisms; and
- Physical alteration or destruction of aquatic habitat.

The physical disruption, or destruction of wetlands, sediment, and other aquatic habitat is an especially troublesome impact. It is a result of both the original construction of the marina, ramps, and related facilities, as well as their ongoing use, operation, and maintenance.

Although most of the water quality problems listed above arise from the direct discharge of wastes by vessels, pollutants can also be transported into marina waters by way of storm water runoff from parking lots, docks, and other impervious surfaces.

Oceanside Harbor

CZARA(G) GUIDANCE FOR MARINAS

Most of the impacts listed above can be mitigated by utilizing best possible siting and design criteria for each marina. Construction and operation and maintenance practices are also crucial to protecting water quality. Recognizing the importance of this, USEPA developed fifteen specific management measures (BMPs) to protect coastal waters from nonpoint pollution from marinas and recreational boating.

The management measures for marinas which are grouped into two broad headings, (1) siting and design; and (2) operation and maintenance, were developed pursuant to section 6217 of the Coastal Zone Act Reauthorization Amendments (CZARA) of 1990 and are incorporated into the (g) guidance. As with all nonpoint source pollution protection measures, the key to protecting water quality in marinas is pollution prevention.

REGULATION OF VESSELS AND MARINAS

Management measures related to preventing pollutants, such as sewage, fuel and oil leaks, toxics, fish wastes, and hull scrapings from entering coastal waters are primarily the responsibility of the Regional Board. The Regional Board prohibits the discharge of these wastes through a variety of Basin Plan discharge prohibitions. The Board also encourages and participates in public education/awareness campaigns. The Harbors and Navigation Code section 151 prohibits the intentional or negligent discharge of oil to the waters of the state. Penal Code section 374(e) as amended in 1970 provides that any person who litters or places waste matter into any bay, lagoon, channel, river, creek, slough, canal or reservoir or body of water is guilty of a misdemeanor.

Local governments have significant authority to carry out these CZARA management measures through their zoning ordinances, and by using their police, fire, or building departments to ensure implementation.

The California Department of Pesticide Regulation regulates the application of antifouling paints. Regulations for organotin-based paints have been established which limit the TBT release rate, require application by certified commercial applicators, and allow application only on vessels at least 25 meters in length and/or aluminum hulls and parts. As described earlier, tributyltin fluoride or tributyltin oxide are the principal toxicants in organotin-based paints.

The Health and Safety Code section 4425 prohibits a vessel with a toilet from operating upon the waters of any lake, reservoir, or fresh water impoundment of this State unless the toilet is designed so that no human sewage can be discharged in such waters. This code section does not apply to rivers, estuaries or saltwater areas of California. Section 312 of the Clean Water Act provides that marine sanitation devices on board new or existing vessels must be designed to prevent the discharge of untreated or inadequately treated sewage into or upon the navigable waters of the United States (see discussion below on "No Discharge Zone"). The Marine Sanitation (section 775) of the Harbors and Navigation Code declares that every vessel terminal shall be equipped with vessel pumpout facilities for the transfer and disposal of sewage from marine sanitation devices in order to protect water quality.

NO DISCHARGE ZONE

Division 7 of the Water Code authorizes the Regional Board to regulate any discharge of waste, including sewage, to waters of the state. The federal Clean Water Act however partially preempts the state's authority to regulate vessel sewage discharges. Section 312 of the Clean Water Act provides that no state or local entity may adopt or enforce any laws regarding the design, manufacture, installation or use of marine sanitation devices (MSDs). Instead, USEPA must adopt federal standards of performance for MSDs which must be enforced and implemented through regulations adopted by the United States Coast Guard (USCG).

Marine sanitation devices either retain sewage or discharge treated sewage. If sewage is discharged, the effluent must meet USCG specified effluent standards described in 33 CFR 159, Coast Guard Regulations on Marine Sanitation Devices. Types I and II MSDs are flow-through systems which treat and discharge sewage. Type I MSDs produce an effluent having a fecal coliform bacteria count not greater than 1,000 per 100 ml and no visible floating solids. Type II MSDs produce an effluent having a fecal coliform bacteria count not greater than 200 per 100 ml and suspended solids not greater than 150 mg/l. Type III MSDs are holding tanks only and prevent the overboard discharge of treated or untreated sewage.

There is one significant exception to the federal preemption of a state's regulation of vessel sewage discharges. Clean Water Act section 312 (f) allows states to completely prohibit vessel sewage discharges into waters requiring greater water quality protection, provided that USEPA determines that adequate vessel sewage pumpout facilities are available for these waters.

In 1976 the State of California petitioned USEPA, pursuant to section 312 (f)(3) of the Clean Water Act, for a determination that adequate pump-out facilities were reasonably available for that portion of San Diego Bay that is less than 30 feet deep at MLLW; and for all of Mission Bay, Oceanside Harbor, and Dana Point Harbor (41 Federal Register 21516 May 26, 1976). On August 6, 1976, USEPA made the requested determination (41 Federal Register 34453 August 6, 1976).

As a result, the discharge of all sewage, treated or untreated, from all vessels is completely prohibited in all portions of Mission Bay, Oceanside Harbor, and Dana Point Harbor (regardless of vessel size or water depth). Mission Bay, Oceanside Harbor, and Dana Point Harbor are, in their entirety, "No Discharge Zones". (Note that this prohibition includes discharges from a properly functioning USCG certified MSD).

The discharge of all sewage, treated or untreated, from all vessels is completely prohibited in all portions of San Diego Bay that are less than 30 feet deep at MLLW. The No Discharge Zone in San Diego Bay is defined as all portions of the bay having a depth of less than 30 feet MLLW. In the absence of the no discharge zone (i.e., in those portions of San Diego Bay having a depth of 30 feet or greater), discharge of treated sewage through a properly functioning USCG certified Type I or II marine sanitation device is allowed. (USCG certification provides that the specified effluent limitations will be met). The discharge of untreated sewage from a Type III holding tank is not allowed under any condition in any portion of San Diego Bay (regardless of depth).

Because of dilution and circulation in San Diego Bay, it is assumed that the discharge of treated sewage into waters deeper than 30 feet from a properly functioning USCG certified Type I or II MSD will not degrade the bay's beneficial uses. Additionally, with the exception of a few recent uses (such as jet skiing and sail boarding), the REC I designated beneficial use occurs in shallow waters (i.e., in waters less than 30 feet). This supports the need for a complete prohibition in such shallow waters.

Furthermore, as a practical matter, it is not possible to regulate sewage discharges from all vessels in San Diego Bay. For example, some foreign vessels may not be equipped to use the existing pump-out facilities. Since the no discharge designation is conditioned upon the existence of adequate pump-out facilities, it was necessary to make an allowance in the prohibition for such vessels. These vessels require berthing accommodations outside of the designated area. (All US Navy vessels are equipped to connect to pump-out barges or pier-side sewage facilities).

Most small pleasure craft are equipped with either a Type I or II flow-through treatment device or a Type III holding tank, but rarely both. Those vessels equipped with only a flow-through treatment device must secure their device while in a No Discharge Zone in order to prevent overboard sewage discharges. Those vessels equipped with only a holding tank are required to utilize pump-out facilities at all times and may not discharge into any portion of any bay. In other words, a vessel in San Diego Bay with a holding tank may not move into water greater than 30 feet and discharge sewage from its holding tank.

A study of the levels of coliform and Enterococcus bacteria caused by vessel discharges is needed to allow the Regional Board to make decisions based on measured levels. The Regional Board could then advise the county health officer, the Port District, and the Coast Guard so appropriate actions could be taken to abate the effects of sewage discharges from vessels.

SHIPYARDS

This section contains a general discussion of shipyards, their threat to water quality, and regulatory complexity. A discussion specific to San Diego Bay shipyards is included near the end of this section.

Shipyard activities may result in the discharge of wastes to receiving waters. The presence of elevated concentrations of pollutants, primarily heavy metals, in the sediment adjacent to shipyards nationwide is well documented in the literature (see references). Although there are numerous other potential threats, the single most significant threat to water quality posed by shipyards is the potential discharge of abrasive blast waste to receiving waters.

SHIPYARD THREAT TO WATER QUALITY

From the perspective of protecting beneficial uses, a discharger's threat to water quality is critically important and plays a role in virtually all regulatory decisions. By definition, the basis of a discharger's threat to water quality is the effect the discharger would have on the receiving water if discharges occurred in violation of its NPDES permit. In other words, a discharger's threat to water quality is its potential for degrading water quality. The following six characteristics are relevant in evaluating a shipyard's threat to water quality: (1) primary activities; (2) facilities; (3) industrial processes; (4) materials used; (5) wastes generated; and (6) waste discharges to receiving waters (actual and potential). A discussion of each follows.

PRIMARY ACTIVITIES AT SHIPYARDS

The shipbuilding and repair industry is engaged in the construction, conversion, alteration, repair, and maintenance of all types of military and commercial ships and vessels. Shipbuilding and repair encompasses a large number and variety of activities and industrial processes including, but not limited to, formation and assembly of steel hulls; application of paint (coating) systems; installation and repair of a large variety of mechanical, electrical, and hydraulic systems and equipment; repair of damaged vessels; removal and replacement of expended or failed paint (coating) systems; and provision of entire utility/support systems to ships (and crew) during repair.

The list of occupations required to conduct these activities is also extensive, including sandblasters, painters, shipfitters, machinists, metalsmiths, welders/burners, blacksmiths, boilermakers, chemists, carpenters, coppersmiths, electricians, electronic technicians, joiners and patternmakers, laborers, riggers, pipefitters, and foundrymen. Not all occupations are present at all shipyards.

SHIPYARD FACILITIES

There are four major types of building/repair facilities at shipyards, which together with cranes, enable ships to be assembled, launched, or repaired. These facilities are graving docks/shipbuilding ways, floating drydocks, marine railways, and berths/piers. With the exception of berths and piers, the basic purpose of each facility is to separate the vessel from the bay and provide access to parts of the ship normally underwater.

Each facility type presents its own unique set of environmental concerns. Depending on size and capabilities, a single shipyard will generally have a combination of two or more of these facilities.

In addition to these facilities, shipyards must also conduct the wide range of support or complementary activities previously described. Many of these activities require their own facility, space, or shop; for example concrete platens (for steel fabrication), machine shop, pipe shop, electroplating shop, weld shop, sheet metal shop, electrical shop, coppersmith shop, blacksmith shop, carpentry shop, and boiler shop, etc. Not all facilities are present at all shipyards.

SHIPYARD INDUSTRIAL PROCESSES

The primary activities described above involve a multitude of industrial processes, many of which must be conducted over water or very close to the waterfront. Because they typically represent the greatest threat to water quality, the following discussion will focus primarily on the industrial processes conducted inside graving docks or floating drydocks.

Surface Preparation and Paint Removal

Methods of surface preparation and paint removal include dry abrasive blasting, wet abrasive or slurry blasting, hydroblasting, and chemical paint stripping. Each paint removal method has a unique purpose and poses its own set of water quality risks.

Dry abrasive blasting is the preferred method of preparing steel surfaces for application of a new paint (coating) system for saltwater immersion. It is used for most exterior hull work and virtually all interior tank work (e.g., fuel, bilge, ballast tanks etc). Dry abrasive blasting is the process in which blasting abrasive is conveyed in a medium of high pressure air, through a nozzle at velocities up to 450 feet per second resulting in very large quantities of solid waste and airborne particulates (dust). Although the most efficient of the paint removal methods, dry blasting produces the largest quantity of airborne particulates.

Wet abrasive or slurry blasting is the process in which water replaces air as the abrasive propellant. The use of water significantly reduces airborne particulate emissions but generates large quantities of wet residue and wastewater.

Hydroblasting is a process in which water under very high pressure is used instead of abrasive. Hydroblasting produces large amounts of wastewater and is primarily used at shipyards to remove marine growth, not to remove existing coatings. Chemical paint stripping is uncommon in drydocks and used primarily for removable parts.

Paint (coating) Application

After preparation, surfaces are painted. Most painting occurring in a drydock involves the ship hull and internal tanks. Painting is also conducted in other locations throughout a shipyard including piers and berths. Paint application is accomplished by way of air or airless spraying equipment.

Tank Cleaning

Tank cleaning operations utilize steam to remove dirt and sludge from internal tanks, particularly fuel tanks and bilges. Detergents, cleaners, and hot water may be injected into the steam supply hoses. Wastewater is generated.

Other Industrial Processes (graving docks/drydocks)

Other industrial processes conducted inside graving docks or floating drydocks include mechanical repair, maintenance, installation; structural repair, alteration, assembly; and integrity/ hydrostatic testing. Hydrostatic or strength testing (flushing) is conducted on hull, tanks, or pipe repairs and on new systems during ship construction phases. Hydrostatic testing generates significant water flow.

Other Industrial Processes (elsewhere)

Numerous other industrial processes take place at numerous other locations throughout a typical shipyard, including activities at a variety of repair and specialty shops. Examples include paint equipment cleaning; engine repair/ maintenance/ installation; pipe fitting; steel fabrication and machining; electrical repair/ maintenance/ installation; hydraulic repair/ maintenance/ installation; tank emptying; fueling; pattern making; shipfitting; boiler cleaning; carpentry; refurbishing/ modernization/ cleaning; air conditioning/ refrigeration repair; sheet metal fabrication; fiberglass repair; electroplating/ metal finishing; blacksmithing; zinc primer application; printing; and photo processing. As a result of these processes, an assortment of wastes are generated, many of which are hazardous.

MATERIALS USED AT SHIPYARDS

Materials commonly used at shipyards are described below beginning with those utilized during graving dock or floating drydock operations.

Abrasive Grit

Abrasive grit is typically slag from the smelting of copper ore and consists principally of iron. Trace elements such as copper, zinc and titanium may also be present in the slag. Sand, cast iron, or steel shot are also used as abrasives. Very large amounts of abrasive are needed to remove paint to bare metal. For example, removing paint from a 15,000 square foot hull can take up to 6-days and consume 87 tons of grit. Grit is needed in all dry and wet (slurry) abrasive blasting.

Fresh Paints

Fresh paints contain copper, zinc, chromium, and lead (all priority pollutants) as well as numerous hydrocarbons. The two major types of paints used on ship hulls are anticorrosive paints and antifouling paints. Anticorrosive paint (primers) include vinyl, vinyl-lead, or epoxy based coatings. Others contain zinc chromate and lead oxide. (Although newer paint formulations no longer include chromium and lead, such constituents may be present in shipyard wastes due to the removal of older coating systems).

Antifouling paints are designed to prevent growth and attachment of marine organisms by continuously releasing toxic substances into the water. Cuprous oxide and tributyltin fluoride or tributyltin oxide are the principal toxicants in copper-based and organotin-based paints, respectively.

Other Materials

Other materials used include oils (engine, cutting, and hydraulic); lubricants, grease; fuels; weld rod; detergents, cleaners; rust inhibitors; paint thinners; hydrocarbon and chlorinated solvents; degreasers; acids; caustics; resins; adhesives/ cement/ sealants; cyanide; zinc (e.g., zinc dust); chlorine; and mercury.

WASTES GENERATED AT SHIPYARDS

The major categories of wastes commonly generated by shipyard industrial processes are discussed below. Wastes resulting from graving or floating drydock operations are presented first.

Abrasive Blast Waste

Abrasive blast waste, consisting of spent grit, spent paint, marine organisms, and rust is generated in very large quantities during all dry or wet abrasive blasting procedures. The constituent of greatest concern with regard to toxicity is the spent paint, particularly the copper and tributyltin antifouling components, which are designed to be toxic and designed to continuously leach into the water column. Other priority pollutants in paint include zinc, chromium, and lead. Although the grit itself is not highly toxic, it is a major component in the large solid waste load and is settleable. As a result, its deposition can degrade the benthic community and increase the need for dredging. Abrasive blast waste can be conveyed by water flows, become airborne (especially during dry blasting), or fall directly into receiving waters. Wet abrasive blasting of a Naval DDG class destroyer (437-536 feet long; 47-67 feet wide; 15-20 feet draft) can generate up to 180 tons of solid wet abrasive waste.

Paint Losses

Paint losses, or paint which ends up somewhere other than its intended location (e.g., drydock floor, bay, worker's clothing), results from spills, drips, and overspray. Typical overspray losses are estimated at approximately 5% for air spraying and 1-2% for airless spraying.

Bilge Waste/Other Oily Wastewater

This is generated during tank emptying, leakages, and cleaning operations (bilge, ballast, fuel tanks). In addition to petroleum products (fuel, oil), tank washwater may also contain detergents or cleaners (nitrogen and phosphorus compounds) and can be generated in large quantities.

Blast Wastewater

Wet abrasive (slurry) blasting and hyrdoblasting generates large quantities of wastewater. Wet abrasive blasting of a Naval DDG class destroyer can generate up to 500,000 gallons of contaminated water. In addition to suspended and settleable solids (spent abrasive, paint, rust, and marine organisms) and water, blast wastewater may also contain rust inhibitors such as diammonium phosphate and sodium nitrite.

Other Wastes

These include oils (engine, cutting, and hydraulic); lubricants, grease; fuels; waste paints/ sludge/ solvents/ thinners; construction/ repair wastes and trash; asbestos (from ship refurbishing/ modernization); sewage (black and grey water from vessels or docks); boiler blowdown, condensate, discard; spent hydrocarbon or chlorinated solvents; electroplating/ metal finishing wastes; acid wastes; caustic wastes; and aqueous wastes (with and without metals).

SHIPYARD WASTE DISCHARGES TO RECEIVING WATERS

Actual and potential waste discharges to receiving waters from typical shipyard operations are discussed below. Most are either the direct result of an industrial process (drydock, marine railway, or berth operations) or, more commonly, the result of water coming into contact with wastes, typically spent abrasive blast waste. There are numerous sources of water at a shipyard including: industrial processes; building or repair facilities (e.g., drydock); vessels under repair (e.g., cooling water); bay water (e.g., due to tidal influence or wave action); storm water; or other sources.

Actual and potential waste discharges to receiving waters include: floating drydock deballasting (tanks); floating drydock submergence/ emergence (platform); floating drydock operations; graving dock dewatering; gate leakage; hydrostatic relief flows; shipbuilding ways dewatering/ gate leakage/ relief flows; marine railway operations; berth and pier operations; storm water; integrity/ hydrostatic testing discharge (new vessels); boiler and cogeneration feedwater; fire protection system discharge; cooling water; and miscellaneous water flows.

SHIPYARD COMPLEXITY

From a regulatory and environmental control standpoint, shipyards present a unique and difficult problem. Traditional NPDES dischargers generate or intake wastewater, treat it to specified effluent limits, and discharge treated effluent, often by way of a single pipe. Unlike traditional dischargers, shipyards are significantly more complex in all respects: numerous and diverse industrial processes; numerous discharge mechanisms, waste streams, and discharge points; and Best Management Practices Plan based permits. Each is discussed below.

Numerous and Diverse Industrial Processes

As described previously, shipyards conduct a large number and broad range of industrial processes which require a wide range of facilities and substantial workforce.

Numerous Discharge Mechanisms, Waste Streams, and Discharge Points

Shipyards are complex to regulate because they have numerous discharge mechanisms, discharge points, and waste streams. A less complex discharger will typically have a single or small number of each. A discussion of abrasive blast waste with respect to discharge mechanisms, discharge points, and waste streams follows. Abrasive blast waste is discharged primarily as a result of graving dock flooding, drydock immersion, drainage, or runoff. In other words, at shipyards, the principle mechanism by which wastes are conveyed to receiving waters is via the contact of wastes with water, both of which occur in large quantities. For this reason, storm water and storm drain inlets are of particular concern at shipyards. Abrasive blast waste can also become subject to tidal or wave action. Airborne releases represent another important discharge mechanism. Because abrasive blast waste is generated in part as airborne particulates, such releases to receiving waters pose a significant threat to water quality. Furthermore, and because of their proximity to receiving waters, a third discharge mechanism exits at shipyards. Direct discharges from shipyards occur when wastes are allowed to fall directly into receiving waters (off the end drydock, edge of pier, between gratings, etc).

In summary, because abrasive blast waste can be washed, hosed, pushed, blown, become subject to tidal/wave action, and be directly or otherwise discharged, the potential for abrasive blast waste from shipyards to enter receiving waters is great. In addition to multiple discharge mechanisms, numerous waste streams, and discharge points also exist at shipyards. The discharges described above can potentially enter receiving waters from numerous shipyard worksites including graving docks, drydocks, marine railways, piers, repair/ specialty shops, as well as via storm drains and sheet flow runoff.

Best Management Practices Based Permits

Unlike traditional NPDES discharges which are regulated by numerical effluent limits, the control of waste discharges from shipyards is accomplished by the implementation of BMP plans. The purpose of a BMP plan is to prevent, reduce, or eliminate the spillage or illicit discharge of pollutants into receiving waters and can include any number of preventive controls or measures. Due to the types of activities and multiple discharge pathways, numerical effluent limitations are not practical at shipyards. The evaluation of the effectiveness of BMP Plans from a regulatory standpoint is more complicated and resource intensive than comparison of end-of-pipe monitoring results to numerical effluent limitations.

LONG-TERM EFFECTS OF SHIPYARD DISCHARGES ON WATER QUALITY AND BENEFICIAL USES

Unlike short lived pollutants (e.g., BOD and bacteria) the type of pollutants present in shipyard discharges are typically long-lasting. Shipyard pollutants, such as heavy metals and PAHs are persistent in the marine environment, in part, because they can become attached to sediment particles and can accumulate to high concentrations in both sediments and in marine organisms. Once incorporated into sediment and tissues, these pollutants are very difficult to remove and may recycle in the marine system indefinitely. Because sediment cleanup projects are difficult, expensive, and lengthy, contaminated sediment can remain in place, adversely affecting beneficial uses and water quality, for many years.

SAN DIEGO BAY SHIPYARDS

The following discussion is specific to San Diego Bay shipyards.

NPDES Permits

There are currently four commercial shipyards in the San Diego Region, all of which are located adjacent to San Diego Bay. All of the shipyards are currently regulated under individual NPDES permits which are BMP based, rather than based on effluent limits. The shipyard permits also include standard receiving water limitations and discharge prohibitions. Additionally, all of the shipyards are also subject to the statewide General Industrial Storm Water Permit.

Threat to Water Quality and Best Management Practices

Although the discussion above was intended as a general description of the shipyard industry as a whole, the majority of the information is applicable to the San Diego Bay shipyards. One notable exception is that wet abrasive or slurry blasting and chemical paint stripping are currently not conducted at San Diego Bay shipyards.

By definition a discharger's threat to water quality is its potential to cause damage to water quality and beneficial uses under worst case conditions, i.e., assuming all BMPs and treatment measures fail. For this reason, the general shipyard discussion on threat to water quality focuses on potential risks rather than on BMPs. As described, a shipyard's potential risks to water quality are significant in many respects. BMPs are specifically designed to reduce those risks and are therefore extremely important for shipyards. Hence, the second reason to focus on potential risks is to emphasize the need for effective BMPs at shipyards.

San Diego shipyards report strict adherence to a large number of BMPs to control water and airborne wastes during a variety of industrial processes. Such BMPs include physical and procedural controls. Physical controls isolate runoff pathways from contact with abrasive blast wastes through the use of shrouding, sealing of drains, and diversion of sump discharge pathways. Procedural control methods include dock sweeping and elimination of sources of runoff during blasting operations. The shipyards also report the effective management of their wastes including treatment, recycling, and disposal in compliance with the San Diego County Hazardous Materials Management Division, their San Diego Metropolitan Industrial Waste Program permits, and the San Diego County Air Pollution Control District.

Contaminated San Diego Bay Sediment and Mussels

Regional Board staff has reviewed the results of sediment samples collected adjacent to the shipyards in San Diego Bay. Elevated concentrations of copper, tributyltin, and zinc exist in these sediments. Copper, tributyltin and zinc are contained in both the materials used by San Diego Bay shipyards as well as in the wastes which they generate. Furthermore elevated concentrations of copper, tributyltin, and zinc have also been measured in the tissues of mussels collected from stations located adjacent to San Diego Bay shipyards.

Although this data may suggest that the BMPs employed by San Diego Bay shipyards are not effective, it may also represent historical discharges which occurred at a time when BMPs were not carefully implemented. Regional Board staff plans to investigate the matter further. The existence of contaminated sediment adjacent to the shipyards serves to further underscore the importance of shipyard BMPs.

SHIPYARDS – GENERAL CONCLUSIONS

In summary, shipyards typically pose a significant threat to water quality for the following reasons. Relative to other regulated dischargers, shipyards conduct a large number and wide variety of activities and industrial processes. The conduct of these industrial processes requires numerous physical facilities and a large number, amount, and variety of materials. As a result, a large number, amount, and variety of wastes are generated and are, or may be, discharged to receiving waters. Shipyard discharges have the potential to cause the long-term loss of a designated beneficial use in receiving waters.

From a regulatory perspective, shipyards are complex. Toxic pollutants are, or could be, present in wastes discharged to receiving waters from shipyards. They have numerous discharge points and are regulated by permits which do not contain numeric effluent limits. Shipyards are typically "major" NPDES dischargers and require a high level of regulatory effort.

In conclusion, because shipyards pose a significant threat to water quality and are complex to regulate, the BMPs which they employ (to reduce or eliminate the discharge of wastes to receiving waters) are extremely important. It is critical that shipyard BMPs are effective and diligently implemented.

BOATYARDS

There are currently 12 boat building and boat repair facilities (commonly called boatyards) adjacent to receiving waters in the San Diego Region. Most of the boatyards are located adjacent to San Diego Bay, while Mission Bay, Oceanside Harbor, and Dana Point Harbor are serviced each by a single boatyard. Additional boatyards are located in inland areas of the Region. Seven of the boatyards located adjacent to receiving waters are currently regulated under an individual NPDES permit. Eventually all of the waterfront boatyards will be regulated under an individual NPDES permit. Additionally, all of the boatyards in the Region are currently subject to the statewide General Industrial Storm Water Permit. Like the shipyard permits, boatyard permits do not contain numeric effluent limits but are based instead on BMPs.

The most significant waste categories associated with boatyards include hull maintenance related wastes and marine engine related wastes. Hull maintenance related wastes, and particularly antifouling paints, are believed to pose the greatest threat to water quality from boatyard operations. Cuprous oxide (copper) and TBT fluoride or TBT oxide are the principle toxicants in antifouling paint used at boatyards. Marine engine related wastes include fuels, oils, lubricants, antifreeze, solvents, and bilge water. The pollutants of concern from marine engine wastes are metals and petroleum hydrocarbons. PAHs are of particular concern because they persist in the marine environment. Implementation of BMPs is the key to controlling boatyard waste discharges to receiving waters.

GROUND WATER DEWATERING

A number of dewatering operations are associated with construction projects for foundations, bridges, roads, etc. Other dewatering operations are ground water remediation projects which are required under Cleanup and Abatement Orders issued by the Regional Board. Many of the proposed dewatering operations are located where petroleum or other pollutants plumes exist. Petroleum or other pollutants may be pumped from the ground water and discharged to a storm drain and subsequently to a water of the United States.

Since the mid-1980's, the Regional Board has regulated dewatering operations under the NPDES permit process. Two general NPDES permits have been adopted by the Regional Board which regulate discharges from ground water remediation projects and discharges from ground water dewatering operations to surface waters of the United States.

The first permit, Order No. 2000-90, NPDES No. CAG919001 regulates temporary ground water extraction and similar waste discharges to San Diego Bay and storm drains or other conveyance systems tributary thereto. This Order prohibits ground water extraction waste discharges to San Diego Bay from new permanent ground water extraction operations.

The second permit, Order No. 2001-96, NPDES No. CAG919002 regulates ground water extraction waste discharges from construction, remediation, and permanent ground water extraction projects to surface waters within the San Diego Region except for San Diego Bay.

In addition, the Waiver Order described earlier in this Chapter waives WDRs for short-term construction dewatering operations where there is no discharge to surface waters.

DREDGING AND DISPOSAL OF DREDGE SPOIL

REGULATORY FRAMEWORK FOR DREDGED MATERIAL DISPOSAL

FEDERAL STATUTES AND REGULATION

The regulation of dredged material disposal in waters of the United States (US) on a federal level is a responsibility shared by the USEPA and the USACOE. The Marine Protection, Research and Sanctuaries Act, also called the Ocean Dumping Act, is the primary federal environmental statute governing the discharge of dredged material to the ocean. The Clean Water Act is the primary federal statute governing the discharge of dredged and/or fill material into US waters. Material dredged from waters of the US and disposed in the territorial sea is evaluated under the Marine Protection, Research and Sanctuaries Act unless the material discharged is for the primary purpose of fill (e.g., beach replenishment, island creation, or underwater berms), in which case the disposal is evaluated under the Clean Water Act [33 CFR 336.0(b)]. Other applicable federal statutes and regulations include the following.

The Rivers and Harbors Act of 1899

The Rivers and Harbors Act of 1899 (33 USC 401 et. seq.) requires a USACOE permit for any work or structure, including fill material discharges, in navigable waters of the United States. The primary purpose of section 10 of this act is to ensure that structures (i.e., disposal berms, piers, pipelines, bridges, wharfs) constructed in navigable waters do not adversely affect federal interstate navigation.

The Fish and Wildlife Coordination Act of 1958

The Fish and Wildlife Coordination Act requires that, for any proposed federal project or permit that may affect a stream or other body of water, the USACOE must first consult with federal and state fish and wildlife agencies. This consultation addresses the prevention of damages to wildlife resources and provides for the development and improvement of wildlife resources.

The Endangered Species Act of 1973

Section 7(a)(2) of the Endangered Species Act (ESA), as amended (16 USC 1531 et. seq.) requires federal agencies, in consultation with the Secretaries of Interior (represented by the US Fish and Wildlife Service) and Commerce (represented by the National Marine Fisheries Service), to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of such species.

The Coastal Zone Management Act of 1972

The Coastal Zone Management Act (16 United States Code (USC) 1451 et. seq.) authorizes a federal program for the effective management, beneficial use, protection and development of the coastal zone. The act requires the USACOE to coordinate permit review and federal projects with all state level coastal zone review agencies. Under this act, coastal states are required to formulate a management program for the land and water resources of its coastal zone, which extends out to the seaward limit of the territorial sea, and submit it for approval to the Secretary of Commerce. In 1977, the California Coastal Management Program was approved.

Overview of the Clean Water Act

California tree frog

Section 404 of the Clean Water Act requires the USEPA, in conjunction with the USACOE, to promulgate guidelines for the discharge of dredged or other fill material to ensure that such proposed discharge will not result in unacceptable adverse environmental impacts to waters of the United States. Section 404 assigns to the USACOE the responsibility for authorizing all such proposed discharges, and requires application of the guidelines in assessing the environmental acceptability of the proposed action. The USACOE and the USEPA also have authority under section 230.80 to specify, in advance, sites that are either suitable or unsuitable for the discharge of dredged or fill material in US waters. In addition, Clean Water Act section 401 provides the States a certification role as to project compliance with applicable water quality standards.

Clean Water Act, Section 401 Certification State of California

The Clean Water Act, section 401 gives the states authority to grant, deny, or waive certification for a federally permitted or licensed activity that may result in a discharge to waters of the United States. Any applicant for a federal permit which conducts any activity which may result in any discharge into the navigable waters of the State must present to the permitting agency a certification (or waiver of certification) from the State that any such discharge will comply with the applicable Clean Water Act provisions of section 301, 302, 303, 306, and 307. The certification issued by the State should establish relevant effluent limitations, monitoring requirements, and standards or performance which become conditions of the federal permit. In California, the responsibility for section 401 certification is assigned to the State Board and regional boards. After review of data submitted by an applicant, and any other information available as to whether the proposed activity will comply with all applicable water quality standards, limitations and restrictions, the Regional Board may:

- Waive water quality certification;
- Issue waste discharge requirements; or,
- Recommend approval with or without conditions, or denial of water quality certification, to the State Board.

In order to grant section 401 certification, the State Board must certify that the proposed discharge will not result in unacceptable adverse environmental impacts to waters of the United States.

For a project to proceed, a waiver of certification or waste discharge requirements must be obtained from the Regional Board or a certification with or without conditions must be obtained from the State Board, indicating the Board's concurrence with the decision that the proposed action is not expected to cause a violation of the State's water quality standards.

STATE STATUTES AND REGULATIONS

The State of California has several programs that parallel or overlap many of the listed federal Acts. Relevant state statutes and regulations include the following:

- Water Code, Division 7 (Porter-Cologne Water Quality Control Act);
- State Board and Regional Water Quality Control Board Plans and Policies;
- Water Code, Division 4 (California Bay Protection and Toxic Cleanup Act);
- California Fish and Game Code;
- California Environmental Quality Act; and
- California Coastal Zone Management Act.

The primary statutory state law pertaining to the regulation of water quality and sediment control issues is the Porter-Cologne Water Quality Control Act which is contained in Division 7 of the Water Code.

California Water Code, Division 7 (Porter-Cologne Water Quality Control Act)

Dredging and dredged material disposal is an ongoing activity at harbors within the San Diego Region. The discharge of dredged or fill material which comes within the purview of section 404 of the federal Clean Water Act is not subject to regulation under the NPDES permit program (Clean Water Act section 402). However, if the project involves the discharge or potential discharge of waste (e.g. dredge spoils, dredge spoil return water, etc.) which may adversely impact water quality, then the discharge may be regulated through the issuance of WDRs. WDRs are issued by the Regional Board pursuant to the Porter-Cologne Water Quality Control Act.

The Regional Board is concerned with turbidity, dissolved oxygen depletion, and other physical, chemical, and biological parameters in the receiving waters which are impacted by dredge/fill projects. In recent years, there has also been concern about the concentrations of chemicals in the material to be dredged. Harbor areas may contain high levels of contaminants in bottom sediments due to navigational use, and due to wastes from urban, industrial, and riverine sources. For projects involving dredging the proponent is required to submit a Report of Waste Discharge (RWD) in application for WDRs. The RWD must include a characterization of the material to be removed to determine whether the proposed project is expected to meet all applicable water quality standards, limitations, restrictions and discharge prohibitions. The decision to issue or waive WDRs for dredging projects is made on a case-by-case basis regardless of dredge spoil volume. Disposal of dredge material at authorized open-ocean disposal sites (e.g., LA-5 Ocean Dredged Material Disposal Site) fall under the jurisdiction of the USEPA and the USACOE. However, because of the potential threat to water quality due to dredging operations, the Regional Board may still issue a WDR for the actual dredging portion of the project.

Adopted WDRs typically require monitoring for dissolved oxygen, turbidity and, where concentrations of chemicals in the sediments are high, monitoring for chemical constituents. Monitoring may be required of the receiving water at the dredge site or at the disposal site(s), and of the dredge spoil return water if applicable.

Enforcement Process for Contaminated Sediment

Dredging is often part of the remediation process for contaminated sediments in marine waters. The Regional Board under the authority of the Water Code section 13304 may issue a cleanup and abatement order to require an identified responsible party which caused the discharge of chemical constituent(s) present in a contaminated sediment to remediate or effect cleanup of the contaminated sediment.

Specific directives of cleanup and abatement orders issued for remediation or cleanup of contaminated sediments typically direct the responsible party to:

- Quantify the lateral and vertical extent of the contaminated sediment;

- Examine the engineering feasibility of the following alternative sediment cleanup/ remediation strategies;

  - ✓ Complete removal of all contaminated sediment;

  - ✓ Removal or remediation of contaminated sediment to a level that will conform with water quality objectives and protect/ restore beneficial uses; and

  - ✓ No action alternative level - The "no action" alternative level involves reliance upon natural processes for the remediation of contaminated sediment sites;

- Examine the cost of sediment cleanup/ remediation to various cleanup/ remediation levels; and

- Examine the environmental consequences of sediment cleanup/ remediation to various cleanup/remediation levels.

State Water Resources Control Board and Regional Water Resources Control Board Plans and Policies

State plans and policies which affect dredging and disposal of dredge spoil include the Ocean Plan, the (Resolution No. 74-43), the Basin Plan, and any other applicable plans or policies.

Ocean Plan

The Ocean Plan establishes general requirements for waste discharges which could affect state ocean waters. For dredge/fill projects, this may include discharges associated with dredging operations, dredge spoils disposal including beach replenishment, or discharge of dredge spoil return water. The Ocean Plan requirements are incorporated into WDRs issued by the Regional Board for dredge/fill projects.

Water Quality Control Policy for the Enclosed Bays and Estuaries of California

This policy requires that dredge spoils to be disposed of in bay and estuarine waters must comply with federal criteria for determining the acceptability of dredged spoils to marine waters, and must be certified by the State Board or Regional Board as in compliance with state plans and policies. Dredging must also comply with applicable discharge prohibitions contained in the policy (i.e., the policy prohibits the direct or indirect discharge of silt, sand, soil, clay, or other earthen materials from onshore operations including mining, construction, agriculture, and lumbering, in quantities which unreasonably affect or threaten to affect beneficial uses).

California Bay Protection and Toxic Cleanup Act

The California Bay Protection and Toxic Cleanup Act (Water Code, Division 4, Chapter 5.6, sections 13390-13396) requires the Regional Board to identify and characterize toxic hot spots in bays and estuaries and ocean waters of the state and plan for cleanup or remediation of the sites. Furthermore, CWC section 13396 states that no person shall dredge or otherwise disturb a toxic hot spot without first obtaining Clean Water Act section 401 certification or WDRs. Dredging projects involving removal or disturbances of sediments at toxic hot spots must meet the following conditions to the satisfaction of the Regional Board:

- The polluted sediment will be removed in a manner that prevents or minimizes water quality degradation.

- Polluted dredge spoils will not be deposited in a location that may cause significant adverse effects to aquatic life, fish, shellfish, or wildlife or may harm the beneficial uses of the receiving waters, or does not create maximum benefit to the people of the state.

- The project or activity will not cause significant adverse impacts upon a federal sanctuary, recreational area, or other waters of significant national importance.

California Coastal Zone Management Act

The California Coastal Zone Management Act requires that the dredging of coastal waters and estuaries be limited where feasible to maintaining navigational depths [section 30233(a)(2)]. Section 30233(b) further encourages the transportation of dredged material so generated and determined to be suitable for beach replenishment to appropriate beaches or into suitable long shore current systems.

California Fish and Game Code

Dredging operations and the disposal of dredge spoil and dredge spoil return water are subject to applicable sections of the California Fish and Game Code, especially those pertaining to:

- Water pollution (Division 6, Chapter 2, section 5650);

- Endangered species (Division 3, Chapter 1.5, sections 2050 - 2098); and/ or the

- Alteration of any river, stream or lake (Division 2, Chapter 6, section 1601 and section 1603).

California Environmental Quality Act of 1973

The Regional Board may not adopt WDRs for a dredge/fill project until the California Environmental Quality Act (CEQA; P.R.C. 21000-21177) requirements have been satisfied. CEQA requires full public disclosure of a project and the assurance that environmental factors are considered in the decision making process. CEQA requires one of the following:

- An Environmental Impact Report;

- A Categorical Exemption; or

- A Negative Declaration.

HISTORY OF DREDGE AND FILL PROJECTS

SAN DIEGO BAY

San Diego Bay Bridge

Dredging of San Diego Bay has occurred for a variety of reasons. San Diego Bay is a major port for commercial and military vessels. In order to provide adequate water depths for navigation and berthing of vessels, dredging projects are required from time-to-time to maintain existing water depths or to increase depths to accommodate these vessels. Significant dredging first occurred within San Diego Bay in the early 1900's.

The volume of material dredged from San Diego Bay over the years is estimated to be between 180 and 190 million cubic yards (mcy) (Smith, 1977 from US Navy, Sept. 1992). About 5 to 8 mcy was disposed at ocean dumping sites, about 35 mcy was placed along Silver Strand beach, and about 147 mcy was used around the Bay as fill. Most of this material was placed prior to 1970. During 1992 and 1993, there were a total of fifteen recent, ongoing, and future dredge and fill projects in San Diego Bay for a total volume of about 3.7 mcy. The US Navy anticipates dredging an additional 13 mcy through 1998.

OTHER AREAS

There is on-going maintenance dredging in other areas throughout the San Diego region.

These areas include:

- Agua Hedionda Lagoon;

- Mission Bay; and

- Oceanside Harbor.

Mission Bay and San Diego River

California Coastal Records Project www.californiacoastline.org

Additional areas which have dredging projects scheduled include the following:

- Batiquitos Lagoon;
- Murrieta Creek;
- San Marcos Creek; and
- Santa Margarita River.

DISPOSAL OF DREDGED MATERIAL

Disposal of dredged material is a necessity whenever a dredging project is undertaken. There are alternatives for disposal available within the San Diego Region, including several which can yield significant environmental benefits. However, disposal of dredged material can be a significant problem when there is toxic contamination of the dredged materials. Prior to dredging, physical, chemical, and biological testing of the sediment have been required in order to determine the appropriate alternative for disposal of the dredged material. Potential alternatives for the disposal of dredged material from San Diego Bay include:

- Beach replenishment;
- Habitat restoration/ enhancement;
- Ocean disposal;
- Incineration;
- Upland disposal without treatment;
- Upland disposal with treatment;
- Confined aquatic disposal; and
- Reuse sites such as capping.

Physical Characteristics of Dredged Material

Evaluation of the physical characteristics of sediments proposed for discharge is necessary to determine potential environmental impacts of disposal, the need for additional chemical or biological testing, as well as potential beneficial use of the dredged material. The physical characteristics of the dredged material include: particle-size distribution, water content or percent solids, specific gravity of solids, and plasticity characteristics. The sediment physical characteristics should also be evaluated from the standpoint of compatibility with different kinds of biological communities likely to develop for the disposal environments under consideration.

Chemical Characteristics of Dredged Material

The initial screening for contamination is designed to determine, based on available information, if the sediments to be dredged contain any contaminants in forms and concentrations that are likely to cause unacceptable impacts to the environment. During this screening procedure, specific contaminants of concern are identified in a site-specific sediment so that any subsequent evaluation is focused on the most pertinent contaminants.

Physical behavior of the material at the disposal site

Physical testing and assessment should focus on both the short-term and long-term physical behavior of the material. For open-water alternatives, these assessments might include an analysis of water-column dispersion, mound development, and long-term mound stability or dispersion. For confined alternatives, these assessments might include an analysis of solids retention and storage requirements during disposal and long-term consolidation behavior in the confined disposal facility.

Any contaminant testing should focus on those contaminant pathways where contaminants may be of environmental concern, and the testing should be tailored to the available disposal site. For open-water alternatives, contaminant problems may be related to either the water column or benthic environment, and the appropriate testing and assessments would include required Clean Water Act or MPRSA testing. For confined sites, potential contaminant problems may be either water quality related (return water effluent, surface runoff, and ground water leachate), contaminant uptake related (plant or animal), or air related (gaseous release).

Traditional locations for disposal of non-contaminated dredged material have included nearshore ocean waters along Silver Strand, in-bay waters of the Naval Amphibious Base Coronado, and the LA-5 Ocean Dredged Material Disposal Site (LA-5).

Dredging permits issued during the past twenty years have allowed about 10 mcy of material to be disposed either on Silver Strand beaches or LA-5. Chemical testing data for projected future US Navy projects suggest that 92 percent of the material planned to be dredged from San Diego Bay will qualify for placement at either habitat enhancement sites, Silver Strand beaches or at LA-5.

Material which is not physically compatible with the receiving disposal site may qualify to be disposed of at LA-5. Material which cannot meet either the 404(b)(1) Guidelines or the USEPA ocean dumping criteria must be disposed in a different manner.

Beach Replenishment

Shore erosion is a major concern along the coast of the San Diego Region. Beach replenishment is usually accomplished by dredging sand from inshore or offshore locations and transporting the sand by truck, by split-hull hopper dredge, or by hydraulic pipeline to an eroding beach (e.g., Silver Strand beach). These operations may result in displacement of the substrate, changes in the topography or bathymetry of the borrow and replenishment areas, and destruction of nonmotile benthic communities. However, a well-planned beach nourishment operation can minimize these effects by taking advantage of the resiliency of the beach and nearshore environment and its associated biota, and by avoiding sensitive resources. When dredged material is used for beach replenishment it should closely match the sediment composition of the eroding beach and be low in fine sediments, organic material, and pollutants. The USACOE requires that dredged sediments proposed for placement on a beach must be:

- Particles mostly greater than 74 microns (i.e., sand, gravel or rock);
- Compatible with sediments on the receiving beach; and
- Substantially the same as the disposal site.

Generally, the disposal of clean, sandy material on beaches poses no present problem in terms of sediment quality, quantity, or feasibility. In fact, to be consistent with the California Coastal Management Plan, every effort must be made to beneficially use sandy material for beach nourishment or habitat restoration/ enhancement.

Habitat Restoration/ Enhancement

Restoration/ enhancement of wetlands is an alternative that can benefit the environment. In general, restoration of a former wetland is more likely to be successful than creation of a new wetland where none had existed previously. In selecting a site, alteration of substrate and changes in circulation and sedimentation patterns should be considered. In general, the material used for wetland restoration should remain water-saturated, reduced, and near neutral in pH. These characteristics have a great influence on the environmental activity of any chemical contaminants which may be present.

Ocean Disposal

The ocean water disposal technique involves placing the dredged sediment in open ocean waters at an USEPA approved site. The suitability of dredged sediment for open-water disposal is evaluated by effects-based testing as there are no sediment criteria.

In situations where the contaminated sediment will not meet USEPA's or the Corps of Engineers' criteria for ocean disposal, the sediment must be treated to meet those criteria by physical, chemical, biological, or thermal treatment methods.

LA-5 Ocean Dredged Material Disposal Site

LA-5 received final designation from the USEPA in 1991. This site has been used for the disposal of dredged material since the 1970's and has no capacity or dumping rate restrictions. About 4 mcy were disposed there by the USACOE between 1977 and 1987. About 2.5 mcy were deposited by the US Navy, the National Steel and Shipbuilding Corporation, and Southwest Marine, Inc. during that same period (USEPA, 1988). The LA-5 site is a non-dispersive open water disposal site. Most of the material placed here is intended to remain on the bottom following placement. This site is located 11 km (5.4 nm) southwest of Point Loma on the continental shelf in 147 to 200 m (80 to 110 fm) of water. The center coordinates of the site are 32º 36' 83" North latitude and 117º 20' 67" West longitude, with a radius of 910 m (1,000 yd).

Upland (Landfill) Disposal without Treatment

Upland disposal is the process of placing dredged material into or onto a properly permitted solid waste disposal facility or landfill, or into a structure specifically designed to accept dredged material. This upland disposal alternative is used when the dredged material does not qualify for any aquatic disposal alternative.

Upland (Landfill) Disposal with Treatment

The landfill disposal with treatment technique refers to situations where the contaminated sediment will not meet state criteria for landfill disposal without the employment of physical, chemical, biological or thermal treatment methods.

Confined Disposal

Confined disposal is placement of dredged material within diked nearshore or upland confined disposal facilities via pipeline or other means. Confined disposal facilities are designed and operated to provide adequate storage capacity for meeting dredging requirements and to maximize efficiency in retaining the solids. If contaminants are present in the dredged material, then control of contaminant releases is important in the design and operation of the confined disposal facility. In most cases confined disposal facilities must be used over a period of many years, storing material dredged periodically over the design life. Long-term storage capacity of these confined disposal facilities is therefore a major factor in design and management. Once water is drained from the confined disposal facility following active disposal operations, natural drying forces begin to dewater the dredged material, adding additional storage capacity.

Reuse Sites – Capping

Capping can be done in place or through the controlled accurate placement of contaminated material at an open water disposal site. Capping in place is a type of non-removal action and refers to the placement of a clean cover material over the contaminated sediment. Capping can also be done by the accurate placement of contaminated material at an open water disposal site followed by a covering or cap of clean isolating material.

In both cases, the purpose of the cover material is to minimize or prevent the migration of contaminants from the sediment to the water column. In remedial actions involving capping, monitoring is needed to ensure that the integrity of the cap is maintained. The key elements of the monitoring program may include the monitoring of:

- Changes in cap thickness;
- Erosion around cap boundaries; and/ or
- Possible leakage of contaminants from the cap.

PROBLEMS POSED BY DREDGING SEDIMENT / CONTAMINATED SEDIMENT

Many chemical substances discharged into marine waters tend to become attached to sediment particles and thus accumulate to high concentrations in benthic sediments. The dredging process can disturb bottom sediments leading to the release of pollutants into the water column by resuspension of contaminated sediment particles; dispersal of interstitial water in the sediment pores; and desorption of chemicals from the contaminated sediment. Common toxic constituents of many sediments include ammonia, low dissolved oxygen and hydrogen sulfide.

ENVIRONMENTAL THREAT ASSOCIATED WITH CONTAMINATED SEDIMENTS

Benthic marine sediments support biological communities which reside there (e.g., clams, worms, bottom feeding fish), and provide spawning habitat for many pelagic species (e.g., invertebrates and fish). Elevated concentrations of chemicals in the sediment may cause acute mortality or affect the reproductive behavior, egg hatching characteristics, and early life development of these organisms. In addition to causing acute mortality and abnormal development, contaminated sediments can also lead to the accumulation of contaminants in organisms due to the effects of bioaccumulation. In addition, biomagnification of the contaminants can occur in the food chain when small contaminated organisms are consumed by higher trophic level species including man.

The threat to the public health from contaminated sediments centers around three principal pathways of exposure:

- Consumption of fish and shellfish contaminated by chemicals in the sediment through the processes of bioaccumulation and biomagnification;
- Direct contact with contaminated sediments by people; and
- Incidental ingestion of contaminated sediment or associated waters by people.

DISPOSAL OF CONTAMINATED MATERIAL AND DREDGE SPOIL RETURN WATER

After removal of the contaminated material from the water, the contaminated material must be separated from the slurry to attain two distinct waste streams, the concentrated contaminated material and the dredge spoil return water. The methods for separating the material solids from the water include the use of settling basins, clarifiers, impoundment basins, screens and cyclones. The dredge spoil return water consists of a substantially liquid waste stream that may need to be subsequently treated by physical, chemical or biological methods for removal of dissolved and suspended pollutants.

DISCHARGES OF WASTE TO LAND

Discharges of solid, semi-solid, and liquid wastes to landfills, waste piles, surface impoundments, pits, trenches, tailings ponds, natural depressions and land treatment facilities (collectively called "waste management units") have the potential to create significant pollution sources affecting water quality. Unlike surface waters, which often have the capacity to assimilate discharges of wastes, ground waters have little or no assimilative capacity. This is due to slow contaminant migration rates, lack of aeration, minimal biological activity, and laminar flow patterns. Waste containing elevated pollutant concentrations can require containment in waste management units or active treatment for extended periods to prevent waste migration and impairment of the underlying ground water quality. The pollutants may continue to affect water quality long after the discharge has ceased, either because of continued leachate or gas discharges from the unit, or because pollutants have accumulated in underlying soils from which they are gradually released to ground water.

Landfills for disposal of municipal or industrial solid waste (solid waste disposal sites) are the major categories of waste management units in the Region. Surface impoundments are also used for storage or evaporative treatment of liquid wastes, waste piles for the storage of solid wastes, and land treatment units for the biological treatment of semi-solid sludge from wastewater treatment facilities. Sumps, trenches, and soil depressions have also been used in the past for liquid waste disposal. The Regional Board issues waste discharge requirements to ensure that these discharges are properly contained to protect the Region's water resources from degradation, and to ensure that dischargers implement effective monitoring to verify continued compliance with all applicable requirements.

Waste Management Units may be subject to concurrent regulation by other state and local agencies responsible for land use planning, solid waste management, and hazardous waste management. "Local enforcement agencies" (LEAs) implement the State's solid waste management laws and local ordinances governing the siting and operation of solid waste disposal facilities (usually landfills) with the concurrence of the California Department of Resources Recycling and Recovery (CalRecycle). CalRecycle also has direct responsibility for review and approval of plans for closure and post-closure maintenance of nonhazardous solid waste landfills. The Department of Toxic Substances Control (DTSC) issues permits for all hazardous waste management treatment, storage, and disposal facilities (which include incinerators, tanks, and warehouses where hazardous wastes are stored in drums as well as landfills, waste piles and surface impoundments). The State Board, Regional Boards, CalRecycle, and DTSC have entered into a Memorandum of Understanding to coordinate their respective roles in the concurrent regulation of these discharges.

The laws and regulations governing discharges of hazardous and non-hazardous wastes have been revised and strengthened over the past decade. The discharge of municipal solid wastes to land are closely regulated and monitored; however, some water quality problems have been detected and are being addressed. Past monitoring efforts under the State and Regional Boards' Land Disposal and SWAT programs revealed that discharges of municipal solid wastes to unlined landfills have resulted in ground water degradation and pollution by volatile organic constituents (VOCs) and other waste constituents. VOCs are components of many household hazardous wastes and certain industrial wastes that are present within municipal solid waste streams. VOCs can easily migrate from landfills either in leachate or by vapor-phase transport. Clay liners and natural clay formations between discharged wastes and ground waters are largely ineffective in preventing water quality impacts from municipal solid waste constituents. In a recently adopted policy for water quality control, the State Board found that "research on liner systems for landfills indicates that (a) single clay liners will only delay, rather than preclude, the onset of leachate leakage, and (b) the use of composite liners represents the most effective approach for reliably containing leachate and landfill gas" (State Board Resolution No. 93-62, Policy for Regulation of Discharges of Municipal Solid Waste).

The USEPA adopted federal regulations under Subtitle D of the Resource Conservation and Recovery Act (RCRA) which require the containment of municipal solid wastes by composite liners and leachate collection systems. Composite liners consist of a flexible synthetic membrane component placed above and in intimate contact with a compacted low-permeability soil component. This liner system enhances the effectiveness of the leachate collection and removal system and provides a barrier to vapor-phase transport of VOCs from the unit. Regional Boards and CalRecycle are implementing these new regulations in California under a policy described in State Board Resolution No. 93-62. The State Board developed revised regulations under

CCR, Division 2, Title 27, Solid Waste, to fully implement water quality-related portions of the RCRA Subtitle D federal regulations. While a single composite liner of the type that can be approved under RCRA Subtitle D regulations is a significant improvement over past municipal solid waste containment systems, it should be noted that single composite liners will not necessarily provide complete protection for ground water resources.

CALIFORNIA CODE OF REGULATIONS TITLE 27 AND TITLE 23, CHAPTER 15

Discharges of wastes to land include treatment, storage, or disposal:

- The regulations governing discharges of non-hazardous wastes to land in California Code of Regulations (CCR) Title 27, Division 2 cover landfills, surface impoundments, waste piles, land treatment units, mining waste management units and confined animal facilities.

- The regulations governing discharges of hazardous wastes to land in CCR, Title 23, Division 3, Chapter 15 cover landfills, surface impoundments, and waste piles.

In addition, actions to clean up and abate conditions of pollution or nuisance at contaminated sites[9] are covered by relevant portions of the regulations where contaminated materials are taken off-site for treatment, storage, or disposal and, as feasible, where wastes are contained or remain on-site at the completion of cleanup actions. The regulations classify wastes according to their threat to water quality, classify waste management units according to the degree of protection that they provide for water quality, and provide siting, construction, monitoring, corrective action, closure and post closure maintenance criteria. The applicable regulatory requirements are minimum standards for proper management of each waste category. These regulations require the complete containment of wastes which, if discharged to land for treatment, storage or disposal, have the potential to degrade the quality of water resources. The Regional Board may impose more stringent requirements to accommodate regional and site-specific conditions.

The applicable regulations define waste types including hazardous wastes, designated wastes,[10] nonhazardous wastes and inert wastes as shown in Table 4-6.

Chapter 15 required the review and update of waste discharge requirements for all nonhazardous waste treatment, storage, and disposal sites by July 1, 1994. As of 2014, the San Diego Region has two hazardous waste disposal sites (Class I), which are the Otay Class I Landfill and former Omar Rendering Class I Landfill. Designated wastes (Class II), nonhazardous solid wastes (Class III) and the management of inert wastes are regulated by the Regional Board.

The regulation of nonhazardous solid waste disposal sites (Class III) has been ongoing by the Regional Board since the early 1960's. Many of the small older sites have closed, and waste is now being disposed at large regional sanitary landfills. The Regional Board's main actions at nonhazardous solid waste facilities are review of Joint Technical Documents (JTDs) for the review and revision of waste discharge requirements for the active sites to assure consistency with the current regulations. These actions include review of proposed engineering design and construction plans for liner systems, leachate collection and removal systems, storm water conveyance systems, etc. and construction quality assurance (CQA) documents for new expansions of operating waste containment units and landfill cover systems at closing units; defining the levels of designated wastes, the upgrading of water quality monitoring systems to determine if water quality protection standards are violated; establishing corrective action programs where standards are violated; and review and oversight of the development and implementation of facility closure plans.

[9] Also see State Water Board Policy Resolution No. 92-49 (Chapter 5)

[10] Also see Water Code section 13173

Table 4 – 6. Landfill Classifications

Disposal Site Classification	Definitions of Waste Types (California Code of Regulations, Title 27, Division 2, section 20220 et. seq.)	Examples
Class I Hazardous Waste	(a) Hazardous waste is any waste which, under Division 4.5 of Title 22, is required to be managed according to Division 4.5 of Title 22. (b) Hazardous waste shall be discharged only at Class I waste management units which comply with the applicable provisions unless wastes qualify for a variance under section 25143 of the Health and Safety Code. (c) Waste which have been designated as restricted wastes by DTSC pursuant to section 66268.29, of Title 22 shall not be discharged to waste management units after the restriction dates established by Article 2, Chapter 18, Division 4.5 of Title 22 unless: (1) Such discharge is for retrievable storage; and (2) DTSC has granted a variance from restrictions against land disposal of the waste under section 66268.29 of Title 22.	Materials that contain high concentrations of pesticides, certain solvents, and PCBs are examples of hazardous wastes.
Class II Designated Waste	(a) Designated waste is defined as: (1) Nonhazardous waste which consists of or contains pollutants which, under ambient environmental conditions at the waste management unit, could be released at concentrations in excess of applicable water quality objectives, or which could cause degradation of waters of the state. (2) Hazardous waste which has been granted a variance from hazardous waste management requirements pursuant to section 25143 of the Health and Safety Code. (b) Wastes in this category shall be discharged only at Class I waste management units in compliance with Chapter 15 or at Class II waste management units which comply with the applicable provisions of Title 27 and have been approved for containment of the particular kind of waste to be discharged. Decomposable wastes in this category may be discharged to Class I or II land treatment waste management units.	Materials with high concentrations of biological oxygen demand (BOD), hardness, or chloride. Inorganic salts and heavy metals are "manageable" hazardous wastes.
Class III Nonhazardous Solid Waste	(a) Nonhazardous solid waste means all putrescible and nonputrescible solid, semi-solid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, manure, vegetable or animal solid and semi-solid wastes and other discarded solid or semi-solid waste: provided that such wastes do not contain wastes which must be managed as hazardous wastes, or wastes which contain soluble pollutants in concentrations which exceed applicable water quality objectives, or could cause degradation of waters of the state (i.e., designated waste).	Garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid wastes.

Table 4 – 6 (continued). Landfill Classifications

Disposal Site Classification	Definitions of Waste Types (California Code of Regulations, Title 27, Division 2, section 20220 et. seq.)	Examples
Class III Nonhazardous Solid Waste (continued)	(b) Except as provided in section 20220(b) of Title 27, nonhazardous solid waste may be discarded at any classified landfill which is authorized to accent such waste, provided that: (1) The discharger shall demonstrate that co-disposal of nonhazardous solid waste with other waste shall not create conditions which could impair the integrity of containment features and shall not render designated waste hazardous (e.g., by mobilizing hazardous constituents); (2) A periodic load-checking program approved by CalRecycle or Solid Waste LEA and Regional Boards shall be implemented to ensure that hazardous materials are not discharged at Class III landfills. (c) Dewatered sewage or water treatment sludge may be discharged at a Class III landfill under the following conditions, unless DTSC determines that the waste must be managed as a hazardous waste: (1) The landfill is equipped with a leachate collection and removal system; (2) The sludge contains at least 20 percent solids by weight if primary sludge, or at least 15 percent solids if secondary sludge, mixtures of primary and secondary sludges, or water treatment sludge; and (3) A minimum solids-to-liquid ration of 5:1 by weight shall be maintained to ensure that the co-disposal will not exceed the initial moisture-holding capacity of the nonhazardous solid wastes. The actual ratio required by the Regional Board shall be based on site-specific conditions. (d) Incinerator ash may be discharged at Class III landfill unless DTSC determines that the waste must be managed as hazardous waste.	Garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid wastes.
Unclassified/ Inert Waste	(a) Inert waste does not contain hazardous waste or soluble pollutants at concentrations in excess of applicable water quality objectives. It does not contain significant quantities of decomposable waste. (b) Inert waste do not need to be discharged to classified management units. (c) Regional Boards may prescribe individual or general waste discharge requirements for discharges of inert wastes.	Concrete, rock, asphalt, plaster, brick, vehicle tires, uncontaminated soils.

The criteria for classifying a nonhazardous waste as a designated waste are based on water quality objectives in the vicinity of the site, the containment features of the solid waste facility, and the solubility/mobility of the waste constituents. Therefore, all owners andoperators of active nonhazardous municipal solid waste facilities in the San Diego Region who wish to receive wastes other than municipal solid waste or inert waste must propose waste constituent concentration criteria above which wastes will be considered designated waste and therefore, not suitable for disposal at their site.

In addition, the Regional Board may revise waste discharge requirements to incorporate reclassification and retrofitting requirements and a revised monitoring program. Closed, abandoned and inactive landfills and other nonhazardous solid waste disposal sites are also subject to the provisions of either Title 27 (section 20080(g) for nonhazardous wastes) or Chapter 15 (for hazardous wastes).

Persons responsible for such sites may be required to develop and implement monitoring, to comply with closure and post-closure maintenance requirements, and to comply with reporting, notification, financial assurances, and record keeping requirements.

Waste Classification

Contaminated soil and other material must be treated or properly disposed in order to minimize the threat to the quality of surface or ground waters.

Waste is classified in California by two separate California Environmental Protection Agency (Cal-EPA) agencies with separate regulatory authority. The California Department of Toxic Substances Control (DTSC) classifies waste as hazardous or non-hazardous based on the threat to public health. The State Board, together with the Regional Boards, classifies non-hazardous waste as "designated", "nonhazardous", or "inert" based on the threat that each poses to the beneficial uses of ground and surface waters, as required by the Porter-Cologne Water Quality Control Act and regulations, water quality control plans and policies set forth by the Regional Board.

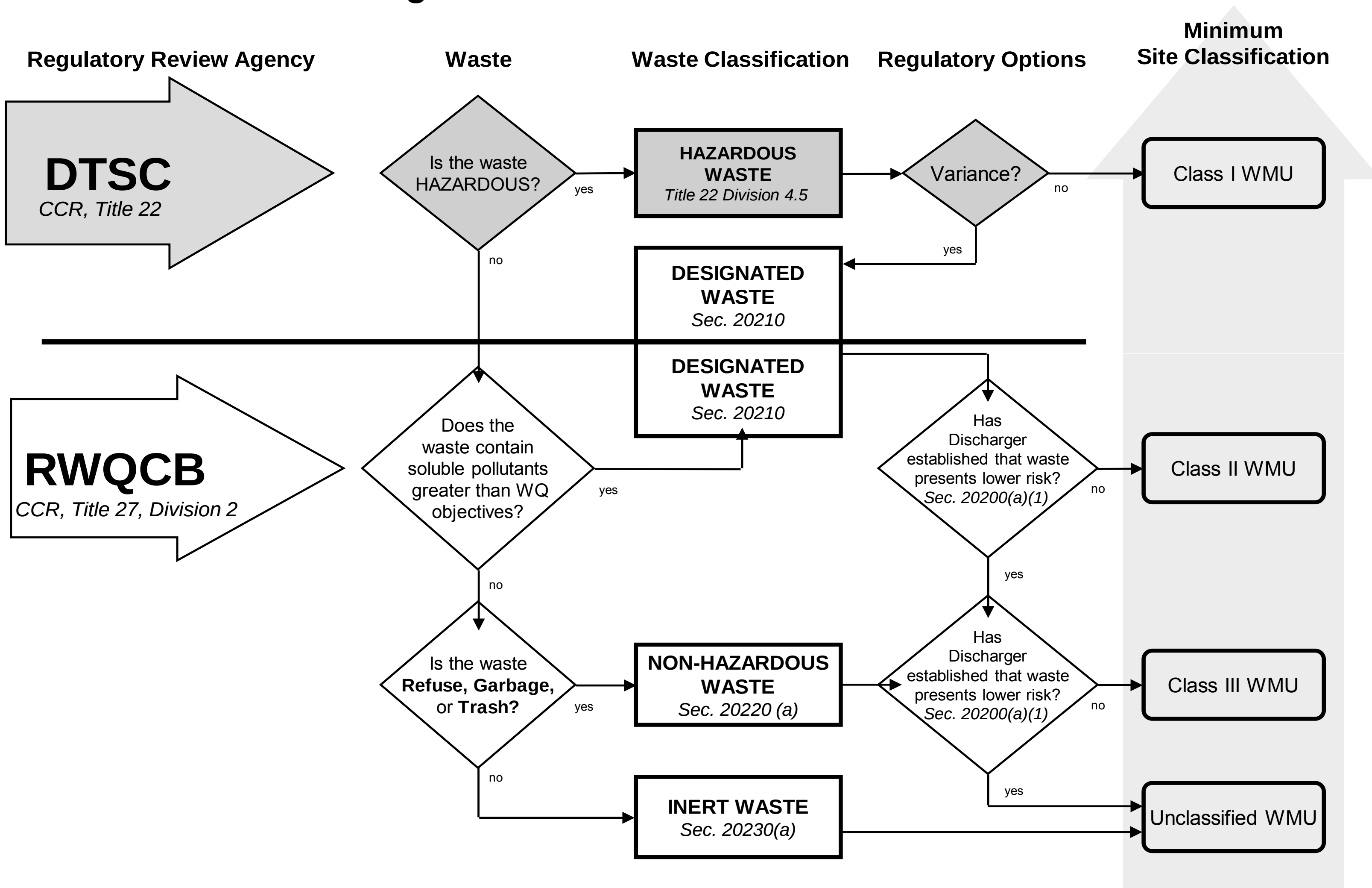
As shown in Figure 4-2, the applicable regulations divide waste into four categories which in turn, determine the classes of waste management units to which their discharge is permitted for treatment, storage or disposal. Detailed criteria are contained in Title 22 of the CCR, Division 4.5, for determining whether a waste falls into the hazardous category. These criteria fall under the headings of toxicity, ignitability, reactivity, corrosivity, and listing under the Resource Conservation and Recovery Act (RCRA). Hazardous waste may be discharged only to Class I waste management units which provide both natural geologic and engineered containment features to isolate the wastes from the environment, unless a specific variance has been granted by DTSC from California's hazardous waste management requirements.

"Nonhazardous solid waste" (see Title 27, section 20220, Table 4-6) is the regulatory term for "municipal solid waste" or "refuse" and is characterized as having a significant proportion of putrescible (degradable) matter, stringent moisture limitations, and prohibitions against inclusion of "designated" or "hazardous" wastes. "Nonhazardous solid waste" may be discharged to Class III landfills that protect beneficial uses of nearby waters, but do not provide complete waste containment. The only threat to water quality posed by wastes in the "inert" category is siltation. Paving fragments and non-degradable construction debris are examples of "inert waste". Wastes in this category may be discharged to unclassified waste management units that are located and managed to keep the wastes from entering surface waters or drainage courses.

"Designated waste" is defined in the California Water Code section 13173 and Title 27, section 20210 regulations, and is described in Table 4-6. The second part of the definition refers to those wastes granted a variance by DTSC from Class I disposal.

Dischargers are required to submit an initial analysis of the material by a state-certified laboratory. If the material is deemed hazardous, the discharger is referred to the California Department of Toxic Substances Control. For non-hazardous materials, general WDRs can be issued on a case-by-case basis.

Figure 4-2. Waste Classification Process



All permitted treatment or disposal includes monitoring and reporting requirements.

Remediation treatment includes biodegradation (by a land treatment process) for hydrocarbon contaminated soil found on a site and a fixation process for metals contaminated soils. In-situ disposal (without treatment) can be allowed, on a case-by-case basis, for material that is not considered to be a threat to surface or ground water.

RESOURCE CONSERVATION AND RECOVERY ACT OF 1976

The Resource Conservation and Recovery Act (RCRA) is the federal law regarding the treatment, storage and disposal of waste to land. The State implements RCRA's Subtitle C (management of hazardous wastes) through the Department of Toxic Substance Control (DTSC) and the Regional Boards. In August 1992, the USEPA formally delegated RCRA Subtitle C program implementation authority to DTSC. As described above, regulation of hazardous waste discharges is also included in Chapter 15. Monitoring requirements were amended in 1991 to make Chapter 15 equivalent to RCRA requirements. Those RCRA equivalent monitoring requirements also carried over into Title 27 in 1997. These monitoring requirements are implemented through the adoption of WDRs for hazardous waste sites covered by RCRA. The discharge requirements are then a part of a state RCRA permit issued by DTSC.

Federal regulations required by the RCRA's Subtitle D (nonhazardous wastes) were adopted for municipal solid waste landfills (40 CFR Parts 257 & 258). The California Department of Resources Recycling and Recovery (CalRecycle) and the State Board are jointly responsible for implementation of Subtitle D in California. The State Board also has the responsibility to implement Subtitle I (Underground Storage Tanks).

SOLID WASTE ASSESSMENT TEST (SWAT)

The Regional Board administers the Solid Waste Assessment Test (SWAT) Program in the Region. The SWAT program requires owners of active or inactive non-hazardous solid waste disposal sites to evaluate the possible migration of hazardous waste or leachate to waters of the state. The SWAT program was initiated with the enactment of Water Code section 13273 in 1985. In addition to requiring site evaluations, the SWAT program also:

- Provides deadlines for implementation of water quality monitoring systems at active solid waste disposal sites;

- Requires the State Board to develop a ranked list of all solid waste disposal sites, on the basis of the threat which they may pose to water quality; and

- Requires operators of active and inactive solid waste disposal sites to implement a water quality monitoring system to verify that the solid waste disposal site has not been affected by leakage, and if there is leakage to take remedial actions under the Land Disposal program.

Program funding was eliminated in 1991, reducing Regional Board review to SWAT sites under regulation due to higher priority work in other Regional Board programs. All sites eventually will be required to complete a SWAT and more sites will be reviewed if more program funding becomes available.

SLUDGE USE AND DISPOSAL

Sludge is a residual by-product of sewage treatment, water treatment, and certain industrial processes. The higher the degree of wastewater treatment, the larger the residue of sludge that must be handled. The treatment and disposal of sludge can be the single most complex and costly operation in a municipal wastewater treatment system. The sludge is made of materials settled from the wastewater- such as rags, sticks, and organic solids - and of solids generated in the wastewater treatment processes - such as the excess activated sludge created by aeration or the chemical sludge created by a tertiary treatment process.

The quantities of sludge involved are significant. For primary treatment the quantities of sludge may be 2,500 to 3,500 gallons per MG of wastewater treated. When treatment is upgraded to activated sludge, the quantities increase by 15,000 to 20,000 gallons per MG of wastewater treated. Use of chemicals can add another 10,000 gallons. For a typical activated sludge municipal wastewater treatment plant, the amount of sludge to be disposed of is typically about one ton per MG or about 20 pounds per month per home.

Raw sludge usually contains 93 to 99.5 percent water before it is treated further or dewatered. It contains organic solids and dissolved nutrients (e.g., nitrogen and phosphorus), making it useful as a supplement to chemical fertilizers and soil conditioners. Other typical constituents are inorganic ions, such as iron and zinc. While trace amounts of these inorganic ions are used by plants and organisms, some heavy metals that may be present in sewage sludge from household or commercial and industrial sources can be toxic to plants, animals, and humans. Untreated sludge also contains disease-causing organisms (e.g., bacteria, viruses, protozoa, and eggs of parasitic worms). In addition, sewage sludge may contain toxic chemicals from household, commercial, and manufacturing activities that use the sewer system to dispose of these liquid wastes.

Most wastewater treatment plants treat the sludge prior to ultimate use or disposal. Normally this treatment consists of some combination of the following processes:

Conditioning
Treatment of the sludge with chemicals or heat so that the water may be readily separated.

Thickening
Separation of as much water as possible by gravity or flotation process by subjecting the sludge to vacuum pressure, or other drying processes.

Stabilization
Stabilization of the organic solids so that they may be handled or used as soil conditioners without causing a nuisance or health hazard through processes referred to as "digestion".

Reduction
Reduction of solids to a stable form by wet oxidation processes or incineration.

The disposal point alternatives for municipal wastewater sludge in the San Diego Region are limited. Since treated and untreated sludge can contain high concentrations of toxic metals and significant amounts of toxic organic pollutants and pathogens, the USEPA and the Regional Board do not allow the direct discharge of sludge to the ocean or any other surface waters. Air pollution regulations have strict requirements on sludge incineration processes. Sludge disposal to land must be carefully controlled because of potential impacts on ground and surface water quality.

Sludge handling and disposal is regulated under 40 CFR Part 503 as a self-implementing program enforced by USEPA; the State does not have delegated authority for implementing the sludge program. Uses of sludge or sludge by-products and sludge disposal in the Region include:

- Sludge digester methane gas as fuel in gas boilers to generate electricity;
- Sludge as a soil amendment: composting dewatered sludge (pathogens are killed at composting temperatures);
- Sludge as a nutrient source for non-edible crops: direct application to agricultural crops not meant for direct human consumption (mixing, tilling, or injecting sludge into soil);

- Sludge disposal directly in certain landfills;
- Sludge disposal in-situ; and
- Incineration.

Prior to disposal of sludge, an initial analysis by a state certified laboratory is required to determine if there are any hazardous substances in the sludge. Nonhazardous sludge can be disposed of in the above ways, usually under WDRs. Disposal of nonhazardous sludge at Class III landfills is regulated under WDRs and must meet criteria listed in Table 4-6. Landfills are required to report the quantity and chemical composition of all accepted sludge as part of their individual WDRs.

Currently, the Regional Board can regulate handling and disposal of sludge pursuant to Title 27 and DTSC standards. The USEPA has promulgated a policy of promoting those municipal sludge management practices that provide for the beneficial use of sludge while maintaining or improving environmental quality and protecting public health. USEPA is currently developing sludge use and disposal criteria. The USEPA has also proposed a rule which requires states to develop a program to assure compliance with the Federal criteria. The State Board will be developing a state sludge management program consistent with the USEPA policy and criteria.

AUTO SHREDDER WASTE

According to CalRecycle, autoshredder waste is one of the top three materials used for alternative daily cover at nonhazardous waste landfills in California. There is a significant volume of auto shredder waste generated in California every year. CalRecycle reports that approximately 500,000 tons of autoshredder wastes were used as alternative daily cover in 2004, 2008 and 2012. Auto shredder waste is the material that remains after articles such as auto bodies, appliances and sheet metal are shredded and have had their metals removed. The majority of auto shredder waste is being treated to nonhazardous levels, but a significant portion of the waste must be disposed of in a hazardous waste landfill. Eight metal compounds, which include cadmium, total and hexavalent chromium, lead, copper, mercury, nickel and zinc, plus PCBs may cause auto shredder waste to be classified as hazardous. Senate Bill 976 was passed in 1985 which required Regional Boards to prepare a list of Class III, nonhazardous waste landfills as authorized to accept and dispose of auto shredder waste.

POLICY ON DISPOSAL OF SHREDDER WASTE

The State Board Policy on the Disposal of Shredder Wastes (Shredder Waste Disposal Policy Order 87-22) was adopted on March 19, 1987. The Regional Board adopted Resolution No. 88-06 on February 8, 1988 to incorporate that policy into the Basin Plan and enforce the statewide policy (Resolution 87-22). This policy designates West Miramar Landfill, Otay Annex Landfill, and Prima Deshecha Landfills as facilities that are authorized to receive shredder wastes. The policy also permits the disposal of shredded wastes produced by the mechanical destruction of car bodies, old appliances and similar castoffs, into certain landfills under specific conditions designated and enforced by the Regional Boards. Hazardous and nonhazardous shredder waste may be disposed of in appropriate Class III landfills where doing so would not cause water quality impairment. The policy specifies the shredder waste must not exceed PCB levels of 50 milligrams per kilogram (mg/kg). Also, the shredder waste must be disposed on the last and highest lift in a closed disposal cell or in an isolated cell solely designated for the disposal of shredder waste.

CONTROL OF NONPOINT SOURCE POLLUTION

CHRONOLOGY OF NONPOINT SOURCE POLLUTION CONTROL MEASURES

To implement nonpoint source pollution control, several regulatory measures have been taken by federal, state, regional and local government. The following chronology shows the applicable regulatory measure, responsible governmental agency, and year when each measure was enacted or adopted. These regulatory measures will be discussed in the pages that follow.

Regulatory Measure	Responsible Agency	Year
RB Resolution No. 79-25	RB	1979
RB Resolution No. 87-91	RB	1987
CWA, section 201(g)(1)(b)	USEPA	1987
CWA, section 205(j)(5)	USEPA	1987
CWA, section 319(h)	USEPA	1987
CWA, section 402(p)	USEPA	1987
CWA, section 603(c)(2)	USEPA	1987
CZARA, section 6217	USEPA	1990
RB Resolution No. 92-21	RB	1992

THE NEED FOR NONPOINT SOURCE POLLUTION CONTROL

Efforts to improve water quality under the NPDES program have traditionally focused on reducing pollutants from the major point sources, namely municipal sewage and industrial process wastewater. Point sources are defined as discrete conveyances, from which pollutants are, or may be discharged. These point sources received early emphasis because they were obvious sources of pollution and easily linked to degraded water quality conditions. However, as the permitting effort proceeded and control measures for municipal sewage and industrial wastewater were implemented, it became increasingly clear that control and reduction of nonpoint source pollution was also needed in order to restore and protect the nation's waters.

DEFINITION OF NONPOINT SOURCE POLLUTION

In contrast to point sources, nonpoint sources of water pollution are generally defined as sources which are diffuse in nature, usually associated with man's uses of land, and are not subject to the federal NPDES permitting program. Diffuse sources originate over a wide area rather than from a definable point. They often enter receiving waters in the form of surface runoff but are not conveyed by way of pipes or discrete conveyances. By definition, nonpoint sources (like discharges to ground water) are exempt from the federal NPDES permitting program which regulates point sources to surface waters.

CATEGORIES OF NONPOINT SOURCE POLLUTION

Nonpoint source pollution is primarily the result of man's uses of land such as urbanization, roads and highways, vehicles, agriculture, construction, industry, mineral extraction, physical habitat alteration (dredging/ filling), hydromodification (diversion, impoundment, channelization), silviculture (logging), and other activities which disturb land. Additional categories of nonpoint sources include agricultural return water, marinas and recreational boating, confined animal facilities, resource extraction, channel erosion, resuspension of pollutants from contaminated aquatic sediments, waste disposal sites, septic systems (onsite or subsurface disposal), atmospheric deposition, acid precipitation, seawater intrusion, and geothermal development.

OVERLAPS BETWEEN NONPOINT & POINT SOURCES

The distinction between point source and nonpoint sources is not always clear. As a result, there have always been overlaps and ambiguities between programs designed to control nonpoint sources and those designed to control point sources of pollution. The most important example of such an overlap involves urban runoff and storm water which are clearly diffuse and nonpoint in origin, but become channelized and are ultimately discharged through discrete point source conveyance systems to receiving waters. Because it becomes channelized, urban runoff is legally considered a point source discharge. However, because it originates as nonpoint source, urban runoff and storm water are discussed in the Nonpoint Source section.

SEVERITY OF NONPOINT SOURCE PROBLEM

According to the 1988 National Water Quality Inventory, nonpoint source pollution has become the largest single factor preventing the attainment of water quality standards. The inventory reported over 40% of the nation's rivers and streams are impaired due to siltation and 25% are impaired due to nutrients (such as phosphorus and nitrogen) from nonpoint sources. Agricultural runoff was reported as the major nonpoint pollution source affecting over 50% of impaired rivers. Also, over half of the states reported threats to ground water from nonpoint pollution sources.

NONPOINT SOURCE FUNDING

Innovative ways of financing and implementing nonpoint source projects have been developed. Prior to the 1987 amendments to the Clean Water Act, states used section 106 and 205(j) monies to fund limited nonpoint source activities. The primary federal funding for current nonpoint source program development and implementation includes section 104(b)(3), 205(j)(5), 319(h), 201(g)(1)(b), 603(c)(2), and 604(b) monies as described below.

Section 104(b)(3)

This section established grants for state water pollution control agencies and others for the purpose of conducting and promoting research and investigations related to the causes, effects, extent, prevention, reduction, and elimination of pollution. Such research and investigations are to be carried out in cooperation with federal, state, and local agencies.

Section 205(j)(5)

This section established a set-aside of construction grants for the purposes of carrying out activities under section 319, including program development and the preparation of state assessment reports and management plans. These funds were used for assessment and development activities for California's program through fiscal year 1989.

Section 319(h)

Grant funds authorized by this section can be used for the implementation of nonpoint source management programs but cannot be used for assessment activities. States must have an USEPA approved Assessment and Management Plan before qualifying for these monies. This grant program funds both State and Regional Board programs and provides competitive grants for other agencies to use in implementing nonpoint source measures around the state. These grants include a "non-federal" match of 40 percent which illustrates the intent of Congress and USEPA to have the states make a financial commitment to implementing nonpoint source programs.

Section 201(g)(1)(b)

The 1987 amendments to the Clean Water Act added this section that established a new purpose for which 201 funds could be used, "...*any purpose for which a grant can be made under section 310(h) and (i)*". These funds can be used for either nonpoint source development or implementation projects.

Section 603(c)(2)

The 1987 amendments added Title VI to the Clean Water Act establishing a State Water Pollution Control Revolving Fund Program (SRF). This program provides funding in the form of loans, refinancing, and bond insurance which can be used for (1) construction of publicly owned treatment works, (2) the implementation of state nonpoint source management programs, and (3) the development and implementation of state estuary conservation and management plans. The State and Regional Boards encourage local agencies to apply for these low-interest loans to implement nonpoint source demonstration projects and programs in the Region.

Section 604(b)

States must set aside one percent of their Title VI allotments or $100,000, whichever is greater, to carry out planning programs under 205(j) and 303(e) of the Clean Water Act. These funds can be used under 205(j) planning for nonpoint source related activities. This can become an important source of funding for nonpoint source planning and assessment tasks since these types of activities cannot be carried out under section 319.

SECTION 319 NONPOINT SOURCE MANAGEMENT PROGRAM

To address the nonpoint source pollution problem, Congress added section 319 to the Clean Water Act in 1987. Section 319 requires each state to develop and implement a Nonpoint Source Management Program and to conduct an inventory of the waterbodies in the State which are impaired due to nonpoint source pollution. To fulfill these requirements, the State Board adopted the Nonpoint Source Management Plan (NPSMP) in 1988 which is discussed in Chapter 5 and the Water Quality Assessment in 1990 which is discussed later in this chapter.

The NPSMP established a statewide policy for managing nonpoint source inputs to California's waters and is incorporated by reference into this Basin Plan. The objective of the Nonpoint Source Management Program in California is to measurably improve water quality through the implementation of various BMPs.

Unlike end of pipe treatment for point sources (which is impractical and cost prohibitive for nonpoint sources), the key to managing nonpoint source pollution is pollution prevention. Pollution prevention means stopping the generation of pollution at its source by reducing the use of products containing pollutants. Once pollutants have been generated, pollution control BMPs must be employed to prevent the existing pollution from coming into contact with the waters of the State. BMPs are defined as the schedules of activities, prohibitions, procedures, or other management practices designed to prevent or reduce the discharge of pollutants into receiving waters.

The State and Regional Board(s) believe that the voluntary and widespread application of BMPs is the most effective means by which nonpoint source pollution can be reduced. Accordingly the following three general management options are adopted in the

Nonpoint Source Management Plan to address nonpoint source problems. In general, the least stringent option that successfully protects or restores water quality is employed. More stringent options are only required if water quality improvements are not achieved.

Voluntary Implementation of BMPs

Voluntary implementation of BMPs is encouraged through financial assistance, education, training, technical assistance, and demonstration projects. Grants and loans provide incentives.

Regulatory Based Encouragement of BMPs

Regional Boards require waste discharge requirements for nonpoint sources but waive the requirement if BMPS are effectively implemented. Regional Boards can also enter into Management Agency Agreements (MAAs) with other agencies which specify acceptable BMPs and their implementation. The MAAs are referenced in Regional Board basin plans and become the primary basis for evaluation of compliance. The State Board has existing MAAs with the US Forest Service, the California Board of Forestry and Department of Forestry.

In either case, the Regional Board will generally refrain from imposing effluent requirements on dischargers who are implementing BMPs in accordance with a waiver of waste discharge requirements or an approved management agency agreement. In both cases, the BMPs become the primary mechanism for meeting water quality standards.

Issuance of Permits

Adopt and enforce waste discharge requirements which set effluent limits on the discharge of specific pollutants.

The State Board has also established four program objectives for its Nonpoint Source Management Program, each of which are being implemented in the San Diego Region as follows:

(1) **Implementation of Nonpoint Source Management Plan.** This includes integration of the Coastal Nonpoint Pollution Control Program (which is required under the CZARA and is described below) into the NPSMP.

(2) **Outreach Activities.** Regional Board outreach activities primarily center around the industrial, construction, and municipal participants in the NPDES Storm Water Permit Program (described in a later section). Other activities include participation in Resource Conservation District, technical advisory and planning committee, and lagoon foundation meetings.

(3) **Watershed Assessment Projects.** San Diego's target watershed is Escondido Creek and San Elijo Lagoon.

(4) **Project Tracking and Participation.** The Regional Board has two nonpoint source program contracts. The first contract is entitled the Chollas Creek Watershed Protection Plan project. The Chollas Creek contract has been completed. However, the watershed remains a high priority for the toxic substances monitoring program and for chronic and acute toxicity monitoring. These monitoring programs may identify changes in the water quality due to the education program funded by this contract. The second project involves a nitrate contamination project in the Rainbow Creek watershed. Although the USEPA funded study has not been formally initiated, the Flynn-Rainbow Nursery has converted to a complete tailwater recovery and reuse system. This conversion resulted in a reduction of nitrate loads to the creek. The Rainbow Creek contract will be modified to study other nurseries and sources of nutrients.

ALL NONPOINT SOURCE DISCHARGES ARE CURRENTLY REGULATED

Despite the overlaps between point and nonpoint sources, all nonpoint source discharges are currently regulated under one of two relatively new statutory requirements. These requirements are the NPDES Storm Water Permitting Program required under section 402(p) of the Clean Water Act and the Coastal Nonpoint Pollution Control Program required under section 6217 of the CZARA.

Although the two programs are complementary and exclusive of each other (i.e., one program applies to any discharge that the other does not), their recent implementation has heightened the confusion about point source verses nonpoint source program applicability.

Both the programs are fully discussed in later sections, and a brief overview is included here. In its simplest form, the Clean Water Act section 402(p) program, which is an NPDES permitting program, is designed to regulate storm water and urban runoff (i.e., the nonpoint source discharges that become point sources). Virtually all other nonpoint sources are subject to the Coastal Nonpoint Pollution Control Program under CZARA. Although there are a few minor complications which are also discussed later, the essential concept is that all nonpoint source discharges are currently subject to regulation under either the NPDES Storm Water Program or the Coastal Nonpoint Pollution Control Program.

NPDES STORM WATER PROGRAM

CLEAN WATER ACT SECTION 402(P)

Pursuant to the federal Clean Water Act, many municipalities and most industries in the United States are now required to obtain coverage under an NPDES permit for discharges of storm water runoff. NPDES storm water permits authorize only the discharge of storm water into storm water conveyance systems and prohibit all non-storm water discharges.

DEFINITION OF STORM WATER

The federal regulations (40 CFR 122, 123, 124, November 1990) define storm water as surface runoff from rain or snow melt, including sheet flow. This is a narrow definition which is meant to include the runoff of precipitation only. Storm water does not include water which originates from any source other than precipitation such as process wastewater, cooling waters, and wash waters. These are examples of non-storm water discharges and are not allowed in the storm water conveyance system. A non-storm water discharge is any discharge that is not composed entirely of storm water. Also unacceptable for discharge into the storm water conveyance system is precipitation runoff which has come in contact with pollutants.

THE PROBLEM

Although storm water runoff is part of the natural hydrologic cycle, human activities, particularly urbanization, can result in significant and problematic changes to the natural hydrology of an area. Under conditions of minimal urbanization, water is percolated through pervious surfaces in which soil filtration and biological action remove pollutants. During urbanization, pervious surfaces (i.e., vegetated and natural ground cover) are converted to impervious surfaces (i.e., rooftops and roads) decreasing the infiltration capacity of the soil for both water and pollutants.

As a result, when rain falls on and drains through urban freeways, industries, construction sites, and neighborhoods it picks up a multitude of pollutants. The pollutants can be dissolved in the runoff and quickly transported by gravity flow through a vast network of concrete channels and underground pipes referred to as storm water conveyance systems.

Such systems ultimately discharge the polluted runoff, without treatment, into the nation's creeks, rivers, estuaries, bays, and oceans. In short, urbanization results in a dramatic increase in the volume, velocity, and especially in the pollutant load carried by storm water runoff to receiving waters.

Pollutants typically found in urban runoff include sediment, nutrients (e.g., fertilizers), oxygen-demanding substances (e.g., decaying vegetation), bacteria, viruses, heavy metals, synthetic organics (e.g., fuels, oils, solvents, lubricants), pesticides, and other toxics. These pollutants severely degrade the beneficial uses of surface waters, and threaten the health of both humans and aquatic organisms.

In addition to the pollutants contributed by precipitation runoff, dry weather flows also cause serious degradation of receiving water quality. Dry weather flows, which can be substantial, consist of flows from illicit connections and illegal discharges to the storm water conveyance system. Common examples of the latter include illegally disposed used motor oil and antifreeze.

Studies, most notably the Nationwide Urban Runoff Program (NURP), found pollutants in urban runoff to be similar to those found in sewage and industrial wastewater discharges. Similar concentrations were also observed. Thirty-eight states report urban runoff as a major cause of impaired water quality. Locally, the closure of Southern California beaches following major storm events due to high bacteriological levels in ocean waters is a common occurrence. Clearly urban runoff is a significant water quality problem which deserves attention.

STATUTORY AUTHORITY

To address the storm water/urban runoff problem, Congress added section 402(p) to the Clean Water Act in 1987. This section, and the federal regulations which implement it (40 CFR 122, 123, and 124; November 1990) require NPDES permits for storm water/ urban runoff discharges from municipalities and industries, including construction.

The distinction between point source and nonpoint sources of pollution begins to fade with the requirement for NPDES permits for storm water discharges. Although storm water is clearly diffuse and nonpoint source in origin, it is quickly channelized and ultimately discharged through discrete point source conveyance systems to receiving waters. Because of this, storm water is legally considered a point source discharge and as such is subject to the NPDES permitting program under section 402(p).

MUNICIPAL, INDUSTRIAL, AND CONSTRUCTION PERMITS - COMMON CHARACTERISTICS

As a result of the 1987 Clean Water Act amendments, there are currently three types of storm water permits in California: municipal, industrial, and construction. The municipal permits are areawide permits which were issued by the Regional Board. The industrial and construction permits are statewide general permits which were issued by the State Board. There are three important characteristics which all storm water permits have in common.

Permit Objective

The overall objective of the entire storm water program and all three types of permits is to reduce or eliminate the discharge of pollutants into the storm water conveyance system. Section 402(p) of the Clean Water Act does however establish different performance standards for municipal and industrial discharges. Municipalities must reduce pollutant discharges to the maximum extent practicable, or MEP (see discussion below). Industries (including construction) must implement Best Available Technology (BAT) and Best Conventional Pollutant Control Technology (BCT) to reduce pollutants.

Pollution Prevention

Best Management Practices

The permit objective is achieved by way of pollution prevention. To eliminate pollutants in storm water, one can either clean it up by removing pollutants or prevent it from becoming polluted in the first place. Because of the overwhelming volume of storm water and the enormous costs associated with pollutant removal, pollution prevention is the only approach that makes sense.

Pollution prevention which means stopping the generation of pollution at its source by reducing the use of products containing pollutants, is in fact, the basis of the entire storm water program. Once pollutants have been generated, pollution control best management practices (BMPs) must be employed to prevent the existing pollution from coming into contact with the water of the State. It is important to point out that this approach is distinctly different from the conventional end-of-pipe treatment approach commonly used in water quality regulation.

Pollution prevention is accomplished by way of BMPs which are defined as schedules of activities, prohibitions, procedures, or other management practices designed to prevent or reduce the discharge of pollutants to storm water.

Source control BMPs include practices that eliminate or reduce pollutants at their point of generation, or source, so that they cannot come into contact with storm water. Source controls are non-structural, inexpensive, and can be extremely effective. Because source control BMPs are site specific, they vary widely depending on the application. For example, regulatory powers and land use planning are important BMPs for municipalities. Berming and covering storage areas are excellent BMPs at industrial facilities; reduced vegetation removal and phased development planning are effective at construction sites.

Two source control BMPs are common to all three applications (municipalities, industries, and construction), namely good housekeeping practices (cleaning up and immediately disposing of wastes properly) and most importantly, education (employee and public). Education, which ultimately results in a change in behavior and increased public awareness, is the key to pollution prevention. Many people think that street gutters are plumbed to the sanitary sewage treatment plant and do not realize that they flow instead directly to the bays and ocean without treatment. Education should be conducted in two directions: (1) prevent the discharge of pollutants and (2) reduce the use of materials which are the sources of pollution.

No Numeric Effluent Limits

None of the three types of storm water permits contain numeric effluent limits at this time. The permits are intended to be BMP based and instead contain narrative receiving water limitations.

AREAWIDE MUNICIPAL STORM WATER PERMITS

Under section 402(p) of the Clean Water Act and the federal regulations implementing it, operators of large and medium sized municipal storm water conveyance systems are required to obtain NPDES permits for their storm water conveyance systems at this time. Large and medium sized municipal storm water conveyance systems are defined as those serving populations greater than 250,000 and 100,000, respectively. Smaller municipalities (those under serving populations less than 100,000) have until late 1994 to obtain coverage but may be required to do so earlier if it is determined that (1) they are significant contributors of pollutants to receiving waters or (2) if their storm water conveyance systems are "interrelated" to larger municipal systems. In the municipal permits the Regional Board made a finding that all of the smaller municipalities in the San Diego Region meet both of these criteria (Order No. 90-42). All the municipalities contribute to the condition of water quality impairment (see Table 4-7) and the storm water discharges are "interrelated" in that they jointly and cumulatively contribute significant pollutants to the near coastal waters of San Diego County. Consequently, in July 1990, the Regional Board adopted an areawide Municipal Storm Water Permit for each of the three counties in the Region, San Diego, Riverside, and Orange as follows:

(1) Order No. 90-42 (NPDES Permit No. CA 0108758), Waste Discharge Requirements for Storm Water and Urban Runoff from the County of San Diego and Incorporated Cities of San Diego County and the San Diego Unified Port District.

Table 4 - 7. Receiving Waters Impacted by Pollution from Storm Water and Urban Runoff (Order No. 90-42)

IMPACTED RECEIVING WATER	REFERENCES	PARAMETERS	MUNICIPALITIES / JURISDICTION
San Diego Bay	WQLS, NPSI	PET, TRA, SYN, COL, DEB, MET	City of San Diego, Coronado, National City, Chula Vista, Imperial Beach, La Mesa, Lemon Grove, County of San Diego, San Diego Unified Port District
Mission Bay	WQLS, NPSI	COL, MET	City of San Diego
Santa Margarita Lagoon	WQLS, NPSI	NUT	Camp Pendleton, County of San Diego, County of Riverside, Temecula
Oceanside Harbor	NPSI	TRA, SYN	Camp Pendleton, Oceanside
Buena Vista Lagoon	NPSI	NUT, SED	Oceanside, Vista, Carlsbad, County of San Diego
Agua Hedionda Lagoon	SDHSR	COL	Carlsbad, San Marcos
Batiquitos Lagoon	WQLS, NPSI	NUT, SED	Carlsbad, Encinitas, San Marcos, County of San Diego
San Elijo Lagoon	WQLS, NPSI	NUT, SED	Encinitas, Escondido, Solana Beach, County of San Diego
San Dieguito Lagoon	NPSI, TSMP	SED, TRA	City of San Diego, Del Mar, Solana Beach, County of San Diego, Escondido
Los Penasquitos Lagoon	WQLS, NPSI	NUT, SED	City of San Diego, Del Mar, Poway, County of San Diego
Tijuana River Estuary	WQLS, NPSI	TRA, SYN, DOX, NUT	Tijuana, Mexico, City of San Diego, Imperial Beach
San Diego River	NPSI	SYN, PES, SED	City of San Diego, La Mesa, El Cajon, Santee, County of San Diego
Forester Creek	NPSI	TRA	El Cajon, Santee
Tijuana River	WQLS, NPSI	NUT, DEB, COL, DOX, SYN, PES, TRA	Tijuana, City of San Diego
Lake Hodges	NPSI	NUT, DIS	City of San Diego, Escondido, Poway

*** Abbreviations for Table 4-7:**

REFERENCES

- **WQLS** Water Quality Limited Segment
- **NPSI** Nonpoint Source Inventory Report
- **SDHSR** State DHS Report on Shellfish Contamination in Agua Hedionda Lagoon
- **TSMP** Toxic Substances Monitoring Program elevated values

PARAMETERS

- **COL** Coliform bacteria or other microbes
- **DEB** Debris
- **DIS** Dissolved Solids
- **DOX** Low dissolved oxygen, except when associated with algal blooms caused by nutrients
- **MET** Metals, except trace elements
- **NUT** Nutrients, macro- and micro-nutrients, including algal bloom-low dissolved oxygen syndrome
- **PES** Pesticides, except trace elements, including insecticides, nematocides, herbicides, and fungicides
- **PET** Petroleum distillates
- **SED** Sedimentation/turbidity, including habitat alteration due to sedimentation
- **SYN** Synthetic organics, except herbicides and pesticides
- **TRA** Trace elements: aluminum, beryllium, cadmium, chromium, copper, lead, mercury, manganese, molybdenum, nickel, selenium, silver, titanium, and zinc

(2) Order No. 90-46 (NPDES Permit No. CA 0108766), Waste Discharge Requirements for Storm Water and Urban Runoff from the Riverside County Flood Control and Water Conservation District, the County of Riverside and the Incorporated Cities of Riverside County within the San Diego Region.

(3) Order No. 90-38 (NPDES Permit No. CA 0108740), Waste Discharge Requirements for Storm Water and Urban Runoff from the County of Orange, the Orange County Flood Control District and the Incorporated Cities of Orange County within the San Diego Region.

Included as co-permittees in the above permits are all of the land use regulatory agencies; the county, all incorporated cities within the county, and special districts. For this reason, the municipal permits are referred to as "areawide" permits. As it moves from inland to coastal areas, storm water does not recognize jurisdictional boundaries. Since all municipalities contribute to the cumulative storm water pollution problem, a coordinated, "areawide" approach to managing it is essential, more effective, and far less expensive than numerous individual efforts.

Objective

The objective of an areawide municipal storm water permit is to reduce pollutants in storm water discharges to the maximum extent practicable (MEP). This is a standard used by USEPA for municipal discharges of storm water. Although not specifically defined in the federal regulations, the intent of MEP is to reduce as much as possible the discharge of pollutants. Thus, the municipal dischargers are required to employ whatever BMPs are feasible (i.e., are likely to be effective and are not cost prohibitive). Where a choice is made between two BMPs which provide generally comparative effectiveness, the discharger may choose the least expensive alternative and exclude the more expensive BMP. However, it would not be acceptable either to reject all BMPs which address a pollutant source or to pick a BMP based solely on cost, which would be clearly less effective. In order to reduce pollutants to the MEP many factors including technical feasibility and effectiveness, as well as economic factors, must be taken into consideration.

Permit Requirements

Municipal Storm Water Permits contain the following two major requirements:

(1) Prohibit non-storm water discharges; and

(2) Develop/implement a comprehensive storm water management program. The comprehensive storm water management program must include the following five components:

- BMP program;
- Monitoring and reporting program;
- Illicit connection/ illegal discharge detection program;
- Storm water ordinance or code; and
- A funding source.

Ultimate Responsibility for Quality of Storm Water Discharges (Municipal Regulation of Industry)

Under an areawide municipal storm water permit, municipalities are ultimately held responsible for the quality of discharges from their storm water conveyance systems, including contributions from industrial and construction activities. This provides important incentive for municipalities to regulate these activities occurring within their jurisdiction.

As called for in the federal storm water regulations, the regulation of industrial storm water discharges (including construction) into municipal storm water conveyance systems should be accomplished by a cooperative effort between the Regional Board and the local municipality.

Under a municipal storm water permit, municipalities are required to adopt and enforce ordinances (including ordinances for erosion control) which prohibit the discharge of pollutants to storm water conveyance systems. In order for the municipalities to be in compliance with their municipal permit, it is essential that the municipalities rigorously enforce their ordinances and grading permits and conduct inspections for compliance with both. They are further authorized to impose additional requirements on industry as necessary to ensure compliance with their municipal permit.

GENERAL INDUSTRIAL STORM WATER PERMIT

To reduce the administrative burden of issuing individual permits to the overwhelming number of industries now subject to NPDES storm water permitting, USEPA has initiated a four-tiered strategy for regulating industries. The first tier involves the use of a small number of "general" permits. A general permit is a single permit under which many facilities can obtain coverage (for example, all of the industries in a given type). Under the tiered strategy, the permitting process begins general and becomes increasingly more specific and rigorous over time. Subsequent tiers target specific watersheds, industry types, and finally individual facilities.

Consistent with the tiered approach, the statewide General Industrial Storm Water Permit entitled, "*Waste Discharge Requirement (WDR) for Discharges of Storm Water Associated with Industrial Activities excluding Construction Activities, Order No 91-13 (General Permit No. CAS 000001)*" was adopted by the State Board on November 19, 1991.

Industries Requiring Coverage

As shown below, the federal regulations identify eleven categories of industrial facilities which are required to obtain coverage under an NPDES storm water permit. Ten of the eleven categories are covered under the statewide General Industrial Storm Water Permit. Category x, construction activities, is covered under a separate permit, which will be discussed in a later section.

Categories i through ix are considered "mandatory industries" and are required to obtain coverage under the General Industrial Storm Water Permit whether or not they have materials and activities exposed to storm water. Category xi, "*conditional industries*," are only required to obtain coverage under the general permit if they have materials, equipment, or activities exposed to storm water. Six of the categories are defined by narrative descriptions of the industrial activity. The remaining five categories are defined by Standard Industrial Classification (SIC) codes.

(i)	Facilities Listed Under 40 CFR Subchapter N
(ii)	(Heavy) Manufacturing Facilities
(iii)	Oil and Gas/ Mining Facilities
(iv)	Hazardous Waste Treatment, Storage, or Disposal Facilities
(v)	Landfill, Land Application Sites and Open Dumps
(vi)	Recycling Facilities
(vii)	Steam Electric Power Generation Facilities
(viii)	Transportation Facilities
(ix)	Sewage or Wastewater Treatment Works
(x)	Construction Activities
(xi)	(Light) Manufacturing Facilities (with exposure)

In addition to private industry, industrial facilities owned or operated by governmental entities (including federal, state, and municipal facilities) are also required to obtain permit coverage.

When Is Coverage Not Needed

If a facility discharges all of its storm water to a municipal sanitary sewer system or to evaporation ponds, percolation ponds, or dry wells, and if there is no discharge to surface water under any circumstances, coverage under the general permit may not be required.

Permit Requirements

The General Industrial Storm Water Permit and General Construction Storm Water Permit both contain the following three major requirements:

(1) Eliminate non-storm water discharges;

(2) Develop and implement a Storm Water Pollution Prevention Plan. A Storm Water Pollution Prevention Plan (SWPPP) is a site specific plan consisting of all BMPs which will be implemented at a facility to reduce or eliminate the discharge of pollutants to storm water. (It is the most important requirement and the key to source controls); and

(3) Develop and implement Monitoring and Reporting program in accordance with the general permit.

GENERAL CONSTRUCTION STORM WATER PERMIT

Although it is one of eleven industrial categories specified in the federal regulations, construction activities are regulated under a separate general permit in California. The statewide General Construction Storm Water Permit entitled, "*Waste Discharge Requirements (WDRs) for Discharges of Storm Water Runoff Associated with Construction Activity, Order No. 92-08-DWQ (General Permit No. CAS 000002),*" was adopted by the State Board on August 20, 1992.

Definition of Construction

Construction activity includes, but is not limited to clearing, grading, and excavation, as well as building and reconstruction. Construction activity does not include routine maintenance to maintain original line and grade, hydraulic capacity, or original purpose of the facility.

Who Needs Coverage?

In California at this time, discharges of storm water associated with construction activities that result in the disturbance of five acres or more of total land are required to obtain coverage under the general permit. Construction activities disturbing less than five acres are also required to obtain coverage under the permit if they are part of a larger common plan of development or sale. Because of a recent court ruling, it is important to note that the current five acre exemption is subject to change.

Erosion - The Major Construction Concern

Natural erosion processes are greatly accelerated when protective ground cover is removed during construction activities. Studies reveal that the rate of erosion on land where construction activities are occurring is approximately 2,000 times greater than on timber land that has not been logged.

Erosion results in not only the loss of productive soil, which is essentially irreplaceable, but also in severe impacts to water quality. Twenty-one states, including California, report construction site runoff as a major cause of water quality impairment. "Clean sediment" alone is by definition, a pollutant because of its ability to degrade water quality. Although there are many water quality impacts associated with clean sediment, the two most important ones include: (1) increased turbidity and corresponding decreased light transmittance (resulting in reduced biological productivity and adverse effects on aesthetic value); and (2) direct suffocation of benthic (bottom dwelling) communities due to excessive sediment deposition. In addition to these problems, sediment also provides a major transport mechanism for countless other pollutants. First priority should be placed on soil stabilization and erosion prevention, not sediment interception.

Permit Requirements

The General Construction Storm Water Permit contains the same three requirements as the General Industrial Storm Water Permit (see discussion above).

Industries/Construction Are Subject To Municipal Regulation

There is a "double" system of regulation for industrial storm water which is discharged through municipal conveyance systems. Such discharges are regulated by both the statewide general permit (industrial or construction) issued to the discharger and by the municipality subject to the areawide Municipal Storm Water Permit. It is the Regional Board's responsibility to enforce the general permits and the areawide Municipal Storm Water Permit. It is the responsibility of the municipality to enforce its own ordinances. The statewide general permits (industrial and construction) specifically require dischargers to comply with the lawful requirements of local agencies regarding discharges to storm water conveyance systems within their jurisdiction.

HIGHWAY RUNOFF CONTROL PROGRAM

Cars, trucks, and other vehicles are the major contributors to highway runoff pollution. Landscaping, highway maintenance, and highway construction also contribute to highway runoff pollution (see Table 4-8). An essential component of the NPDES storm water program is the implementation of practices for maintaining public highways that reduce impacts on receiving waters from highway runoff.

Highway

However, cities and counties (permittees) do not have jurisdiction over public highways controlled by the California Department of Transportation (Caltrans). To comply with the requirements of the NPDES storm water program, Caltrans must either actively participate as an entity in the Area Wide storm water program, or obtain a separate NPDES permit for storm water discharges for highways under its jurisdiction. Such a program for Caltrans shall include a Storm Water Management Plan which addresses the design, construction, and maintenance of highway facilities relative to reducing pollutants in highway discharges to the maximum extent practicable. The Plan shall include:

- A characterization of Caltrans highway systems, including pollutants, highway layout, and drainage control system in the area;
- A description of existing highway runoff control measures;
- A description of additional highway runoff control measures to enhance pollutant removal; and
- A plan for monitoring the effectiveness of control measures and highway runoff water quality and pollutant loads.

The highway runoff management plan shall specifically address litter control, proper pesticide/ herbicide management, reduction of direct discharges, reduction of runoff velocity, landscape over-watering, use of grassed channels, curb elimination, catch basin maintenance, appropriate street cleaning, establishing and maintaining vegetation, infiltration practices, and detention/ retention practices. Caltrans shall coordinate its urban runoff program with local agencies and existing programs related to the reduction of pollutants in highway runoff.

Table 4-8. Highway Runoff Constituents and their Primary Sources

CONSTITUENT	PRIMARY SOURCES
Particulates	Pavement wear, vehicles, maintenance
Nitrogen, Phosphorus	Atmosphere, roadside fertilizer application
Lead	Tire wear (lead oxide filler material, lubricating oil and grease, bearing wear)
Zinc	Tire wear (filler material), motor oil (stabilizing additive), grease
Iron	Auto body rust, steel highway structures (guard rails, bridges, etc.), moving engine parts
Copper	Metal plating, bearing and bushing wear, moving engine parts, brake lining wear, fungicides and insecticides
Cadmium	Tire wear (filler material), insecticide application
Chromium	Metal plating, moving engine parts, brake lining wear
Nickel	Diesel fuel and gasoline (exhaust), lubricating oil, metal plating, bushing wear, brake lining wear, asphalt paving
Manganese	Moving engine parts
Cyanide	Anticake compound used to keep deicing salt granular (ferric ferrocyanide, sodium ferrocyanide, yellow prussiate of soda)
Sodium, Calcium, Chloride	Deicing salts
Sulfate	Roadway beds, fuel, deicing salts
Petroleum	Spills, leaks or blow-by of motor lubricants, antifreeze and hydraulic fluids, asphalt surface leachate

COASTAL NONPOINT POLLUTION CONTROL PROGRAM

COASTAL ZONE ACT REAUTHORIZATION AMENDMENTS


Imperial Beach

In 1990, Congress amended the Coastal Zone Management Act (CZMA). The amendments are referred to as the Coastal Zone Act Reauthorization Amendments (CZARA). Section 6217, "Protecting Coastal Waters", of CZARA established the Coastal Nonpoint Pollution Control Program. Section 6217 of CZARA requires USEPA to develop, and states to implement, enforceable "management measures" (i.e., BMPs) to control nonpoint source pollution in coastal waters. The definition of the "coastal zone" in California was expanded to encompass the entire state.

Like the NPDES storm water permitting program, implementation of the Coastal Nonpoint Pollution Control Program is still evolving. As of the 1994 Basin Plan update, USEPA has published management measures, which are collectively referred to as the "(g) guidance", pursuant to section 6217(g) of the CZARA. There are six major categories of nonpoint sources addressed by the (g) guidance, including: agriculture sources, forestry, urban areas, marinas, hydromodification projects and wetlands.

The storm water NPDES permitting program under the Clean Water Act and the Coastal Nonpoint Pollution Control Program section under CZARA are intended to be complimentary but exclusive of each other. In other words, the Coastal Nonpoint Pollution Control Program applies only to nonpoint sources that are not currently regulated under an NPDES storm water permit. This includes all of the traditional non-urban nonpoint sources such as agriculture and silviculture and those urban sources which are not currently subject to the NPDES storm water permitting program. Examples of the latter in 1994 include some municipalities with populations under 100,000; construction sites disturbing less than 5 acres; and storm water discharges from wholesale, retail, service, or commercial activities.

The key concept is that all nonpoint pollution sources, both urban and non-urban (including those that become point sources), are currently subject to regulation under either the NPDES Storm Water Permitting Program required under section 402 (p) of the Clean Water Act or the Coastal Nonpoint Pollution Control Program required under section 6217 of the CZARA.

AGRICULTURE

In the San Diego Region, agriculture ranks as the fourth largest industry in the economy and accounts for 1.7 percent of the Region's economy. The coastal and inland valley areas of the county possess a moderate and virtually frost-free climate able to support a variety of sub-tropical crops, making the San Diego area a unique agricultural region. The primary crops being grown for the national and international markets are avocados, citrus, cut flowers, and nursery products. To a lesser extent, local fresh market crops and livestock are produced in the area.

The San Diego County Water Authority (Authority) is the largest agricultural water consuming agency within Metropolitan Water District (MWD), requiring approximately 50 percent of MWD's total agricultural water supply each year. Agricultural water use within the Authority is concentrated mainly in north county agencies such as Rainbow MWD, Valley Center MWD, Fallbrook PUD and Yuima MWD.

Pursuant to the CZARA section 6217 (g), USEPA has identified management measures to protect coastal waters from sources of nonpoint pollution from agriculture. Specifically, the (g) Guidance for agriculture contains management measures to address erosion from cropland, applying nutrients to cropland, applying pesticides to cropland, confined animal facilities, land used for grazing, and cropland irrigation. The three most significant water quality impacts from agriculture in the San Diego Region are:

- Erosion of agricultural soils;
- Agricultural irrigation return water (salt loading and applied chemicals); and
- Confined animal facilities.

Basic information on each impact is summarized below.

EROSION CONTROL

Erosion is a problem, not only in terms of the loss of agricultural production, but also because it degrades important aquatic habitat. Eroded soils can bury benthic communities, cover spawning grounds, destabilize channel banks and fill sensitive wetland areas. Furthermore, other pollutants are often bound to eroded soils. Under certain conditions, these pollutants may be remobilized into the water column causing problems for human health, wildlife, and aquatic resources.

The State and Regional Boards have adopted narrative standards that prohibit the impairment of aquatic habitat from erosion. However, no specific numeric standard limiting sediment loads has been established. Implementation of effective management practices to control erosion is typically accomplished through the combined efforts of several agencies working with landowners. Local Resource Conservation Districts, with technical assistance from the U.S. Soil Conservation Service, help landowners prevent erosion problems. The University of California, Agricultural Extension Service also assists in developing management practices and informing growers of optimum strategies for soil fertility and stabilization. Additionally, the U.S. Agricultural Stabilization and Conservation Service provides grants and low interest loans to farmers for improvements which retain valuable topsoil in cultivated areas.

AGRICULTURAL IRRIGATION RETURN WATER

Agricultural irrigation return water is the wastewater which runs off or leaches through an irrigated area. The two major concerns with agricultural irrigation return water are salt loading and the release of applied chemicals.

SALT LOADING

Since the water supply in the San Diego Region is generally quite high in salts and the climate is dry, irrigation with this relatively saline water causes salt accumulation in the soil. Crop roots absorb only essentially pure water while leaving dissolved salts behind. If these salts are not leached out by regularly applying more irrigation water than is needed for evapotranspiration, salts accumulate in the root zone and the land eventually becomes too salty for agriculture. However, the saline soils may be reclaimed by leaching. The percolation of the water used to leach salts from the soil can be a serious source of ground water degradation.

The actual effect of irrigation return water on ground water quality in the Region is difficult to determine without further study. The construction of irrigation return water drain tiles to collect and transport return flows is a possible remedial measure that could be implemented in certain portions of the Region. This has not been considered necessary to date and no plans for such construction are presently pending.

APPLIED CHEMICALS

Modern agriculture is based on the extensive use of applied chemicals such as fertilizers, pesticides, and herbicides to obtain high crop yields. The improper use of these applied chemicals may lead to serious degradation of both ground water and surface water quality. Some of the chemicals applied to farm land move down with deep-percolation water from crop root zones and can contaminate underlying ground water. Surface waters are primarily contaminated by the runoff of irrigated agriculture containing sediments, nutrients such as phosphorus and nitrogen, pesticides, and other pollutants.

The release of applied chemicals, into surface and ground waters can have adverse effects on the quality of those waters and the beneficial uses supported by them. Aquatic toxicity, as measured by toxicity bioassay tests, has been found in many waters within the State. The application of agricultural chemicals, in some cases, has been linked directly to this toxicity and is suspect in many other impaired waterbodies. In addition to degradation of the aquatic environment, the contamination of ground and surface waters by pesticides and fertilizers is believed to also pose a threat to human health. Pesticides for example are known to bioaccumulate.

The Basin Plan contains a water quality objective requiring that all waters be maintained free of toxic substances in concentrations that are toxic to human, plant, animal, or aquatic life. The Basin Plan also contains a water quality objective for pesticides requiring that no individual pesticide or combination of pesticides be present in the water column, sediments, or biota at concentrations that adversely affect beneficial uses.

Although the Department of Pesticide Regulation (DPR) controls the application and use of agricultural pesticides, regulation of the quality of agricultural runoff waters is the responsibility of the State and regional boards. The regional boards have adopted water quality standards that apply to all surface waters of the State. Although standards for certain metals and some older pesticides have been adopted, standards for the majority of currently used agricultural chemicals do not exist. Generally, narrative standards which prohibit toxicity and degradation of waterbodies apply to agricultural discharges as do specific toxicity standards. To implement these standards, the regional boards have relied on a number of voluntary efforts and a concerted effort to educate growers on the need to protect waterbodies from the adverse effects of farm chemicals. The State Board also uses grant funds to support implementation of projects which demonstrate improved management practices.

In coordination with DPR, the regional boards have begun to put restrictions on the use of certain agricultural chemicals to address water quality problems. DPR has the responsibility to condition the use of any agricultural chemical to ensure its safe use. Where DPR has been convinced of the significant potential to cause environmental problems, it has established restrictions on the application, release, or timing of pesticide applications. DPR also encourages changes in formulations or in the combinations of pesticides applied in order to minimize water quality problems. An overall integrated pest management program for each agricultural site, rather than sole reliance on pesticides is needed.

There are other reasons to be concerned with the judicious use of agricultural chemicals (in addition to environmental issues). These interests are often concerned with questions of production and profit. To the extent that the application of agricultural chemicals are limited for cost control reasons, these concerns often result in benefits for water quality as well.

The narrative and/or numeric nutrient objectives presented in this Basin Plan are also applicable to irrigation return water. The State Board may require the use of pollutant control techniques to implement irrigation water management in its water rights permits or through Nonpoint Source Management Plan.

Irrigation water management may be implemented through reducing the use of fertilizers and pesticides to levels which minimize their presence in irrigation return water, as well as through the implementation of irrigation systems which reduce the volume of return water.

IRRIGATION WATER

In 1992, two laws were passed which require agricultural water suppliers delivering more than 50,000 AF/Y to prepare water management plans (CWC, sections 10800 and 10904). The plans are to focus on water conservation measures, improved irrigation efficiency, and environmental enhancement. The Department of Water Resources has established an advisory committee to review and study irrigation practices for these purposes. The implementation of conservation plans will likely have a side benefit of reduced erosion as irrigation efficiency improves.

DAIRIES – CONFINED ANIMAL FACILITIES


Dairy

Problems associated with dairy operations in the San Diego Region include ground water mineralization, the addition of nitrates to ground water, surface runoff of biodegradable and suspended material, nuisance odors, the addition of nutrients to adjacent surface water streams and other miscellaneous problems. All dairies in the Region are regulated under waste discharge requirements. These waste discharge requirements implement the regulations for confined animal facilities contained in CCR, Title 27, Division 2, Article 1, sections 22560-22565.

The major requirements contained in waste discharge requirements for dairies are as follows:

(1) Dairies must be designed and constructed to retain all facility wastewater generated, together with all precipitation on, and drainage through manured areas during a 25-year, 24-hour storm.

(2) All precipitation and surface drainage outside of manured areas, including that collected from roofed areas, and runoff from tributary areas during the storm events described in subsection (1) of this section, shall be diverted away from manured areas, unless such drainage is fully retained.

(3) Retention ponds and manured areas at dairies must be protected from inundation or washout by overflow from any stream channel during 20 year peak stream flows. Existing facilities that are protected against 100-year peak stream flows must continue to provide such protection.

(4) New facilities shall be protected against 100 year peak stream flows.

(5) Retention ponds shall be lined with or underlain by soils which contain at least 10 percent clay and not more than 10 percent gravel or artificial materials of equivalent impermeability.

(6) Facility wastewater, collected precipitation and drainage may be discharged to properly operated use or disposal fields or to wastewater treatment facilities approved by the Regional Board.

Regional Board Dairy Waste Management Policy (Resolution No. 87-71)

The Regional Board adopted Resolution No. 87-71, "*A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region*" (Regional Board Dairy Waste Management Policy) on November 16, 1987. On March 17, 1988, the State Board adopted Resolution No. 88-35 approving the Regional Board Dairy Waste Management Policy with a few minor changes.

The Regional Board Dairy policy contained in Resolution No. 87-71 is incorporated below; accordingly Resolution No. 87-71 is superseded.

The Regional Board regulatory program on dairy waste disposal is designed to be a part of the Basin Plan. The program is based upon the following principles to ensure that the goals of the Basin Plan are implemented:

(1) The Regional Board is committed to the reasonable protection of present and future beneficial uses of ground water.

(2) Coordination among state, federal, and local agricultural and regulatory agencies, the dairy industry, local planning and land-use agencies is necessary to resolve potential water quality problems associated with dairies.

(3) Cooperation between this Regional Board and the dairy industry is required when developing and implementing measures to achieve conformance with the Basin Plan ground water objectives.

(4) Comprehensive assessments of salt loading on the ground water basins in the San Diego Region are necessary to develop reasonable and cost effective water quality protection measures for all nonpoint and point sources of waste.

(5) An interim dairy wasteload regulatory program is necessary until the assessment studies noted in Principle 4 are completed. The interim program should provide a simple, region-wide approach to controlling dairy wasteloads, that may be reviewed on a case-by-case basis if necessary. The program should be easy to understand, easy to implement and enforce and provide greater protection of water quality than present practices.

As part of an overall program of dairy waste management, the following measures shall be implemented:

(1) The Regional Board shall continue to enforce all State and Federal water quality laws, and regulations regarding dairy waste treatment and disposal, including CCR Title 27 and USEPA Effluent Guidelines and Standards for feedlots point source category (40 CFR 412).

(2) The Regional Board shall continue to seek funding to conduct the necessary studies and develop computer models to provide an accurate assessment of existing and projected wasteloads in the various ground water basins.

(3) Based upon the results of the studies described in item 2, the Regional Board will revise Basin Plan ground water objectives if warranted and specify or revise wasteload limits that will be appropriate for the point and nonpoint sources of waste, including dairies if necessary.

(4) For an interim period, until the necessary ground water assimilative capacity and wasteload assessment studies are completed, the Regional Board shall limit the disposal of corral manure to dairy disposal land to no more than 3 tons dry weight or 10 cubic yards per acre per year, and to cropland where crops are grown and harvested twice annually, to no more than 12 tons dry weight per acre per year. The Regional Board shall consider manure application higher than the 12 tons per acre per year limit upon demonstration that the crops require the increased manure loadings.

(5) The U.S. Department of Agriculture, Soil Conservation Service, University of California at Riverside, the State and County Departments of Agriculture and other governmental and educational institutions are encouraged to provide dairy operators with the latest technical information regarding waste disposal practices that would result in additional water quality protection.

(6) The local land use and planning agencies are encouraged to conduct long-term planning for addressing water quality issues of new and expanded dairies in the region. The dairy industry is encouraged to provide accurate five-year projections of dairy herds at existing dairies and potential locations for new dairies to the planning agencies and to the Regional Board, so that the Board may include the required Basin Plan studies as part of the Board's triennial review process.

(7) The Regional Board will continue to obtain and review technical information regarding the hydrologic basins and to recommend the update of Basin Plan standards if warranted.

(8) The Regional Board encourages the implementation of water conservation measures at dairies, and the beneficial reuse of dairy farm wastewater that would replace the use of imported water.

EROSION AND SEDIMENT CONTROL

Currently erosion and sediment control is accomplished primarily by way of the municipal and construction storm water permits (see previous discussion).

In 1987, the San Diego Regional Water Quality Control Board implemented a policy for the control of human induced erosion and sedimentation. This policy is presented below. The Regional Board deferred the implementation of regulatory programs for erosion and sedimentation control to local government agencies. The local Resource Conservation Districts have agreements with the Regional Board regarding erosion and sediment control.

Santa Margarita River

Soil erosion resulting from a wide variety of causes, including construction, hillside cultivation and other agricultural activities, non-maintained roads, and off road vehicles may result in serious water quality impacts. The goal of the policy is the protection of water quality through the reduction and prevention of accelerated (man-caused) erosion to the level necessary to restore and protect beneficial uses of receiving waters now significantly impaired or threatened by impairment due to sedimentation through the implementation of the Best Soil Management Practices (BMPs). Construction sites can contribute runoff into storm drains at rates 100 to 2,000 times greater than non-developed sites, due to the large amounts of soil that are usually uncovered. Property owners are held responsible for all activities and practices that may cause an adverse impact on water quality due to waste discharges and surface runoff from their lands.

Sediment and erosion control is particularly important in areas with, or that drain into, delicate habitats such as lagoons, floodplains and some waterways. Lagoons are particularly sensitive to influx of silts and nutrients, which may cause severe turbidity and eutrophication problems. Severe amounts of silt may cause a lagoon to eventually become infilled. Siltation also damages tributaries and riparian corridors leading to the lagoons.

Poor agricultural grading practices may cause significant erosion of the soil, causing heavy sediment, nutrient and possibly herbicide and pesticide runoff loads to be discharged into nearby surface waters.

In most cases, the adverse results of man's activities can be reduced and in some instances eliminated through the use of both structural and non-structural measures of various types that are properly employed at the appropriate time. The high cost of lost resources, resource replenishment and after-the-fact repair and maintenance make both pre-project erosion control planning and preventive maintenance necessary.

EROSION AND SEDIMENT CONTROL PROGRAM (RESOLUTION NO. 87-91)

Regional Board Resolution No. 87-91 entitled, "A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region" (Erosion and Sediment Control Program) was adopted on December 21, 1987. The Regional Board Erosion and Sediment Control Program contained in Resolution No. 87-91 is incorporated below; accordingly Resolution No. 87-91 is superseded.

GOAL OF PROGRAM

The goal of the Regional Board's erosion control program is the protection of water quality through the reduction and prevention of accelerated (man-caused) erosion to the level necessary to restore and protect beneficial uses of receiving waters now significantly impaired, or threatened by impairment, by sediment.

MANAGEMENT PRINCIPLES

(1) Property owners are considered ultimately responsible for all activities and practices that could result in adverse effects on water quality from waste discharges and from surface runoff.

(2) Local units of government should have the lead role in controlling land use and construction activities that cause erosion and may, as necessary, impose further conditions, restrictions, or limitations on waste disposal and other activities that might degrade the quality of waters of the State.

(3) BMPs should be implemented to reduce erosion and sedimentation and minimize adverse effects on water quality.

REGIONAL BOARD IMPLEMENTATION MEASURES

(1) Local governments shall be encouraged to develop effective erosion and sedimentation control ordinances and regulatory programs that are at least equivalent to the model ordinance in the "*Erosion and Sediment Control Handbook*" published by the California Department of Conservation, May 1981.

(2) If necessary, a Memorandum of Understanding (MOU) or Management Agreement could be adopted to more clearly define the cooperative roles between the local units of government and the Regional Board.

(3) The Regional Board may participate with other concerned agencies such as the California Department of Fish and Game, the Resource Conservation Districts, the various lagoon foundations, etc., to identify watersheds, coastal lagoons and estuaries with critical erosion and sediment problems. The Regional Board may assist in the assessment of such problems and causes, and assist in the development of alternative measures to prevent future problems.

(4) As time and resources permit, the Regional Board will review existing local grading ordinances to determine the adequacy of the ordinances to provide effective erosion control. The Regional Board may then recommend specific improvements to the ordinances for consideration by the local agencies. If necessary, the Regional Board may request a report on the implementation of the Board's recommendation.

(5) If necessary, the Regional Board may request periodic status reports of construction and grading activities from local agencies to determine the effectiveness and potential problems with the implementation of local erosion and sediment control program.

(6) The Regional Board shall encourage the Resource Conservation Districts to review and update if necessary, their erosion control ordinances in order to develop more effective programs for erosion and sediment control for agricultural activities. Local units of government are encouraged to take a more active role in addressing erosion problems from agricultural activities.

THE ELSINORE-MURRIETA-ANZA RESOURCE CONSERVATION DISTRICT SEDIMENT CONTROL ORDINANCE (RESOLUTION NO. 79-25) AND THE RESOURCE CONSERVATION DISTRICTS OF SAN DIEGO COUNTY EROSION AND SEDIMENT CONTROL POLICY (RESOLUTION NO. 92-21)

The Elsinore-Murrieta-Anza Resource Conservation District and the Resource Conservation Districts (RCDs) of San Diego County were established to provide for the conservation of soil and water resources and for the prevention and control of soil erosion and sediment damage due to agricultural and other land use activities.

The RCDs establish guidelines for land management programs by adopting BMPs such as those presented in the Soil Conservation Service Technical Guide covering San Diego County. Currently, farmers and other land owners contact the RCDs on a voluntary basis for assistance in developing individual erosion and sediment control programs which conform to the BMPs.

In order to assure that all farmers and other land owners operate under the Resource Conservation Districts BMP guidelines, and to better address the existing and potential water pollution problems caused by agriculture and other land uses, the RCDs have adopted sediment control ordinances and policies (e.g., Elsinore-Murrieta-Anza Resource Conservation District Sediment Control Ordinance and the Resource Conservation Districts of San Diego County Erosion and Sediment Control Policy). These documents formally adopt the Soil Conservation Service's BMPs and define the existing and expanded functions and responsibilities of the RCDs. These documents also suggest means by which the California Regional Water Quality Control Board, San Diego Region, can assist the RCDs in implementation of the policy.

The Resource Conservation District Sediment Control Ordinance, and the Erosion and Sediment Control Policy establish the duties of the Regional Board and the RCD's as outlined below. The Resource Conservation Districts will implement these documents as follows:

(1) Continue to assist farmers and other land owners in establishing management programs which comply with BMPs.

(2) Authorize any of its directors to file a formal complaint against any person who is causing or permitting any accelerated erosion and sediment damage.

(3) Take action against any person causing or permitting any accelerated erosion and sediment damage.

   A. Receive complaints from RCD directors, land occupiers, or city, state and county officials responsible for the maintenance of water quality in the jurisdictions.

   B. Conduct hearings of the Resource Conservation District Board of Directors on complaints. If the complaint is valid, the "land disturber" is allowed two months to develop and implement a voluntary conservation plan.

   C. Request action by the Regional Board if compliance schedules are not followed or if further noncompliance occurs, when such noncompliance results in the intentional or negligent discharge or deposition of any waste where it is, or probably will be discharged into the waters of the state or creates or threatens to create a condition of pollution or nuisance.

The Regional Board will assist the Resource Conservation Districts in implementing the Erosion and Sediment Control Policy by doing the following:

(1) Inform the appropriate RCD of instances when the staff of the Regional Board finds that accelerated erosion damage has occurred or is likely to occur as a result of violations of the BMP guidelines.

(2) Receive requests for action on complaints from the RCDs when compliance schedules have not been met or when further noncompliance has occurred, and consider appropriate enforcement action pursuant to section 13304 (a) of the Porter-Cologne Water Quality Control Act.

RESOURCE EXTRACTION

SAND, GRAVEL AND OTHER MINERAL RESOURCE EXTRACTION OPERATIONS

The sand and gravel related processing industry represents one of the largest single classes of industry in the San Diego Region. Construction activities in the Region will require a continuing need for sand and gravel products. The industry can generally be classified as follows:

- Sand and gravel processing (including rock crushing);
- Concrete batching;
- Asphalt batching;
- Asphalt product manufacturing;
- Concrete product manufacturing; and
- Clay and clay product processing.

The largest volume of waste from sand and gravel processing operations results from product washing. Many of the sedimentary deposits mined for sand and gravel in the San Diego Region contain a high percentage of silt and clay. Extensive washing is required to remove the fine material. Other waste includes cement truck wash water, sediment separated from the wash water, and rejected product (broken brick, block, pipe etc.).

Recycled wash waters are discharged to storage ponds and can contain high concentrations of total dissolved solids because of evaporation and leaching from product materials. The percolation of these recycled waters can adversely affect ground water quality. It is recognized that the permeability of the ponds receiving the wash waters is low because of the sealing effects of silts and clay sediments in the wash water. Sediment and wash water discharged to surface waters can adversely affect aquatic life through sediment deposition and increases in turbidity.

Many sand and gravel operations are regulated with waste discharge requirements (WDR). The waste discharge requirements prohibit the discharge of sand and gravel wash water to surface waters. The requirements also require that waste holding ponds have 100-year frequency flood protection. Mining Operations may also be subject to “Mining Waste Management” requirements in CCR Title 27 (sections 22470 to 22510).

Sand and gravel mining operations are subject to regulation under section 404 of the Clean Water Act. Before a section 404 permit can be obtained, the discharger must obtain water quality certification pursuant to section 401 of the Clean Water Act. See previous discussion of Water Quality Certification (section 401).

Many mining operations are subject to California's Surface Mining and Reclamation Act (SMARA) of 1975 and the federal Surface Mining Control and Reclamation Act (SMCRA) of 1977. These laws, which have similar provisions, require reclamation of mined lands in order to protect public health and safety and to prevent or minimize adverse environmental effects such as water quality degradation, flooding, erosion, and sedimentation. Additionally, SMCRA requires mine operators to establish baseline hydrologic conditions; in the event that adjacent waters are contaminated, diminished, or interrupted, SMCRA further requires mine operators to replace the water supply.

Under SMARA regulations (California Public Resources Code (section 3505, Article 1), mining operators must:

- Control soil erosion by minimizing removal of vegetation and overburden, managing stockpiles, and constructing erosion control facilities;
- Control water quality by constructing settling ponds and basins and conducting operations in such a way as to prevent siltation of ground water recharge areas;
- Protect fish and wildlife habitat by taking "reasonable measures";
- Protect natural drainage ways by proper placement and control of mine waste rock and overburden piles or dumps; and
- Control erosion and drainage by grading and revegetation, and construction of basins to impound surface runoff, and protection of spillways from erosion.

FLOOD CONTROL

In a natural setting, the dynamic nature of water creates an ever changing stream channel within the floodplain. In the San Diego Region, where rainfall is extremely variable, flood plains which appear to be dry one year, may contain tremendous torrents the following year. Sometimes the dry appearance of the flood plain has made people mistakenly think flood waters do not occur there. The dry appearance of a portion of the flood plain is deceptive. Floods are a natural part of any flood plain. Flood plains cannot be fully protected against floods.

In the past, developments clustered near or within the flood plain. Flood control channels were constructed to protect these properties. Flood control channels were built to constrict the flood plain and to allow maximum development on adjacent lands. These developments increased the amount of impervious area (roads, buildings, parking lots and other structures) and increased local storm runoff. Storm water, which prior to development would have been absorbed into the soil, instead filled local storm drains. Thus, the precipitation which might at one time have caused local flooding caused intensified downstream flooding.

Today, many flood plains have been channelized to protect property. There are a variety of channel designs which have been built. Channel designs vary in range from completely natural to entirely concrete lined with concrete bottoms. Other channel types include natural channels modified to contain a low-flow channel with or without side filling or riprap or concrete; and with or without encroachment by agriculture and/or urban areas.

Rose Canyon Creek

IMPACTS OF CHANNELIZATION

To the degree that a natural watercourse is channelized, the negative impacts to the watershed are increased. The following impacts occur with channelization:

(1) Channel modification and channelization of streams induces changes in land use practices. The resulting change in land use practices often results in detrimental changes to surface water quality.

(2) With future increases in the urbanization of an area, the impervious area increases, contributing additional storm water runoff. Flood channels were built to contain a certain design flow and the design flow can be exceeded by additional storm water runoff.

(3) As the flood plain is constricted and confined within a channel, the potential damage from storm runoff is increased.

(4) Channelization reduces ground water recharge.

(5) Impervious channels designed to remove the runoff quickly also transport pollutants down the flood control system just as quickly. Most of the surface water runoff from urban areas flows into flood control channels without any mechanism to control the input of toxics.

(6) Channelization results in the direct loss of instream habitat. Fish and other aquatic life are totally dependent upon the surface waters within floodplains.

(7) Channelization results in the loss of riparian habitat.

(8) Channelization causes an increase in ambient stream temperatures within and downstream from the channelized section. The rise in stream temperature may degrade the habitat for aquatic life.

(9) The loss of riparian areas through channelization results in the loss of wildlife. Riparian areas are the most important habitat for the majority of western wildlife species, and are essential for many wildlife species.

(10) Loss of riparian areas results in a loss of the buffering capacity of the riparian vegetation to moderate flows.

(11) Loss of the riparian areas results in a loss of the natural filtering capacity that these areas provide. The natural filtering capacity of riparian areas reduces the concentration of potentially toxic constituents in storm water runoff. Riparian areas provide an improvement in the quality of water produced from the watershed.

(12) Stream and riparian habitats are needed to provide corridors for fish and wildlife resources. A highly modified concrete channel may not allow for fish or wildlife passage. Even a limited section of concrete channel can disconnect habitats. The separation of habitats reduces the viability of fish and wildlife populations.

CONCLUSION

Channel modifications need to be evaluated for their ultimate consequences for the watershed. In California's past there was inadequate consideration towards the retention of wetlands, riparian systems, and natural flood plains. The economic assessment of flood control alternatives should consider any proposed project in its entirety. Wetlands, riparian systems and natural flood plains accommodate natural stream meandering, aggradation, degradation and overbank flow better than those lands directly encroached upon by development.

Consideration and utilization of methods to reduce storm water runoff and allow infiltration and percolation of storm waters are needed. Methods should include minimizing the further construction of flood control channels, particularly concrete channels, and the retention of riparian areas within floodplains. Riparian areas within flood plains need to be protected in order to allow the natural filtering capacity of the riparian area to improve the quality of storm water produced from the watershed; and to preserve alluvial percolation capacity and aquatic habitat values. When possible riparian areas need to be restored.

Riparian and stream habitats provide natural beauty which is appreciated and valued by people. Riparian and stream habitats, especially in urban areas, are vital to enhancing our quality of life. People are far more likely to respect and be stewards of "natural" reaches of streams than channelized or artificially modified reaches. Riparian lands represent a significant value to society.

Noble Canyon Creek

FUTURE DIRECTION: WATERSHED-BASED WATER QUALITY CONTROL

The concept of comprehensive watershed level management of water resources is currently being incorporated into various elements of the State's Nonpoint Source Management Program. The watershed protection approach is an integrated strategy for more effectively protecting and restoring beneficial uses of state waters. By looking at an entire watershed, one can more clearly identify critical areas and practices which need to be targeted for pollution prevention and corrective actions. This approach not only addresses the waterbody itself, but the geographic area which drains to the watercourse. This strategy also integrates both surface and ground waters, inland and coastal waters, and point and nonpoint sources of pollution. Point sources have received most of the regulatory attention in the past, however, significant improvements in point sources, coupled with continued water quality impairments, have necessitated that the water resources community look at a more integrated approach which considers impacts from both point and nonpoint sources of pollutants.

The Watershed Protection Approach is built on the following three main principles:

- The target watersheds should be those where pollution poses the greatest risk to human health, ecological resources, desirable uses of the water, or a combination of these;

- All parties with a stake in the specific local situation should participate in the analysis of the problems and the creation of solutions; and

- The actions undertaken should draw on the full range of methods and tools available, integrating them into a coordinated, multi-organizational attack on the problems.

Many agencies and organizations concerned with water resources have come to recognize that this type of approach can be very effective in realistically assessing cumulative impacts and formulating workable mitigation strategies. The CZARA, USEPA guidance, and various legislative proposals clearly state the need to consider the implications of land use on water quality. USEPA program managers are re-thinking their approach to the allocation of resources (especially within the Nonpoint Source Program) and will be primarily funding studies that are part of a watershed planning and implementation effort.

The traditional approach to managing pollutant discharges into streams, lakes, and the ocean has evolved over time, often with separate programs to address various aspects of the total water quality problem. Some of these programs have different, overlapping, or conflicting priorities. Moving from the more facility-specific controls of the past to management of water quality on a watershed basis, will entail some growing pains. Many of the programs at our disposal will need to be reshaped and integrated at the watershed level. Some programs will need to be reoriented and integrated, while other programs may not be amenable to the watershed approach. Nonetheless, public agencies and private organizations concerned with water resources have come to recognize that a comprehensive evaluation of pollutant contributions on a watershed scale is the only way to realistically assess cumulative impacts and formulate workable strategies to truly protect our water resources. Both water pollution and habitat degradation problems can best be solved by following a basin-wide approach.

REMEDIATION OF POLLUTION

The Regional Board allocates substantial resources to the investigation of polluted waters and enforcement of corrective actions needed to restore water quality. Specific remediation programs include:

- Underground Storage Tanks Program including the Local Oversight Program;

- Site Cleanup Program;

- Aboveground Petroleum Storage Tank Program; and

- DOD Site Investigations.

Naval Base Point Loma (submarine facility)
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The Regional Board sets cleanup goals based on the State's Antidegradation Policy set forth in State Board Resolution No. 68-16 and Resolution No. 92-49 Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code section 13304 and the Cleanup and Abatement Policy discussed later in this chapter. Under these policies, whenever the existing quality of water is better than that needed to protect present and potential beneficial uses, such existing quality will be maintained, with certain exceptions (as described in Chapter 5, Plans and Policies). Accordingly, the Regional Board prescribes cleanup goals that are based upon background concentrations. For those cases where dischargers have demonstrated that cleanup goals based on background concentrations cannot be attained due to technological and economic limitations, the Antidegradation Policy sets forth policy for cleanup and abatement based on the protection of beneficial uses. The Regional Board can, on a case-by-case basis, set cleanup goals as close to background as technologically and economically feasible. Such goals must at a minimum, restore and protect all designated beneficial uses of the waters.

Furthermore, such cleanup levels cannot result in water quality less than that prescribed in the Basin Plan and policies adopted by the State and Regional Board, and must be consistent with maximum benefit to the people of the State.

UNDERGROUND STORAGE TANKS

Underground storage tank

The Underground Storage Tank Program was enacted in 1983 and took effect January 1, 1984. The authority for the program is found in the Health and Safety Code, Division 20, Chapter 6.7, and the regulations for the program are found in the CCR, Title 23, Division 3, Chapter 16. The regulations are designed to ensure the integrity of all underground storage tanks (UST), and to detect any leaks.

There are approximately 2,000 known cases of leaking underground storage tanks in the Region. Approximately 35 percent of the cases involve instances where only soil contamination is present, 35 percent involve instances where ground water contamination has been confirmed, and the remaining 30 percent are cases which have been closed. The majority of the releases from these underground storage tanks are gasoline and the constituent of most concern is benzene, a known carcinogen. A smaller percentage of the underground storage tank releases involve chlorinated industrial solvents, which are suspected carcinogens. As anticipated, the majority of the sites where these releases have occurred are automotive service stations. Tanks from industrial facilities contribute a smaller but significant minority. To date, these ground water impacts have affected only a few drinking water supply wells. The Regional Board maintains and regularly updates the Leaking Underground Storage Tank Information System (LUSTIS) database, which identifies all known underground storage tank release sites in the Region.

Implementation of the underground storage tank program includes direct Regional Board oversight of leaking underground storage tank cleanups. It also involves coordination of oversight activities with local agencies under contract with the State Board through the Local Oversight Program. Local agencies have the authority, pursuant to section 25297.1 of the Health and Safety Code to act on behalf of the Regional Board in requiring investigations and cleanup of underground tank cases. The local agencies also implement the permitting, construction, inspections and monitoring portion of the Underground Tank Regulations. The Orange County Health Care Agency, the County of Riverside Department of Environmental Health and San Diego County Department of Health Services, Environmental Health Services handle the vast majority of the active cases in the Region.

Title 23, Division 3, Chapter 16, Article 11 provides that corrective action of releases from underground storage tanks includes one or more of the following phases:

Preliminary Site Assessment Phase
This includes, at a minimum, initial site investigation, initial abatement actions and initial site characterization.

Soil and Water Investigation Phase
This includes the collection and analysis of data necessary to assess the nature and vertical and lateral extent of the unauthorized release to determine a cost-effective method of cleanup.

Corrective Action Plan Implementation Phase
This consists of carrying out the cost-effective alternative selected during the Soil and Water Investigation Phase for remediation or mitigation of the actual or potential adverse effects of the unauthorized release.

Verification Monitoring Phase
This includes all activities required to verify implementation of the Corrective Action Plan and evaluate its effectiveness.

Cleanup levels for soil and ground water pollution resulting from leaking underground storage tanks will be established based on the Cleanup and Abatement Policy described later in this chapter.

UNDERGROUND STORAGE TANK CLEANUP FUND

The State Board, Division of Clean Water Programs, administers the Underground Storage Tank Cleanup Fund. The Cleanup Fund can be used as a mechanism to satisfy federal financial responsibility requirements and pay for corrective action and third party liability costs resulting from a leaking petroleum underground storage tank. The Fund can also pay for direct cleanup (by local agency or regional board) of underground storage tank sites requiring emergency and prompt action on abandoned or recalcitrant sites. This Fund, collected by the Board of Equalization, is supported by a 0.6 cent per gallon fee for gasoline. The Fund has been established to provide reimbursement to tank owners or operators for costs of cleanup of the effects of unauthorized releases of petroleum. Up to 1.5 million dollars ($1,500,000) can be provided per site, with the first ten thousand dollars ($10,000) being provided by the claimant. With certain qualifications, expenditures made to remediate an unauthorized petroleum release since January 1, 1988, can be reimbursed and letters of credit can be issued for the funding of ongoing remediation activities.

Owners/operators of petroleum USTs as defined in section 25281(x) of the California Health and Safety Code and owners of petroleum USTs located on residential property who meet the following requirements are eligible for the fund:

- There has been an unauthorized release of petroleum from the UST reported to and confirmed by the regulatory agency.
- As a result of this unauthorized release, the owner/operator must take corrective action as required by a regulatory agency.
- The owner/operator must be in compliance with any applicable financial responsibility requirements and any UST requirements.

Regional boards provide technical support to both applicants who file claims against the underground storage tank Cleanup Fund and State Board staff members who verify the corrective action work that the claims cover. For claims that involve future work, the Regional Board will oversee site investigation and cleanup on cases for which they are the lead agency.

SITE CLEANUP

Reports of unauthorized discharges, such as spills and leaks from above ground storage tanks are investigated through the Regional Board's Site Cleanup Program. This program is not restricted to particular pollutants or environments; rather, the program covers all types of pollutants (such as solvents, petroleum fuels, and heavy metals) and all environments (including surface and ground water, and the vadose zone). Upon confirming that an unauthorized discharge is polluting or threatens to pollute regional waterbodies, the

Regional Board oversees site investigation and corrective action. Statutory authority for the program is derived from the Water Code, Division 7, section 13304. Guidelines for site investigation and remediation are promulgated in State Board Resolution No. 92-49 as amended on April 21, 1994 entitled "*Policies and Procedures For Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304*".

Cleanup levels for soil and ground water pollution resulting from sites investigated through the SLIC Program will be established based on the Cleanup and Abatement Policy described later in this chapter.

ABOVEGROUND PETROLEUM STORAGE TANKS

In order to prevent unauthorized discharges from aboveground petroleum storage tanks, the State of California has enacted legislation designed to lower the risk of spills and leaks. The state's Aboveground Petroleum Storage Act was enacted in 1989 and amended in 1991. The Act became effective on January 1, 1990 (Health and Safety Code, Chapter 6.67, section 25270 et. seq.) The Act requires owners or operators of above ground petroleum storage tanks to file a storage statement with the State Board and implement spill prevention measures. Examples of such measures include daily visual inspections of any storage tanks containing crude oil or its fractions, the installation of secondary containment for all tanks with sufficient capacity to hold the contents of the largest tank at the facility plus sufficient volume for rainfall to avoid the overflow, and development of a "Spill Prevention Control and Countermeasure Plan." In the event of an unauthorized release, the owner or operator must notify the Regional Board officials and undertake appropriate monitoring and corrective action. Additionally, annual fees are levied on tank owners. These fees are used to fund aboveground petroleum tank inspections and enforcement.

DEPARTMENT OF DEFENSE FACILITIES

There are twenty-two major Department of Defense (DOD) facilities in the San Diego Region. The following is a list of DOD facilities and the corresponding lead agency for the facility in the Region.

Department of Defense Facility	**Lead Agency**
United States Marine Corps Base, Camp Pendleton	USEPA
Coronado Navy Amphibious Base	DTSC
Imperial Beach Auxiliary Landing Field	DTSC
Naval Air Station Miramar	DTSC
North Island Naval Aviation Depot	DTSC
Naval Air Station North Island	DTSC
San Diego Fleet Anti-Submarine Warfare Training Center	DTSC
San Diego Fleet Combat Training Center	DTSC
Marine Corp Recruit Depot, San Diego	DTSC
Naval Command, Control and Ocean Surveillance Center	DTSC
San Diego Naval Computer and Telecommunications Station	DTSC
San Diego Naval Electronics Systems Engineering Center	DTSC
San Diego Naval Hospital	DTSC
32 Street Naval Station, San Diego	DTSC
Naval Submarine Base, San Diego	DTSC
Fleet Industrial Supply Center	DTSC
San Diego Naval Training Center	DTSC
San Diego Public Works Center	DTSC
San Diego Shore Intermediate Maintenance Activity	DTSC
Air Force Plant # 19, San Diego	DTSC
Fallbrook Naval Weapons Station	DTSC
Search, Evade, Resist, Escape Camp, Warner Springs	DTSC

Significant ground water contamination has been detected at a number of these facilities. Contamination is severe enough at one of these facilities to have it placed on USEPA's National Priorities List (NPL) for remediation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, commonly referred to as Superfund).

For the National Priority List facility (Camp Pendleton), the USEPA is the lead environmental regulatory agency for oversight of investigation and cleanup. CERCLA requires USEPA to consider applicable or relevant and appropriate state laws and regulations when establishing cleanup standards for remedial activities. To ensure that the state's concerns are properly addressed, two Cal-EPA agencies, the Regional Board and the Department of Toxic Substances Control (DTSC), also perform a significant oversight role in the investigations and cleanup of these facilities.

The USEPA, DOD, DTSC and the Regional Board have signed Federal Facility Agreements (FFA) for the National Priorities List facility. The intent of the FFA is to ensure that:

(1) Environmental impacts are investigated;

(2) Remedial actions are defined;

(3) Procedural framework or schedules are established;

(4) Cooperation among agencies is facilitated;

(5) Adequate assessment is performed; and

(6) Compromise is reached.

The USEPA is not involved in the investigation and cleanup of DOD facilities that are not on the National Priority List (DOD facilities other than Camp Pendleton). However, many of the facilities potentially have significant contamination. In these cases, the Regional Board and DTSC enter into Federal Facility Site Remediation Agreements (FFSRA) with DOD. Federal Facility Site Remediation Agreements are very similar to the above-mentioned Federal Facility Agreements, with the exception that USEPA is not a party.

In the table above showing the DOD facilities in the San Diego Region, the DTSC has been identified as the "lead" agency, and the Regional Board is the "support" agency. A Memorandum of Understanding has been signed by the State Board and DTSC which describes the roles of each agency. The Regional Board's oversight role is with regard to the investigation and cleanup of water resources that have been impacted, or are threatened, by waste discharges from the facilities. The Regional Board's responsibility also extends to source areas (landfills, contaminated soil, etc.) that currently, or may in the future, pose a threat to water quality. DTSC's role is to address all other environmental aspects including health risk assessment, air emissions, community relations, etc.

The State Board and DTSC have entered into a two-year cooperative agreement with the DOD for cleanup and oversight reimbursement. All work performed by the State agencies with regard to the investigation and cleanup of environmental problems at these facilities is fully reimbursed by DOD.

Cleanup levels for soil and ground water pollution resulting from DOD facilities will be established based on the Cleanup and Abatement Policy described later in this chapter.

CLEANUP AND ABATEMENT POLICY

I. CONTAMINATED SOIL AND GROUND WATER

The Regional Board has identified numerous sites where unauthorized waste discharges have resulted in soil and ground water pollution. The majority of these sites have been identified as a result of the Regional Board's implementation of the remediation programs described previously in this Chapter.

The unauthorized waste discharges at many of these sites have resulted in adverse effects on water quality and beneficial uses. In some cases the polluted sites pose a threat to the public health. It is the responsibility of the Regional Board to establish cleanup and abatement goals and objectives for the protection of water quality and the beneficial uses of waters of the state in this Region which are consistent with applicable state and federal statutes and regulations.

Water Code section 13304 authorizes the Regional Board to require cleanup and abatement of soil and ground water pollution. The Cleanup and Abatement Policy described below shall apply to all types of discharges subject to Water Code section 13304.

II. PURPOSE OF POLICY

The purpose of this Cleanup and Abatement Policy is to provide:

A. Guidance to dischargers involved in the investigation, cleanup and abatement of soil and ground water pollution sites to ensure these activities are in conformance with applicable state and federal laws, regulations and policies;

B. Guidance to dischargers on Regional Board methodology for determining cleanup levels at soil and ground water pollution sites; and

C. Consistency and uniformity in Regional Board requirements for investigation, cleanup and abatement of analogous discharges that involve similar wastes, site characteristics, and water quality considerations.

III. CLEANUP AND ABATEMENT PRINCIPLES

A. The Cleanup and Abatement Policy is guided on the following principles, which are based on Water Code sections 13000 and 13304, CCR, Title 23, Division 3, Chapter 15 (hereinafter Chapter 15), CCR, Title 23, Division 3, Chapter 16 (hereinafter Chapter 16), and applicable State Board policies. The Regional Board shall require:

1. Cleanup and abatement actions to conform with the provisions of State Board Resolution No. 68-16 (Statement of Policy with Respect to Maintaining High Quality Waters in California) provided that under no circumstances shall these provisions be interpreted to require cleanup and abatement which achieves water quality conditions that are better than "natural" background conditions;

2. Cleanup and abatement actions to conform with the provisions of State Board Resolution No. 92-49, Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code section 13304;

3. Cleanup and abatement actions to conform with applicable or relevant provisions of Chapter 15 to the extent feasible;

4. Cleanup and abatement actions to implement the applicable provisions of Chapter 16 for investigations and cleanup of hazardous substances from underground storage tanks; and

5. Dischargers to cleanup and abate the effects of discharges in a manner that promotes attainment of either background water quality, or the best water quality which is reasonable if background levels of water quality cannot be restored, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible. Any alternative cleanup levels less stringent than background shall apply section 2550.4 of Chapter 15, or, for cleanup and abatement associated with underground storage tanks, apply section 2725 of Chapter 16, provided that the Regional Board considers the conditions set forth in section 2550.4 of Chapter 15 in setting alternative cleanup levels pursuant to section 2725 of Chapter 16. Any such alternative cleanup level shall:

a. Be consistent with maximum benefit to the people of the State;

b. Not unreasonably affect present and anticipated beneficial use of such water; and

c. Not result in water quality less than prescribed in the Water Quality Control Plans and Policies adopted by the State and this Regional Board.

IV. CLEANUP AND ABATEMENT INVESTIGATIONS

A. The Regional Board shall apply the guidelines described in IV.B. below in overseeing investigations to determine the nature and extent of a discharge and appropriate cleanup and abatement measures. The level and complexity of the investigations, assessments, and feasibility studies of cleanup and abatement alternatives required below shall be determined by the discharge type, the extent of pollution, and any other applicable site-specific characteristic(s).

B. The Regional Board shall require dischargers to:

1. Investigate the nature and extent of the discharge or threatened discharge to ensure that adequate cleanup plans are proposed. The goal of the investigation shall be to adequately characterize the pollutants in the discharge and determine the vertical and horizontal extent of pollution in soil and ground water. The investigation shall determine where concentrations of pollutants reach background levels.The investigation shall extend off-site to any location necessary to determine the source and assess the vertical and horizontal extent of the discharge.

2. Take immediate action to remove, treat, or contain pollution source(s) to the maximum extent practicable. Sources of pollution may include:

   a. Ongoing sources of discharge from storage or distribution systems for wastes or hazardous materials;

   b. Soils or ground water which are polluted with mobile or immobile concentrations of non-aqueous phase liquids (NAPLs);

   c. Soils which are polluted with leachable concentrations of soluble pollutants;

   d. Polluted soils which are eroded and transported to storm drains, abandoned or active wells, surface waters, or lands beyond the control of the discharger.

3. Submit the following information for consideration in establishing cleanup levels in accordance with the conditions set forth in Chapter 15, section 2550.4:

   a. An assessment of the adverse effects on ground water quality and beneficial uses;

   b. A risk assessment to determine impacts and threats to human health and the environment; and

   c. A feasibility study of cleanup alternatives which compares effectiveness, relative cost, and time to attain the following alternative cleanup levels:

(1) Background levels;

(2) Levels which meet all applicable water quality objectives and do not pose significant risks to health or the environment; and

(3) An alternate cleanup level in between the cleanup levels described in (1) and (2) above which meets the requirements as specified in section III.A.5. of this Cleanup and Abatement Policy.

4. Provide documentation that plans and reports are prepared by professionals qualified to prepare such reports, and that all investigative, and cleanup and abatement activities are conducted under the direction of appropriately qualified professionals. Professionals should be qualified, licensed where applicable, and competent and proficient in the fields pertinent to the required activities. A statement of qualifications of the responsible lead professionals shall be included in all plans and reports submitted by the discharger.

V. APPROVAL of CLEANUP LEVELS

A. The Regional Board shall approve soil and ground water cleanup levels through the adoption or affirmation of cleanup and abatement orders; or

B. The Executive Officer or a local agency may approve cleanup levels as appropriately delegated by the Regional Board.

VI. GROUND WATER CLEANUP LEVELS

A. Ground water cleanup levels shall be based on:

1. The provisions of State Board Resolution No. 68-16, Statement of Policy with Respect to Maintaining High Quality of Waters in California, State Board Resolution No. 88-63, Sources of Drinking Water, and State Board Resolution No. 92-49, Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code section 13304.

2. Applicable narrative and numerical water quality objectives and beneficial uses described in Chapters 2 and 3 of this Basin Plan.

3. Pollutant concentrations which do not pose a significant threat to human health or the environment. Threat to human health and the environment shall be determined through a risk assessment:

   a. The Regional Board is not the lead agency for specifying risk assessment procedures. The risk assessment shall be conducted using the most current procedures authorized by the DTSC, Office of Environmental Health Hazard Assessment or the USEPA. The Regional Board will assist the discharger, as necessary, in obtaining the appropriate, most current, procedures from these agencies.

   b. In the absence of scientifically valid data to the contrary, theoretical risks from chemical constituents shall be considered additive across all media of exposure, and shall be considered additive for all chemicals having similar toxicological effects or having carcinogenic effects.

c. The Regional Board is not the lead agency for reviewing risk assessments. The Regional Board will rely on the California Department of Toxic Substances Control, Office of Environmental Health Hazard Assessment, or appropriately designated regulatory local health agencies to review and evaluate the adequacy of risk assessments.

d. The discharger shall submit the risk assessment to the Regional Board in accordance with section IV.B.3.b. of this policy. The Regional Board will coordinate the review of the risk assessment in accordance with the following hierarchy:

(1) The Regional Board will first seek the assistance of any appropriate supporting health agency currently involved with the cleanup of the site.

(2) If unsuccessful, the Regional Board will seek the assistance of previously uninvolved appropriate health agencies.

(3) If unsuccessful, the Regional Board will seek the assistance of the DTSC in accordance with the terms and conditions of the *Memorandum of Understanding Between the Department of Health Services and the State Water Resources Control Board, the Regional Water Quality Control Boards for the Cleanup of Hazardous Waste Sites August 1, 1990*.

4. Applicable state and federal statutes and regulations.

5. Relevant standards, criteria, and advisories adopted by other state and federal agencies.

6. Technical and economic feasibility of attaining background concentrations and of attaining concentrations lower than defined by 2 and 3 above. Technical and economic feasibility shall be determined in accordance with the following criteria:

   a. Technical feasibility shall be determined by assessing the availability of technologies which have been shown to be effective in reducing the pollutant concentrations to the established cleanup levels. Bench-scale and/or pilot-scale studies may be necessary to make this feasibility assessment.

   b. Economic feasibility refers to the objective balancing of the incremental benefit of attaining more stringent cleanup levels compared with the incremental cost of achieving those levels. Economic feasibility does not refer to the subjective measurement of the discharger's ability to pay the costs of cleanup.

   c. Applicable factors to be considered in the establishment of cleanup levels greater than background are listed in Chapter 15, section 2550.4.

   d. The discharger's ability to pay is one factor to be considered in determining whether the cleanup level is reasonable. However, availability of economic resources to the discharger is primarily considered in establishing reasonable schedules for compliance with cleanup levels.

B. The Regional Board shall set ground water cleanup levels to attain background water quality, unless the discharger demonstrates that it is either technically or economically infeasible to attain background water quality. If the discharger makes such a demonstration to the satisfaction of the Regional Board, cleanup levels are set between background water quality concentrations and concentrations that meet all criteria in items A.2 and A.3 above. Within this concentration range, cleanup levels will be set at the lowest concentrations that are technically and economically feasible to achieve. In no case will cleanup levels be established below natural background conditions.

C. Compliance with cleanup levels must occur at all points throughout the plume or area of contamination to protect potential beneficial uses of water resources as required by Water Code sections 13000 and 13244 and Health and Safety Code section 25356.1 (c).

D. The Regional Board may consider relaxing ground water cleanup levels that were previously established at levels more stringent than applicable water quality objectives, only when a final remedial action plan has been pursued in good faith and all of the following conditions are met:

1. Modified cleanup levels meet the conditions listed in VI.A.1., VI.A.2., and VI.A.3. above; and

2. An approved cleanup program has been fully implemented and operated for a period of time which is adequate to understand the hydrogeology of the site, pollutant dynamics, and the effectiveness of available cleanup technologies; and

3. Adequate source removal and/or isolation is undertaken to eliminate or significantly reduce future migration of pollutants to ground water; and

4. The discharger has demonstrated that no significant pollutant migration will occur to other underlying or adjacent aquifers; and

5. Ground water pollutant concentrations have reached asymptotic levels (i.e., pollutant concentration reductions are no longer significant) using appropriate technology; and

6. Alternative remediation techniques for achieving cleanup levels have been evaluated and are inappropriate or not economically feasible.

VII. SOIL CLEANUP LEVELS

A. Soil pollution can present a health risk and a threat to water quality. The Regional Board designates soil cleanup levels for the unsaturated zone based upon threat to water quality and risk to human health or the environment. Guidance from the USEPA, DTSC, or the Office of Health Hazard Assessment is considered in determining health and environmental risks. Cleanup levels for contaminated soils which threaten water quality, shall be established in accordance with the following criteria:

1. Concentrations of the residual leachable/mobile pollutants shall be equal to background concentrations unless background levels are technically or economically infeasible to achieve.

2. Where background levels are technically or economically infeasible to achieve, soil cleanup levels shall be established to ensure that residual leachable/mobile pollutants will not cause, or threaten to cause, exceedances of applicable ground water cleanup levels or water quality objectives, and do not pose significant risks to health or the environment.

3. Soil cleanup levels less stringent than background may be based on site specific technical evaluations of pollutant fate and transport processes, human health and environmental risk assessment methods as long as such methods are based on site specific field data, technically sound principles, and the criteria described in VII.A.2 above.

B. Where residual leachable/mobile soil pollutants which threaten water quality remain on site the discharger shall:

1. Implement measures as necessary to ensure that soils with residual pollutants are covered or otherwise managed to minimize pollution of surface waters or exposure to the public; and

2. Implement the applicable provisions of Chapter 15 to the extent that it is technologically or economically feasible to do so as described in State Board Resolution No. 92 - 49. This may include, but is not limited to, subsurface barriers or other containment systems, pollutant immobilization, toxicity reduction, and financial assurances.

C. The Regional Board shall generally require sampling to verify soil cleanup and may also require follow-up ground water monitoring. The degree of monitoring will reflect the amount of uncertainty associated with the soil cleanup level selection process. Follow-up ground water monitoring may be limited where residual concentrations of leachable/mobile pollutants in soils are not expected to adversely affect ground water quality.

VIII. TIME SCHEDULES

The Regional Board shall determine schedules for investigation, and cleanup and abatement, taking into account the following factors:

A. The degree of threat or impact of the discharge on water quality and beneficial uses;

B. The obligation to achieve timely compliance with cleanup and abatement goals and objectives that implement the applicable Water Quality Control Plans and Policies adopted by the State and Regional Board;

C. The financial and technical resources available to the discharger; and

D. Minimizing the likelihood of imposing a burden on the people of the state with the expense of cleanup and abatement, where feasible.

TOTAL MAXIMUM DAILY LOADS

A total maximum daily load (TMDL) is the amount of a pollutant that can be discharged into a waterbody and still maintain its water quality standards (i.e., the designated beneficial uses and the adopted water quality objectives that support the beneficial uses). A TMDL must account for seasonal variations and include a margin of safety (MOS) to account for any lack of knowledge concerning the relationship between pollutant loadings and receiving water quality.

Pollutant loadings in excess of the TMDL are expected to have an adverse effect on water quality by causing exceedances of the applicable water quality standards. Allowable pollutant loadings are calculated and assigned to all point source and nonpoint source discharges to ensure that the applicable water quality standards are not exceeded in the receiving water.

A portion of the TMDL may be held explicitly in reserve as the MOS (e.g., MOS = 10 percent of TMDL), or the MOS may be implicitly included (i.e., MOS = 0) by incorporating conservative assumptions in the calculation of the TMDL (i.e., assumptions result in a lower calculated TMDL). The portion of the TMDL not in the MOS is assigned to point sources and nonpoint sources.

Point sources are assigned wasteload allocations (WLAs) and nonpoint sources (including natural and background sources) are assigned load allocations (LAs). The WLAs and LAs may differ for each pollutant source, but the TMDL and MOS do not change. The TMDL for a pollutant in the receiving water, and the WLAs and LAs for a pollutant discharged from different sources into a waterbody are calculated at levels that, when each are met, are expected to result in the attainment of the associated water quality objectives for the pollutant and protection of the applicable beneficial uses in the receiving water.

Establishing TMDLs for waters is required under section 303(d) of the Clean Water Act. Clean Water Act section 303(d) requires that the State establish a priority ranking of waters that do not meet water quality standards after application of technology based controls. The USEPA strongly encourages states to include the priority ranking as part of the Biennial Clean Water Act Sections 303(d), 305(b) and 314 Integrated Report, which is discussed in more detail in Chapter 6.

Waters identified under section 303(d) (a.k.a. the 303(d) List) are designated as Water Quality Limited Segments (WQLSs). In accordance with the priority ranking, TMDLs must be established for pollutants suitable for such calculations. For the purpose of developing information for all waters not identified as WQLSs, states are also required to estimate the TMDLs with seasonal variations and margin of safety.

One or more numeric targets are typically required to calculate TMDLs at levels necessary to attain and maintain applicable narrative and numerical water quality standards in WQLSs. Numeric targets interpret the existing water quality standards (i.e., beneficial uses and the water quality objectives established at levels sufficient to support those uses). After identifying the impaired beneficial uses of a waterbody, the numeric targets are often based on the water quality objectives in Chapter 3. Chapter 3 contains numeric and narrative water quality objectives. If applicable water quality objectives are numeric, the numeric water quality objectives can serve as the basis for the numeric targets. If applicable water quality objectives are narrative, one or more quantifiable target values or measurable indicators must be selected to measure progress and evaluate final attainment and maintenance of the narrative water quality objectives. In WQLSs, when numeric targets are met in the waterbody, the water quality standards should be attained and restored. While numeric targets and TMDLs interpret water quality standards, *numeric targets and TMDLs are not water quality standards.*

TMDLs are not self-implementing or directly enforceable for sources in the watershed. Instead, TMDLs must be implemented through the programs or authorities of the San Diego Water Board and/or other entities to compel dischargers responsible for controllable sources to achieve the pollutant load reductions identified by a TMDL analysis to attain the water quality objectives that will support the designated beneficial uses of a waterbody.

The authorities that are available to the San Diego Water Board to implement TMDLs are given under the Porter-Cologne Water Quality Control Act (Division 7 of the Water Code). The available regulatory authorities include incorporating discharge prohibitions in to the Basin Plan, issuing individual or general waste discharge requirements (WDRs), or issuing individual or general conditional waivers of WDRs. The San Diego Water Board has the authority to enforce Basin Plan prohibitions, WDRs, or conditional waivers of WDRs through the issuance of enforcements actions (e.g., time schedule orders, cleanup and abatement orders, cease and desist orders, administrative civil liabilities). The San Diego Water Board also has the authority to require monitoring and/or technical reports from dischargers, which may be used to support the development, refinement, and/or implementation of TMDLs, WLAs, and/or LAs.

Additionally, the USEPA has delegated responsibility to the State and Regional Boards for implementation of the federal National Pollutant Discharge Elimination System (NPDES) program, which specifically regulates discharges of "pollutants" from point sources to "waters of the United States." The San Diego Water Board regulates discharges from point sources to surface waters with WDRs that implement federal NPDES regulations (NPDES requirements). Federal regulations require that NPDES requirements incorporate water quality based effluent limitations (WQBELs) that must be consistent with the requirements and assumptions of any available WLAs. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a best management practice (BMP) program of expanded or better-tailored BMPs.

Upon establishment of TMDLs by the state or U.S. Environmental Protection Agency (USEPA), the state is required to incorporate TMDLs into the state water quality management plan. This Basin Plan and applicable statewide plans serve as the water quality management plan for the watersheds under the jurisdiction of the Regional Board. TMDLs are programs for the implementation of existing water quality standards, and are established in the Basin Plan subject to the requirements of Water Code section 13242. TMDLs incorporated into the Basin Plan, therefore, are required to include 1) a description of the actions (i.e., programs or authorities) of the Regional Board and/or other entities necessary to achieve the TMDLs, 2) a compliance time schedule by which the TMDLs, and thereby the restoration of the beneficial uses in the receiving waters, are to be achieved, and 3) a description of the monitoring program that is required to determine compliance with TMDLs, WLAs, and LAs in the receiving waters. These elements are referred to as the TMDL Implementation Plan.

TMDLs that have been established for the San Diego Region are provided in Chapter 7.

IMPLEMENTATION PROVISIONS FOR INDICATOR BACTERIA WATER QUALITY OBJECTIVES IN THE CONTEXT OF A TMDL

Water quality objectives for indicator bacteria shall be strictly applied except when otherwise provided for in a TMDL. Within the context of a TMDL, the Regional Board may implement the indicator bacteria water quality objectives by using a “reference system and antidegradation approach” or a “natural sources exclusion approach,” as described in Chapter 3 (Water Quality Objectives).

There are natural sources of bacteria which may cause or contribute to exceedances of water quality objectives for indicator bacteria. It is not the intent of the Regional Board to require treatment or diversion of natural water bodies or to require treatment of natural sources of bacteria. Such requirements, if imposed by the Regional Board, could adversely affect valuable aquatic life and wildlife beneficial uses supported by water bodies in the Region.

Implementation of indicator bacteria water quality objectives using the reference system and antidegradation approach requires control of indicator bacteria from anthropogenic sources so that bacteriological water quality in the targeted waterbody is consistent with that of a reference system. The reference system and antidegradation approach also requires that no degradation of existing bacteriological water quality in the targeted water body occurs when the existing bacteriological water quality is better than that of a water body in a reference system. A reference system is a watershed and the beach to which the watershed discharges that is minimally impacted by anthropogenic activities that can affect bacterial densities in the water body. Under the reference system and antidegradation approach, a certain frequency of exceedances of the indicator bacteria water quality objectives is allowed. The allowed frequencies of exceedances are either the observed frequency of exceedances in the selected reference system or the targeted water body, whichever is less.

Under the natural sources exclusion approach, dischargers must demonstrate they have implemented all appropriate best management practices to control all anthropogenic sources of indicator bacteria to the target water body such that they do not cause or contribute to exceedances of the indicator bacteria water quality objectives. The requirement to control all sources of anthropogenic indicator bacteria does not mean the complete elimination of all anthropogenic sources of bacteria as this is both impractical as well as impossible. Dischargers must also demonstrate that the residual indicator bacteria densities are not indicative of a human health risk. After all anthropogenic sources of indicator bacteria have been controlled such that they do not cause exceedances of the indicator bacteria water quality objectives, and natural sources have been identified and quantified, exceedances of the indicator bacteria water quality objectives may be allowed based on the residual exceedances in the target water body. The residual exceedances shall define the background level of exceedance due to natural sources.

The Regional Board will evaluate the appropriateness of these approaches and the specific exceedances or exceedance frequencies to be allowed under each within the context of TMDL development or recalculation for a specific water body. If appropriate, the Regional Board may select to use one or both of these approaches during initial TMDL calculation or during subsequent recalculation following TMDL implementation.

These implementation provisions may only be used within the context of a TMDL addressing municipal storm water (including discharges regulated under statewide municipal NPDES waste discharge requirements), discharges from concentrated animal feeding operations, and discharges from non-point sources. These implementation provisions shall not be applied within the context of a TMDL addressing individual industrial storm water discharges, or general industrial and construction storm water discharges.

OTHER PROGRAMS

GROUND WATER MANAGEMENT

Ground water management programs can both enhance water quality and protect beneficial uses of ground water in the larger basins of the San Diego Region. These management programs consist of measures for the periodic monitoring and assessment of ground water levels and quality; the planned extraction and export of poor quality ground water with recharge of better quality water from an outside source; controls established on the use of ground water within the basin; and controls on inflow of poor quality water from outside the basin.

Because of the limited amount of natural recharge, the use of reclaimed water for ground water recharge must be considered in any effective ground water management program in the San Diego Region. For this reason, agencies involved in wastewater disposal play a vital role in the development of these programs. Several local and state agencies, as well as some private consultants have been studying ways to encourage this approach for protecting the Region's ground water basins. Proponents have noted that there are many advantages in storing water and reclaimed water in ground water aquifers as opposed to surface water reservoirs. Underground facilities are less costly than surface storage facilities and they are less land intensive than surface water reservoirs. Also, the ground water aquifers can serve as distribution systems, minimizing the need for surface water transport facilities. In addition, reclaimed water stored in ground water aquifers are not subject to evaporative losses.

Filtration through the soils in the basin can provide additional treatment of the reclaimed water, and injection of reclaimed water along the coastal strip can be used to help combat seawater intrusion.

Ninety percent of the potable water supply for the San Diego Region comes from two major sources of imported water. Water from the Colorado River is imported through the Colorado River Aqueduct and water from northern California is imported through the State Water Project. Both sources are blended to form San Diego Region's water supply. Additionally, approximately ten percent of the water supply comes from local reservoirs. The quality of the imported water has been showing increases in mineral content, particularly boron, percent sodium and TDS. Direct use of this supply reflects the mineral content of Colorado River water. Each additional use of the water (reclaimed from this supply) for irrigation and ground water recharge incrementally increases the dissolved mineral content.

Water reclamation activities should, then, be focused on local benefits and impacts on ground water quality. Proposed projects should be examined in terms of:

- Areas with high reclaimed water demands;
- Constituent concentrations in relation to basin plan objectives;
- Assimilative capacity of receiving basins; and
- Potential for improving ground water quality in near-surface and deep aquifers.

The major basins in San Diego County that have been studied for the implementation of a ground water management plan are the San Juan Creek, Upper Santa Margarita River Basin, Lower San Luis Rey Valley, Lower San Dieguito River Valley, San Pasqual Valley, Santee, Lower Sweetwater River Basin, and the Lower Tijuana River Basin. A goal of these management plans is to rejuvenate the quality of the ground water in these basins to meet basin objectives. The general plan is to pump the poor quality ground water from these basins to the ocean, and recharge the basins with reclaimed and natural run off waters, which will then be extracted for beneficial use when water quality objectives are met. The following is a description of the proposed programs.

SAN JUAN CREEK

In Orange County, a management plan is underway in the San Juan Creek Basin. Ground water supplies are limited in this basin due to low recharge and poor quality. The capacity of the San Juan Creek Basin is approximately 90,000 acre-feet. With proper management of the ground water basin, approximately 50,000 AF/Y could be utilized. The basin currently provides approximately 5,000 AF/Y of usable ground water - less than 2,000 AF/Y is used for urban supply and approximately 3,000 AF/Y is used for agricultural and irrigation purposes. The only ground water that meets drinking water standards and most agricultural requirements is found in the highlands of the northeasternmost portion of the basin. Ground water quality data indicate that the TDS concentration ranges from 300 mg/l (in the northeasternmost portion of the basin) to 1,850 mg/l (in the lower and western portion of the basin). Approximately 3.0 MGD of treated wastewater is being reclaimed for irrigation of a golf course, park, greenbelt and landscaping. In addition, reuse is proposed for effluent from Moulton-Niguel Water District's Water Reclamation Plant 3A, which has been expanded from a capacity of 0.5 MGD to 2.4 MGD, and for effluent from Trabuco Canyon Water District's Robinson Ranch Wastewater Reclamation Plant, which has a capacity of 0.25 MGD. The TDS concentration in secondary effluent in the basin ranges from 500 to 900 mg/l. Reclaimed water could be used to enhance surface water flows and quality or to improve ground water quality in the lower and western parts of the basin. The use of reclaimed water for urban or agricultural irrigation could help reduce demands for ground and imported water. A ground water monitoring plan for the San Juan Creek Basin has been proposed by the Department of Water Resources which would identify any basinwide changes that may occur in water quality that could affect current and potential beneficial uses. This program would provide an early warning that ground water supplies may be endangered.

UPPER SANTA MARGARITA RIVER BASIN

In Riverside County, the upper Santa Margarita River Basin contains several million acre-feet of high quality ground water in the Pauba/ Temecula aquifer system. The Rancho California Water District is considering a plan that will implement the use of reclaimed water for beneficial uses and for ground water recharge. Some changes in basin plan water quality objectives are needed to develop this project. The Santa Rosa SBR Water Reclamation Facility, near Temecula, percolates reclaimed waters through highly permeable alluvium, which recharge and mix with ground water in an upper aquifer. A tentative projection calls for 5 MGD of reclaimed water production by the year 2000.

LOWER SAN LUIS REY VALLEY

Imported water comprises almost the entire supply for this basin. Ground water use is limited due to deteriorated water quality. There are four operating wastewater treatment facilities in this basin that could supply over 12,000 acre-feet per year (AF/Y) of treated wastewater that could be used for ground water recharge or other beneficial uses. At the present time reclaimed water is only being used for freeway landscape irrigation. Many springs and wells that used to be ephemeral, now flow all year long with imported irrigation return water. In many areas of this basin, reclaimed water is of higher quality than the existing ground water quality. Use of reclaimed water can be utilized to improve the conditions of the ground water quality.

LOWER SAN DIEGUITO RIVER VALLEY

The San Dieguito ground water management plan includes the utilization of approximately 2,000 to 4,000 AF/Y of recharge of reclaimed water. The reclaimed water will initially be used for irrigation, rejuvenation of non-potable ground water resources and for creating a fresh water barrier near Interstate 5. Water from the City of Escondido's Hale Avenue Reclamation Facility will be treated to tertiary treatment standards and pumped to the reclamation area in the San Dieguito Valley, where it will undergo recharge to replace poor quality water pumped to the ocean or desalted and treated to potable water standards. This reclaimed water will be used for agriculture and landscape irrigation. As the ground water quality improves, this basin could supply water to areas outside the basin, such as La Jolla Valley and North City West for landscape irrigation. The San Dieguito Basin lacks a centralized wastewater collection system. Water services are provided by four different governmental agencies, and sewer service is provided by eight governmental agencies. There are plans to interconnect the existing and proposed treatment facilities into an integrated system which can supply reclaimed water throughout the basin. The benefits of a ground water management plan in this basin include inexpensive storage and distribution of excess reclaimed water flows available during low irrigation months. This ground water management plan will result in improved ground water quality and will provide an efficient use of available water resources.

SAN PASQUAL VALLEY

The San Pasqual ground water management plan would utilize between 5,000 and 8,000 AF/Y of reclaimed water for agricultural irrigation and ground water recharge, thus reducing the need for this amount of imported water. The reclaimed water is available from the City of Escondido Hale Avenue Wastewater treatment plant, which presently discharges directly to the ocean. The City of San Diego owns 7,436 acres of land in the San Pasqual Valley which has been set aside as an agricultural preserve. There is 38,000 acre-feet of usable ground water in the valley. The western portion of the valley has degraded ground water quality, and has been designated as the reclamation basin. There is a plan to pump this poor quality ground water to the ocean and recharge the basin with reclaimed water of higher quality, to provide a positive salt balance. When the ground water quality improves, it will be used for irrigation of parks and golf courses, the Wild Animal Park and for landscape and freeway irrigation. There is a large and continued demand for irrigation water in the area. The eastern portion of the basin is designated as potable, and efforts will be made to keep the quality of the ground water from degrading. A third part of the basin, called the Narrows, is located between the San Pasqual reclamation basin and the Hodges basin. It has a very small capacity and will be used to prevent surface and ground water flows of reclaimed water from entering Lake Hodges Reservoir, a potable storage reservoir for the City of San Diego.

SANTEE

The Padre Dam Municipal Water District is reviewing the feasibility of a comprehensive ground water management plan for Santee basin. Ground water from the eastern part of the basin is used for domestic, agricultural and stock watering purposes, and generally has TDS concentrations of 260-1,310 mg/l. The ground water in the main portion of the Santee basin has TDS concentrations of up to 2,990 mg/l. In times of drought, this water could supplement imported water supplies. At the present time, reclaimed water is used only for recreational purposes at Santee Lakes Campground, and Park. The Padre Dam Municipal Water Districts 1.0 MGD tertiary and 2.0 MGD secondary capacity treatment facility provides 1,200 AC/Y of reclaimed water which is used for the Santee Lakes. Water from Lake No. 1 is used to irrigate the landscaping of the surrounding the lakes. Currently only 1 MGD of the plant's capacity is being utilized. All flows over 1 MGD are sent to the Metropolitan Sewer System. Future water reuse projects include another 1,200 AF/Y projected need for the Santee Town Center and city park and approximately 1,400 AF/Y for industrial use. High quality reclaimed water could provide a potential source for recharging the ground water basin and improve existing water quality. Careful management of the basin could mitigate impacts of a high water table to prevent resurfacing of reclaimed water.

LOWER SWEETWATER RIVER BASIN

The Sweetwater Authority completed initial ground water basin studies of the Lower Sweetwater River Basin in June, 1993. As part of the agency's water resources program, the Sweetwater Authority is reviewing the feasibility of using ground water from the Lower Sweetwater Basin to augment its potable water supply.

The Lower Sweetwater Basin extends along the Sweetwater River from the Sweetwater Reservoir Dam approximately eight miles to San Diego Bay. It consists of an alluvial aquifer and the underlying San Diego Formation aquifer. Current use of ground water within the basin is limited, with turf irrigation the predominate use. The Basin is recharged from natural runoff and water from the upstream urban runoff diversion system which, in part, surrounds the Sweetwater Reservoir and spills over the Sweetwater Dam. Water quality data indicate that the ground water is moderately saline with TDS concentrations averaging 1,400 mg/l.

The Sweetwater Authority is currently evaluating the feasibility of constructing ground water extraction wells, a water treatment facility, a brackish water pipeline from each well to the treatment facility, a product water delivery pipeline and pump station, and a brine disposal pipeline. Preliminary findings indicate that extraction and treatment (to potable water standards) of 1,600 to 3,600 AF/Y of ground water from the Lower Sweetwater River Basin is feasible. Some additional production and/or ground water storage may be available in the San Diego Formation aquifer. San Diego Formation hydrogeological studies are ongoing; however preliminary findings indicate that the managed storage potential in the aquifer may be significant.

LOWER TIJUANA RIVER BASIN

The Tijuana Valley County Water District adopted a Resolution of Intention to prepare a Ground Water Management Plan in accordance with Water Code sections 10750 - 10755 in February, 1993. The stated goals of the District are summarized as follows:

- Protect ground water quality and quantity in the Tijuana River Basin for existing and future property owners, agricultural and recreational users;
- Develop the ground water basin into a sub-regional water supply reservoir;
- Provide water to Valley customers and sell excess ground water to customers outside the Basin;
- Implement measures for ground water recharge with surface floodwater containment and runoff control facilities, and reclaimed water, if available; and
- Work with the City and County of San Diego and appropriate state and federal agencies, to propose a workable international floodwater and wastewater control solution for the Valley.

The District's current plans include development of ground water management alternatives for the production and treatment of approximately 2,500 AF/Y of potable ground water.

SALT BALANCE

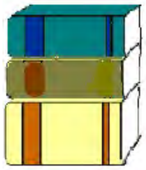
Salt balance is a theoretical concept where the total mass of dissolved minerals entering a ground water basin system from all sources is equal to the total mass of dissolved minerals leaving the system, either through extraction or natural outflow. It is preferable to have a balance of the salt inflows and outflows to maintain water quality in a basin.

Utilizing the following management measures would enhance the prospects for salt balance for ground water basins in the Region. These measures include:

- Limiting ground water extractions from basins to perennial-yield levels;
- Increasing the efficiency of irrigation practices;
- Reducing fertilizer application;
- Improving the quality of imported water used for irrigation;
- Use storm water runoff for ground water recharge, since storm water is low in TDS;
- Extract and demineralize poor quality ground water when this option becomes economically feasible; and
- Utilize intrusion barriers and regulate ground water pumpage to prevent and reverse problems of salt water intrusion.

SOLE SOURCE AQUIFER PROGRAM

The Safe Drinking Water Act of 1974 provides for a sole source aquifer program. Under this program, USEPA may designate an aquifer as a sole source if it provides more than half of the drinking water for a given area, and no other affordable sources of drinking water exist. The Act provides that, when certain criteria are met, a group may petition the USEPA to designate a sole source aquifer. Thus, in May of 1993, a local citizens' group, Backcountry Against Dumps petitioned the USEPA to designate the Campo/ Cottonwood Creek aquifer as the sole source of drinking water in a 400 square-mile area. The Campo/Cottonwood aquifer is bordered by Mexico to the south, and includes within its borders reservations for the Campo, La Posta, Manzanita, and Cuyapaipe Indian tribes. The aquifer lies about 20 miles east of El Cajon, California. This designation means the USEPA may review proposed projects in the aquifer area which receive partial federal funding and which could contaminate the aquifer or endanger public health. Examples of projects potentially subject to review include construction or renovation of housing projects, airports, and highways. Projects that do not receive some federal funds would not be reviewed.



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CHAPTER 5

PLANS AND POLICIES

INTRODUCTION ***1***

STATE BOARD PLANS AND POLICIES ***1***

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5. PLANS AND POLICIES

INTRODUCTION

The State Board has adopted several statewide Water Quality Control Plans that are incorporated by reference into the Regional Board Basin Plan. Additionally, both the State and Regional Boards adopt policies, separate from the plans, that provide detailed direction on the implementation of certain plan provisions. In the event that inconsistencies exist among various plans and policies, the more stringent provisions apply.

This update of the San Diego Region's Basin Plan has been revised to be consistent with all State and Regional Board plans and policies adopted to date. All of the Regional Board plans and policies which implement, interpret, or make specific the Basin Plan and which are listed later in this chapter have been incorporated in this Basin Plan and are superseded. Following are summaries of these plans and policies.

STATE BOARD PLANS AND POLICIES

ANTIDEGRADATION POLICY (RESOLUTION NO. 68-16)

One of the most significant water quality control policies with respect to the protection of water quality is the *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (State Board Resolution No. 68-16), also known as the State Antidegradation Policy. This policy was adopted on October 28, 1968. It satisfies the federal Clean Water Act antidegradation policy requirement (40 Code of Federal Regulations (CFR) 131.12). The State Antidegradation Policy requires that high quality waters of the state are maintained to the maximum extent possible, even where that quality is better than needed to protect beneficial uses. Specific findings must be made in order to allow any changes in water quality. Changes in water quality are allowed only if the change is consistent with maximum benefit to the people of the State, does not unreasonably affect present and anticipated beneficial uses, and does not result in water quality less than that prescribed in water quality control plans or policies.

Actions which may adversely affect surface water quality must satisfy both Resolution No. 68-16 and the federal antidegradation policy (40 CFR 131.12). The requirements of the two policies are similar: the federal policy requires that existing instream uses and the level of water quality necessary to protect them must be maintained and protected. In addition, a reduction in water quality can be allowed only if there is a demonstration that such a reduction is necessary to accommodate important economic or social development.

STATE POLICY FOR WATER QUALITY CONTROL

The *State Policy for Water Quality Control* serves as the general basis for water quality control policies and was adopted by the State Board on July 6, 1972. The policy declares the State Board's intent to protect water quality through the implementation of water resources management programs.

The policy provides that water quality control plans adopted by the State Board will include minimum requirements for effluent quality. Water quality control plans will also specifically define the maximum constituent levels acceptable for discharge to various waters of the State. However, the policy allows discretion in the application of the latest available technology for the design and operation of wastewater treatment systems. The policy states that secondary treatment systems are the minimum acceptable level of treatment and that advanced treatment systems will be required where necessary to meet water quality objectives.

The policy contains twelve general principles to implement the provisions and intent of the Porter-Cologne Act. These principles are listed below:

(1) Water rights and quality control decisions must assure protection of available fresh water and marine water resources for maximum beneficial use.

(2) Municipal, agricultural, and industrial wastewaters must be considered as a potential integral part of the total available fresh water resource.

(3) Coordinated management of water supplies and wastewaters on a regional basis must be promoted to achieve efficient utilization of water.

(4) Efficient wastewater management is dependent upon a balanced program of source control of environmentally hazardous substances, treatment of wastewaters, reuse of reclaimed water, and proper disposal of effluents and residuals.

(5) Substances not amenable to removal by treatment systems presently available or planned for the immediate future must be prevented from entering sewer systems in quantities which would be harmful to the aquatic environment, adversely affect beneficial uses of water, or affect treatment plant operation. Persons responsible for the management of waste collection, treatment, and disposal systems must actively pursue the implementation of their objective of source control for environmentally hazardous substances. Such substances must be disposed of such that environmental damage does not result.

(6) Wastewater treatment systems must provide sufficient removal of environmentally hazardous substances which cannot be controlled at the source to assure against adverse effects on beneficial uses and aquatic communities.

(7) Wastewater collection and treatment facilities must be consolidated in all cases where feasible and desirable to implement sound water quality management programs based upon long-range economic and water quality benefits to an entire basin.

(8) Institutional and financial programs for implementation of consolidated wastewater management systems must be tailored to serve each particular area in an equitable manner.

(9) Wastewater reclamation and reuse systems which assure maximum benefit from available fresh water resources shall be encouraged. Reclamation systems must be an appropriate integral part of the long-range solution to the water resource needs of an area and incorporate provisions for salinity control and disposal of non-reclaimable residues.

(10) Wastewater management systems must be designed and operated to achieve maximum long-term benefit from the funds expended.

(11) Water quality control must be based on the latest scientific findings. Criteria must be continually refined as additional knowledge becomes available.

(12) Monitoring programs must be provided to determine the effects of discharges on all beneficial water uses including effects on aquatic life and its diversity and seasonal fluctuations.

AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE AND STATE WATER QUALITY PROTECTION AREAS (RESOLUTION NO. 74-28)

The Regional Boards were required to select areas in coastal waters which contain "*biological communities of such extraordinary, even though unquantifiable, value that no acceptable risk of change in their environments as a result of man's activities can be entertained."* These areas are known as 'Areas of Special Biological Significance' (ASBS).

ASBS are those areas designated by the State Water Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All ASBS are also classified as subset of State Water Quality Protection Areas (SWQPAs).

SWQPAs are defined in Public Resources Code, section 36700(f) as "a non-terrestrial marine or estuarine area designated to protect marine species or biological communities from an undesirable alteration in natural water quality, including, but not limited to, areas of special biological significance that have been designated by the State Water Resources Control Board through its water quality control planning process."

In the San Diego Region, Areas of Special Biological Significance ASBS/SWQPAs include the following:

Irvine Coast, Orange County

Ocean waters within that portion of California state tide and submerged lands adjoining the Newport Beach Marine Life Refuge bounded by a line beginning at the intersection of the southwesterly extension of Lot 141, Tract No. 3357, as shown on a map recorded in Book 107, Page 1 of Miscellaneous Maps on file in the office of the County Recorder, Orange County and the line of ordinary high tide; thence, southeasterly along the line of ordinary high tide approximately 20,000 feet to its intersection with the southwesterly extension of the northwesterly boundary line of the City of Laguna Beach; thence, southwesterly along such southwesterly extension 1,000 feet or to the 100-foot isobath, whichever distance from shore is greater; thence northwesterly along a line parallel to and 1,000 feet or to the 100-foot isobath, whichever distance from shore is greater southwesterly of the line of ordinary high tide to the southwesterly extension of said Lot 141; thence northeasterly along such southwesterly extension to the point of beginning.

Heisler Park, Orange County

Ocean waters within a line beginning at the intersection of the line of mean high tide with the westerly boundary line of Heisler Park, as described in a deed to the City of Laguna Beach, recorded in book 1666, page 144, Official Records Orange County, California; thence south 16o 21' west 800 feet more or less to the line of the Laguna Beach Marine Life Refuge, as per Division 7, Chapter 1, Article 2, section 10904, State of California Fish and Game Code; thence along said marine life refuge south 73o 39' east, 2,400 feet more or less to the easterly boundary of said refuge; thence along said easterly boundary north 14o 58' west, 700 feet more or less to the line of mean high tide in a westerly direction to the point of beginning.

San Diego - Scripps, San Diego County

Ocean waters within that portion of Fish and Game District 19 consisting of that certain strip of land lying between the westerly edge of Pueblo Lot No. 1298 of the Pueblo Lands of the City of San Diego, according to the official map of said pueblo lands as made by James Pascoe, and filed in the office of the County Recorder of said County of San Diego, and the mean high tide line opposite to and west of said pueblo lot, which said strip of land is bounded on the north by the northerly boundary line of said pueblo lot extended westerly and on the south by the southerly boundary line of said pueblo lot extended westerly; together with the state waters of the

State of California adjacent thereto, being those state waters which lie between said extended northerly and southerly boundaries of said pueblo lot and extend westerly from said mean high tide line for a distance of 1,000 feet.

La Jolla, San Diego County

Ocean waters within the boundaries of the City of San Diego, County of San Diego, State of California, as follows: beginning at the most northerly point of Goldfish Point as shown on La Jolla Park Map No. 352 filed in the office of the County Recorder of said county, thence in a northerly direction to a point being the intersection of longitude 117o 16' 15" west with the easterly prolongation of the southerly line of Pueblo Lot 1298 as shown on the map of Pueblo Lands of San Diego made by James Pascoe known as miscellaneous map No. 36 filed in the office of the County Recorder as said county, thence easterly along said prolongation of the southerly line of Pueblo Lot 1298 to the intersection with the mean high tide line, thence in a generally southerly direction along said mean high tide line to the point of beginning.

The impact of the adoption of ASBS and SWQPAs on the Basin Plan is that discharges of wastewaters and/or heat must be sufficiently removed spatially from these areas to assure the maintenance of natural water quality conditions in these areas. Existing wastewater and/or heat discharges which influence the natural water quality in these areas shall be prohibited and phased out as promptly as possible, or limited by the imposition of special conditions in accordance with the Porter-Cologne Water Quality Control Act and implementing regulations, including, but not limited to the California Ocean Plan and the California Thermal Plan.

ENCLOSED BAYS AND ESTUARIES POLICY (RESOLUTION NO. 74-43)


San Diego Bay

The *Water Quality Control Policy for Enclosed Bays and Estuaries of California* (Enclosed Bays and Estuaries Policy) was adopted by State Board Resolution No. 74-43 on May 16, 1974. This policy is designed to prevent water quality degradation and protect beneficial uses in enclosed bays and estuaries. The policy outlines water quality principles and guidelines to achieve these objectives. Decisions by the Regional Board must be consistent with the provisions designed to prevent water quality degradation.

The policy lists principles of management that include the State Board's desire to phase out all discharges of municipal wastewaters and industrial process waters (exclusive of cooling waters) to enclosed bays and estuaries as soon as practicable. Exceptions to this provision may be granted by a Regional Board only when the Regional Board finds that the wastewater in question would consistently be treated and discharged in such a manner that it would enhance the quality of the receiving waters above that which would occur in the absence of the discharge. Discharge prohibitions are placed on the following:

- New discharges of municipal wastewaters and industrial process waters (exclusive of cooling water, treated ballast water and innocuous non-municipal wastewater discharges, such as clear brines, wash water and pool drains) which are not consistently treated and discharged in a manner that would enhance the quality of the receiving waters as defined in the Policy;

- Municipal and industrial waste sludge and untreated sludge digester supernatant, centrate, or filtrate;

- Rubbish or refuse into surface waters or at any place where they would be eventually transported to enclosed bays and estuaries;

- Silt, sand, soil, clay, or other earthen materials from onshore operations including mining, construction, and lumbering in quantities which unreasonably affect or threaten to affect beneficial uses;

- Materials of petroleum origin in sufficient quantities to be visible or in violation of waste discharge requirements (except for scientific purposes);

- Radiological, chemical, or biological warfare agent or high-level radioactive waste; and

- Discharge or by-pass of untreated waste.

POLICY ON THE USE AND DISPOSAL OF INLAND WATERS USED FOR POWERPLANT COOLING (RESOLUTION NO. 75 58)

The *Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling* (Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling) was adopted by State Board Resolution No. 75-58 on June 19, 1975. The purpose of the policy is to provide consistent statewide water quality principles and guidance for adoption of discharge requirements, and implementation actions for powerplants which depend upon inland waters for cooling. In addition, this policy is intended to protect the beneficial uses of the State's water resources by keeping the consumptive use of freshwater for powerplant cooling to a minimum. The Regional Board is responsible for the enforcement of this policy.

The policy is based on the seven principles listed below:

(1) It is the State Board's position that from a water quantity and quality standpoint the source of powerplant cooling water should come from the following sources in this order of priority depending on site specifics such as environmental, technical, and economic feasibility consideration:

  - Wastewater being discharged to the ocean;
  - Ocean;
  - Brackish water from natural sources or irrigation return flow;
  - Inland wastewaters of low TDS; and
  - Other inland waters.

(2) Where the State Board has jurisdiction, use of fresh inland waters for powerplant cooling will be approved by the Board only when it is demonstrated that the use of other water supply sources or other methods of cooling would be environmentally undesirable or economically unsound.

(3) In considering issuance of a permit or license to appropriate water for powerplant cooling, the Board will consider the reasonableness of the proposed water use when compared with other present and future needs for the water source and when viewed in the context of alternative water sources that could be used for the purpose. The Board will give great weight to the results of studies made pursuant to the Warren-Alquist State Energy Resources Conservation and Development Act and carefully evaluate studies by the Department of Water Resources made pursuant to sections 237 and 462, Division 1 of the California Water Code.

(4) The discharge of blowdown water from cooling towers or return flows from once-through cooling shall not cause a violation of water quality objectives or waste discharge requirements established by the Regional Boards.

(5) The use of unlined evaporation ponds to concentrate salts from blowdown waters will be permitted only at salt sinks approved by the Regional and State Boards. Proposals to utilize unlined evaporation ponds for final disposal of blowdown waters must include studies of alternative methods of disposal. These studies must show that the geologic strata underlying the proposed ponds or salt sink will protect usable groundwater.

(6) Studies of availability of inland waters for use in powerplant cooling facilities to be constructed in Central Valley basins, the South Coastal Basins or other areas which receive supplemental water from Central Valley streams as for all major new uses must include an analysis of the impact of such use on Delta outflow and Delta water quality objectives. The studies associated with powerplants should include an analysis of the cost and water use associated with the use of alternative cooling facilities employing dry, or wet/dry modes of operation.

(7) The State Board encourages water supply agencies and power generating utilities and agencies to study the feasibility of using wastewater for powerplant cooling. The State Board encourages the use of wastewater for powerplant cooling where it is appropriate. Furthermore, section 25601(d) of the Warren-Alquist Energy Resources Conservation and Development Act directs the water and other advances in powerplant cooling and section 462 of the Waste Water Reuse Law directs the Department of Water Resources to "...*conduct studies and investigations on the availability and quality of waste water and uses of reclaimed waste water for beneficial purposes including, but not limited to ... and cooling for thermal electric powerplants.*"

In addition, the policy contains three discharge prohibitions. The prohibitions are listed below:

(1) The discharge to land disposal sites of blowdown waters from inland powerplant cooling facilities shall be prohibited except to salt sinks or to lined facilities approved by the Regional and State Boards for the reception of such wastes.

(2) The discharge of wastewaters from once-through inland powerplant cooling facilities shall be prohibited unless the discharger can show that such a practice will maintain the existing water quality and aquatic environments of the State's water resources.

(3) The Regional Boards may grant exceptions to these discharge prohibitions on a case-by-case basis in accordance with exception procedures included in the *Water Quality Control Plan for Control of Temperature In the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California.*

THERMAL PLAN (RESOLUTION NO. 75-89)

The *Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California* (Thermal Plan) was adopted by the State Board in 1971, revised in 1972 and revised again on September 18, 1975. The Thermal Plan specifies water quality objectives and general water quality provisions for new and existing discharges into enclosed bays, estuaries, cold interstate waters, warm interstate waters and coastal waters. The State and Regional Boards administer the plan by establishing waste discharge requirements for elevated temperature wastes. Existing and future dischargers of thermal waste are required to conduct studies to define the effect of the discharge on beneficial uses and, for existing discharges, determine design and operating changes which would be necessary to achieve compliance with the provisions of the Thermal Plan.

Existing waste discharge requirements are required to be reviewed to determine any necessary revisions, changes in monitoring programs and the need for studies of the effect of the thermal discharge on beneficial uses. Proposed thermal dischargers may be required to submit studies prior to the establishment of WDRs. Appropriate post discharge studies are also required by the Regional Board. The Thermal Plan specifies that the Regional Board shall outline the scope and design of any necessary studies to include the following as applicable:

(1) Existing conditions in the aquatic environment;

(2) Effects of the existing discharge on beneficial uses;

(3) Predicted conditions in the aquatic environment with waste discharge facilities designed and operated in compliance with the provisions of the plan;

(4) Predicted effects of the proposed discharge on beneficial uses;

(5) An analysis of costs and benefits of various design alternatives; and

(6) The extent to which intake and outfall structures are located and designed so that the intake of planktonic organisms is at a minimum, waste plumes are prevented from touching the ocean substrate or shorelines, and the waste is dispersed into an area of pronounced along-shore or offshore currents.

The Thermal Plan further specifies that WDRs adopted for discharges of thermal wastes shall be monitored in order to determine compliance with effluent or receiving water temperature requirements. For significant thermal discharges, the State or Regional Boards shall require expanded monitoring programs to assess whether the thermal discharge continues to provide adequate protection to the beneficial uses of the water. The State or Regional Board may require the discharger(s) to pay a public agency or other appropriate person an amount sufficient to carry out the expanded monitoring program if:

(1) The discharger has previously failed to carry out a monitoring program satisfactory to the State or Regional Board; or

(2) More than a single facility, under separate ownerships, may significantly affect the thermal characteristics of the body of water, and the owners of such facilities are unable to reach agreement on a cooperative program within a reasonable time period specified by the State or Regional Board.

POLICY WITH RESPECT TO WATER RECLAMATION IN CALIFORNIA (RESOLUTION NO. 77 1)

The *Policy with Respect to Water Reclamation in California* (Reclamation Policy) was adopted by the State Board on January 6, 1977. The Reclamation Policy provides that the water resources of the State be put to beneficial use to the fullest extent of which they are capable. The policy provides that water resources shall not be wasted, nor be put to an unreasonable use, nor be used in an unreasonable method.

This policy commits both the State and Regional Board to support reclamation and to undertake all possible steps to encourage the development of water reclamation facilities to reclaim water to supplement existing surface and ground water supplies. It requires the Regional Board to conduct reclamation surveys and specifies actions to be implemented by the State and Regional Board and other agencies.

The State Board adopted the four following principles in order to implement the Reclamation Policy. These principles are listed below:

(1) The State and Regional Boards shall encourage, and consider or recommend for funding, water reclamation projects which meet the conditions below and which do not adversely impact vested water rights or unreasonably impair instream beneficial uses or place a unreasonable burden on present water supply systems:

A. Beneficial use will be made of wastewaters that would otherwise be discharged to marine or brackish receiving waters or evaporation ponds;

B. Reclaimed water will replace or supplement the use of fresh water or better quality water;

C. Reclaimed water will be used to preserve, restore, or enhance instream beneficial uses which include, but are not limited to, fish, wildlife, recreation, and aesthetics associated with any surface water or wetlands.

(2) The State and Regional Boards shall encourage reclamation and reuse of water in water-short areas of the State, encourage water conservation measures which further extend the water resources of the State, and encourage other agencies, in particular the Department of Water Resources, to assist in implementing this policy.

(3) The State and Regional Boards recognize the need to protect the public health including potential vector problems and the environment in the implementation of reclamation projects.

(4) In implementing these principles, the State and/or Regional Board shall take appropriate actions, recommend legislation, and recommend actions by other agencies in the areas of planning, project funding, water rights, regulation and enforcement, research and demonstration, and public involvement and information.

This resolution has been reprinted at the end of this Chapter.

POLICY ON THE DISPOSAL OF SHREDDER WASTE (RESOLUTION NO. 88-06)

The *Policy on the Disposal of Shredder Wastes* (Shredder Waste Disposal Policy) was adopted on February 8, 1988. This policy permits the disposal of shredded wastes produced by the mechanical destruction of car bodies, old appliances and similar castoffs, into certain landfills under specific conditions designated and enforced by the Regional Boards. Hazardous and nonhazardous shredder waste may be disposed of in appropriate Class III landfills where doing so would not cause water quality impairment. The policy specifies the shredder waste must not exceed PCB levels of 50 milligrams per kilogram (mg/kg). Also, the shredder waste must be disposed in an isolated cell solely designated for the disposal of shredder waste.

SOURCES OF DRINKING WATER POLICY (RESOLUTION NO. 88 63)

Drinking Water

The *Sources of Drinking Water Policy* was adopted by the State Board on May 19, 1988. The policy provides that all surface and ground waters of the State are considered to be suitable or potentially suitable for municipal or domestic water supply and should be so designated by the Regional Boards. Those waters excepted under the policy include the following:

(1) Surface or ground waters where the total dissolved solids exceed 3,000 milligrams per liter (mg/l) and it is not reasonably expected by the Regional Boards to supply a public water system;

(2) Surface or ground waters which have been contaminated and cannot be reasonably treated for domestic use using either Best Management Practices or best economically achievable treatment practices;

(3) Surface or ground waters which do not provide sufficient water for extraction of 200 gallons per day;

(4) Surface waters which are in systems designed or modified to carry municipal, industrial, agricultural or mining wastewaters, or storm water runoff;

(5) Surface waters in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards; and

(6) Ground waters where the aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, section 261.3. This resolution has been reprinted at the end of this Chapter.

NONPOINT SOURCE MANAGEMENT PLAN (RESOLUTION NO. 88-123)

The *Nonpoint Source Management Plan* was adopted by the State Board on November 15, 1988, pursuant to section 319 of the federal Clean Water Act. Section 319 requires each state to prepare a Nonpoint Source Management Plan and to conduct an assessment of the impact nonpoint sources have on the state's waterbodies. In response to these requirements, the State Board adopted the Nonpoint Source Management Plan (NPSMP) in 1988 and the Water Quality Assessment in 1990. The NPSMP established a statewide policy for managing polluted runoff in California. The plan identifies three management approaches which are used by the State and Regional Boards to address nonpoint source problems:

(1) Voluntary implementation of best management practices;

(2) Regulatory-based encouragement of best management practices; and

(3) Effluent requirements.

The primary goal of the program is to measurably improve water quality and/or implementation of Best Management Practices by meeting several objectives specified in the plan.

The Nonpoint Source Management Plan outlines steps to initiate systematic management of nonpoint sources in California. These steps include:

(1) An explicit long-term commitment by the State and Regional Board;

(2) More effective coordination of existing State and Regional Board nonpoint-source related programs;

(3) Greater use of Regional Board regulatory authorities coupled with non-regulatory programs;

(4) Stronger links between the local, State and Federal agencies which have powers that can be used to manage nonpoint sources;

(5) Development of new funding sources; and

(6) Implementation of the requirements of the 1990 Reauthorization of the Coastal Zone Management Act (CZMA) which requires the State Board and the California Coastal Commission to develop and implement an enforceable nonpoint source program in the coastal zone.

The reauthorization of the CZMA, together with specific guidance from the USEPA and the National Oceanic & Atmospheric Administration (NOAA), requires coastal states to develop coastal nonpoint pollution control programs. These programs are to implement management measures for the control of land uses which contribute nonpoint source pollution to coastal waters. Management measures, which include specific measures for mitigating water quality impacts, are specified for the following land uses: agriculture; grazing; confined animal facilities; forestry; urban development; roads; marinas and recreational boating; hydromodification; and mines. The state's coastal program is to be considered for approval by the USEPA and NOAA in July 1995.

Revision of the State Nonpoint Source Management Plan (NPSMP) has been initiated. The State Board intends to consider the requirements of the Coastal Zone Act Reauthorization Amendments (CZARA) during the review and revision of the NPSMP. There will also be more of an emphasis placed on watershed based nonpoint source controls in the revised NPSMP. To develop these management measures, the State Board is forming Task Force Committees composed of experts in the various nonpoint source categories. The management measures developed by the Task Force Committees will be reviewed by an Oversight Committee made up of State and Regional Board staff prior to inclusion in the revised NPSMP. The anticipated date of completion of the revised NPSMP is in 1995.

The plan describes an implementation project entitled the "Southern California Coastal Lagoon Urban Runoff Management." This project requires land developers to incorporate low flow sand filters into project designs and to implement street sweeping programs. The performance of the filters and programs are monitored to incorporate design modifications as needed to improve performance.

Other implementation actions specified in the plan for Region 9 include the following regulatory and non-regulatory program(s).

REGULATORY PROGRAMS

Dairies

The Regional Board issues Waste Discharge Requirements which limit the amount of manure that can be applied per acre to agricultural land.

Erosion Control

The Regional Board implements policies requiring cities and counties to adopt erosion control ordinances. Thus, the Regional Board adopted Resolution No. 92-21, *A Resolution Concerning the Agreement Between the California Regional Water Quality Control Board, San Diego Region, and the Resource Conservation Districts of San Diego County Regarding the Erosion and Sediment Control Policy* (Resource Conservation Districts of San Diego County Erosion and Sediment Control Policy. In addition, staff reviews ordinances and assists with enforcement.

Subsurface Disposal Policy

Regional Board staff will develop criteria for minimum lot sizes for septic systems.

NON-REGULATORY PROGRAM

San Diego Bay Study

The Regional Board will continue a five year study to identify the sources and extent of water quality pollution in San Diego Bay. Possible nonpoint sources such as storm water runoff and past point source pollutants now bound to bottom sediments will be investigated.

CALIFORNIA OCEAN PLAN (RESOLUTION NO. 90-27)

Pacific Ocean, Scripps Pier

The *Water Quality Control Plan for Ocean Waters of California* (California Ocean Plan) was adopted by the State Board in 1972, and later revised in 1978, 1983, 1988 and 1990. The revision in effect at the time of this writing is Resolution No. 90 27, which was adopted by the State Board on March 22, 1990. The California Ocean Plan is applicable to all point source discharges to the ocean.

The California Ocean Plan is designed to protect the quality of the ocean waters for use and enjoyment by the people through the control of waste discharges to the ocean. The plan sets forth water quality objectives for ocean waters which impose limits on bacteriological, physical, chemical, biological, toxic, and radioactive characteristics for ocean waters in numerical and descriptive terms to ensure the reasonable protection of beneficial uses and the prevention of nuisance. Also, the plan describes requirements for management and design of systems discharging wastewaters to the ocean and effluent quality requirements for discharges. Systems must be designed and operated in a manner that will maintain the indigenous marine life and a healthy and diverse marine community. In addition, discharge prohibitions are placed on hazardous substances, warfare agents and high level radioactive wastes, sludge and digester supernatant, and bypassed untreated waste discharges. Furthermore, the plan states that "*Areas of Special Biological Significance*" shall be designated by the State Board. In these areas, the maintenance of natural water quality conditions must be assured. Waste discharges to ASBS are prohibited unless the State Board finds that there would be no adverse impact to beneficial uses. Lastly, discharge requirements within the California Ocean Plan include the maximum allowable monthly mass emission rates for each effluent quality constituent included therein.

The California Ocean Plan declares the State Board's intent to require continual monitoring of the marine environment to assure that the California Ocean Plan reflects the latest available data and that the water quality objectives are adequate to fully protect indigenous marine species and to protect human health.

CALIFORNIA WETLANDS CONSERVATION POLICY

The California Wetlands Conservation Policy was established by the Governor on August 23, 1993. The goal of the California Wetlands Conservation Policy is to establish a policy framework and strategy that will:

- Ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property;

- Reduce procedural complexity in the administration of State and Federal wetlands conservation programs; and

- Encourage partnerships to make landowner incentive programs and cooperative planning efforts the primary focus of wetlands conservation and restoration.

Three measures are identified to achieve these objectives, these include: (1) statewide policy initiatives; (2) regional strategies; and an (3) interagency wetlands task force.

Statewide Policy Initiative

These policy initiatives include a statewide wetlands inventory, support for wetlands planning, improved administration of existing wetland's regulatory programs, development and adoption of a consistent wetlands definition for state regulatory programs, development and adoption of a state policy regarding Army Corps of Engineers nationwide permits, development and adoption of consistent wetlands standards and guidelines, enhancing efficiency of and coordination in the wetland permitting process, encouragement of regulatory flexibility in situations in which wetlands are created unintentionally or incidentally to other activities, encouragement of regulatory flexibility to allow public agencies and water districts to create wetlands but later remove them if the wetlands are found to conflict with the primary purpose to which the property is devoted, strengthened landowner incentives to protect wetlands, support for mitigation banking, development and expansion of other wetlands programs, and integration of wetlands policy and planning with other environmental and land use processes.

Regional Strategies

These include three geographically based regional strategies in which wetlands programs can be implemented, refined, and combined in unique ways to achieve the goals and objectives of the wetlands policy. These three strategies are to be implemented in the Central Valley, the San Francisco Bay area, and Southern California. For Southern California, the regional strategy is to initiate better coordination and communication among diverse interests in southern California by establishing a "*Southern California Wetlands Joint Venture.*" This group would set long-term goals and priorities for the conservation of wetlands and develop a policy to achieve those goals, and would encourage a variety of demonstration projects designed to enhance the State's ability to constructively address regional wetlands issues.

Interagency Wetlands Task Force

This task force is to be created to direct and coordinate administration and implementation of the Wetlands Policy. This task force will be advisory to the Governor and help resolve inter-agency conflicts on wetlands. The task force will appoint an advisory committee of stakeholders and may seek additional technical advice as necessary.

CLEANUP AND ABATEMENT POLICIES AND PROCEDURES (RESOLUTION NO. 92-49)

The *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code section 13304* (Cleanup and Abatement Policies and Procedures) was adopted by State Board Resolution No. 92-49 on June 18, 1992, and amended on April 21, 1994. The Policy describes the procedures the State Board and the Regional Board follow in making decisions on investigations to determine the vertical and horizontal extent of a discharge, and the appropriate cleanup and abatement methods. The Policy applies to all investigations and cleanup and abatement activities, for all types of discharges subject to California Water Code (Water Code) section 13304.

Section 13304 applies to any person who discharges or who has discharged waste into waters of the State in violation of any waste discharge requirement or other order or prohibition issued by a Regional Board or the State Board, or who has caused or permitted, causes or permits, or threatens to cause or permit any waste to be discharged or deposited where it is, or probably will be, discharged into the waters of the State and creates, or threatens to create, a condition of pollution or nuisance. Section 13304 authorizes the Regional Board to require complete cleanup of all waste discharged and to require restoration of affected water to background conditions (i.e., the water quality that existed before the discharge). The Policy requires dischargers to clean up and abate the effects of discharges in a manner that promotes attainment of either background water quality, or the best water quality which is reasonable, if background levels of water quality cannot be restored. Cleanup levels prescribed by the State Board or Regional Boards must:

- Be consistent with maximum benefit to the people of the State; and
- Be established in a manner consistent with CCR, Title 23, Chapter 15 regulations.

Dischargers are required to carry out a phased investigation to determine the nature and extent of soil and ground water pollution at a site. The Policy describes various procedures to ensure that dischargers have the opportunity to select cost-effective methods, for detecting discharges, and for cleanup and abatement. The Policy also contains criteria for development of reasonable schedules for investigation and cleanup and abatement, or other remedial action at a site.

For further details about the Policy, the reader should refer to State Board Resolution No. 92 49.

WATER QUALITY ENFORCEMENT POLICY

The *Water Quality Enforcement Policy* became effective on May 20, 2010. This Policy addresses the enforcement component (i.e. actions that take place in response to a violation) of the Regional and State Boards' regulatory framework, which is a critical element of a successful regulatory program. Without a strong enforcement program to follow through on non-compliance, the entire regulatory framework would be in jeopardy. Enforcement is a critical ingredient in creating the deterrence needed to encourage the regulated community to anticipate, identify, and correct violations. The Policy includes a process for ranking of enforcement priorities, a methodology for calculating civil liability, and requires recording and reporting of enforcement data to the public and regulated community.

POLICY ON SUPPLEMENTAL ENVIRONMENTAL PROJECTS

The *Policy on Supplemental Environmental Projects* became effective on February 3, 2009. This Policy guides the process of the Regional or State Board accepting a Supplemental Environmental Project (SEP) that may allow a discharger to satisfy part of the monetary assessment imposed in an administrative civil liability (ACL). California Water Code section 13385(i) allows limited use of SEPs associated with mandatory minimum penalties and provides criteria and reporting requirements for qualifying SEPs.

ONSITE WASTEWATER TREATMENT SYSTEMS POLICY (RESOLUTION NO. 2012-0032)

The purpose of the *Water Quality Control Policy for Siting, Design, and Maintenance of Onsite Wastewater Treatment Systems*[1] (OWTS Policy) is to allow the continued use of OWTS, while protecting water quality and public health. The OWTS Policy was adopted by the State Board on June 19, 2012. The OWTS Policy recognizes that responsible local agencies can provide the most effective means to manage OWTS on a routine basis. It is the intent of the OWTS Policy to efficiently utilize and improve coordination between the State and local agencies to improve the implementation of the OWTS Policy for the protection of water quality. To accomplish this purpose, the OWTS Policy establishes a statewide, risk-based, tiered approach for the regulation and management of OWTS installations and replacements, and sets the level of performance and protection expected from OWTS. The OWTS Policy also allows Regional Boards to conditionally waive issuing Waste Discharge Requirements (WDRs) for OWTS that meet requirements specified in the Policy.

The regulation of OWTS is organized into five separate implementation tiers (tiers outlined in Chapter 4). An OWTS that meets the criteria of one of the five tiers is eligible for the conditional waiver of WDRs, with regulation of the qualifying OWTS deferred to the appropriate local agency.

[1]OWTS Policy can be found online at http://www.waterboards.ca.gov/

RECYCLED WATER POLICY (RESOLUTION NO. 2009-0011)

The main goals of the Recycled Water Policy are to provide direction to the Regional Boards, proponents of recycled water projects, and the public regarding the appropriate criteria to be used in issuing permits for recycled water projects; increase the use of recycled water from municipal wastewater sources; and streamline and expedite permitting of recycled water projects by the Regional Boards. These goals will help promote long-term protection of regional groundwater supplies. The Recycled Water Policy[2] was adopted by the State Board on February 9, 2009 and amended on January 22, 2013.

The Policy requires that by May 2014 individual salt and nutrient management plans (SNMPs) be developed for every groundwater basin in California. The SNMPs required by the Recycled Water Policy are to be developed by local stakeholder driven processes led mainly local water purveyors and wastewater agencies. The development of SNMPs allows for a more comprehensive approach to management of all contributors of salt and nutrient loading to groundwater on a basin-wide or watershed-basis; and in a manner that ensures attainment of water quality objectives and protection of beneficial uses.

The Recycled Water Policy specifies permitting criteria for landscape irrigation and groundwater recharge projects, and includes criteria for streamlined permitting. Irrigation projects that meet criteria specified in the Recycled Water Policy are entitled to a streamlined permitting process. The Recycled Water Policy also establishes a program to evaluate the risks of constituents of emerging concern to public health and the environment; and promotes incentives to encourage and facilitate recycled water use.

[2] Recycled Water Policy can be found online at: http://www.waterboards.ca.gov/

REGIONAL BOARD RESOLUTIONS

The San Diego Regional Board has adopted many resolutions which, in addition to the State Board Resolutions described previously, are important to the Regional Board's implementation of the Basin Plan. The Regional Board Resolutions that implement, interpret, or make specific the Basin Plan are incorporated into the Basin Plan are listed below.

Resolution No. 78-6
Adopted February 27 1978. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region.* This resolution deleted water quality objectives and beneficial uses for certain portions of basins 1.10, 1.20, 1.30, 1.40, 1.50, 2.10, 3.10, 4.10, 4.20, 4.30, 4.40, 4.50, 4.60, 5.10, 6.10, 7.10, and 11.10.

Resolution No. 79-25
Adopted March 26, 1979. *A Resolution Concerning the 'Agreement Between the California Regional Water Quality Control Board, San Diego Region and the Elsinore-Murrieta-Anza Resource Conservation District Regarding the Sediment Control Ordinance*.'

Resolution No. 79-44
Adopted June 25, 1979. *A Resolution Concerning 'Guidelines for New Community and Individual Sewerage Facilities.'*

Resolution No. 80-48
Adopted September 22, 1980. *A Resolution Concerning the San Diego County Department of Health Services Minimum Criteria for the Design and Construction of Evapotranspiration and Evapotranspiration-Infiltration Systems.*

Resolution No. 81-16
Adopted March 23, 1981. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region.* This resolution amended the beneficial uses and water quality objectives for the Aliso, Carlsbad, Agua Hedionda, Batiquitos and Telegraph hydrographic subareas.

Resolution No. 83-04
Adopted January 24, 1983. *A Resolution Adopting an Amendment to the Comprehensive Water Quality Control Plan for the San Diego Region.* This resolution amended the water quality objectives for nutrients in coastal lagoons.

Resolution No. 83-27
Adopted October 3, 1983. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region, San Elijo Hydrographic Subarea.*

Resolution No. 83-28
Adopted August 29, 1983. *A Resolution Supporting the County of San Diego's Moratorium on Subsurface Disposal Systems in the Valley Center Area.*

Resolution No. 84-20
Adopted August 27, 1984. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region, Mission San Diego Hydrographic Subarea.*

Resolution No. 85-89
Adopted December 16, 1985. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region, Mission San Diego Hydrographic Subarea and Sycamore Canyon Subarea, and a portion of the Santee Hydrographic Subarea.*

Resolution No. 85-92
Adopted December 16, 1985. *Designation of Class III Landfills Within the San Diego Region to Accept Shredder Wastes as Required by Section 25143.6 of the Health and Safety Code.*

Resolution No. 86-06
Adopted March 24, 1986. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region.* This resolution established a goal and action plan for encouraging and promoting water reclamation.

Resolution No. 87-71
Adopted November 16, 1987. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region.* This resolution established a policy on dairy waste management.

Resolution No. 87-91
Adopted December 21, 1987. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region.* This resolution established a policy on erosion and sediment control.

Resolution No. 88-06
Adopted February 8, 1988. *Policy on the Disposal of Shredder Waste*. The policy specifies the shredder waste must not exceed PCB levels of 50 milligrams per kilogram (mg/kg). Also, the shredder waste must be disposed on the last and highest lift in a closed disposal cell or in an isolated cell solely designated for the disposal of shredder waste.

Resolution No. 88-25
Adopted March 14, 1988. *A Resolution Regarding the Proposed State Water Resources Control Board Policy for Water Quality Control Defining 'Sources of Drinking Water' for the Purposes of Discharge Prohibitions.*

Resolution No. 88-49
Adopted April 25, 1988. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region for a Portion of the Otay Hydrographic Subunit.*

Resolution No. 88-97
Adopted October 3, 1988. *A Resolution Supporting the Proposed Interim Solution to the Tijuana Sewage Problem Consisting of a Sewage Treatment Plant Within the United States and an Ocean Outfall.*

Resolution No. 89-33.
Adopted April 10, 1989. *Incorporation of 'Sources of Drinking Water' Policy into the Water Quality Control Plan (Basin Plan) of the San Diego Region.*

Resolution No. 89-53
Adopted July 10, 1989. *Addition of Portions of the Otay Valley Hydrologic Area to the List of Waters Excepted From the 'Sources of Drinking Water' Policy.*

Resolution No. 90-27
Adopted April 23, 1990. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region, for the Mission San Diego and a Portion of the Santee Hydrologic Subareas.* This resolution establishes a biostimulatory substances water quality compliance methodology for part of the San Diego River.

Resolution No. 90-28
Adopted March 12, 1990. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region, for a Portion of the San Clemente Hydrologic Subunit.*

Resolution No. 90-53
Adopted September 24, 1990. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for Portions of the Santa Margarita Hydrologic Unit (2.00), San Diego Region.* This resolution establishes a biostimulatory substances water quality compliance methodology for part of the Santa Margarita River.

Resolution No. 90-61
Adopted November 5, 1990. *A Resolution Amending Resolution No. 90-40, A Regionwide Groundwater Amendment to the Comprehensive Water quality Control Plan for the San Diego Region.* This resolution revised the language regarding use of reclaimed water contained in Resolution No. 90-40, *A Resolution Reconsidering and Amending Resolution No. 90-26, 'A Regionwide Groundwater Amendment to the Comprehensive Water Quality Control Plan for the San Diego Region'*, and Resolution No. 90-26, *A Resolution Adopting A Regionwide Groundwater Amendment to the Comprehensive Water Quality Control Plan for the San Diego Region.*

Resolution No. 91-23
Adopted March 11, 1991. *A Resolution Amending Resolution No. 90-27, 'A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region, for the Mission San Diego and a Portion of the Santee Hydrologic Subareas.'*

Resolution No. 91-46
Adopted May 20, 1991. *A Resolution Rescinding and Replacing Resolution No. 88-91 and Addenda, and Establishing a Regional Board Drought Policy.*

Resolution No. 91-79
Adopted December 9, 1991. *A Resolution Amending Resolution No. 90-55, 'Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region.'* This resolution establishes revised Basin Plan chapters for beneficial uses and water quality objectives.

Resolution No. 92-21
Adopted April 6, 1992. *A Resolution Concerning the Agreement Between the California Regional Water Quality Control Board, San Diego Region, and the Resource Conservation Districts of San Diego County Regarding the Erosion and Sediment Control Policy.*

Resolution No. 93-02
Adopted February 1, 1993. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region for the Escondido Hydrologic Subarea (4.62).*

Resolution No. 94-09
Adopted February 10, 1994. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region, Portions of the Pauba (2.51) and Wolf (2.52) Hydrologic Subareas.*

Resolution No. 94-10
Adopted September 8, 1994. *A Resolution Adopting an Update to the Water Quality Control Plan for the San Diego Basin.*

Resolution No. 94-25
Adopted February 10, 1994. *A Resolution Adopting Amendments to the Comprehensive Water Quality Control Plan for the San Diego Region for the Laguna (1.10), Mission Viejo (1.20), and San Clemente (1.30) Hydrologic Areas.*

Resolution No. 94-139
Adopted October 13, 1994. *A Resolution Adopting Amendments to the Water Quality Control Plan for a portion of the Poway Hydrologic Area (6.20).*

Resolution No. 95-48
Adopted May 16, 1995. *A Resolution Adopting Amendments to the Water Quality Control Plan for the Alluvial Aquifer of the Moosa (903.13) and the Valley Center (903.14) Hydrologic Subareas.*

Resolution No. 95-115
Adopted October 12, 1995. *A Resolution Adopting Amendments to the Water Quality Control Plan for the San Diego Basin (9), Table 4-4. Types of Discharges Identified for Conditional Waiver of Waste Discharge Requirements.*

Resolution No. 96-30
Adopted May 9, 1996. *A Resolution Adopting an Amendment to the Water Quality Control Plan for the San Diego Region.* This resolution provides an Exception to the Prohibition of Discharges of Recycled Wastewater to Surface Water Bodies Used for Municipal Water Supply.

Resolution No. 96-34
Adopted August 8, 1996. *A Resolution Adopting an Amendment to the Water Quality Control Plan for the San Diego Region, Table 4-4, Item 24, Composting and Processing, Mulching, or Grinding Waste Management Units.*

Resolution No. 97-04
Adopted March 12, 1997. *A Resolution Adopting Amendments to the Water Quality Control Plan for the San Diego Basin for the Designation of COLD and SPWN Beneficial Uses.*

Resolution No. R9-2002-0123
Adopted August 14, 2002. *Total Maximum Daily Load (TMDL) for Diazinon in Chollas Creek Watershed, San Diego County.*

Resolution No. R9-2005-0019
Adopted February 9, 2005. *Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay*.

Resolution No. R9-2005-0036
Adopted February 9, 2005. *A Resolution Adopting an Amendment to the Water Quality Control Plan for the San Diego Region (9) to Incorporate Total Maximum Daily Loads (TMDLs) for Total Nitrogen and Total Phosphorus in the Rainbow Creek Watershed, San Diego County.*

Resolution No. R9-2005-0238
Adopted November 9, 2005. *Resolution Amending the Water Quality Control Plan for the San Diego Basin (9) to Incorporate Authorization for Compliance Time Schedules in National Pollutant Discharge Elimination System Requirements (Basin Plan Issue No. 6).*

Resolution No. R9-2005-0239
Adopted November 9, 2005. *A Resolution Amending the Water Quality Control Plan for the San Diego Basin (9) to Add Unnamed or Unidentified Waterbodies to the Beneficial Use Tables and Make Water Quality Objective Table Corrections (Basin Plan Issue No. 3).*

Resolution No. R9-2006-0029
Adopted April 12, 2006. *Resolution Amending the Water Quality Control Plan for the San Diego Basin (9) to Edit and Reformat Text, and Update Graphics; and Reinstating Text on "Controllable Water Quality Factors" (Basin Plan Issue No. 1)*

Resolution No. R9-2007-0043
Adopted June 13, 2007. *A Resolution Adopting an Amendment to the Water Quality Control Plan for the San Diego Basin (9) to Incorporate Total Maximum Daily Loads for Dissolved Copper, Lead and Zinc in Chollas Creek, Tributary to San Diego Bay, and to Revise the Toxic Pollutants Section of Chapter 3 to Reference the California Toxics Rule.*

Resolution No. R9-2008-0027
Adopted June 11, 2008. *A Resolution to Adopt an Amendment to the Water Quality Control Plan for the San Diego Basin (9) to Incorporate Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay.*

Resolution No. R9-2008-0028.
Adopted May 14, 2008. *A Resolution Amending the Water Quality Control Plan for the San Diego Basin (9) to Incorporate Implementation Provisions for Indicator Bacteria Water Quality Objectives to Account for Loading from Natural Uncontrollable Sources within the Context of a Total Maximum Daily Load.*

Resolution No. R9-2010-0001
Adopted February 10, 2010. *A Resolution Amending the Water Quality Control Plan for the San Diego Basin (9) to Incorporate Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).*

Resolution No. R9-2012-0033
Adopted June 13, 2012. *A Resolution Amending the Water Quality Control Plan for the San Diego Basin (9) to Incorporate the Total Maximum Daily Load for Sedimentation in Los Peñasquitos Lagoon.*

REPRINT OF RESOLUTION NO. 77-1

STATE WATER RESOURCES CONTROL BOARD

RESOLUTION NO. 77-1

POLICY WITH RESPECT TO WATER RECLAMATION IN CALIFORNIA

WHEREAS:

1. The California Constitution provides that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that waste or unreasonable use or unreasonable method of use of water be prevented, and that conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare;

2. The California Legislature has declared that the State Water Resources Control Board and each Regional Water Quality Control Board shall be the principal state agencies with primary responsibility for the coordination and control of water quality;

3. The California Legislature has declared that the people of the State have a primary interest in the development of facilities to reclaim water containing waste to supplement existing surface and underground water supplies;

4. The California Legislature has declared that the State shall undertake all possible steps to encourage the development of water reclamation facilities so that reclaimed water may be made available to help meet the growing water requirements of the State;

5. The Board has reviewed the document entitled "*Policy and Action Plan for Water Reclamation in California*," dated December 1976. This document recommends a variety of actions to encourage the development of water reclamation facilities and the use of reclaimed water. Some of these actions require direct implementation by the Board; others require implementation by the Executive Officer and the Regional Boards. In addition, this document recognizes that action by many other state, local, and federal agencies and the California State Legislature would also encourage construction of water reclamation facilities and the use of reclaimed water. Accordingly, the Board recommends for its consideration a number of actions intended to coordinate with the program of this Board;

6. The Board must concentrate its efforts to encourage and promote reclamation in water-short areas of the State where reclaimed water can supplement or replace other water supplies without interfering with water rights or instream beneficial uses or placing an unreasonable burden on present water supply systems; and

7. In order to coordinate the development of reclamation potential in California, the Board must develop a data collection, research, planning, and implementation Program for water reclamation and reclaimed water uses.

THEREFORE, BE IT RESOLVED:

1. That the State Board adopts the following Principles:

   I. The State Board and the Regional Boards shall encourage, and consider or recommend for funding, water reclamation projects which meet Condition 1, 2, or 3 below and which do not adversely impact vested water rights or unreasonably impair instream beneficial uses or place an unreasonable burden on present water supply systems;

(1) Beneficial use will be made of wastewaters that would otherwise be discharged to marine or brackish receiving waters or evaporation ponds,

(2) Reclaimed water will replace or supplement the use of fresh water or better quality water,

(3) Reclaimed water will be used to preserve, restore, or enhance instream beneficial uses which include, but are not limited to, fish, wildlife, recreation and esthetics associated with any surface water or wetlands.

II. The State Board and the Regional Boards shall (1) encourage reclamation and reuse of water in water-short areas of the State, (2) encourage water conservation measures which further extend the water resources of the State, and (3) encourage other agencies, in particular the Department of Water Resources, to assist in implementing this policy.

III. The State Board and the Regional Boards recognize the need to protect the public health including potential vector problems and the environment in the implementation of reclamation projects.

IV. In implementing the foregoing Principles, the State Board or the Regional Boards, as the case may be, shall take appropriate actions, recommend legislation, and recommend actions by other agencies in the areas of (1) planning, (2) project funding, (3) water rights, (4) regulation and enforcement, (5) research and demonstration, and (6) public involvement and information.

2. That, in order to implement the foregoing Principles, the State Board:

(a) Approves Planning Program Guidance Memorandum No. 9, "*PLANNING FOR WASTEWATER RECLAMATION*,"

(b) Adopts amendments and additions to Title 23, California Administrative Code sections 654.4, 761, 764.9, 783, 2101, 2102, 2107, 2109, 2109.1, 2109.2, 2119, 2121, 2133(b)(2), and 2133(b)(3),

(c) Approves Grants Management Memorandum No. 9.01, "*WASTEWATER RECLAMATION*,"

(d) Approves the Division of Planning and Research, Procedures and Criteria for the Selection of Wastewater Reclamation Research and Demonstration Project,

(e) Approves "*GUIDELINES FOR REGULATION OF WATER RECLAMATION*,"

(f) Approves the Plan of Action contained in Part III of the document identified in Finding Five above,

(g) Directs the Executive Officer to establish an Interagency Water Reclamation Policy Advisory Committee. Such Committee shall examine trends, analyze implementation problems, and report annually to the Board the results of the implementation of this policy, and

(h) Authorizes the Chairperson of the Board and directs the Executive Officer to implement the foregoing Principles and the Plan of Action contained in Part III of the document identified in Finding Five above, as appropriate.

3. That not later than July 1, 1978, the Board shall review this policy and actions taken to implement it, along with the report prepared by the Interagency Water Reclamation Policy Advisory Committee, to determine whether modifications to this policy are appropriate to more effectively encourage water reclamation in California.

4. That the Chairperson of the Board shall transmit to the California Legislature a complete copy of the "*Policy and Action Plan for Water Reclamation in California*."

CERTIFICATION

The undersigned, Executive Officer of the State Water Resources Control Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a special meeting of the State Water Resources Control Board held on January 6, 1977.

Original signed by

Bill B. Dendy

Executive Officer

State Water Resources Control Board

REPRINT OF RESOLUTION NO. 88-63

STATE WATER RESOURCES CONTROL BOARD

RESOLUTION NO. 88-63

ADOPTION OF POLICY ENTITLED "*SOURCES OF DRINKING WATER*"

WHEREAS:

1. California Water Code section 13140 provides that the State Board shall formulate and adopt State Policy for Water Quality Control; and,

2. California Water Code section 13240 provides that Water Quality Control Plans "*shall conform*" to any State Policy for Water Quality Control; and,

3. The Regional Boards can conform the Water Quality Control Plans to this policy by amending the plans to incorporate the policy; and,

4. The State Board must approve any conforming amendments pursuant to Water Code section 13245; and,

5. "*Sources of drinking water*" shall be defined in Water Quality Control Plans as those water bodies with beneficial uses designated as suitable, or potentially suitable, for municipal or domestic water supply (MUN); and,

6. The Water Quality Control Plans do not provide sufficient detail in the description of water bodies designated MUN to judge clearly what is, or is not, a source of drinking water for various purposes.

THEREFORE BE IT RESOLVED:

All surface and ground waters of the state are considered to be suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Boards 1 with the exception of:

1. Surface and ground waters where:

   a. The total dissolved solids (TDS) exceed 3,000 mg/l (5,000 μS/cm, electrical conductivity) and it is not reasonably expected by Regional Boards to supply a public water system, or

   b. There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or

   c. The water source does not provide sufficient water to supply a single well capable of producing an average sustained yield of 200 gallons per day.

2. Surface waters where:

   a. The water is in systems designed or modified to collect or treat municipal or industrial wastewaters, process waters, mining wastewaters, or storm water runoff, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards; or,

b. The water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards.

3. Ground water where:

The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, section 261.3.

4. Regional Board Authority to Amend Use Designations:

Any body of water which has a current specific designation previously assigned to it by a Regional Board in Water Quality Control Plans may retain that designation at the Regional Board's discretion. Where a body of water is not currently designated as MUN but, in the opinion of a Regional Board, is presently or potentially suitable for MUN, the Regional Board shall include MUN in the beneficial use designation.

The Regional Boards shall also assure that the beneficial uses of municipal and domestic supply are designated for protection wherever those uses are presently being attained, and assure that any changes in beneficial use designations for waters of the State are consistent with all applicable regulations adopted by the Environmental Protection Agency.

The Regional Boards shall review and revise the Water Quality Control Plans to incorporate this policy.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a policy duly and regularly adopted at a meeting of the State Water Resources Control Board held on May 19, 1988.

Original signed by

Maureen Marche

Administrative Assistant to the Board

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[1] This policy does not affect any determination of what is a potential source of drinking water for the limited purposes of maintaining a surface impoundment after June 30, 1988, pursuant to section 25208.4 of the Health and Safety Code.

CHAPTER 6
SURVEILLANCE, MONITORING AND ASSESSMENT

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6. SURVEILLANCE, MONITORING AND ASSESSMENT

INTRODUCTION

Laboratory

California's well-being is linked to the health of its water. To protect and preserve this basic resource, the State Board and the Regional Board closely monitor water quality throughout the state. A comprehensive surveillance and monitoring program provides basic information needed to evaluate the effectiveness of California's water quality control program.

Historically, a wide variety of interested state, federal, and local agencies have sampled, analyzed, and tracked water quality. The State Board monitoring program coordinates existing information, and supplements it where necessary to meet data needs.

The Porter-Cologne Water Quality Control Act delegates primary responsibility for coordination and control of water quality in California to the State Board. Section 13163 of the Act states that in conducting this mission, the State Board shall coordinate water quality investigations, recognizing that other state agencies may have primary statutory responsibility for such investigations, and shall consult with the concerned Regional Boards in implementing this section.

Pursuant to these mandates, the State Board in 1976 established a coordinated Primary Water Quality Monitoring Network for California. Participants in the coordinated Primary Network included the California Departments of Fish and Game (DFG), Water Resources (DWR), and Health Services (DHS) as well as the Federal Bureau of Reclamation, United States Geologic Survey (USGS), and the United States Environmental Protection Agency (USEPA).

The goal of the Primary Network has been to provide an overall, continuous assessment of water quality in the State. This goal is to be achieved by statewide monitoring of water quality parameters that can affect beneficial uses of state waters.

This chapter contains a discussion of the objectives and various elements of the State and Regional Board's surveillance and monitoring programs. Not all of these programs are currently active in the San Diego Region, as many are unfunded at this time.

STATE SURVEILLANCE AND MONITORING PROGRAMS

The State's surveillance and monitoring programs are designed to assure the collection of data necessary to:

- Establish and review water quality standards, goals, and objectives;
- Determine maximum daily loadings, waste load allocations, and effluent limitations;
- Perform segment classifications and ranking; and
- Establish the relationship between water quality and individual point and nonpoint sources of pollutants.

These data must be verified and properly interpreted to evaluate water quality trends and to make the necessary changes in the enforcement and/or planning programs to carry out program objectives. Output based upon data obtained from this program is used to prepare reports satisfying the requirements of federal Clean Water Act, sections 104, 106, 208, 301, 303, 304, 305, 307, 308, 314, 402, and the applicable portions of the State's Porter-Cologne Water Quality Control Act.

The overall objectives of the State's surveillance and monitoring program are:

- To measure the achievement of water quality goals and objectives specified in the Basin Plan;
- To measure specific effects of water quality changes on the established beneficial uses;

- To measure background conditions of water quality and determine long-term trends in water quality;
- To locate and identify sources of water pollution that pose an acute, accumulative, and/or chronic threat to the environment;
- To provide information needed to relate receiving water quality to mass emissions of pollutants by waste dischargers;
- To provide data for determining compliance with permit conditions;
- To provide the documentation necessary to support the enforcement of permit conditions and waste discharge requirements;
- To measure waste loads discharged to receiving waters and to identify the limits of their effects, and in water quality limited segments, to prepare waste load allocations necessary to achieve water quality control;
- To provide data needed to carry on the continuing planning process;
- To provide a clearinghouse for the collection and dissemination of water quality data gathered by other agencies and private parties cooperating in the program;
- To measure the effects of water rights decisions on water quality and to guide the State Board in its responsibility to regulate unappropriated water for the control of quality; and
- To prepare reports on water quality conditions as required by federal and state regulations and other users requesting water quality data.

The surveillance and monitoring program is designed to meet the objectives set forth above. An optimum surveillance and monitoring program requires flexibility and must be able to respond to needs specified in the Basin Plan as it is implemented and revised. To ensure that the surveillance and monitoring program is flexible and adapts to change, statewide water quality assessments are performed every two years to provide a timely cycle to evaluate the program's effectiveness and make appropriate changes.

The surveillance and monitoring program provides for collection and analysis of samples and the reporting of water quality data. It includes laboratory support and quality assurance, storage of data for rapid and systematic retrieval, and preparation of reports and data summaries. Most importantly, it includes interpretation and evaluation of data leading to recommendations for action.

Surveillance and monitoring at the State level is made up of three programs. These are the Toxic Substance Monitoring, State Mussel Watch and Bay Protection and Toxic Cleanup Programs.

San Mateo Creek steelhead trout

TOXIC SUBSTANCE MONITORING PROGRAM

One method of monitoring for toxic substances (toxic elements and organic compounds) is to collect and analyze water samples. A major problem with this approach is that toxic discharges are likely to occur in an intermittent fashion and thus are likely to be missed with "*grab*" sampling of the water. Another limitation to analyzing water samples is that generally, harmful toxicants are present in low concentrations in the water. Toxicants are concentrated through the aquatic food chain through the process of bioaccumulation. Thus, in the Toxic Substances Monitoring Program, the flesh of fish and other aquatic organisms is analyzed for toxic metals and synthetic organic compounds.

Streams and lakes in the region are sampled according to their importance to the State in terms of water quality. Priority is given to waters where contaminants are suspected and/or to waters where no other source of water quality information is available. Routine chemical and biological water monitoring is performed by the DWR and/or USGS; and toxic substances monitoring of resident organisms is performed by the DFG.

The objectives of the Toxic Substance Monitoring program are:

- To develop statewide baseline data and to demonstrate trends in the occurrence of toxic elements and organic substances in the aquatic biota;
- To assess impacts of accumulated toxicant upon the usability of State waters by man;
- To assess impacts of accumulated toxicant upon the aquatic biota; and
- Where problem concentrations of toxicant are detected, to attempt to identify sources of toxicant and to relate concentrations found in the biota to concentrations found in the water.

The samples collected in the Toxic Substance Monitoring program are benthic invertebrates and fish. The flesh of bivalve mollusks or crayfish tailflesh and fish livers are analyzed for important metals, including arsenic, cadmium, chromium, copper, lead, nickel, silver, and zinc; fish flesh is analyzed for mercury. In addition, both invertebrate and fish flesh samples are analyzed for 55 synthetic organic compounds, most of which are pesticides. Toxic Substance Monitoring reports have been published annually since 1977.

STATE MUSSEL WATCH PROGRAM

The State Mussel Watch (Mussel Watch) program provides documentation of the quality of coastal marine and estuarine waters. The Mussel Watch program fulfills the goal of providing the state with long-term trends in the quality of these waters. Mussels were chosen as the indicator organism for trace metals and synthetic organic compounds in the coastal and estuarine waters. Although the mussel populations of bays and estuaries are of a different species than those found in the open coast; their suitability as sentinels for monitoring the presence of toxic pollutants stems from several factors including: (1) their ubiquity along the California coast; (2) their ability to concentrate pollutants above ambient sea water levels and to provide a time-averaged sample; and (3) their non-motile nature which permits a localized measurement of water quality. The trace metals analyzed for in mussel tissues include aluminum, cadmium, chromium, copper, lead, manganese, mercury, nickel, silver, and zinc. Synthetic organic compounds analyzed for are summarized in Table 6-1.

TABLE 6 - 1. SYNTHETIC ORGANIC COMPOUNDS ANALYZED IN THE STATE MUSSEL WATCH AND TOXIC SUBSTANCES MONITORING PROGRAMS

Aldrin	P, P'- DDE	Endosulfan [2]	Methyl Parathion
Chlorbenside	O, P'- DDE	Endosulfan Sulfate	Oxadiazon [2]
alpha Chlordane	P, P'- DDD	Total Endosulfan	PCB 1248
gamma Chlordane	O, P'- DDD	Ethyl Parathion	PCB 1254
cis Chlordane	P, P'- DDMS	Heptachlor	PCB 1260
trans Chlordane	P, P'- DDMU	Heptachlor Epoxide	Total PCB
Oxychlordane	O, P'- DDT	Heptachlorobenzene	Pentachlorophenol [1]
Total Chlordane	P, P'- DDT	alpha Lindane	Phenol [1]
cis Nonachlor	Total DDT	beta Lindane	Ronnel [1]
trans Nonachlor	Diazinon	gamma Lindane	Tetrachlorphenol [1]
Chlorpyrifos	Dieldrin	delta Lindane	Tetradifon [1]
Dacthal	Endrin	Total Lindane [2]	Toxaphene
Dicofol [2]	Endosulfan [1]	Methoxychlor	Tributylin [1]

[1] These constituents only sampled in the State Mussel Watch Program.
[2] These constituents only sampled in the Toxic Substances Monitoring Program.

When compared with alternative sampling designs such as seawater and sediment sampling, the Mussel Watch program is a more cost effective program. Mussel Watch reports have been published annually since 1978.

During the 1977 and 1978 sampling periods, the focus of the Mussel Watch program was, for the most part, on open coast monitoring of sites outside the vicinity of known pollutant sources. Monitoring of water quality in the State Board's designated Areas of Special Biological Significance (ASBS), to establish baseline conditions relating to the range of typical conditions in water, sediment and biota, was given prime importance in the early years of the program.

Based on the identification of "*hot spot*" areas during 1977 and 1978, intensive sampling of these areas was implemented in 1979. Such a sampling strategy was intended to confirm previous findings, establish the magnitude of the potential problem and identify pollutant sources. The program has since evolved to include transplanting *Mytilus californianus* mussels into select California bays and estuaries at selected sites to confirm potential toxic substance pollution (i.e., in the vicinity of dischargers).


San Diego Bay

BAY PROTECTION AND TOXIC CLEANUP PROGRAM

California Water Code, Division 7, Chapter 5.6 established a comprehensive program within the State Board to protect the existing and future beneficial uses of California's bays and estuaries. The Bay Protection and Toxic Cleanup Program (BPTCP) provides focus on the State Board and regional boards efforts to control pollution of the State's bays and estuaries. The BPTCP also establishes a program to identify toxic hot spots and plan for their cleanup. Chapter 5.6, sections 13390 through 13396.5 were added to Division 7 of the California Water Code by SB 475 (Stats. 1989, Chapter 269), SB 1845 (Stats. 1990, Chapter 1294), and AB 41 (Stats. 1989, Chapter 1032). New legislation (SB 1084 Calderon; Stats. 1993, Chapter 1157) extends program funding through 1998. The BPTCP is a statewide program which is coordinated with the DFG and California Environmental Protection Agency's (Cal-EPA's) Office of Environmental Health Hazard Assessment. The program was established: (1) to provide protection for existing and future beneficial uses of bay and estuarine waters; (2) to provide a plan for remedial action at toxic hot spots; (3) to further compliance with federal law pertaining to the identification of waters where the protection and propagation of shellfish, fish, and wildlife are threatened by toxic pollutants and contribute to the development of effective strategies to control these pollutants; and (4) to allow these programs to be structured and maintained in a manner which allows the State and Regional Boards to make maximum use of any federal funds which may be available for the program. To attain the goals of the program, the State and Regional Boards are required to do the following:

- Develop and maintain a program to identify toxic hot spots, plan for their cleanup or mitigation, and amend water quality control plans and policies to abate toxic hot spots;
- Formulate and adopt a water quality control plan for enclosed bays and estuaries;
- Review and, if necessary, revise waste discharge requirements to conform to the plan;
- Develop a database of toxic hot spots;
- Develop an ongoing monitoring and surveillance program;
- Develop sediment quality objectives;
- Develop criteria for the assessment and priority ranking of toxic hot spots; and
- Fund the program through fees on point and nonpoint dischargers (Title 17 California Code of Regulations section 2236).

Program accomplishments include:

- Adoption of an approach for establishing sediment quality objectives;
- Installation of a computer system for a consolidated database of information being collected to identify toxic hot spots;

- Implementation of regional monitoring program;

- Development of draft site ranking criteria to be used for priority ranking of toxic hot spots; and

- Implementation of a fee system supporting the program.

The development of regional and statewide cleanup plans is ongoing. For the period July, 1992 through June, 1994 there are two main sediment sampling and analysis efforts for the BPTCP. The first includes toxicity screening where the primary goal is to determine bioassay protocols, establish reference sites and a consolidated database. The second is measurement of the bioeffects associated with toxicants. This includes a survey of sediment contamination and toxicity; two independent toxicity tests including ten-day solid phase amphipod survival, and pore-water test of sea urchin egg fertilization; chemical analyses of sediment samples including trace metals, pesticides, hydrocarbons, tributyltin, acid volatile sulfides and selected normalizers (such as grain size and total organics). Surveillance and monitoring sites in this region are located in the Pacific Ocean, Tijuana River, San Diego Bay, and Mission Bay.

In addition, the San Diego Region BPTCP includes an Underwater Hull Cleaning (UHC) study and a water circulation study for San Diego Bay. The components of the UHC study includes surveys, water sampling and recommendations. The results of the UHC study should assist the Regional Board to determine appropriate regulations for underwater hull cleaners.

REGIONAL SURVEILLANCE AND MONITORING PROGRAMS

The Regional Board participates in the implementation of the following surveillance and monitoring programs:

- Compliance Inspections and Monitoring;
- Complaint Investigation;
- Intensive Surveys;
- Municipal Storm Water Monitoring;
- Water Quality Assessment Activities; and
- Quality Assurance and Quality Control.

COMPLIANCE INSPECTIONS AND MONITORING

The Regional Board ensures compliance with the Water Quality Control Plan, NPDES permits and WDRs through implementation of a comprehensive self monitoring program and compliance inspection program.

COMPLIANCE MONITORING

Compliance monitoring provides data which is used to determine compliance with discharge requirements and receiving water standards and to support enforcement actions. Data are collected from self monitoring reports generated by waste dischargers.

Self monitoring reports submitted to the Regional Board are reviewed, and if violations are noted, appropriate action is taken, ranging from administrative enforcement to judicial abatement depending on the circumstances. Self monitoring data have also been used to develop pollutant loadings and to indicate the general improvement noted in the receiving water.

Self monitoring report requirements are dependent on the type and quantity of effluent discharged. For example, the City of San Diego, Water Utilities Department, conducts an Ocean Monitoring Program as part of the environmental monitoring requirements for the Point Loma Sewage Outfall. The program includes chemical and biological testing of ocean waters, sediments, fish, and benthic infauna. Most of the monitoring stations are in close vicinity to the Point Loma Sewage Outfall; however, stations range geographically from the shoreline to six miles offshore and from La Jolla to the Mexican border.

COMPLIANCE INSPECTIONS

Regional Board staff periodically conducts inspections of all dischargers regulated under an NPDES permit or waste discharge requirements. Treatment, storage, and discharge facilities are inspected to determine compliance with the permit. Compliance inspection reports are written based on staff inspections of a particular site and include observations made by staff and/or results of analyses performed on samples collected by staff. During the inspections facts and information are gathered to assess the degree of compliance with the following NPDES permit or WDR provisions:

- Effluent and receiving water limitations;
- Self-monitoring reports;
- Record keeping and reporting;
- Compliance time schedules, if applicable;
- Best management plans, if applicable; and
- Other conditions, provisions and prohibitions.

During some inspections, samples are collected to further determine compliance. Inspections can be either announced or unannounced. Announced inspections facilitate direct communication with the discharger to review procedures and operations. Unannounced inspections have the advantage that staff can witness normal day-to-day operations without giving the discharger the opportunity to prepare for the visit. Upon discovery of a noncompliance the procedures discussed in the enforcement section of Chapter 4 are followed to gain correction.

COMPLAINT INVESTIGATIONS

This task involves investigation of complaints of citizens and public or governmental agencies on the discharge of pollutants or creation of nuisance conditions. It is a Regional Board responsibility to prepare reports or letters and follow-up actions to document observed conditions and to institute appropriate corrective actions. In instances where the Regional Board cannot respond to a complaint because of resource limitations, the Regional Board notifies other agencies if it falls within their jurisdiction.

The Regional Board strives to ensure that responses to complaints involving threats to water quality be made in an expedient manner, as resources allow. For the purpose of this policy, response includes the following three components: (1) Thorough documentation of complaints; (2) Appropriate follow-up including site inspections, referral to, or notification of, other regulatory agencies, corrective actions, enforcement actions, etc.; and (3) Notification to complainant, as appropriate, of findings and subsequent actions.

DEFINITION OF ACTIVITIES

Complaint activities include all activities necessary to respond to a complaint or incident including the following: (1) Receiving and documenting complaints/incidents (e.g., spills); (2) Any follow-up activities to gather additional information (e.g., research, telephone contacts, coordination with other agencies, etc.); (3) Preparation for any field inspections necessary to investigate a complaint/incident; (4) Field inspections, including travel; (5) Sampling of spill and/or receiving waters for documentation, if appropriate; and (6) Documenting findings and responding to complainant.

NOTIFICATION TO OTHER AGENCIES

The Regional Board notifies other responsible regulatory agencies (e.g., Public Health, DHS, DFG, Department of Food and Agriculture, Integrated Solid Waste Management Board) of the content of a complaint if it falls within said agency's jurisdiction.

Except for a discharge in compliance with waste discharge requirements, any person who causes or permits any reportable quantity of hazardous substance or sewage to be discharged in or on any waters of the State, or discharged or deposited where it is or probably will be discharged in or on any waters of the State, shall, as soon as possible, notify the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State toxic disaster contingency plan. The person shall also immediately notify the State Board or appropriate Regional Board of the discharge (Water Code section 13271).

Similarly, any person who discharges any oil or petroleum product under the above-stated conditions shall, as soon as possible, notify the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State oil spill contingency plan. Immediate notification of an appropriate agency of the federal government, or of the appropriate Regional Board (in accordance with the reporting requirements set under Water Code section 13267 or 13383) shall satisfy the oil spill notification requirements of this paragraph (Water Code section 13272).

REPORTABLE QUANTITIES OF HAZARDOUS WASTE AND SEWAGE DISCHARGES

Water Code section 13271 requires that the State Board and the DHS adopt regulations establishing reportable quantities for substances listed as hazardous wastes or hazardous materials pursuant to section 25140 of the Health and Safety Code. Reportable quantities are those which should be reported because they may pose a risk to public health or the environment if discharged to ground or surface water.

Similarly, the State Board was required to adopt regulations establishing reportable quantities for sewage. These regulations for sewage and hazardous materials discharge do not supercede waste discharge requirements or water quality objectives.

The State Board adopted regulations for reportable quantities are included in subchapter 9.2 of the California Code of Regulations.

INSPECTION IN RESPONSE TO COMPLAINTS

The Regional or State Board may inspect the facilities of any discharger at any time pursuant to Water Code, section 13267. Such inspections should normally be conducted with consent of the occupant and/or owner of the facilities. If an inspection request is refused by any occupant of the premises, an effort to gain access should be made with the owner of the premises. The Clean Water Act and California Water Code provide that a credentialed inspector must be allowed entry to the facilities subject to regulation under these laws. Regional Board staff do not inspect sites which pose a threat to their health or safety. For sites which could involve toxic and hazardous materials field work, a Health Evaluation Plan (HEP) is completed.

If all attempts to obtain consent fail, the inspection may be made pursuant to a warrant in accordance with the procedure set forth in Title 13, section 13267(c). In all cases where an inspection warrant is required, staff of the State Board's Office of Chief Counsel is consulted relative to procedures.

An inspection is permitted without consent and without a warrant when there is an emergency which affects the public health or safety. Advice from the State Board's Office of Chief Counsel is sought before making such an inspection.

When an inspection is done in response to a complaint, and the inspector may be entering an *"unknown"* situation, every safety precaution is taken. Again, in no instance does staff make an inspection of a site which may pose a threat to their health and safety. Thorough notes and documentation are made during the inspection, including photographs, if appropriate. After an inspection is completed, an inspection report is prepared describing what was found.

FINDINGS OF NONCOMPLIANCE

If during the course of a complaint investigation, a noncompliance is discovered, procedures as outlined in the enforcement section of Chapter 4 (Implementation chapter) are followed.

INTENSIVE SURVEYS

Intensive monitoring surveys provide detailed water quality data to locate and evaluate violations of receiving water standards, to develop waste load allocations and to assess the water quality condition.

They usually involve localized, intermittent sampling at a higher than normal frequency. Intensive surveys should be repeated at appropriate intervals depending on the parameters involved, the variability of conditions, and changes in hydrologic or effluent regimes.

MUNICIPAL STORM WATER MONITORING

The storm water permitting program has been established to protect water quality of the water bodies which receive storm water runoff. (For a complete description of this program, refer to Chapter 4, Implementation chapter). Sampling of storm water runoff has indicated that storm water discharges contain significant amounts of pollutants. Therefore, the Region's municipal storm water permits requires the permittee to develop comprehensive management and monitoring programs. Because each permit generally covers a large number of water bodies, the required monitoring program is in two phases.

Phase I requires the discharger to sample storm water discharges and to sample those receiving waters where the beneficial uses are threatened or impaired due to runoff of storm water and urban nuisance water. Phase I requires both a dry and wet weather monitoring program. San Diego copermittees are required to sample two major types of runoff stations: (1) mass loading; and (2) land use stations. The dry weather monitoring program requires periodic colorimetric field tests and visual inspections of the storm water conveyance system to detect non-storm water flows. Under Phase II the dischargers will be required to develop storm water management and monitoring programs for the remaining water bodies included under the permit.

Storm water discharges from urbanized areas consist mainly of surface runoff emanating from residential, commercial, and industrial areas. In addition, there are storm water discharges from agricultural and other land uses. The constituents of concern in these discharges include: total and fecal coliform, *enterococcus*, total suspended solids, biochemical oxygen demand, chemical oxygen demand, total organic carbon, oil and grease, heavy metals, nutrients, base/neutral and acid extractables, pesticides, herbicides, petroleum hydrocarbon products, and/or those causing extremely high or low pH.

The objectives of the storm water monitoring program are to: (1) define the type, magnitude, and sources of pollutants in the storm water discharges within the permittee's jurisdiction so that appropriate pollution prevention and correction measures can be identified; (2) evaluate the effectiveness of pollution prevention and correction measures; and (3) evaluate compliance with water quality objectives established for the storm water system or its components.


Sampling biota

BIENNIAL CLEAN WATER ACT SECTIONS 303(D), 305(B), AND 314 INTEGRATED REPORT

Every two years states are required to provide an assessment of the quality of all their waters and a list of those waters that are impaired or threatened, in accordance with the following sections of the Clean Water Act:

Section 303(d): Requires states to identify waters for which technology based effluent limitation are not stringent enough to meet applicable water quality standards. States must establish a priority ranking for such waters and must establish TMDLs for all such waters in accordance with the priority ranking. Waters identified and prioritized for TMDL development under section 303(d) (a.k.a. the 303(d) List) are designated as Water Quality Limited Segments (WQLSs).

Section 305(b): Requires states to prepare a description of the water quality of all navigable waters of the state; an analysis of the extent to which navigable waters provide protection and propagation of a balanced population of shellfish, fish, and wildlife and allow recreational activities in and on the water; an analysis of the extent to which elimination of the discharge of pollutants has been achieved; an estimate of the environmental impact, the economic, and social costs necessary to achieve the objective of the Clean Water Act, the economic and social benefits of the achievement, and the date of such achievement; and, a description of the nature and the extent of nonpoint sources of pollutants and recommendations as to the programs which must be taken to control them, with estimates of cost.

Section 314: Requires states to identify and classify all publicly owned lakes in the state according to eutrophic condition. States must list and describe those publicly owned lakes known to be impaired and assess the status and trends of water quality. This information is required to be submitted as part of the section 305(b) report.


San Mateo Creek

The USEPA strongly encourages states to submit a single Integrated Report that satisfies the reporting requirements for each of these sections. Each Regional Board prepares an Integrated Report for its Region, using data collected by regional planning, permitting, surveillance, and enforcement programs. The regional Integrated Reports contain inventories of the major water bodies in the region, including rivers and streams, lakes and reservoirs, bays and harbors, estuaries, coastal waters, wetlands, and ground water.

The regional Integrated Report presents the results of the assessment of the waterbodies in the Region, and the waters are categorized as one or more of the following:

Category 1: All designated uses are supported, no use is threatened.

Category 2: Available data and/or information indicate that some, but not all of the designated uses are supported.

Category 3: There are insufficient available data and/or information to make a use support determination.

Category 4: Available data and/or information indicate that at least one designated use is not being supported or is threatened, but a TMDL is not needed.

Category 5: Available data and/or information indicate that at least one designated use is not being supported or is threatened and a TMDL is needed.

Upon adoption of the regional Integrated Reports by respective Regional Boards, the reports are compiled into a statewide report. Upon adoption of this statewide report by the State Board, the report is submitted to the USEPA to satisfy the reporting requirements of Clean Water Act sections 303(d), 305(b) and 314. Subsequently, the USEPA submits the Integrated Reports from the states to the United States Congress, which serves as the primary vehicle for informing Congress and the public about general water quality conditions in the United States.

CLEAN WATER STRATEGY

The Clean Water Strategy (CWS) is a process that the State Board implemented to assure that staff and fiscal resources are directed at the highest priority water quality issues throughout California. The primary objective of the CWS is to more effectively define and respond to priorities as revealed by the best available water quality information.

The CWS relies on the Water Quality Assessment condition ratings to provide the technical information necessary to identify water bodies needing protection or prevention actions, additional assessment, or cleanup activities. In addition to the Water Quality Assessment, the regions determined the relative resource value of their water bodies to recognize the relative importance of individual waters when compared to each other. The regions developed priority water body lists which are based upon the severity of their water quality problems or needs and relative resource values, from which the State Board assembled a statewide priority list based upon the same criteria.

There are six phases involved in implementing the Clean Water Strategy. As of this date, phase 1 and 2 have been completed. The State Board has begun a pilot study to determine the feasibility of phases 3 through 6.

Phase 1: Obtain the best information;

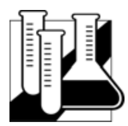
Phase 2: Compare and prioritize water body concerns;

Phase 3: Prioritize actions to address concerns;

Phase 4: Allocate new resources;

Phase 5: Implement strategy goals; and

Phase 6: Review results.



QUALITY ASSURANCE AND QUALITY CONTROL

The statewide Quality Assurance (QA) program was developed to ensure that data generated from environmental studies are technically sound, scientifically valid, and legally defensible. A federal regulation (USEPA Order 5360.1) requiring the State to develop and implement a Quality Assurance Program Plan (QAPP) was adopted in April 1993. The program mandate is identified in 40 CFR 30.503 (July 1, 1987).

The State Board has appointed a QA Program manager to direct, coordinate, and administer the State QAPP. Independently, each Regional Board has appointed a QA officer to administer its Regional responsibilities. The State and Regional Boards jointly administer the program, however the State Board has lead responsibility for managing the overall program and reporting to the USEPA. The duties of the Regional Board QA officer include overseeing and implementing QA procedures conducted in the Regional Board laboratory, interacting with project managers on the required preparation of QA Project Plans, and evaluating compliance inspection data on all major dischargers.

OTHER MONITORING PROGRAMS

In addition to the State's surveillance and monitoring program, several other agencies monitor water quality, complementing the State's efforts. These agencies are usually local health departments or water supply agencies.

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CHAPTER 7
TOTAL MAXIMUM DAILY LOADS

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7. TOTAL MAXIMUM DAILY LOADS

INTRODUCTION

This chapter contains the Total Maximum Daily Loads (TMDLs) that have been adopted by the Regional Water Quality Control Board, San Diego Region (RWQCB), approved by the State Water Resources Control Board (SWRCB) and Office of Administrative Law (OAL), and/or adopted/approved by the United State Environmental Protection Agency (USEPA). Table 7-1 lists the adopted and approved TMDLs that have been incorporated into the Basin Plan.

Table 7-1. Adopted and Approved Total Maximum Daily Loads in the San Diego Region

Total Maximum Daily Load	RWQCB Adoption Date	SWRCB Approval Date	OAL Approval Date	USEPA Approval Date
Total Maximum Daily Load for Diazinon, Chollas Creek Watershed, San Diego County	8/14/02	7/16/03	9/11/03	11/3/03
Total Maximum Daily Load for Dissolved Copper, Shelter Island Yacht Basin, San Diego Bay	2/9/05	9/22/05	12/2/05	2/8/06
Total Maximum Daily Loads for Total Nitrogen and Total Phosphorus in the Rainbow Creek Watershed	2/9/05	11/16/05	2/1/06	3/22/06
Total Maximum Daily Loads for Copper, Lead, and Zinc in Chollas Creek	6/13/07	7/15/08	10/22/08	12/18/08
Total Maximum Daily Loads for Indicator Bacteria, Project I – Beaches and Creeks in the San Diego Region	12/17/07	--[a]	--	--
Total Maximum Daily Loads for Indicator Bacteria, Baby Beach and Shelter Island Shoreline Park Shorelines	6/11/08	6/16/09	9/15/09	10/26/09
Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)	2/10/10	12/14/10	4/4/11	6/22/11
Total Maximum Daily Loads for Sediment in Los Peñasquitos Lagoon	6/13/12	1/21/14	7/14/14	10/30/14

[a] Withdrawn by the RWQCB on December 18, 2008 from SWRCB consideration for revision. See Revised Total Maximum Daily Loads for Indicator Bacteria Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek).

TOTAL MAXIMUM DAILY LOAD FOR DIAZINON, CHOLLAS CREEK WATERSHED, SAN DIEGO COUNTY

On August 14, 2002 the Regional Board adopted Resolution No. R9-2002–0123, Total Maximum Daily Load (TMDL) For Diazinon In Chollas Creek Watershed, San Diego County. The terms and conditions of Resolution No. R9-2002–0123 are incorporated into the Basin Plan. This amendment establishes the TMDL of diazinon which Chollas Creek can receive and still attain applicable water quality objectives and support beneficial uses. This TMDL is allocated to all contributing sources of diazinon in the watershed by establishing Waste Load Allocations for all point sources and Load Allocations for all nonpoint sources in the watershed. This TMDL includes a margin of safety. The TMDL Implementation Plan and Monitoring Plan are presented below.

NECESSITY STANDARD [GOVERNMENT CODE SECTION 11353(B)]

Amendment of the Basin Plan to establish and implement a Total Maximum Daily Load for Chollas Creek is necessary because water quality in Chollas Creek cannot satisfy applicable water quality objectives for "Toxicity" and "Pesticides" even with implementation of waste discharge requirements containing technology-based effluent limits or water quality-based effluent limits for discharges of pollutants to Chollas Creek and its tributaries. Clean Water Act section 303(d) requires the Regional Board to develop an implement a TMDL under the conditions that exist in Chollas Creek. This TMDL for diazinon is necessary to ensure attainment of applicable water quality objectives and restoration of beneficial uses designated for Chollas Creek.

CLEAN WATER ACT SECTION 303(D)

Chollas Creek is currently identified on the Clean Water Act section 303(d) list of impaired waters due to toxicity during storm events. Results from toxicity identification evaluations (TIEs) indicate that the insecticide diazinon in Chollas Creek has in part caused the toxicity during storm events.

BENEFICIAL USE IMPAIRMENTS

Chollas Creek supports several beneficial uses. The most sensitive beneficial uses are those designated for protection of aquatic life and aquatic dependent wildlife as described in the Basin Plan definition of the warm freshwater habitat (WARM) and wildlife habitat (WILD) beneficial uses. The WARM and WILD beneficial uses of Chollas Creek are adversely affected by toxicity due to diazinon.

WATER QUALITY OBJECTIVES

Diazinon levels in Chollas Creek cause toxicity during storm events. The Basin Plan does not contain a specific water quality objective for diazinon. The Basin Plan establishes narrative water quality objectives for "Toxicity" and "Pesticides" to ensure the protection of the WARM and WILD beneficial uses.

WATER QUALITY OBJECTIVE VIOLATIONS

Toxicity tests using the water flea *Ceriodaphnia dubia* indicate that Chollas Creek storm water flows are toxic. Toxicity Identification Evaluations (TIEs) show that diazinon is responsible for the toxicity to the water flea. Accordingly diazinon concentrations in Chollas Creek cause violations of the "Toxicity" and "Pesticide" water quality objectives during storm events. The average concentration of diazinon in Chollas Creek during storm events is 0.46 micrograms per liter (µg/L). Chollas Creek waters also contain metals that are responsible for toxicity to a marine invertebrate. A separate TMDL is under development to address metals in Chollas Creek.

SOURCES OF DIAZINON

Urban storm water flows represent the most significant source of diazinon to the Chollas Creek watershed.

CONCENTRATION-BASED TMDL

Because aquatic toxicity is the most significant adverse effect of diazinon and because aquatic toxicity is a function of water column concentrations, this TMDL is a concentration-based, rather than mass emission-based TMDL. The Numeric Targets, TMDL (Loading Capacity), and Waste Load and Load Allocations are all defined in terms of concentrations.

NUMERIC TARGETS

The TMDL Numeric Targets, which are derived from the water quality objectives, identify the specific water column, sediment, or tissue concentrations (or other endpoints) which equate to attainment of the Basin Plan water quality objectives and the protection of designated beneficial uses. Therefore, if the Numeric Targets are appropriately selected (for all causative pollutants), attainment of the Numeric Targets will result in attainment of the underlying water quality objectives and beneficial use protection.

The Numeric Targets for diazinon in Chollas Creek are set equal to the California Department of Fish and Game freshwater Water Quality Criteria for diazinon. The acute Water Quality Criterion of 0.08 µg/L diazinon protects aquatic life from short-term exposure to diazinon, while the chronic criterion of 0.05 µg/L diazinon protects aquatic life from long-term diazinon exposure.

Table 7-2. Numeric Targets for Diazinon in Chollas Creek [1]

Exposure Duration	Numeric Target	Averaging Period	Frequency of Allowed Exceedance
Acute	0.08 µg/L	One-hour average	Once every three years on the average
Chronic	0.05 µg/L	Four-day average	Once every three years on the average

[1] For the purpose of evaluating if the Numeric Targets have been attained, sample results shall be used as follows:

1. If only one sample is collected during the time period associated with the numeric target (e.g., one-hour average or four-day average), the single measurement shall be used to determine attainment of the numeric target for the entire time period.
2. The one-hour average shall be the moving arithmetic mean of grab samples over the specified one-hour period.
3. The four-day average shall apply to flow-weighted composite samples for the duration of the storm, or shall be the moving arithmetic mean of flow weighted 24-hour composite samples or grab samples.

TOTAL MAXIMUM DAILY LOAD

The term TMDL, or Loading Capacity, is defined as the maximum amount of a pollutant that a waterbody can receive and still attain water quality objectives and protection of designated beneficial uses. The concentration-based Loading Capacity for diazinon in Chollas Creek is set at exactly the same concentrations as the Numeric Targets.

Table 7.3. TMDL (Loading Capacity) for Diazinon in Chollas Creek

Exposure Duration	TMDL	Averaging Period
Acute	0.08 µg/L	One-hour average
Chronic	0.05 µg/L	Four-day average

LINKAGE ANALYSIS

The purpose of the linkage analysis is to confirm that the TMDL will result in the attainment of applicable water quality objectives and beneficial use protection. With respect to diazinon, this TMDL will result in the attainment of the "Toxicity" and "Pesticide" water quality objectives and the restoration of the WARM and WILD beneficial uses in the Chollas Creek watershed.[1] This is because the Numeric Targets are set equal to the diazinon Water Quality Criteria which are based on toxicity testing and are specifically established at levels to ensure the protection of aquatic life from acute and chronic exposure to diazinon. The Water Quality Criteria protect all aquatic life stages including the most sensitive stages.

WASTE LOAD AND LOAD ALLOCATIONS

The concentration-based Waste Load and Load allocations of this TMDL are applied equally to all diazinon discharge sources in the Chollas Creek watershed. All allocations are set at 90% of the Numeric Targets resulting in a diazinon allocation equal to 0.072 µg/L under acute exposure conditions and a diazinon allocation of 0.045 µg/L under chronic exposure conditions. These allocations include an explicit 10% margin of safety to account for uncertainties in the TMDL analysis. This concentration-based TMDL and its allocations apply year-round and will be protective during all flow conditions and seasons.

Table 7.4. Waste Load and Load Allocations for Diazinon in Chollas Creek

Exposure Duration	Numeric Targets	Margin of Safety	Waste Load and Load Allocations
Acute	0.08 µg/L	0.008 µg/L	0.072 µg/L
Chronic	0.05 µg/L	0.005 µg/L	0.045 µg/L

[1] MULTIPLE POLLUTANTS: The attainment of water quality standards is qualified with the words "with respect to diazinon" because there are multiple pollutants causing toxicity. Toxicity conditions in Chollas Creek are caused by metals and diazinon. Successful implementation of both the Chollas Creek diazinon TMDL and the Chollas Creek metals TMDL is expected to result in full attainment of the "Toxicity" water quality objectives, and of the WARM and WILD beneficial uses

DIAZINON LOAD REDUCTIONS NEEDED

The current average concentration of diazinon in Chollas Creek measured during storm events was 0.46 µg/L during the monitoring period 1998 through 2001. An 84% reduction of current diazinon concentration–based loads is needed to attain the acute diazinon allocations set forth in this TMDL. A 90% reduction of current diazinon concentration–based loads is needed to attain the chronic diazinon allocations set forth in this TMDL.

Table 7.5 Needed Load Reductions in Chollas Creek

Average Diazinon Concentration	**Allocation**		**Reduction Needed**	
	Chronic	**Acute**	**Chronic**	**Acute**
0.46 µg/L	0.045 µg/L	0.072 µg/L	90%	84%

Chollas Creek at Federal Boulevard crossing.

Chollas Creek streamside

SEASONAL VARIATIONS AND CRITICAL CONDITIONS

This concentration–based diazinon TMDL and allocations apply year round and will be protective during all flow conditions and seasons.

RESPONSIBLE PARTIES

As dischargers of diazinon in urban storm water flows to Chollas Creek, the City of San Diego, City of Lemon Grove, City of La Mesa, San Diego Unified Port District, County of San Diego, and the California Department of Transportation (Caltrans) are responsible for implementation of this TMDL. These entities are regulated as municipal Copermittees under the San Diego MS4 Permit or the statewide Caltrans MS4 Permit.

TMDL IMPLEMENTATION PLAN

The three most important mechanisms to implement the diazinon waste load reductions required by this TMDL are (1) USEPA's ongoing diazinon phase-out and elimination program; (2) modification of the San Diego Municipal Storm Water Permit (MS4 Permit)[1] as needed for consistency with this TMDL; and (3) activities by the municipal Copermittees in the Chollas Creek watershed to reduce diazinon discharges pursuant to the MS4 Permit and Water Code section 13267.

(1) USEPA's Diazinon Phase-Out and Elimination Program

The single most important action to implement this TMDL is USEPA's national ongoing Diazinon Phase-Out and Elimination Program. In January 2001, USEPA reached an agreement with registrants (manufacturers) of diazinon to phase-out most uses (USEPA 2002). Under the agreement, all indoor uses will be terminated, and all outdoor non-agricultural uses will be phased-out over the next few years.

Specifically, the terms of the agreement implement the following phase out schedules:

- For the indoor household use, the registration will be canceled on March 2001, and all retail sales will stop by December 2002.

- For all lawn, garden and turf uses, manufacturing stops in June 2003; all sales and distribution to retailers ends in August 2003. Further, the manufacturers will implement a product recovery program in 2004 to complete the phase-out of the product.

- Additionally, as part of the phase-out, for all lawn, garden, and turf uses, the agreement ratchets down the manufacturing amounts. Specifically, for 2002, there will be a 25 percent decrease in production; and for 2003, there will be a 50 percent decrease in production.

- Also, the agreement begins the process to cancel around 20 different uses on food crops.

In summary, the phase-out is designed to reduce diazinon use and sales, availability, and to increase its proper disposal. As a result of the phase-out, USEPA expects, on a national basis, that these actions will end over 90% of current diazinon uses. In the Chollas Creek watershed, since agricultural use is negligible, the phase-out should reduce current source loadings of diazinon, and the resulting aquatic toxicity, to negligible levels over time. For these reasons, the diazinon phase-out is by far the single most significant mechanism by which this TMDL will be implemented. The remaining TMDL implementation actions described below are designed to reduce the discharge of diazinon to the Chollas Creek watershed due to interim (during the phase-out) and residual (post phase-out) diazinon sales, use, and disposal. It should be noted that actions taken by the municipalities and other stakeholders to reduce diazinon discharges to the Chollas Creek watershed will likely be effective in reducing the discharges of alternative pesticides in the long-term as well.

(2) Modification of Existing Waste Discharge Requirements / NPDES Permits

The Regional Board's San Diego Municipal Storm Water Permit, also known as the San Diego MS4 Permit (Regional Board Order No. 2001-01 NPDES No. CAS0108758) is the primary broad-based NPDES permit which directly regulates most pollutant discharges, including diazinon, in the Chollas Creek watershed. Federal regulations require that NPDES permits contain effluent limitations that are consistent with Waste Load Allocations developed under a TMDL [40 CFR 122.44 (d)(vii)(B)]. The Regional Board will revise existing waste discharge requirements / NPDES permits to incorporate effluent limitations in conformance with the Waste Load Allocations for diazinon as specified above. Modifications to the MS4 Permit can occur when the permit is reopened or during scheduled permit reissuance.

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[1] Regional Board Order No. 2001-01 NPDES No. CAS0108758, Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, and the San Diego Unified Port District.

Compliance with numeric limitations for diazinon will be required in accordance with a phased schedule of compliance. The compliance schedule will be jointly developed by the Regional Board and the Chollas Creek stakeholders and will be finalized no later than one year following adoption of this TMDL by the Regional Board. The phased compliance schedule will apply only to attainment of numeric limitations for diazinon. All other requirements of this TMDL will be immediately effective upon incorporation into applicable NPDES permits.

(3) Activities By Municipal Copermittees Pursuant to MS4 Permit and CWC Section 13267

Pursuant to the MS4 Permit and under the authority of Water Code section 13267, the Regional Board will direct the municipal Copermittees in the Chollas Creek watershed to do the following:

a. **Legal Authority:** Enforce existing local ordinances, or adopt new legal authority, as needed to ensure Copermittee compliance with the Waste Load Allocations specified in this TMDL;

b. **Diazinon Toxicity Control Plan:** Develop and implement a "Diazinon Toxicity Control Plan" to promote Copermittee compliance with the Waste Load Allocations specified in this TMDL. The Plan should consist of pollution prevention and source control BMPs designed to reduce the discharge of diazinon to Chollas Creek.

c. **Diazinon Public Outreach / Education Program:** Develop and implement a focused Public Outreach / Education program designed to reduce the discharge of diazinon to the Chollas Creek watershed. By reducing the discharge of diazinon, the Program will promote Copermittee compliance with the Waste Load Allocations specified in this TMDL. The Program should contain the components described in the Regional Board Technical Report, Total Maximum Daily Load for Diazinon in Chollas Creek Watershed San Diego County, dated August 14, 2002, or equivalent components. The diazinon public outreach / education program may be incorporated into the Diazinon Toxicity Control Plan.

(4) Compliance with MS4 Permit

The municipal Copermittees in the Chollas Creek watershed shall implement the requirements of the MS4 Permit.

(5) Compliance with Existing Waste Discharge Prohibitions

Prohibitions against discharges of waste that cause pollution or nuisance, described in the Basin Plan, including discharges of diazinon that cause or contribute to violation of water quality objectives are applicable to the urban land users and land owners in the Chollas Creek watershed. Dischargers of diazinon in the watershed shall also comply with all other applicable waste discharge prohibitions contained in the Basin Plan.

(6) Enforcement Authority of Regional Board

The Regional Board will use its enforcement authority as necessary to ensure compliance with applicable waste discharge requirements and Basin Plan waste discharge prohibitions.

(7) Modification of Other Existing Waste Discharge Requirements

The State Board has issued three additional NPDES storm water permits that regulate the discharge of pollutants including diazinon in the Chollas Creek watershed. These permits are the statewide Caltrans Municipal Storm Water Permit (State Board Order No. 99-06-DWQ NPDES No. CAS 000003), the statewide General Industrial Storm Water Permit (State Board Order No. 97-03-DWQ NPDES No. CAS 000001), and the statewide General Construction Storm Water Permit (State Board Order No. 99-08-DWQ NPDES No. CAS 000002) which directly regulate discharges from Caltrans owned and operated facilities, and from industrial and construction sites respectively, located within the Chollas Creek watershed. Discharges from industrial and construction sites in the Chollas Creek watershed are also indirectly regulated under the MS4 Permit which holds each municipal Copermittee ultimately responsible for all discharges from industrial and construction sites within its jurisdiction. The Regional Board will request the State Board to amend each of these three statewide permits as needed for consistency with this TMDL. Modifications to waste discharge requirements can occur when permits are reopened or reissued.

In addition to the broad-based regulation of discharges under the MS4 Permit, the discharge of pollutants, including diazinon, from utility companies and utility vaults is directly regulated under the State Board's General Permit for Utility Vaults (State Board Order No. 2001-11-DWQ NPDES No. CAG 990002). The Regional Board will request the State Board to also revise the General Permit for Utility Vaults as needed for consistency with this TMDL.

(8) Adoption of New Waste Discharge Requirements / NPDES Permits

The Regional Board may adopt new waste discharge requirements / NPDES permits for any significant source(s) of diazinon identified by the municipal Copermittees or the Regional Board.

(9) Additional Investigations and Reports Pursuant to CWC Section 13225

The Regional Board may use its authority under Water Code section 13225 to request the municipalities in the Chollas Creek watershed to conduct additional investigations which are beyond the purview of the MS4 permit and to report on the findings of such investigations. Any such investigations will address diazinon-related issues in the Chollas Creek watershed for the ultimate purpose of reducing diazinon discharges to the watershed.

(10)Monitoring Plan

Pursuant to the MS4 permit and under the authority of Water Code section 13267, the Regional Board will direct the municipal Copermittees in the Chollas Creek watershed to develop and implement a Monitoring Plan. The Plan shall be designed to assess the effectiveness of this TMDL, its implementation measures, and progress towards the attainment of applicable water quality standards in the Chollas Creek watershed. The Plan should contain the components described in the Regional Board Technical Report, Total Maximum Daily Load for Diazinon in Chollas Creek Watershed San Diego County, dated August 14, 2002, or equivalent components.

(11)Schedule of Implementation

As described in Provision 2 above, Modification of Existing Waste Discharge Requirements/ NPDES Permits, compliance with numeric limitations for diazinon will be required in accordance with a phased schedule of compliance. All other requirements of this TMDL will be immediately effective upon incorporation into applicable NPDES permits as described below

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Table 7.6. Schedule of Implementation

Schedule of Implementation			
Action	**Description**	**Responsible Parties**	**Due Date**
USEPA cancels registration for indoor household uses of diazinon		USEPA	March 31, 2001
IPM Workshop(s)	Conduct first workshop	Chollas Creek watershed municipal copermitees	Within 1 year after USEPA approves TMDL and annually thereafter
Monitoring Plan	Initiate Monitoring Plan	Chollas Creek watershed municipal copermitees	30-days after USEPA approves TMDL
Diazinon Toxicity Control Plan (DTCP)	Initiate DTCP	Chollas Creek watershed municipal copermittees	30-days after USEPA approves TMDL
Retail sales of diazinon (indoor uses) end		USEPA	December 31, 2002
Manufacturing of diazinon for all lawn, garden and turf uses end		USEPA	June 31, 2003
Sales and distribution to retailers ends		USEPA	August 31, 2003
Phase out and eliminate diazinon usage and sales in the Chollas Creek watershed. Ensure proper disposal.		USEPA	2003 for non-agriculture uses
Modify MS4 permit for consistency with TMDL		Regional Board	No later than 2006
Implement legal authority to reduce diazinon discharges in the Chollas Creek watershed.		Chollas Creek watershed municipal copermittees	6 months after USEPA approves TMDL
Compliance with MS4 permit		Chollas Creek watershed municipal copermittees	Ongoing
Compliance with existing Waste Discharge prohibitions		Diazinon dischargers	Ongoing
Enforcement authority of Regional Board		Regional Board	Ongoing
Modification of other existing Waste Discharge Requirements		Regional and State Board	No later than next reissuance
Adoption of new WDRs / NPDES permits	For significant diazinon sources only.	Regional Board	As needed
Additional investigations and reports pursuant to CWC section 13225		Diazinon dischargers	As needed
Submit Annual Reports	Effectiveness reports and monitoring reports	Chollas Creek watershed municipal copermittees	January 31 of each year.

TOTAL MAXIMUM DAILY LOAD FOR DISSOLVED COPPER, SHELTER ISLAND YACHT BASIN, SAN DIEGO BAY

Shelter Island Yacht Basin, San Diego Bay

On February 9, 2005, the Regional Board adopted Resolution No. R9-2005-0019, *A Resolution Adopting an Amendment to the Water Quality Control Plan for the San Diego Region to Incorporate a Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay*. The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board on September 22, 2005, the Office of Administrative Law on December 2, 2005, and the United States Environmental Protection Agency on February 8, 2006. The TMDL is described in the *Total Maximum Daily Load for Dissolved Copper in Shelter Island Yacht Basin, San Diego Bay*, Technical Report dated February 9, 2006.

PROBLEM STATEMENT

Dissolved copper levels in Shelter Island Yacht Basin (SIYB) waters violate water quality objectives for copper, toxicity, and pesticides. Dissolved copper concentrations in SIYB threaten and impair the designated beneficial uses of marine habitat (MAR), and wildlife habitat (WILD).

NUMERIC TARGET

The TMDL Numeric Targets for copper, toxicity and pesticides are set equal to the numeric water quality objectives for dissolved copper as defined in the California Toxics Rule (CTR) and shown below.

Table 7-7. TMDL Numeric Targets

Exposure	Water Quality Objective*	Numeric Target*
Continuous or Chronic (4 day average)	3.1 μg/L** of copper (Cu)	3.1 μg/L** of Cu
Maximum or Acute (1 hour average)	4.8 μg/L** of Cu	4.8 μg/L** of Cu

* Concentrations should not be exceeded more than once every three years.
** micrograms/liter (μg/L)

If the water quality objectives for dissolved copper in SIYB are modified in the future, as in the case of a site-specific objective, then the numeric targets will be set equal to the new water quality objectives.

SOURCE ANALYSIS

Approximately 98 percent of all copper loading to SIYB is attributable to copper-based antifouling paints applied to the hulls of recreational boats. The passive leaching of copper from antifouling paint is 93 percent of the total loading. The remaining five percent of total copper loading results from underwater hull cleaning operations in SIYB.

Table 7-8. Summary of Dissolved Copper Sources to SIYB

Source	Mass Load (kg/year)	Percent Contribution (% Cu)
Passive Leaching	2,000	93
Hull Cleaning	100	5
Urban Runoff	30	1
Background	30	1
Direct Atmospheric Deposition	3	<1
Sediment	0	0
Combined Sources	**2,163**	**100**

TOTAL MAXIMUM DAILY LOAD

The TMDL or loading capacity for dissolved copper discharges into SIYB is 1.6 kilograms/day (kg/day) or 567 kilograms/year (kg/year).

MARGIN OF SAFETY

The TMDL includes an explicit and implicit margin of safety (MOS). Ten percent of the loading capacity was reserved as an explicit MOS and calculated to be 57 kg/year. The implicit MOS was incorporated into the TMDL source analysis through numerous conservative assumptions.

ALLOCATIONS AND REDUCTIONS

A 76 percent overall reduction of residual copper loading to SIYB is required to meet the TMDL of 567 kg/year as shown in the table below. The assigned allocations from each source translate into a percent reduction of dissolved copper from current loading. Loading due to passive leaching must be reduced by 81 percent from current loading. Loading due to underwater hull cleaning must be reduced by 28 percent from current loading. From an overall perspective, passive leaching loading must be reduced by 75 percent from the combined total loading of all sources to SIYB. Underwater hull cleaning loading must be reduced by one percent from the combined total loading of all sources to SIYB.

Table 7-9. TMDL and Allocation Summary

Source	Current Load (kg/year of Cu)	Percent Contribution (% Cu)	Allocation (kg/year of Cu)	Percent Reduction from Current Source Load (%)	Percent Reduction from Total Loading to SIYB (%)
Passive Leaching	2,000	93	375	81	75
Hull Cleaning	100	5	72	28	1
Urban Runoff	30	1	30	0	0
Background	30	1	30	0	0
Direct Atmospheric Deposition	3	<1	3	0	0
Sediment	0	0	0	0	0
Current Mass Load	2,163	100			0
Margin of Safety			57		0
TMDL			567		0
Total Load Reduction				76	76

RECALCULATIONS IF WATER QUALITY OBJECTIVES CHANGE

If the water quality objectives for dissolved copper in SIYB are changed in the future, then the MOS, TMDL and allocations will be recalculated using the method shown below in the section titled, *Method for Recalculation of the Total Maximum Daily Load for Dissolved Copper in the Shelter Island Yacht Basin, San Diego Bay*.

TMDL IMPLEMENTATION PLAN

The TMDL will be implemented as follows:

The Regional Board will coordinate with governmental agencies having legal authority over the use of copper-based antifouling paints to protect water quality from the adverse effects of copper-based antifouling paints in SIYB; and

The Regional Board will regulate discharges of copper to SIYB through the issuance of Waste Discharge Requirements (WDRs), Waivers of WDRs (waivers), or adoption of Waste Discharge Prohibitions. WDRs could build upon pollution control programs developed by discharger organizations or the Port. Likewise, waivers or prohibitions could be conditioned on implementation of pollution control programs through third party agreements between the Regional Board and discharger organizations, and/or other agencies.

The Regional Board will amend Order No. 2001-01, **"**Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm /Sewer System**"** to require that discharges of copper into SIYB waters via the City's municipal separate storm/sewer system not exceed a 30 mg/kg wasteload for copper.

The dischargers will be required to monitor SIYB waters and provide monitoring reports to the Regional Board for the purpose of assessing the effectiveness of the alternatives implemented.

COMPLIANCE SCHEDULE

Copper load and wasteload reductions are required over a 17-year staged compliance schedule period. The first stage consists of an initial 2-year orientation period during which no copper load reductions are required. The subsequent 15-year reduction period is comprised of three stages during which incremental copper load and wasteload reductions are required as shown below.

Table 7-10. Interim Loading Targets for Attainment of the TMDL

Stage	Time Period	Percent Reduction from Current Estimated Loading	Reduction to be Attained by End of Year	Estimated Interim Target Loading (kg/year of dissolved Cu)
Stage 1	Years 1-2	0%	N/A	N/A
Stage 2	Years 2-7	10%	7	1,900
Stage 3	Years 7-12	40%	12	1,300
Stage 4	Years 12-17	76%	17	567

METHOD FOR RECALCULATION OF THE TOTAL MAXIMUM DAILY LOAD FOR DISSOLVED COPPER IN THE SHELTER ISLAND YACHT BASIN, SAN DIEGO BAY

This section describes the method for recalculating the Shelter Island Yacht Basin TMDL for dissolved copper if the water quality objectives for dissolved copper are modified in the future.

Numeric Target

The numeric targets are set equal to the new water quality objectives.

Margin of Safety

The explicit margin of safety (MOS) equals ten percent of the loading capacity. The equation to calculate the loading capacity is given below.

Total Maximum Daily Load

The TMDL or loading capacity is recalculated using equations 1 through 4 below.

The loading capacity is recalculated according to equation 1 below:

$$(1) \quad R_S = C_2\left(\frac{KA_c}{\Delta x} + k_L V_2\right) - A_c C_1\left(\frac{eA_s}{A_c} + \frac{K}{\Delta x}\right)$$

where C_1 = average background concentration of copper measured in the area of San Diego Bay adjacent to SIYB, expressed as total copper, (0.05 μg/L)

- C_2 = average target concentration for copper in the SIYB (expressed as total copper) when the maximum concentration of copper in SIYB is equal to or less than the numeric target (mass/volume)
- K = dispersion coefficient calculated from salinity measurements and mixing length approximation (15.3 m^2/sec)
- A_c = cross-sectional area of entrance to SIYB (1,000 m^2)
- A_s = surface area of SIYB (740,000 m^2)
- Δx = average mixing length between SIYB and adjacent area; estimated distance between the endpoints for S_1 and S_2 (2,000 m)
- V_2 = volume of SIYB (31,000,000 m^3)
- e = evaporation rate (0.43 cm/day)
- k_l = rate of total copper loss to sediment (7%/day)
- R_S = loading capacity, expressed as total copper (mass/time); R_S is calculated iteratively to find the maximum possible value that does not cause C_2 to exceed the numeric target.

The dispersion coefficient K is calculated using equation 2 below:

$$(2) \quad K \cong \frac{eA_s S_1 \Delta x}{A_c (S_2 - S_1)}$$

where S_1, S_2 =salinity data obtained in SIYB and San Diego Bay adjoining SIYB (33.62 practical salinity units (psu) and 33.46 psu, respectively).

The average target concentration, C_2, must be lower than the numeric target concentration to ensure that the loading capacity will not cause an exceedance of the numeric target anywhere in SIYB. C_2 is calculated by multiplying the numeric target for chronic exposure by the ratio of the average measured concentration of copper in SIYB to the maximum measured concentration as expressed in equation 3 below:

(3) C_2 = numeric target [average measured concentration/maximum measured concentration]

or,

C_2 = numeric target * [5.45 μg/L / 8 μg/L]

To convert C_2 from dissolved copper concentration to total copper concentration, the number calculated from equation 3 is multiplied by the ratio of dissolved copper to total copper in seawater. If site-specific data are not available, the ratio of 0.83 can be used. This is the USEPA's conversion factor for saltwater acute criteria.[4]

Finally, the TMDL is calculated according to equation 4 below:

(4) TMDL = Rs - MOS

Allocations

Equation 5 is used to determine the new allocation for passive leaching. In equation 5, the only variable is the allocation for passive leaching (Ap), while the other source allocations are constants. The allocation for hull cleaning remains the same, since it was based on the assumption that all of the divers will use Management Practices (MPs) to clean boat hulls that have copper bottom paints. Allocations for the other sources, namely urban runoff, background and sediment will not be recalculated because these sources of copper are insignificant.

(5) TMDL = Wasteload Allocation + Load Allocations + MOS

TMDL = Au + Ap + Ah + As + Ab + Aa + MOS

where:

Au = allocation for urban runoff = 30 kg/year
Ap = allocation for passive leaching
Ah = allocation for hull cleaning = 72 kg/year
As = allocation for sediment = load from sediment = 0 kg/year
Ab = allocation for background = load from background = 30 kg/year
Aa = allocation for direct atmospheric deposition = load from direct atmospheric deposition = 3 kg/year

[4] USEPA. 2000. Water Quality Standards; Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California; Rule. 40 CFR Part 131. May 18, 2000.

TOTAL MAXIMUM DAILY LOADS (TMDLS) FOR TOTAL NITROGEN AND TOTAL PHOSPHORUS IN THE RAINBOW CREEK WATERSHED

Rainbow Valley, California

On February 9, 2005, the Regional Board adopted Resolution No. R9-2005-0036, *A Resolution Adopting an Amendment to the Water Quality Control Plan for the San Diego Region (9) to Incorporate Total Maximum Daily Loads (TMDLs) for Total Nitrogen and Total Phosphorus in the Rainbow Creek Watershed, San Diego County*. The Basin Plan amendment was subsequently approved by the State Water Resources Control Board on November 16, 2005, the Office of Administrative Law on February 1, 2006, and the United States Environmental Protection Agency on March 22, 2006. The TMDL is described in the Basin Plan Amendment and Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads for Rainbow Creek, dated February 9, 2005.

PROBLEM STATEMENT

Nitrate, total nitrogen, and total phosphorus concentrations in Rainbow Creek exceed the Inorganic Chemicals nitrate and Biostimulatory Substances water quality objectives. These exceedances threaten to unreasonably impair the municipal supply (MUN), warm freshwater habitat (WARM), cold freshwater habitat (COLD), and wildlife habitat (WILD) beneficial uses of Rainbow Creek. Excessive nutrient levels in Rainbow Creek promote the growth of algae in localized areas, creating a nuisance condition, that unreasonably interferes with aesthetics and contact and non-contact water recreation (REC1, REC2) and threatens to impair WARM, COLD and WILD beneficial uses. State highways, agricultural fields and orchards, commercial nurseries, residential and urban areas, and septic tank disposal systems contribute to increased nutrient levels in Rainbow Creek as a result of storm water runoff, irrigation return flows, and ground water contributions to the creek.

NUMERIC TARGETS

The Numeric Targets for nitrate, total nitrogen, and total phosphorus are set equal to the Inorganic Chemicals nitrate water quality objective for municipal water supply and the numeric goals of the Biostimulatory Substances water quality objective as defined in the Basin Plan and shown below.

Table 7-11. Rainbow Creek Nitrate, Total Nitrogen, and Total Phosphorus Numeric Targets

Constituent	Water Quality Objective	Numeric Target
Nitrate (as nitrogen)	10 mg NO_3-N/L	10 mg NO_3-N/L
Total Nitrogen	1.0 mg N/L	1.0 mg N/L
Total Phosphorus	0.1 mg P/L	0.1 mg P/L

If the Inorganic Chemicals nitrate and Biostimulatory Substances water quality objectives in Rainbow Creek are modified in the future then the TMDL will be recalculated and the numeric targets will be set equal to the new water quality objectives.

SOURCE ASSESSMENT

Seventy-nine percent (79%) and seventy percent (70%) of total nitrogen and total phosphorus mass loading, respectively, are attributable to controllable sources, which include certain land use activities, septic tank disposal systems (total nitrogen only), and Interstate 15 (I-15). The land use activities include commercial nurseries, agricultural fields, orchards, residential areas, urban areas, and park areas.

Background and direct atmospheric deposition are not considered to be controllable sources.

Table 7-12. Summary of Total Nitrogen and Total Phosphorus Sources to Rainbow Creek

Source	Total Nitrogen Mass Load (kg N/yr)	Percent Contribution (% N)	Total Phosphorus Mass Load (kg P/yr)	Percent Contribution (% P)
Land Uses Runoff	2,662	69	262	66
Background	779	20	116	29
Septic Tank Disposal Systems	200	5	0	0
I-15 Runoff (Caltrans)	153	4	14	4
Direct Atmospheric Deposition	40	1	2	1
Combined Sources	**3,834**	**100**	**394**	**100**

TOTAL MAXIMUM DAILY LOADS OR LOADING CAPACITY

The TMDLs for nutrients in Rainbow Creek are 1,658 kg N/yr for total nitrogen and 165 kg P/yr for total phosphorus in order to attain and maintain the Inorganic Chemicals – Nitrate and Biostimulatory Substances water quality objective in Rainbow Creek waters.

The annual loading limit of total nitrogen and total phosphorus to Rainbow Creek shall be reduced incrementally from the current load of 3,834 kg/yr and 394 kg/yr, respectively, to 1,658 kg/yr and 165 kg/yr, respectively, by no later than December 31, 2021. The annual nutrient loading limits to be attained by December 31, 2021 is listed in Table 7-13.

Table 7-13. Annual Nutrient Loading Capacity and Compliance Date

TMDL	December 31, 2021[1]	
Total Nitrogen – Annual Load	1,658 kg/yr	3,648 lbs/yr
Total Phosphorus – Annual Load	154 kg/yr	365 lbs/yr

[1] Compliance to be achieved no later than this date. The Regional Board may require earlier compliance with these targets when it is reasonable and feasible.

MARGIN OF SAFETY

Explicit and implicit margins of safety (MOS) were considered for these TMDLs. An explicit MOS of 5% is reserved to account for uncertainties and calculated to be 83 kg/year total nitrogen and 8 kg/year total phosphorus. An implicit MOS has been incorporated through conservative assumptions in the analysis.

LOAD ALLOCATIONS AND WASTELOAD ALLOCATIONS

A seventy-four percent (74%) and an eighty-five percent (85%) overall reduction of total nitrogen and total phosphorus loading, respectively, to Rainbow Creek is required to meet the TMDLs described in Table 7.13.

The load allocations for the initial annual loading are provided in Table 7-14 and 7-15, below. A margin of safety (MOS) of 5% is subtracted from this nutrient TMDL to account for unknowns, errors in assumptions, and potential future development in the watershed. This 5% is reserved for unknowns and is not allocated to any source. Allocations (other than for background and margin of safety) will be further reduced by 20% every 4 years until the biostimulatory targets for nitrogen and phosphorus are met. In the event that a nonpoint source becomes a permitted discharge, the portion of the load allocation that is associated with the source can become a wasteload allocation.

Table 7–14. Annual Total Nitrogen Allocations for Rainbow Creek

Source	Annual Total Nitrogen Load Allocations			
	2009 kg/yr[1]	2013 kg/yr[1]	2017 kg/yr[1]	2021 kg/yr[1]
Load Allocations (LA)				
Commercial nurseries	390	299	196	116
Agricultural fields	504	386	253	151
Orchards	607	465	305	182
Park	5	3	3	3
Residential areas	507	390	260	149
Urban areas	40	27	27	27
Septic tank disposal systems	200	100	46	46
Air deposition	40	40	40	40
Wasteload Allocations (WLA)				
Caltrans highway runoff	118	90	59	49
Unidentified & future point sources	33	33	33	33
Total LA & WLA	**2,444**	**1,833**	**1,222**	**796**
Background	779	779	779	779
Margin of Safety (not allocated)	83	83	83	83
Total	**3,306**	**2,695**	**2,084**	**1,658**

[1] To calculate pounds per year, multiply by 2.2.
[2] Background is calculated based on reference concentrations in San Diego streams and Rainbow Creek annual flow volumes.

Table 7-15. Annual Total Phosphorus Allocations for Rainbow Creek

Source	Annual Total Phosphorus Load Allocations			
	2009 kg/yr[1]	2013 kg/yr[1]	2017 kg/yr[1]	2021 kg/yr[1]
Load Allocations (LA)				
Commercial nurseries	20	16	10	3
Agricultural fields	28	21	14	4
Orchards	50	37	24	6
Park	0.15	0.10	0.10	0.10
Residential areas	99	74	47	12
Urban areas	9	6	6	6
Air deposition	2	2	2	2
Wasteload Allocations (WLA)				
Caltrans highway runoff	11	8	5	5
Unidentified & future point sources	3	3	3	3
Total LA & WLA	**223**	**116**	**111**	**41**
Background	116	116	116	116
Margin of Safety (not allocated)	8	8	8	8
Total	**346**	**291**	**235**	**165**

[1] To calculate pounds per year, multiply by 2.2.
[2] Background is calculated based on reference concentrations in San Diego streams and Rainbow Creek annual flow volumes.

RECALCULATIONS IF WATER QUALITY OBJECTIVES CHANGE

If the water quality objectives for Biostimulatory Substances are changed in the future, then the MOS, TMDL and allocations and reductions will be recalculated using the method shown below in the section titled, *Method for Recalculation of the Total Maximum Daily Loads for Nitrogen and Phosphorus in Rainbow Creek*.

TMDL IMPLEMENTATION ACTION PLAN

The necessary actions to implement the TMDLs are described in section 9 of the *Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads (TMDLs) in Rainbow Creek*, dated February 9, 2005 and listed below.

A. Regional Board Actions

1. Caltrans – Incorporate Wasteload Allocations in NPDES Storm Water Permit

The Regional Board shall request that the State Water Resources Control Board amend the Caltrans statewide NPDES storm water permit[5] to include the following requirements:

[5] The term "statewide NPDES storm water permit" refers to Order No. 99-06-DWQ, NPDES No. CAS000003, *National Pollutant Discharge Elimination System Permit, Statewide Storm Water Permit, and Waste Discharge Requirements for the State of California, Department of Transportation (Caltrans)* or subsequent superceding NPDES renewal Orders.

a. MS4 discharges to Rainbow Creek shall not exceed the following wasteloads for nitrogen and phosphorus:

Table 7-16. Wasteloads for nitrogen and phosphorus

Nitrogen Wasteload	Phosphorus Wasteload	Compliance Due Date
118 kg N/yr[1]	11 kg P/yr[1]	Dec. 31, 2009
90 kg N/yr[1]	8 kg P/yr[1]	Dec. 31, 2013
59 kg N/yr[1]	5 kg P/yr[1]	Dec. 31, 2017
49 kg N/yr[1]	5 kg P/yr[1]	Dec. 31, 2021

b. A directive to submit annual progress reports to the Regional Board detailing progress made on attaining the nutrient wasteload reductions in Rainbow Creek. The report shall be due on April 1 of each year shall be incorporated within section 2, Program Management of Caltrans MS4 Order No. 99-06-DWQ, NPDES No. CAS000003. Reporting shall continue on an annual basis until the nutrient water quality objective is attained in Rainbow Creek.

2. County of San Diego – Issue Water Code Governmental Water Quality Investigation Request Order for Nutrient Reduction and Management Plan

The Regional Board shall issue an Order under Water Code section 13225 requiring the County of San Diego to investigate excessive levels of nutrients in Rainbow Creek and feasible management strategies to reduce nutrient loading in Rainbow Creek. A Nutrient Reduction and Management Plan (NRMP) for the Rainbow Creek watershed containing the elements described below in section C, County of San Diego Nutrient Reduction Management Plan Elements, would satisfy such an Order. The County may submit alternative or additional elements equivalent to those described in section C that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

3. County of San Diego – Establish Management Agency Agreement (MAA)

The Regional Board shall consider, following concurrence with the County of San Diego's Nutrient Reduction and Management Plan (NRMP) for Rainbow Creek, entering into a Management Agency Agreement (MAA) with the County of San Diego. The MAA shall set forth the commitment of both parties to undertake various oversight responsibilities for the nonpoint source nutrient load reduction component of this TMDL, and the County's commitments to implement the NRMP.

4. County of San Diego – Issue Water Code Governmental Water Quality Investigation Request for Groundwater Investigation and Characterization Report

The Regional Board could issue an Order under Water Code section 13225 directing the County of San Diego to prepare and submit a workplan and report described below in section B, County of San Diego Actions, Item 3 Submit Groundwater Investigation and Characterization Workplan and Item 4 Groundwater Investigation and Characterization Report.

5. California Department of Forestry and Fire Protection – Issue Water Code Section 13267 Order

The Regional Board shall issue a Water Code section 13267 order directing the California Department of Forestry and Fire Protection, Rainbow Conservation Camp (CDFFP) to submit any additional technical information needed to 1) evaluate whether CDFFP's discharge is surfacing and/or contributing to the impairment of Rainbow Creek; and 2) estimate the actual nutrient load originating from the septic tank and percolation ponds to Rainbow Creek via groundwater flow. Based on the review of this information the Regional Board may further direct the CDFFP to implement an alternate means of wastewater disposal or additional treatment necessary to attain and maintain nutrient water quality objectives in Rainbow Creek.

6. **Establish Memorandum of Understanding (MOU) with Agencies or Organizations**

The Regional Board shall consider entering into a memorandum of understanding (MOU) to document cooperative agreements with other agencies or organizations that are able to provide information, technical assistance, or financial assistance to dischargers to support the Regional Board's goals of attaining the nutrient load reductions required under this TMDL and compliance with the nutrient water quality objective. These agencies and organizations include, but are not limited to, the United States Department of Agriculture, Natural Resources Conservation Service (NRCS), Mission Resource Conservation District (MRCD), and the University of California Cooperative Extension (UCCE).

7. **Adopt Waste Discharge Requirements (WDRs), Waivers, and Discharge Prohibitions**

In conjunction with an MAA or MOU with another third-party representative, organization, or government agency describing an adequate NPS pollution control implementation program, the Regional Board shall adopt individual or general waivers or waste discharge requirements (WDRs) for NPS discharges in the Rainbow Creek watershed. The waivers or WDRs shall require NPS dischargers to either participate in the third party NPS program or, alternatively, submit individual pollution prevention plans that detail how they will comply with the waivers and WDRs. Alternatively, the Regional Board may adopt a discharge prohibition, which includes exceptions for those discharges that are adequately addressed in an acceptable third-party MAA or MOU NPS pollution control implementation program.

8. **Take Enforcement Actions**

The Regional Board shall take enforcement action[6], as necessary, against any discharger failing to comply with applicable waiver conditions, waste discharge requirements (WDRs), discharge prohibitions, or take enforcement action, as necessary, to control the discharge of nutrients to Rainbow Creek, to attain compliance with the nutrient wasteload and load reductions specified in this TMDL, or to attain compliance with the nutrient water quality objectives. The Regional Board may also terminate the applicability of waivers and issue waste discharge requirements or take other appropriate action against any discharger(s) failing to comply with the waiver conditions.

9. **Review and Revise Existing Waste Discharge Requirements**

The Regional Board shall review and, if necessary, update existing waste discharge requirements for discharges to land as well as groundwater in the Rainbow Creek watershed to incorporate effluent limitations for nutrients consistent with applicable nutrient groundwater quality objectives and surface water quality objectives.[7]

10. **Recommend High Priority for Grant Funds**

The Regional Board shall recommend that the State Board assign a high priority to awarding grant funding[8] for projects to implement the Rainbow Creek nutrient TMDLs. Special emphasis will be given to projects that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations.

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[6] An enforcement action is any formal or informal action taken to address an incidence of actual or threatened noncompliance with existing regulations or provisions designed to protect water quality. Potential enforcement actions include a notice of violation (NOV), notices to comply (NTC), imposition of time schedules (TSO), issuance of cease and desist orders (CDOs) and cleanup and abatement orders (CAOs), administrative civil liability (ACL), and referral to the attorney general (AG) or district attorney (DA). The Regional Board generally implements enforcement through an escalating series of actions to: (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.

[7] There are currently three dischargers in the Rainbow Creek watershed regulated under waste discharge requirements for the discharge of waste to land or groundwaters: Oak Crest Mobile Estates (Order No. 1993-69), Rainbow Conservation Camp (Order No. 1995-20), and Temecula Truck Inspection Facility (Order No. 1992-56). The Rainbow Truck Weigh and Inspection Facility, discharges under the terms of a waiver of waste discharge requirements (Order No. 2000-235).

[8] The State Water Resources Control Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL implementation for NPS pollution.

11. Incorporate Water Code Section 13291 Regulations in Basin Plan

The Regional Board shall incorporate regulations currently under development by the State Water Resources Control Board pertaining to onsite wastewater treatment systems[9] into the Basin Plan as soon as practicable upon their adoption by the State Board.[10]

B. County of San Diego Actions

1. Control MS4 Discharges to Rainbow Creek

For nutrient discharges to or from Municipal Separate Storm Sewer Systems (MS4) within the Rainbow Creek watershed, the County has an existing obligation under the NPDES requirements for MS4s in San Diego County[11] to require increasingly stringent best management practices, pursuant to the iterative process described in Receiving Water Limitation C.2.a.[12] of the MS4 Requirements, to reduce nutrients discharges in the Rainbow Creek watershed to the maximum extent practicable and restore compliance with the nutrient water quality objective.

2. Submit Nutrient Reduction and Management Plan (NRMP)

The County of San Diego shall, upon request by the Regional Board pursuant to Water Code section 13225, prepare and submit a NRMP for the Rainbow Creek watershed, consistent with the SWRCB NPS Implementation and Enforcement Policy and containing the elements described in section C, County of San Diego Nutrient Reduction and Management Plan or their equivalent. The County may submit alternative or additional elements equivalent to those described in section C that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

3. Submit and Implement Groundwater Investigation and Characterization Workplan

The County of San Diego shall, upon request by the Regional Board pursuant to Water Code section 13225, undertake an investigation of groundwater quality within the Rainbow Creek watershed, and shall prepare and submit a workplan designed to guide the collection of information to produce the technical report described in Item 4, Groundwater Investigation and Characterization Report below. The workplan shall include the following:

a. A schedule for completion of all activities and submission of a final Groundwater Investigation and Characterization Report.

b. A description of proposed actions including drilling methods, analytical methods, sampling locations, and purging and sampling methods.

c. The location of existing monitoring wells and the proposed location of additional monitoring wells needed to characterize nutrient concentrations and their lateral and vertical extent in groundwater.

d. Contingencies for collection of additional samples.

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[9] "Onsite wastewater treatment system(s)" (OWTS) is any individual or community onsite wastewater treatment, pretreatment and dispersal system including, but not limited to, a conventional, alternative, or experimental sewage dispersal system such a septic tanks having a subsurface discharge.

[10] Water Code section 13291 directs the Regional Board to incorporate the regulations in the Basin Plan upon their adoption by the State Water Resources Control Board.

[11] The term "MS4 NPDES Storm Water Permit" refers to Order No.2001-001, NPDES No. CAS0108758, *Waste Discharge Requirements For Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities Of San Diego County, and the San Diego Unified Port District* or subsequent superceding NPDES renewal Orders.

[12] Groundwater beneath the Rainbow Creek watershed is interpreted to occur in both the alluvial deposits where present and in the fractured rock. The groundwater investigation report shall assess the relative contribution from each aquifer.

e. Sufficient scope to meet the objectives of assessing nutrient loading from surface sources to groundwater and the contribution of groundwater to the nutrient loading and nutrient concentrations in Rainbow Creek.

f. Consideration of the following elements or factors:

   i. Nutrient mass loading to groundwater in the fractured rock aquifer and the alluvial deposits aquifer[13] from septic systems, deep percolation of applied irrigation water, and any other sources.

   ii. Base flow contribution to Rainbow Creek from the fractured rock aquifer and the alluvial deposits aquifer.

   iii. Mass balance of nutrients in the fractured rock aquifer and alluvial deposits aquifer (nutrient mass loading to groundwater, removals from the groundwater system including denitrification, plant uptake, and groundwater discharge, and change in the load and concentration of nutrients in groundwater.

The County of San Diego shall implement the workplan within sixty (60) days after submission of the workplan, unless otherwise directed in writing by the Regional Board. Before beginning these activities the County shall notify the Regional Board of the intent to initiate the proposed actions included in the workplan submitted; and comply with any conditions set by the Regional Board.

4. Submit Groundwater Investigation and Characterization Report

The County of San Diego shall, on a schedule agreed to in writing by the Regional Board, submit a Groundwater Investigation and Characterization Report containing a technical analysis and interpretation of the data to assess the contribution of groundwater to the nutrient loading and concentrations in Rainbow Creek. The report shall meet the objectives and address the considerations described in the Groundwater Investigation and Characterization Workplan. The report shall also present recommendations to refine assumptions, resolve uncertainties, and improve the scientific foundation of the TMDL with regard to quantifying groundwater nutrient loading to Rainbow Creek.

5. Establish Management Agency Agreement (MAA)

The County of San Diego is requested to enter into a MAA with the Regional Board setting forth the commitment of both parties to undertake various implementation oversight responsibilities for the nonpoint source nutrient load reduction component of this TMDL and the County's commitments to implement the NRMP.

C. County Of San Diego Nutrient Reduction And Management Plan

1. NPS Nutrient Reduction and Management Plan (NRMP)

A NRMP for the Rainbow Creek watershed shall describe the activities the County of San Diego could undertake to oversee discharger efforts to reduce nutrients in the runoff or groundwater discharges from new and existing (1) commercial nurseries; (2) agricultural fields; (3) orchards; (4) parks; (5) residential area; (6) urban areas; and (7) septic tank disposal system land uses (hereinafter referred to as key nutrient sources). A NRMP should include the following elements as provided in items 2 through 17 below or alternative or additional elements equivalent to those described that would result in equivalent protection from, or prevention of, nutrient discharges to Rainbow Creek.

[13] Groundwater beneath the Rainbow Creek watershed is interpreted to occur in both the alluvial deposits where present and in the fractured rock. The groundwater investigation report shall assess the relative contribution from each aquifer.

2. Legal Authority

The County of San Diego should review its legal authority and evaluate its adequacy to mandate compliance with the nutrient load reductions specified in this TMDL through ordinance, statue, permit, contract or similar means. The County, at a minimum, should evaluate its authority to:

a. Control the discharge of nutrients from nonpoint sources; and

b. Prohibit discharges of nutrients which cause or contribute to exceedances of the nutrient load reductions specified in this TMDL or nutrient water quality objectives.

Alternatively the County of San Diego may certify that its existing legal authority is adequate to mandate compliance with the nutrient load reductions specified in this TMDL and prevent increases in nutrient loading to Rainbow Creek.

3. General Plan Modification

The County of San Diego should evaluate the adequacy of its General Plan to ensure that future land use and zoning decisions do not result in an increase in the nutrient loading to Rainbow Creek. The County should also describe the steps it will take to modify the General Plan as necessary. Alternatively the County of San Diego may certify that its existing General Plan is adequate to prevent an increase in nutrient loading to Rainbow Creek.

4. Modify Development Project Approval Process

The County of San Diego should evaluate the adequacy of its development project approval / permitting process as necessary to ensure that discharges from proposed developments in the Rainbow Creek watershed will comply with the nutrient load reductions specified in this TMDL and ensure that nutrient water quality objectives are not exceeded. The County's evaluation should consider the need to ensure that all development in Rainbow Creek watershed will be in compliance with County's storm water ordinances, permits, and all other applicable ordinances and requirements. The County should also describe the steps it will take to modify the development project approval / permitting process as necessary. Alternatively the County of San Diego may certify that its project approval / permitting process is adequate to ensure that discharges from proposed developments in the Rainbow Creek watershed will comply with the nutrients load reductions specified in this TMDL and ensure that nutrient water quality objectives are not exceeded.

5. CEQA Reviews

The County of San Diego should evaluate the adequacy of its environmental review process pursuant to CEQA to ensure that new development in the Rainbow Creek watershed does not contribute to exceedances of the nutrient load allocations specified in this TMDL or violations of the nutrient water quality objective. For example, diligent performance of environmental review under CEQA and requirements for mitigation of the adverse environmental consequences to water quality of new development and detrimental agricultural practices can significantly reduce nutrient loading to Rainbow Creek. The County's evaluation should consider the need to aggressively review proposed projects that have the potential to contribute nitrogen and phosphorus to the Rainbow Creek watershed and require appropriate mitigation. The County should also describe the steps it will take to revise the development project approval / permitting process as necessary. Alternatively the County of San Diego may certify that its environmental review process pursuant to CEQA is adequate to ensure that new development in the Rainbow Creek watershed does not contribute to exceedances of the nutrient load allocations specified in this TMDL or violations of the nutrient water quality objective.

6. Pollution Prevention (Nutrients)

The County of San Diego should describe the steps it will take to implement pollution prevention[14] methods for nutrients at sites owned by the County and require its use by owners or operators of nutrient sources, where appropriate.

7. Source Identification (Nutrients)

The County of San Diego should describe the steps it will take to develop and update annually an inventory of the individual nutrient sources within the residential, urban, commercial nursery, agricultural field, orchard, park, and septic tank disposal system category of land uses. The use of an automated database system, such as Geographical Information System (GIS) is highly recommended.

8. Threat to Water Quality Prioritization (Nutrients)

The County of San Diego should describe the steps it will take to establish priorities for inspection and oversight activities. Each individual nutrient source in each nonpoint source category should be classified as high, medium, or low threat to water quality. The inventory should include the following minimum information for each site: name; address; SIC codes as appropriate which best reflects the type of site; a narrative description characterizing the nutrient waste generated; and the potential for nutrient discharges to Rainbow Creek.

9. MP Implementation (Nutrients)

The County of San Diego should describe the steps it will take to:

a. Designate a set of minimum MMs / MPs[15] for the high, medium, and low threat to water quality nutrient sources identified in item 7 above. The designated minimum MPs for the high threat to water quality nutrient sources should be site and source specific as appropriate.

b. Establish a time line for installation of the designated minimum MPs at each nutrient source within its jurisdiction. If particular minimum MPs are infeasible for any specific site/source the county of San Diego should describe the steps it will take to require the implementation of other equivalent MPs.

10. Inspection of Sites and Sources (Nutrients)

The County of San Diego should describe the steps it will take to inspect high priority sites and sources for compliance with its ordinances and permits as well as nutrient load reductions required under this TMDL. Inspections should include review of MP implementation plans and effectiveness. The County should also describe the steps it will take to implement all inspection follow-up actions, including enforcement actions, as necessary to obtain discharger compliance in implementing MPs.

11. Enforcement of Sites and Sources (Nutrients)

The County of San Diego should describe the steps it will take to enforce its ordinances, statues, permits, and contracts as necessary to attain compliance with the nutrient load reductions specified in this TMDL.

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[14] Pollution Prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control, treatment, or disposal.

[15] In determining appropriate MPs the County of San Diego is encouraged to consult the State Water Resources Control Board's California Nonpoint Source Encyclopedia (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html). This publication contains extensive information on nutrient reduction management measures (MMs) and management practices (MPs) applicable to the NPS land use activities in the Rainbow Creek watershed. The County is also encouraged to consult the Regional Board's Watershed Management Approach for the San Diego Region, Nonpoint Source (http://www.waterboards.ca.gov/sandiego/programs/wmc.html) for additional information on management measures.

12. Reporting of Non-compliant Sites (Nutrients)

The County of San Diego should describe the steps it will take to provide oral notification to the Regional Board of non-compliant sites that are determined to be recalcitrant in implementing MPs or attaining compliance with nutrient load reductions required under this TMDL within 24 hours of the discovery of noncompliance. The notification process should also include procedures for a follow-up written report to be submitted to the Regional Board within 5 days of the incidence of non-compliance.

13. Monitoring to Assess Compliance With Nutrient Load Reductions

The County of San Diego should describe the steps it will take to conduct, or require nutrient sites or sources to conduct, a monitoring program to assess compliance of runoff or groundwater discharges with the load reductions from each of the land use categories assigned a load reduction. This can be accomplished by placing sampling stations at strategic nodes that would monitor nutrient discharges from individual sources of a common land use category.

14. Community Education and Outreach

The County of San Diego should describe the steps it will take to develop a focused educational program to raise community awareness of the nutrient impairment problem, promote pollution prevention, and increase the use of applicable management measures and practices where needed to control and reduce nutrient discharges to Rainbow Creek. Public education, outreach, and training programs should involve applicable user groups and the community.[16]

15. Seek Financial Assistance

The County of San Diego is encouraged to seek grant funding[17] for projects to implement the Rainbow Creek nutrient TMDLs, particularly those that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations.

16. Nutrient Reduction and Management Plan (NRMP) Effectiveness

The County of San Diego should describe the steps it will take to develop a long-term strategy for assessing the effectiveness of the NRMP. The long-term assessment strategy should identify specific direct and indirect measurements that the County will use to track the long-term progress towards achieving the nutrient load reductions required under this TMDL. Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy shall also discuss the role of monitoring data in substantiating or refining the assessment.

17. Nutrient Reduction and Management Plan (NRMP) Annual Report

The County of San Diego should describe the steps it will take to submit an annual NRMP report to the Regional Board by January 31 of each year following USEPA approval of this TMDL. The reporting period for this annual report should be the previous fiscal year. For example, the report submitted January 31, 2006 would cover the reporting period July 1, 2004 to June 30, 2005. The report should be incorporated in the annual Jurisdictional URMP Annual Report and the Watershed Specific URMP Annual Reports under the County's MS4 NPDES Permit and include the following information:

[16] Consideration should be given to expanding the County of San Diego's ongoing community and education outreach program under the County's MS4 NPDES Storm Water Permit to address the Rainbow Creek nutrient impairment problem. Additional suggestions for the information to be included in pollution prevention and education programs is contained in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (**http://www.waterboards.ca.gov/nps/encyclopedia.html**)

[17] Information on available grant funds is contained in the State Water Resources Control Board's California Nonpoint Source Encyclopedia (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html).

a. Comprehensive description of all activities conducted by the County of San Diego to oversee implementation of the NRMP.

b. An accounting of all: inspections conducted; enforcement actions taken; and education efforts conducted.

c. An assessment of whether actions to implement designated minimum MPs at each nutrient source were actually carried out by dischargers.

d. An assessment of the compliance of runoff or groundwater discharges with the load reductions from each of the land use categories assigned a load reduction.

e. Identification of water quality improvements or degradation in Rainbow Creek with regard to attainment of the nutrient water quality objectives.

f. An evaluation of the effectiveness of the NRMP in achieving the nutrient load reductions required under this TMDL.

D. Discharger Actions

1. State of California, Department of Transportation (Caltrans) Actions

Caltrans shall take all actions necessary to meet the nutrient wasteload reductions assigned to Caltrans. These nutrient wasteload reductions will eventually be incorporated into Caltrans statewide NPDES storm water permit. It is assumed that compliance with the nutrient wasteload reductions will be accomplished through the development and implementation of best management practices (BMPs). Caltrans shall also prepare and submit progress reports in accordance with the Caltrans statewide NPDES storm water permit or as otherwise directed by the Regional Board in a Water Code section 13383 order.

2. State of California Department of Forestry and Fire Protection (CDFFP) Actions

CDFFP shall, upon direction by the Regional Board in a Water Code section 13267 order, undertake an investigation to 1) evaluate whether CDFFP's discharge is surfacing and/or contributing to the impairment of Rainbow Creek; and 2) estimate the actual nutrient load to Rainbow Creek from groundwater flow originating from the septic tank and percolation ponds.

3. Nonpoint Source Dischargers (NPS Dischargers) Actions

NPS discharges of nutrients in the Rainbow Creek watershed result from (1) commercial nurseries; (2) agricultural fields; (3) orchards; (4) parks; (5) residential areas; (6) urban areas; and (7) septic tank disposal system land use activities. Individual landowners and other persons (NPS Dischargers) engaged in these land use activities shall implement pollution prevention[18] methods and increase the use of applicable management measures and practices[19] where needed to control and reduce nutrient discharges to Rainbow Creek and attain nutrient load reductions. Individual landowners and other persons are encouraged to seek grant funding[20] for projects to implement the Rainbow Creek nutrient TMDLs, particularly those that can achieve quantifiable nutrient load reductions consistent with the specific nutrient TMDL load allocations.

[18] Pollution Prevention is defined as practices and processes that reduce or eliminate the generation of pollutants, in contrast to source control, treatment, or disposal.

[19] In determining appropriate management methods and practices to control nutrient discharges interested persons are encouraged to consult the State Water Resources Control Board's California Nonpoint Source Encyclopedia (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html. This publication contains extensive information on nutrient reduction management measures (MMs) and management practices (MPs) applicable to the NPS land use activities in the Rainbow Creek watershed. Interested persons are also encouraged to consult the Regional Board's Watershed Management Approach for the San Diego Region, Nonpoint Source (**http://www.waterboards.ca.gov/sandiego/programs/wmc**.html) for additional information on management measures.

[20] Information on available grant funds is contained in the in the State Water Resources Control Board's *California Nonpoint Source Encyclopedia* (2004) (http://www.waterboards.ca.gov/nps/encyclopedia.html).

NPS dischargers will be subject to Regional Board enforcement action for failing to: comply with applicable waiver conditions, waste discharge requirements (WDRs), discharge prohibitions; attain compliance with the nutrient load reductions specified in this TMDL; or attain compliance with the nutrient water quality objectives. The Regional Board may also terminate the applicability of waivers and issue waste discharge requirements to any NPS dischargers failing to comply with waiver conditions.

TMDL IMPLEMENTATION MONITORING PLAN

The necessary actions to monitor TMDL implementation are described in section 10 of the *Technical Report for Total Nitrogen and Total Phosphorus Total Maximum Daily Loads (TMDLs) in Rainbow Creek*, dated February 9, 2005 and listed below.

A. Regional Board Actions

1. Issue Order to Submit Monitoring Plan to Caltrans and County of San Diego

The Regional Board shall issue an Order to Caltrans under Water Code section 13383 and a Governmental Water Quality Investigation Request Order to the County of San Diego under Water Code section 13225, to prepare and submit an Implementation Monitoring Plan containing the elements described in **Section C. Implementation Monitoring Plan Elements** below. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by-case basis.

2. Issue Order to Implement Monitoring Plan to Caltrans and County of San Diego

Upon concurrence with the County of San Diego's and Caltrans' Implementation Monitoring Plan the Regional Board shall issue an Order to Caltrans under Water Code section 13383 and a Governmental Water Quality Investigation Request Order to the County of San Diego under Water Code section 13225, to implement monitoring. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by-case basis.

B. County of San Diego and Caltrans Actions

1. Prepare and Submit Monitoring Plan

The County of San Diego and Caltrans shall collaborate to prepare and submit an Implementation Monitoring Plan for the Rainbow Creek watershed containing the elements described in **Section C. Implementation Monitoring Plan Elements** below, upon direction by the Regional Board in a Water Code section 13225 / Water Code section 13383 Order. The number of monitoring stations in Rainbow Creek assigned to Caltrans should be based on the number of stations needed by Caltrans to demonstrate compliance with the nutrient wasteload allocation and the success of the TMDL in attaining the nutrient water quality objective in the portion of Rainbow Creek affected by its discharge. The Implementation Monitoring Plan shall be modified as requested by the Regional Board.

2. Implement Monitoring Plan

The County of San Diego and Caltrans shall implement the Implementation Monitoring Plan upon direction by the Regional Board pursuant to a Water Code section 13225 / section 13383 Order. The Regional Board may amend this order at any time to include other nutrient dischargers in the Rainbow Creek watershed on a case-by case basis.

C. Implementation Monitoring Plan Elements

The Implementation Monitoring Plan shall contain the following elements:

1. Surface Water Monitoring Stations

Monitoring stations shall be proposed that best serve the monitoring objectives described above in section 10.2 Monitoring Objectives. Previously monitored locations that shall be considered include Jubilee, Hines Nursery, Oak Crest, Rainbow Glen Tributary, Margarita Glen Tributary, Willow Glen-4, Willow Glen Tributary, Riverhouse, Via Milpas Tributary, and Stage Coach (See Figure A-3, in Appendix A). An additional sampling location between Oak Crest and Willow Glen-4 should also be considered. For instance, a monitoring location might be placed downstream of Oak Crest Mobile Estates to assess nutrient loading from this property. Monitoring stations shall also be considered at strategic nodes in Rainbow Creek and its tributaries that would monitor nutrient discharges from individual sources of a common land use category.

2. Groundwater Monitoring Stations

The location of existing wells and the proposed location of additional monitoring wells needed to define nutrient concentration trends in groundwater. Methods for purging and sampling monitoring wells to provide representative samples for the waste constituents of interest should be described.

3. Surface Water Monitoring Frequency

Monitoring frequencies of the various monitoring parameters shall be proposed that best serve the monitoring objectives described above in section 10.2 Monitoring Objectives. The frequencies should be adequate to evaluate ambient conditions and address any impact from low dissolved oxygen concentrations and algal growth.

4. Groundwater Monitoring Frequency

Monitoring frequencies of the various monitoring parameters shall be proposed that best serve the monitoring objectives described above section 10.2 Monitoring Objectives. The magnitude and timing of nutrient variability may vary significantly in monitoring wells that are located varying distances from nutrient sources. Sampling these wells will likely obtain water from varying depths in the aquifer. To define the nitrate variability at each well, the network will be sampled quarterly for two years. The observed variability will serve as a basis for determining the long-term sampling frequency for the network.

5. Surface Water Quality Parameters

Surface Water Quality Parameters shall include nitrogen (including nitrate, nitrite, ammonia and total Kjeldahl nitrogen (TKN), phosphorus (including orthophosphate and total), dissolved oxygen, pH, turbidity, and temperature.

6. Groundwater Quality Parameters

Groundwater Quality Parameters shall include total nitrogen, nitrate, ammonia, nitrites, TKN, orthophosphate, total phosphorus, pH, dissolved oxygen and TDS.

7. Hydrology

Flow rate measurements shall be taken to calculate nutrient loading, to provide additional information about the hydrology of the watershed, and to identify patterns in algal growth.

8. Algal Biomass

Characterization of algal species composition is needed to provide a more reliable indicator of trophic status and evidence of nutrient condition (USEPA, 2000). The growth of algae is stimulated principally by nutrients such as nitrogen and phosphorus, but also requires adequate water temperature, light, flow, and dissolved oxygen. It is assumed at this time that both factors are co-limiting. Characterization of algal species composition may give a better understanding of the relationships between all the factors that affect algal growth, including sunlight, nitrogen, phosphorus, temperature, and dissolved oxygen. Algal biomass should be quantified by mass and/or by % cover of bottom. Collection and measurement of algal biomass should be performed uniformly or by a standardized method.

9. Biological Assessment Monitoring

It is recommended that biological assessment monitoring of benthic microinvertebrates be performed at a minimum of three stations on Rainbow Creek and a reference stream. Biological assessment monitoring should be performed in accordance with the California Stream Bioassessment Methods Manual (Harrington and Born, 2000). Changes in the stream's biological integrity (e.g., an increase or decrease in diversity and abundance of sensitive species) could be used as an indicator of changes in the health of the creek. Sampling done in 1998-99 for the San Diego Ambient Bioassessment Program (CDFG, 2000) indicates that benthic macroinvertebrate communities vary seasonally. The seasonal trend could be due in part to rainfall and consequent streamflow conditions (e.g., scouring). Thus, sites should be sampled for benthic macroinvertebrates at least twice each year: once during the spring (i.e., May), and again in the fall (preferably in October).

10. Monitoring Reports

Monitoring reports shall be submitted in both electronic and paper formats and include the following information:

a. An executive summary addressing all sections of the monitoring report, comprehensive interpretations and conclusions, and recommendations for future actions.

b. A description of monitoring station locations by latitude and longitude coordinates, frequency of sampling, quality assurance / quality control procedures and sampling and analysis protocols.

c. The data/results, methods of evaluating the data, graphical summaries of the data, and an explanation / discussion of the data.

d. An assessment of the compliance of runoff characteristics with the required load reductions from each of the land use categories assigned a load reduction.

e. Identification and analysis of trends in surface and groundwater quality and assessment of compliance with nutrient water quality objectives.

f. An evaluation of the effectiveness of the TMDL implementation actions and the need for revisions to improve the implementation action plan.

Table 7-17. Required Monitoring Parameters

Parameter	Type of Sample[1]
Surface Water Monitoring	
Total nitrogen, nitrate, ammonia[2], nitrates, TKN, orthophosphate, and total phosphorus concentrations.	Grab
Temperature	In situ
pH	In situ
Dissolved oxygen	In situ
Turbidity	In situ
TDS	Grab
Flow rate	Field measurement
Algal biomass (% cover of bottom and/or Chl a/ash free dry weight (AFDM))	In situ and / or grab
Benthic macroinvertebrate community analysis (recommended)	Grab
Groundwater Monitoring	
Total nitrogen, nitrate, ammonia[2], nitrites, TKN, orthophosphate, and total phosphorus concentrations	Grab
pH	Grab or In situ
Dissolved Oxygen	Grab or In situ
TDS	Grab or In situ

1. A California certified laboratory should be used with an approved QA/QC plan.
2. All laboratory detection limits should be sufficient to determine compliance with the water quality objective. For example, un-ionized ammonia in surface waters (25 µg/L).

11. Quality Assurance/ Quality Control Plan

The monitoring program shall develop and implement a QA/QC plan for field and laboratory operations to ensure that data collected are of adequate quality given the monitoring objectives[21]. The QA/QC plan for field operations shall cover the following, at a minimum:

a. Quality assurance objectives;
b. Sample container preparation, labeling and storage;
c. Chain-of-custody tracking;
d. Field setup;
e. Sampler equipment check and setup;
f. Sample collection;
g. Use of field blanks to assess field contamination;
h. Use of field duplicate samples;
i. Transportation to the laboratory;
j. Training of field personnel; and
k. Evaluation, and enhancement if needed of the QA/QC plan.

The QA/QC plan for laboratory operations shall cover the following, at a minimum:
a. Quality assurance objectives;
b. Organization of laboratory personnel, their education, experience, and duties;
c. Sample procedures;
d. Sample custody;
e. Calibration procedures and frequency;
f. Analytical procedures;
g. Data reduction, validation, and reporting;
h. Internal quality control procedures;
i. Performance and system audits;

[21] For more information on QA/QC activities, including guidelines and example QA/QC documents, refer to http://www.waterboards.ca.gov/swamp/qapp.html

j. Preventive maintenance;
k. Assessment of accuracy and precision;
l. Correction actions; and
m. Quality assurance report.

12. Reporting Period

Annual reports should cover the period of October 1 through September 30. The reports should be submitted to the Regional Board by January 31 of the following year and should be incorporated within the annual receiving water monitoring reports required under the County of San Diego's MS4 NPDES Permit Receiving Waters Monitoring and Reporting Program.[22]

13. Reporting Frequency

The first report shall be due in the first January following initiation of the monitoring program. Reporting shall continue on an annual basis until the nutrient water quality objective has been attained and maintained in Rainbow Creek.

Compliance Schedule

Total nitrogen and total phosphorus reductions are required over a 16-year phased compliance schedule period during which incremental load and wasteload reductions are required as shown in Table 7-18, below. Twenty percent (20%) reductions are required every fourth year for the first three phases (by the end of year 12). The last (fourth) phase requires the remaining 14% total nitrogen reduction and 25% total phosphorus reduction needed to meet the TMDLs.

Table 7-18. Total Nitrogen and Total Phosphorus Phased Load Reduction Compliance Schedule

Compliance Date	Total Nitrogen		Total Phosphorus	
	Current Load & Annual Loads (LA + WLA) kg N/yr	Cumulative % Reduction	Current Load & Annual Loads (LA + WLA) kg P/yr	Cumulative % Reduction
	3,055[1]		278[1]	
12/31/2009	2,444	20	222	20
12/31/2013	1,833	40	167	40
12/31/2017	1,222	60	111	60
12/31/2021	796	74	41	85

1. Current annual nutrient loads from identified point and nonpoint sources (See Table 7-12). This value does not include the contribution for background.

Regardless of what actions are taken to achieve load and wasteload reductions, there may not be an immediate response in the water quality or biological condition of Rainbow Creek. For example, there may be significant time lags between when actions are taken to reduce nutrient loads and resulting changes in nutrient concentrations in Rainbow Creek. This is especially likely if nutrients from past activities are tightly bound to sediments or if nutrient-contaminated groundwater has a long residence time before its release to Rainbow Creek waters. A three-year response time is projected for Rainbow Creek to attain compliance with nutrient water quality objectives after reaching the desired nutrient wasteload and load reductions in 2021. Accordingly the projected date when Rainbow Creek will attain and maintain compliance with nutrient water quality objectives is December 31, 2024.

[22] The term "MS4 NPDES Storm Water Permit" currently refers to Order No.2001-001, NPDES No. CAS0108758, Waste Discharge Requirements For Discharges Of Urban Runoff from the Municipal Separate Storm Sewer Systems (MS4s) Draining the Watersheds of the County of San Diego, the Incorporated Cities Of San Diego County, and the San Diego Unified Port District or subsequent superceding NPDES renewal Orders. Attachment B to this Order contains the Receiving Waters Monitoring and Reporting Program for Order No. 2001-01. The annual receiving water monitoring report is described in Table 6, Item 28, page 51 of Order No. 2001-01.

AGRICULTURAL PROGRAM COSTS AND POTENTIAL SOURCES OF FINANCING

Pursuant to Water Code section 13141 the Regional Board has estimated the TMDL Implementation Program cost for agricultural water quality control in Table 7-19.

Table 7-19. Cost of Implementing Agricultural Water Quality Control

	Initial Capital Costs $ per Operation		Annual Operational Costs $ per Operation	
	Low	**High**	**Low**	**High**
Commercial Nurseries	$26	$41,075	$3	$4,108
Orchards	$26	$57,705	$3	$5,771
Agricultural Fields	$26	$57,705	$3	$5,771

Potential sources of financing include:

- Federal Clean Water Act Section 319(h) grants.
- Federal Clean Water Act Section 205(j) grants.
- State of California Proposition 13 funded grants.
- Small Communities Grants for Water Reclamation and Wastewater Treatment Facilities.
- Other state, federal and business loans, grants, and other assistance programs. These may include assistance from U.S. Small Business Administration and from conservation programs through various agencies such as the U.S. Department of Agriculture and Natural Resource Conservation Service.
- Various secured and unsecured loans, including home equity loans and business loans.

METHOD FOR RECALCULATION OF THE TOTAL MAXIMUM DAILY LOADS FOR NITROGEN AND PHOSPHORUS IN RAINBOW CREEK

This section describes the method for recalculating Rainbow Creek TMDLs for nitrogen and phosphorus if the water quality objectives are modified in the future.

Numeric Target

The numeric targets are set equal to the new water quality objectives.

Margin of Safety

The explicit margin of safety (MOS) equals five percent of the loading capacity. The equation to calculate the loading capacity is given below.

Loading Capacity

The annual total nitrogen loading capacity is determined by multiplying the flow volume (in ft^3/yr) by the new water quality objective (in mg N/L) that will allow the creek to attain water quality standards. The equations below also use terms to convert milligrams to kilograms and cubic feet to liters. The loading capacity for nitrogen is as follows:

Low Flow (0-2.9 cfs)

17,764 * 1 e–3 ft^3/yr * **new water quality objective** in mg N/L * 28.32 L/ft^3 * 1 e –6 kg/mg

= **new low flow loading capacity** in kg N/yr

Moderate – High Flow (3 – 39 cfs)

40,775 * 1 e–3 ft^3/yr * **new water quality objective** in mg N/L * 28.32 L/ft^3 * 1 e –6 kg/mg

= **new moderate - high flow loading capacity** in kg N/yr

Total Annual Nitrogen Loading Capacity = sum of low flow and moderate - high flow loading capacity

Similarly, the annual total loading capacity for phosphorus is as follows:

Low Flow (0-2.9 cfs)

17,764 * 1 e–3 ft^3/yr * **new water quality objective** in mg P/L * 28.32 L/ft^3 * 1 e –6 kg/mg

= **new low flow loading capacity** in kg P/yr

Moderate – High Flow (3 – 39 cfs)

40,775 * 1e–3 ft^3/yr * **new water quality objective** in mg P/L * 28.32 L/ft^3 * 1 e –6 kg/mg

=**new moderate-high flow loading capacity** in kg P/yr

Total Annual Phosphorus Loading Capacity = sum of low flow and moderate - high flow loading capacity

Total Maximum Daily Load

The TMDLs for nitrogen and phosphorous are set equal to the total annual loading capacity for each pollutant. The allocations in Table 7-20 below use the following equation to determine the total load allocations for nonpoint sources (LA) by subtracting background, the margin of safety (MOS), and the point source waste load allocations (WLA) from the TMDL.

$$TMDL = \sum(WLA) + \sum(LA) + Background + MOS$$

Allocations

The allocations of the total annual nitrogen and phosphorous loading capacities to the margin of safety, background, and various point and non-point sources are presented in Table 7-20.

Table 7-20. Total Nitrogen and Phosphorus Allocations for Rainbow Creek TMDL

Source	Nitrogen Allocation	Phosphorus Allocation
Margin of Safety (MOS)	5%[1]	5%[1]
Background	779 kg	116 kg
Caltrans (WLA)	New WQO * volume of Caltrans runoff	New WQO * volume of Caltrans runoff
Unidentified and Future Point Sources (WLA)	2%[1]	2%[1]
Total Allocation for Nonpoint Sources (LA) = Total Annual Loading Capacity – MOS – Background – Caltrans – Unidentified and Future Point Sources		
Commercial nurseries	16%[2]	9%[2]
Agricultural fields	21%[2]	12%[2]
Orchards	25%[2]	18%[2]
Park	0.4%	0.3%
Residential areas	21%[2]	36%[2]
Urban areas	4%[2]	18%[2]
Septic tank disposal systems	6%[2]	0%[2]
Air deposition	6%[2]	6%[2]

[1] percent of the total annual nitrogen and phosphorus loading capacity

[2] percent of the total allocation for nonpoint sources

TOTAL MAXIMUM DAILY LOADS (TMDLS) FOR COPPER, LEAD, AND ZINC IN CHOLLAS CREEK

On June 13, 2007, the Regional Board adopted Resolution No. R9-2007-0043, *Amendment to the Water Quality Control Plan for the San Diego Region to Incorporate Total Maximum Daily Loads for Dissolved Copper, Lead and Zinc in Chollas Creek, Tributary to San Diego Bay*. The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board on July 15, 2008, the Office of Administrative Law on October 22, 2008, and the USEPA on December 18, 2008.

PROBLEM STATEMENT

Dissolved copper, lead and zinc concentrations in Chollas Creek violate numeric water quality criteria for copper, lead, and zinc promulgated in the California Toxics Rule, and the narrative objective for toxicity. Concentrations of these metals in Chollas Creek threaten and impair the designated beneficial uses of warm freshwater habitat (WARM), and wildlife habitat (WILD).

NUMERIC TARGETS

The TMDL numeric targets for copper, lead, and zinc are set equal to the numeric water quality criteria as defined in the California Toxics Rule (CTR) and shown below. Because the concentration of a dissolved metal causing a toxic effect varies significantly with hardness, the water quality criteria are expressed in the CTR as hardness based equations. The numeric targets are equal to the loading capacity of these metals in Chollas Creek.

Table 7-21. Water Quality Criteria /Numeric Targets for dissolved metals in Chollas Creek

Metal	Numeric Target for Acute Conditions: Criteria Maximum Concentration	Numeric Target for Chronic Conditions: Criteria Continuous Concentration
Copper	(1) * (0.96) * {e^ [0.9422 * ln (hardness) - 1.700]}	(1) * (0.96) * {e^[0.8545 * ln (hardness) - 1.702]}
Lead	(1) * {1.46203 – [0.145712 * ln (hardness)]} * {e^ [1.273 * ln (hardness) - 1.460]}	(1) * {1.46203 – [0.145712 * ln hardness)]} * {e^[1.273 * ln (hardness) - 4.705]}
Zinc	(1) * (0.978) * {e^ [0.8473 * ln (hardness) + 0.884]}	(1) * (0.986) * {e^[0.8473 * ln (hardness) + 0.884]}

SOURCE ANALYSIS

The vast majority of metals loading to Chollas Creek are believed to come through the storm water conveyance system. An analysis of source contributions reveals many land uses and activities associated with urbanization to be potential sources of copper, lead and zinc to Chollas Creek. Modeling efforts point toward freeways and commercial/industrial land uses as the major contributors.

TOTAL MAXIMUM DAILY LOADS

The TMDLs for dissolved copper, lead and zinc in Chollas Creek are concentration-based and set equal to 90 percent of the numeric targets/loading capacity.

MARGIN OF SAFETY

The TMDL includes an explicit margin of safety (MOS). Ten percent of the loading capacity was reserved as an explicit MOS.

ALLOCATIONS AND REDUCTIONS

The source analysis showed that nonpoint sources and background concentrations of metals are insignificant, and thus, were set equal to zero in the TMDL calculations. The wasteload allocations are set equal to 90 percent of the numeric targets/loading capacity. Concentrations of dissolved copper, lead and zinc require significant reductions from current concentrations to meet the loading capacity.

TMDL IMPLEMENTATION PLAN

Persons whose point source discharges contribute to exceedance of Water Quality Criteria (WQC) for copper, lead, and zinc in Chollas Creek will be required to meet the WLA hardness dependant concentrations in their urban runoff discharges before it is discharged to Chollas Creek. Actions to meet the WLAs in discharges to Chollas Creek will be required in WDRs that regulate MS4 discharges, industrial facility and construction activity stormwater discharges, and groundwater extraction discharges in the Chollas Creek watershed. The following orders may be reissued or revised by the Regional Board to include requirements to meet the WLAs. Alternatively, the Regional Board may issue new WDRs to meet the WLAs.

Order No. 2007-0001, NPDES No. CAS0108758, *Waste Discharge Requirements for Discharges of Urban Runoff from the Municipal Separate Storm Sewer Systems Draining the Watersheds of the County of San Diego, the Incorporated Cities of San Diego County, and the San Diego Unified Port District*, or subsequent superceding NPDES renewal orders.

Order No. 2000-90, NPDES No. CAG19001, *General Waste Discharge Requirements for Temporary Groundwater Extraction and Similar Waste Discharges to San Diego Bay and Storm Drains or other Conveyance Systems Tributary Thereto*, or subsequent superceding NPDES renewal orders.

Order No. 2001-96, NPDES No. CAG 919002, *General Waste Discharge Requirements for Groundwater Extraction Waste Discharges from Construction, Remediation and Permanent Groundwater Extraction Projects to Surface Waters within the San Diego Region Except for San Diego Bay* or subsequent superceding NPDES renewal orders.

Order No. 97-11, *General Waste Discharge Requirements for Post-Closure Maintenance of Inactive Nonhazardous Waste Landfills within the San Diego Region* or subsequent superceding NPDES renewal orders.

The Regional Board shall request the State Water Resources Control Board amend the following statewide orders:

Order No. 99-06-DWQ, NPDES No. CAS000003, *National Pollutant Discharge Elimination System (NPDES) Permit, Statewide Storm Water Permit, and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans)*, or subsequent superceding NPDES renewal orders.

Order No. 97-03-DWQ, NPDES No. CAS 000001, *Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities Excluding Construction Activities*, or subsequent superceding NPDES renewal orders.

Order No. 2003-0005-DWQ, NPDES No. CAS000004, *Waste Discharge Requirements for Storm Water Discharges from Small Municipal Separate Storm Sewer Systems*, or subsequent superceding NPDES renewal orders.

Order No. 99-08-DWQ, NPDES No. CAS000002, *General Permit for Storm Water Discharges Associated with Construction Activity*, or subsequent superceding NPDES renewal orders.

The Regional Board shall require the U.S. Navy to submit a Notice of Intent to enroll the Naval Base San Diego facility under statewide Order No. 2003-005-DWQ or subsequent superseding NPDES renewal orders.

IMPLEMENTATION MONITORING PLAN

The dischargers will be required to monitor Chollas Creek and provide monitoring reports to the Regional Board for the purpose of assessing the effectiveness of the management practices implemented to meet the TMDL allocations. The Regional Board shall amend the following order to include a requirement that the cities of San Diego, Lemon Grove, and La Mesa, the County of San Diego, the San Diego Unified Port District, and CalTrans investigate excessive levels of metals in Chollas Creek and feasible management strategies to reduce metal loadings in Chollas Creek, and conduct additional monitoring to collect the data necessary to refine the watershed wash-off model to provide a more accurate estimate of the mass loads of copper, lead and zinc leaving Chollas Creek each year.

Order No. R9-2004-0277, *California Department of Transportation and San Diego Municipal Separate Storm Sewer System Copermittees Responsible for the Discharge of Diazinon into the Chollas Creek Watershed, San Diego, California.*

SCHEDULE OF COMPLIANCE

Concentrations of metals in urban runoff shall only be allowed to exceed the WLAs by a certain percentage for the first nineteen years after initiation of this TMDL. Allowable concentrations shall decrease as shown in Table 7-22. For example, if the measured hardness in year ten dictates the WLA for copper in urban runoff is 10 µg/l, the maximum allowable measured copper concentration would be 12.0 µg/L. By the end of the twentieth year of this TMDL, the WLAs of this TMDL shall be met. This will ensure that copper, lead and zinc water quality objectives are being met at all locations in the creek during all times of the year.

Table 7-22. Interim goals for achieving Wasteload Allocations

	Allowable Exceedance of the WLAs (allowable percentage above)		
Compliance Year	**Copper**	**Lead**	**Zinc**
1	100%	100%	100%
10	20%	20%	20%
20	0%	0%	0%

Compliance with the interim goals in this schedule can be assessed by showing that dissolved metals concentrations in the receiving water exceed the WQC for copper, lead, and zinc by no more than the allowable exceedances for WLAs shown in the table above. Regulated groundwater discharges to Chollas Creek must meet the WLAs at the initiation of the discharge. No schedule to meet interim goals will be allowed in the case of groundwater discharges.

The compliance schedule for implementation of the TMDLs shall be as follows in Table 7-23.

Table 7-23. Compliance Schedule

Item	Implementation Action	Responsible Parties	Date
1	Effective date of Chollas Creek Metals TMDL Waste Load Allocations.	San Diego Water Board, Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	October 22, 2008[23]
2	Recommend High Priority for grant funds.	San Diego Water Board	Immediately after effective date
3	Submit annual Progress Report to San Diego Water Board due January 1 of each year.	Municipal Dischargers	Annually after reissue of NPDES WDRs.
4	Submit annual Progress Report to San Diego Water Board due April 1 of each year.	Caltrans	Annually after reissue of NPDES WDRs.
5	Submit annual Progress Report to San Diego Water Board due July 1 of each year.	Industrial Stormwater Dischargers	Annually after reissue of NPDES WDRs.
6	Submit annual Progress Report to San Diego Water Board due July 1 of each year.	Construction Stormwater Dischargers	Annually after reissue of NPDES WDRs.
7	Municipal NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	San Diego Water Board	Within 5 years of effective date
8	Caltrans NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
9	Construction NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
10	Industrial NPDES WDRs shall be issued, reissued, or revised to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	State Water Board	Within 5 years of effective date
11	Amend Orders No. 2000-90, and No. 2001-96 (or superseding renewal orders) which regulates temporary groundwater extraction discharges to San Diego Bay and its tributaries to include WQBELs consistent with the assumptions and requirements of the Chollas Creek WLAs.	San Diego Water Board	Within 5 years of effective date
12	Municipal and Navy WDR Order No. R9-2004-0277 shall amended to require additional monitoring for metals and hardness.	San Diego Water Board	Within 5 years of effective date
13	Landfill NPDES WDR Order No. 97-11 (or superseding renewal orders) shall be issued, reissued, or revised to monitor for metals and hardness.	San Diego Water Board	Within 5 years of effective date
14	Navy and all other Phase II small MS4 permittees in the Chollas Creek watershed shall be enrolled in Order No. 2003-0005-DWQ (or superseding renewal orders).	San Diego Water Board	Immediately after effective date.
15	Take enforcement actions	San Diego Water Board	As needed after effective date.

[23] Upon approval of by Office of Administrative Law.

Item	Implementation Action	Responsible Parties	Date
16	Meet 80% Chollas Creek Metals TMDL WLA reductions.	Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	10 years after effective date.
17	Meet 100% Chollas Creek Metals TMDL WLA reductions.	Municipal Dischargers, Caltrans, Navy, Industrial Stormwater Dischargers, Construction Stormwater Dischargers, Landfill Stormwater Dischargers	20 years after effective date.

TOTAL MAXIMUM DAILY LOADS FOR INDICATOR BACTERIA, BABY BEACH AND SHELTER ISLAND SHORELINE PARK SHORELINES

On June 11, 2008, the San Diego Water Board adopted Resolution No. R9-2008-0027, *A Resolution Amending the Water Quality Control Plan for the San Diego Region (9) to Incorporate Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*. The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board on June 16, 2009, the Office of Administrative Law on September 15, 2009, and the USEPA on October 26, 2009.

PROBLEM STATEMENT

Bacteria densities along the shoreline segments of Baby Beach within Dana Point Harbor and Shelter Island Shoreline Park within San Diego Bay violate water quality objectives (WQOs) for indicator bacteria. Bacteria densities in waters at these shoreline segments unreasonably impair and threaten to impair the water quality needed to support designated beneficial uses of contact recreation (REC-1)[24].

The federal Clean Water Act requires the establishment of Total Maximum Daily Loads (TMDLs) for pollutants that exceed water quality objectives needed to support designated beneficial uses, i.e., that cause or contribute to violation of state “water quality standards.”

NUMERIC TARGETS

When calculating TMDLs, numeric targets are established to meet WQOs and subsequently ensure the protection of beneficial uses. The numeric targets for these TMDLs consist of the REC-1 WQOs for indicator bacteria contained in the Basin Plan. TMDLs were calculated for each impaired waterbody, for each indicator bacteria, for wet and dry weather. The numeric targets used in the TMDL calculations were equal to the WQOs for bacteria for REC-1.

Different dry weather and wet weather numeric targets were used for load calculations because the bacteria transport mechanisms to receiving waters are different under wet and dry weather conditions.

Single sample maximum WQOs were used as wet weather numeric targets. Dry weather numeric targets are typically best represented by geometric mean WQOs. However, due to extreme diurnal variations in bacteria densities that can result from tidal effects, in some cases the maximum hourly concentration could regularly exceed the single sample maximum WQOs. Therefore, both the REC-1 30-day geometric mean and single sample maximum WQOs were selected as numeric targets for dry weather. The numeric targets were equal to the total coliform, fecal coliform and *Enterococcus* WQOs for REC-1 in all cases.

The numeric targets for the scenarios described above are listed in the following tables:

[24] Water quality objectives for indicator bacteria in waters with non-water-contact recreation (REC-2) are less stringent than the water quality objectives for REC-1, therefore, attainment of REC-1 objectives through the implementation of TMDLs will, *a fortiori,* provide the requisite water quality for REC-2.

Table 7-24. Wet Weather Numeric Targets

Basis for Numeric Target	Total Coliform (MPN/100mL)	Fecal Coliform (MPN/100mL)	Enterococcus (MPN/100mL)
Beneficial Use	**REC-1**	**REC-1**	**REC-1**
Single sample maximum	10,000	400	104

Table 7-25. Dry Weather Numeric Targets

Basis for Numeric Target	Total Coliform (MPN/100mL)	Fecal Coliform (MPN/100mL)	Enterococcus (MPN/100mL)
Beneficial Use	**REC-1**	**REC-1**	**REC-1**
30-day geometric mean	1,000	200	35
Single sample maximum	10,000	400	104

SOURCE ANALYSIS

Sources of bacteria are the same under both wet weather and dry weather conditions. Bacteria can enter surface waters from both nonpoint and point sources. Nonpoint sources are typically diffuse sources that have multiple routes of entry into surface waters. Point sources typically discharge at a specific location from pipes, outfalls, and conveyance channels.

The only nonpoint sources identified to potentially affect the waterbodies addressed by these TMDLs were natural sources (e.g., direct inputs from birds, terrestrial and aquatic animals, wrack line and aquatic plants, sediments, or other unidentified or unquantified sources within the receiving waters), homeless encampments, or other background sources (e.g., “ambient” bacteria that may be influenced by illegal discharges from boats). Because the homeless encampments are illegal, these loads are not allowed and must be eliminated. Due to lack of data, bacteria loads from natural sources or other background sources could not be specifically identified or quantified for TMDL development. Until more information is obtained through further study to provide identification of the relative loading from each of these potential sources, they were combined into a single natural and background source for each shoreline segment.

The point sources identified to potentially affect the waterbodies addressed in this study were discharges from municipal separate storm sewer systems (MS4s) and illegal discharges from boats and/or wastewater collection systems and treatment plants. Because the Basin Plan includes waste discharge prohibitions specifically for the discharge of treated or untreated sewage from vessels to Dana Point Harbor and San Diego Bay and the unauthroized discharge of treated or untreated sewage to waters of the state, illegal discharges from boats and wastewater collection systems and treatment plants are not allowed must be eliminated. The watersheds that drain into the receiving waters at the impaired shoreline segments are wholly located within urbanized areas. Therefore, the only allowable point source identified was urban runoff discharged from MS4s, although other point sources may exist.

For both wet weather and dry weather conditions, there are natural and background sources of bacteria within the receiving waters at the impaired shoreline segments. However, for sources of bacteria that originate from the watersheds draining into the receiving waters, the method of transport for the two conditions is very different. Wet weather loading originating from the watersheds is dominated by episodic storm flows that wash off bacteria that build up on the surface of all land use types in the watershed during dry periods. Dry weather loading originating from the watersheds is dominated by nuisance flows from urban land use activities such as car washing, sidewalk washing, and lawn over-irrigation, which pick up bacteria and deposit it into receiving waters.

TOTAL MAXIMUM DAILY LOADS AND ALLOCATIONS

The TMDLs are equal to the assimilative or loading capacity of each shoreline segment for each pollutant. TMDLs for each type of indicator bacteria were developed for each impaired waterbody. TMDLs are defined as the maximum amount of a pollutant the waterbody can receive and still attain water quality objectives and protection of designated beneficial uses. Once calculated, a TMDL is set equal to the sum of all individual Waste Load Allocations (WLAs) for point sources and Load Allocations (LAs) for nonpoint sources. The TMDL includes a margin of safety (MOS) that takes into account any uncertainties in the TMDL calculation, which may be explicit or implicit. For these TMDLs, an implicit margin of safety is included via conservative estimates and assumptions used throughout the TMDL calculations. Separate TMDLs were calculated for wet weather and dry weather conditions to account for seasonal variations, and because the transport mechanism, flow, and bacteria loads from the watersheds draining to the receiving waters are different between dry and wet weather conditions.

Calibrated models were used to simulate flow and bacteria densities from the watersheds draining into the receiving waters and within the receiving waters of the shoreline segments. The models were used to calculate the existing bacteria loads, as well as TMDLs for each impaired shoreline segment. The modeled existing loads were compared to the TMDLs to calculate the necessary load reductions needed to achieve the TMDLs in the waterbodies. The TMDLs were allocated among point sources (WLAs) and nonpoint sources (LAs). The only allowable point source identified was urban runoff discharged from MS4s, which was assigned a WLA for each watershed. The only allowable nonpoint sources identified were natural or background sources, such as direct inputs from birds, terrestrial and aquatic animals, wrack line and aquatic plants, sediments, or other unidentified and unquantified sources within the receiving waters, which were lumped together and assigned a LA. Because only the point sources are considered controllable, a load reduction was only calculated for the bacteria loads from the MS4s. Bacteria loads from sources of illegal discharges were assigned WLAs and LAs of zero. The TMDLs, LAs for natural and background sources, WLAs for municipal MS4s, and load reductions for municipal MS4s are shown below in Tables 7-26 through 7-31.

MARGIN OF SAFETY

There are two ways to incorporate the MOS (USEPA, 1991): (1) implicitly incorporate the MOS using conservative model assumptions to develop allocations; and/or, (2) explicitly specify a portion of the total TMDL as the MOS and use the remainder for allocations. Throughout the TMDL development process, conservative assumptions were employed. Based on the incorporation of all these conservative assumptions, no explicit MOS was necessary.

Table 7-26. REC-1 Wet Weather TMDLs for Total Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

					Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	
Waterbody	**Shoreline Segment/Area**	**Hydrologic Descriptor**	**Model Sub-watershed**	**TMDL** (Billion MPN/ 30 days)	**Natural/Background** (Billion MPN/ 30 days)[1]	**Municipal MS4** (Billion MPN/ 30 days)	**Municipal MS4** (Billion MPN/ 30 days)	**Percent Reduction of Municipal MS4 Existing Wasteload**[2]
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	166,111	162,857	3,254	3,254	0%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	482,598	482,400	198	198	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis (Dry weather LA from Table 7-29 multiplied by 30 days). No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table7-27. REC-1 Wet Weather TMDLs for Fecal Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

					Load Allocations (LAs)	Wasteload Allocations (WLAs)	Existing Wasteloads	
Waterbody	**Shoreline Segment/Area**	**Hydrologic Descriptor**	**Model Sub-watershed**	**TMDL** (Billion MPN/ 30 days)	**Natural/Background** (Billion MPN/ 30 days)[1]	**Municipal MS4** (Billion MPN/ 30 days)	**Municipal MS4** (Billion MPN/ 30 days)	**Percent Reduction of Municipal MS4 Existing Wasteload**[2]
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	32,585	32,473	112	112	0%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	41,408	41,400	8	8	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis (Dry weather LA from Table 7-30 multiplied by 30 days). No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table7-28. REC-1 Wet Weather TMDLs for *Enterococcus* for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ 30 days)	Load Allocations (LAs) Natural/Background (Billion MPN/ 30 days)[1]	Wasteload Allocations (WLAs) Municipal MS4 (Billion MPN/ 30 days)	Existing Wasteloads Municipal MS4 (Billion MPN/ 30 days)	Percent Reduction of Municipal MS4 Existing Wasteload[2]
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	5,730	5,616	114	301	62.2%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	10,556	10,530	26	26	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis (Dry weather LA from Table 7-31 multiplied by 30 days). No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table7-29. REC-1 Dry Weather TMDLs for Total Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ day)	Load Allocations (LAs) Natural/Background (Billion MPN/ day)[1]	Wasteload Allocations (WLAs) Municipal MS4 (Billion MPN/ day)	Existing Wasteloads Municipal MS4 (Billion MPN/ day)	Percent Reduction of Municipal MS4 Existing Wasteload[2]
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	5,430	5,429	0.86	9.0	90.4%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	16,080	16,080	0	0	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis. No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table7-30. REC-1 Dry Weather TMDLs for Fecal Coliform for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ day)	Load Allocations (LAs) Natural/Background (Billion MPN/ day)[1]	Wasteload Allocations (WLAs) Municipal MS4 (Billion MPN/ day)	Existing Wasteloads Municipal MS4 (Billion MPN/ day)	Percent Reduction of Municipal MS4 Existing Wasteload[2]
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	1,083	1,082	0.17	1.0	82.7%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	1,380	1,380	0	0	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis. No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

Table7-31. REC-1 Dry Weather TMDLs for *Enterococcus* for Baby Beach and Shelter Island Shoreline Park Shoreline Segments

Waterbody	Shoreline Segment/Area	Hydrologic Descriptor	Model Sub-watershed	TMDL (Billion MPN/ day)	Load Allocations (LAs) Natural/Background (Billion MPN/ day)[1]	Wasteload Allocations (WLAs) Municipal MS4 (Billion MPN/ day)	Existing Wasteloads Municipal MS4 (Billion MPN/ day)	Percent Reduction of Municipal MS4 Existing Wasteload[2]
Dana Point Harbor	Baby Beach	Dana Point HSA (901.14)	2101,2102 2103,2104	187	187	0.03	0.8	96.2%
San Diego Bay	Shelter Island Shoreline Park	Point Loma HA (908.10)	2201	351	351	0	0	0%

Abbreviations/Acronyms:
TMDL: total maximum daily load
LA: load allocation for nonpoint source
WLA: wasteload allocation for point source
MS4: Municipal Separate Storm Sewer System
MPN: most probable number

Notes:
[1] Calculated by dry weather EFDC model analysis. No reduction required for natural/background sources.
[2] Percent Reduction of Existing Municipal MS4 Wasteload = (Existing Municipal MS4 Wasteload – Municipal MS4 WLA) ÷ (Existing Municipal MS4 Wasteload) x 100%

TMDL IMPLEMENTATION PLAN

By design, waste load allocations and load allocations are established at levels that when met, will result in the full attainment of water quality standards. For this reason, the San Diego Water Board expects that at the end of the TMDL compliance period, applicable load and waste load allocations, as well as the water quality objectives will be met at all times in the receiving water. In the event that water quality objectives are not met at the end of the compliance period, the Board will require the dischargers to conduct an investigation to identify the specific source(s) responsible for the failure to meet water quality objectives. If the source is found to be anthropogenic, the San Diego Water Board will initiate enforcement or other regulatory action as appropriate to correct the problem. If the source is natural, and if all of the conditions for using the natural sources exclusion approach (NSEA) have been met, the Board will consider the application of the NSEA, including the recalculation of the TMDLs to account for the natural sources. The necessary actions to implement the TMDLs are described in section 10 of the Technical Report entitled *Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay*, dated June 11, 2008, and listed below.

(A) Specific Implementation Objectives

Since 2002, the dischargers have implemented several non-structural best management practice (BMP) programs and structural BMPs that have resulted in noticeable improvements in water quality at the impaired shoreline segments. The County of Orange has already conducted numerous studies and implemented a variety of non-structural and structural BMPs in an effort to reduce bacteria levels at Baby Beach since before 2002. These efforts have included installing seasonal plugs in storm drains, increased street sweeping efforts, expedited trash collection to control birds, the installation of bird netting under the pier, public education efforts against bird-feeding at the beach, artificial circulation of water at Baby Beach, a dry weather flow diversion structure and media filter system on the west end of the beach, catch basin filters, and the collection and disposal of bird fecal droppings from the exposed intertidal areas of the beach. The San Diego Unified Port District has also implemented several non-structural BMP programs since 2002. Water quality data from 2002 to 2006 indicate that bacteria levels in the waters at Baby Beach and Shelter Island Shoreline Park have shown significant improvements in water quality since 2002.

As shown in Tables 7-26 through 7-31, the modeling results indicate that no load reductions are required for total coliform, fecal coliform, and *Entercoccus* indicator bacteria for Shelter Island Shoreline Park during wet weather or dry weather conditions. Additionally, the modeling results indicate only *Entercoccus* indicator bacteria wet weather load reductions are required for Baby Beach and no wet weather load reductions are required for total coliform and fecal coliform indicator bacteria. For dry weather, Baby Beach requires between approximately 83 percent and 96 percent wasteload reductions for total coliform, fecal coliform, and *Entercoccus* indicator bacteria. However, based only on the water quality data collected during 2006, the number of samples that exceed the REC-1 water quality objectives are less than the allowable number of exceedances for recommending removal from the 303(d) List. This trend implies that the past and current BMPs that have been implemented are effective in reducing bacteria loads to the receiving waters and that water quality in the impaired shoreline segments already meet REC-1 water quality objectives during dry weather. However, additional monitoring is required to confirm this trend, and additional BMPs may be needed to meet the REC-1 water quality objectives during wet weather.

While the Bacteria Load Reduction Plans (BLRPs), as described below, will still be required from the dischargers, if current trends continue, monitoring and permanent implementation of the current programs and BMPs may be adequate for meeting the wet weather and dry weather TMDLs. If the REC-1 water quality objectives cannot be met in the receiving waters by the end of the compliance schedules, and if natural and background sources appear to be the sole source of continued impairment, application of the natural sources exclusion approach (NSEA) to revise the TMDLs, as described below, may be appropriate.[25]

[25] After adoption of a Basin Plan amendment authorizing the use of the Natural Sources Exclusion Approach by the San Diego Water Board and approval by the Office of Administrative Law.

Therefore, if the water quality data support delisting before the NPDES requirement revisions are considered, specific objectives of this Implementation Plan are as follows:

1. Persons responsible for monitoring the impaired shoreline segments of Baby Beach and Shelter Island Shoreline Park for bacteria will continue with the monitoring program to ensure REC-1 water quality objectives are maintained.

2. If REC-1 water quality objectives are exceeded, actions outlined in Attachment B of Order Nos. R9-2007-0001 and R9-2002-0001 in section II.C, Coastal Storm Drain Outfall Monitoring, and any subsequent amendment or renewal, will be implemented.

3. If sources of bacteria persist at levels that exceed water quality standards, then the persons responsible will take appropriate actions to identify and eliminate the controllable source or sources of the chronic contamination. If natural and background sources appear to be the sole source of the impairment, application of the NSEA to revise the TMDLs may be appropriate.

If the impaired shoreline segments of BB and SISP remain on or are put back on the List during subsequent iterations of the 303(d) listing process due to impacts from controllable sources of bacteria, the San Diego Water Board will revise the current NPDES requirements and/or issue additional waste discharge requirements to be consistent with these TMDLs.

(B) San Diego Water Board Actions

The San Diego Water Board regulates discharges of waste by issuing waste discharge prohibitions, waste discharge requirements, or conditional waivers of waste discharge requirements. Violation of a waste discharge prohibition, waste discharge requirement, or waiver condition is subject to enforcement actions. This section describes the actions that the San Diego Water Board will take to implement the TMDLs.

(1) Process and Schedule for Issuing NPDES Requirements

The TMDLs will be implemented primarily by reissuing or revising the existing NPDES waste discharge requirements for MS4 discharges to include water quality based effluent limitations (WQBELs) that are consistent with the assumptions and requirements of the bacteria WLAs for MS4 discharges, though there may be other or new point sources.

NPDES requirements should be issued, reissued, or revised “as expeditiously as practicable” to incorporate WQBELs derived from the TMDL WLAs. “As expeditiously as practicable” means the following:

1. **New point sources.** “New” point sources previously unregulated by NPDES requirements must obtain their NPDES requirements before they can lawfully discharge pollutants. For point sources receiving NPDES requirements for the first time, “as expeditiously as practicable” means that the San Diego Water Board incorporates WQBELs that are consistent with the assumptions and requirements of the WLAs into the NPDES requirements and requires compliance with the WQBELs upon the commencement of the discharge.

2. **Point Sources Currently Regulated Under NPDES Requirements.** For point sources currently regulated under NPDES requirements, “as expeditiously as practicable” means that:

    a. WQBELs that are consistent with the assumptions and requirements of the WLAs should be incorporated into NPDES requirements during their 5-year term, prior to expiration, in accordance with the applicable NPDES requirement reopening provisions, taking into account factors such as available NPDES resources, staff and budget constraints, and other competing priorities.

    b. In the event the NPDES requirement revisions cannot be considered during the 5-year term, the San Diego Water Board will incorporate WQBELs that are consistent with the assumptions and requirements of the WLAs into the NPDES requirements at the end of the 5-year term.

(2) Actions with Respect to Phase I Municipal Dischargers

The Phase I Municipal Dischargers in San Diego and Orange County are required under Receiving Water Limitations A.3.a.1 and C.2[26] of Orders No. R9-2007-0001 and R9-2002-0001, respectively (San Diego County and Orange County MS4 NPDES requirements), and any subsequent amendment or renewal, to implement additional BMPs to reduce bacteria discharges in impaired watersheds to the maximum extent practicable and to restore compliance with the bacteria water quality objectives. This obligation is triggered when either the discharger or the San Diego Water Board determines that MS4 discharges are causing or contributing to an exceedance of an applicable water quality objective, in this case the REC-1 indicator bacteria water quality objectives. Designation of the shoreline segments in San Diego Bay and Dana Point Harbor as water quality limited segments under Clean Water Act section 303(d) and the TMDL analysis provided sufficient evidence that that MS4 discharges may be causing or contributing to the violation of water quality standards. Thus, the Municipal Dischargers should be, and have been implementing the provisions of Receiving Water Limitation C.2 with respect to bacteria discharges into water quality limited segments.

In addition to enforcing the provisions of Receiving Water Limitation C.2, the San Diego Water Board shall reissue or revise Orders No. R9-2007-0001 and R9-2002-0001, to incorporate WQBELs consistent with the assumptions and requirements of the bacteria WLAs, and requirements for monitoring and reporting. In those orders, the Phase I Municipal Dischargers are referred to as "Copermittees."[27] WQBELs and other requirements implementing the TMDLs can be incorporated into these NPDES requirements upon the normal renewal cycle or sooner, if appropriate. The requirements implementing the TMDLs shall include the following:

a. WQBELs consistent with the requirements and assumptions of the bacteria WLAs described in Tables 7-26 through 7-31 and a schedule of compliance applicable to the MS4 discharges into the impaired shoreline segments described in Tables 7-32 through 7-34. At a minimum, WQBELs shall include a BMP program to attain the WLAs.

b. If the WQBELs consist of BMP programs, then the reporting requirements shall consist of annual progress reports on BMP planning, implementation, and effectiveness in attaining the WQOs in impaired shoreline segments, and annual water quality monitoring reports. The first progress report shall consist of a Bacteria Load Reduction Plan (BLRP), which may be included as part of the annual NPDES reporting requirements. BLRPs must be specific to each impaired waterbody.

   To provide guidance to the dischargers in preparing BLRPs, the following bullets describe components that should be considered for incorporation in the BLRPs.

   Comprehensive Watershed Approach

   - Dischargers should identify the Lead Watershed Contact for their BLRPs. The Lead Watershed Contact should serve as liaison between all other common watershed dischargers and the San Diego Water Board, where appropriate.

   - Dischargers should describe a program for encouraging collaborative, watershed-based, land-use planning in their jurisdictional plans.

[26] Receiving Water Limitations A.3.a.1 and C.2.a provide that "[u]pon a determination by either the Copermittee or the San Diego Water Board that MS4 discharges are causing or contributing to an exceedance of an applicable water quality standard, the Copermittee shall promptly notify and thereafter submit a report to the San Diego Water Board that describes BMPs that are currently being implemented and additional BMPs that will be implemented to prevent or reduce any pollutants that are causing or contributing to the exceedance of water quality standards. The report may be incorporated in the annual update to the Jurisdictional URMP unless the San Diego Water Board directs an earlier submittal. The report shall include an implementation schedule. The San Diego Water Board may require modification to the report." Additional requirements are included in sections C.2.b-d.

[27] Copermittees own or operate MS4s through which urban runoff discharges into waters of the U.S. within the San Diego Region. These MS4s fall into one or more of the following categories: (1) a medium or large MS4 that services a population of greater than 100,000 or 250,000 respectively; or (2) a small MS4 that is "interrelated" to a medium or large MS4; or (3) an MS4 which contributes to a violation of a water quality standard; or (4) an MS4 which is a significant contributor of pollutants to waters of the United States.

- Dischargers should develop and periodically update a map of the BLRP watershed, to facilitate planning, assessment, and collaborative decision-making. As appropriate, the map should include features such as receiving waters; Clean Water Act section 303(d) impaired receiving waters; water quality projects; land uses; MS4s; major highways; jurisdictional boundaries; and inventoried commercial, industrial, and municipal sites.

- Dischargers should annually assess the water quality of the impaired water body in their BLRPs in order to identify all water quality problems within the impaired water body. This assessment should use applicable water quality data, reports, and analysis generated in accordance with the requirements of the applicable NPDES MS4 monitoring and reporting programs, as well as applicable information available from other public and private organizations.

- Dischargers should develop and implement a collective watershed BLRP strategy to meet the bacteria TMDL. The strategy should guide dischargers in developing a Bacteria Compliance Schedule (BCS) which includes BMP planning and scheduling as outlined below.

- Dischargers should collaborate to develop and implement the BLRPs. The BLRP should include a proposal for regularly scheduled meetings among the dischargers in the impaired watershed.

- Because water quality data will ultimately determine if a waterbody will be delisted from the 303(d) List, the BLRP should include a monitoring and reporting program that contains the following elements:

  - Locations of water quality sampling sites that are spatially representative of the waterbody and appropriate for identifying potential sources, including, at a minimum, the monitoring stations currently used to monitor water quality.

  - Schedule of water quality sampling that is temporally representative of both wet weather and dry weather conditions. Wet weather samples are collected during storms of 0.2 inches of rainfall and the 72 hour period after the storm. Dry weather samples are collected from during times when rain has not fallen for the preceding 72 hours.

  - Presentation of past and present water quality data that have been collected.

  - Analysis of water quality data compared to the applicable Basin Plan water quality objectives. Dry weather water quality data are compared to long-term (e.g., geometric mean, mean, or median) water quality objectives, as well as short-term (e.g., single sample maximum) water quality objectives. Wet weather water quality data are compared to short-term (e.g., single sample maximum) water quality objectives.

  - Analysis of water quality data to correlate noticeable improvements in water quality with past and current BMPs that have been implemented and are effective.

  - Analysis of water quality data to correlate elevated bacteria levels with known or suspected sewage spills from wastewater collection systems and treatment plants or boats.

  - Recommendations for increased or decreased water quality sampling based on water quality data analyses.

- Each BLRP and BCS should be reviewed annually to identify needed modifications and improvements. The dischargers should develop and implement a plan and schedule, included in the BCS, to address the identified modifications and improvements. All updates to the BLRP should be documented in the BLRP, and submitted to the San Diego Water Board. Individual dischargers should also review and modify their jurisdictional ordinances and activities as necessary so that they are consistent with the requirements of the BLRP.

Bacteria Compliance Schedule - BMP Planning and Scheduling

The BCS should identify the BMPs/water quality projects that have been implemented or are planned for implementation and provide an implementation schedule for each BMP/water quality project. The BCS should demonstrate how the BMPs/water quality projects will address all the bacteria TMDLs. The BCS, at a minimum, should include scheduling for the following:

Non-structural BMP phasing:

- Completed Non-Structural BMP Analysis – Information should be provided regarding the non-structural BMPs completed and/or currently in practice, a timeline of BMP implementation and maintenance, and an assessment of effectiveness.

If the Completed Non-Structural BMP Analysis indicates additional non-structural BMPs are necessary, the following should be included in the BCS:

- New Non-Structural BMP Analysis - Watershed data should be analyzed to identify new effective non-structural BMPs for implementation. This should be completed and included in the BCS.

- Scheduled Annual Non-structural BMP Implementation - The above analysis should be used to identify BMPs that have and will be implemented and to develop an aggressive non-structural BMP implementation schedule. The BCS should include a schedule of the current BMP staffing for each impaired area, and provide a discussion on adjustments to staff scheduling to meet possible new non-structural BMP demands. Schedules should be realistic and justifiable.

- Scheduled Annual BMP Assessment and Optimizing Adjustments - As the non-structural BMPs are implemented, a scheduled in-depth assessment of the non-structural BMPs' performance should follow. Non-structural BMPs that are found to be ineffective should be modified to incorporate optimizing adjustments to improve performance or be replaced by other effective non-structural BMPs. The results from this assessment should also be used to determine structural BMP selection and the schedule for structural BMP implementation. The BCS should include an annual schedule for in-depth non-structural BMP assessment and optimizing adjustments.

- Scheduled Continuous Budget and Funding Efforts- Securing budget and funding for non-structural BMP staffing and equipment should be scheduled early and continue until the bacteria TMDLs are met. The BCS should include a schedule for staff time, including position and job description, authorized for securing budget and funding for non-structural BMP implementation.

Structural BMP phasing:

- Completed Structural BMP Analysis – Information should be provided regarding the structural BMPs completed and/or currently in practice, a timeline of BMP implementation and maintenance, and an assessment of effectiveness.

If the Completed Structural BMP Analysis indicates additional structural BMPs are necessary, the following should be included in the BCS:

- Scheduled New Structural BMP Analysis– Structural BMP analysis should utilize all available information, including the non-structural BMP assessment and existing structural BMP assessment, to identify, locate, design and build possible new structural BMPs, or a train of BMPs, to meet the these bacteria TMDLs. The BCS should include a schedule for structural BMP analysis.

- Scheduled Annual BMP Construction - The BCS should include a projected general construction schedule with a realistic and justifiable timeline for possible new BMP construction.

- Scheduled Annual BMP Assessment, Optimization Adjustments, and Maintenance - Assessment for structural BMPs should begin immediately upon initial BMP completion, followed by continuously scheduled BMP assessment, optimization adjustments, and maintenance, to both the individual structural BMPs and the structural BMP program as a whole. The BCS should include an annual schedule for in-depth structural BMP assessment.

- Scheduled Continuous Budget and Funding Effort - Securing budget and funding for structural BMPs and additional maintenance staff should be scheduled early and continue until the bacteria TMDLs are met. The BCS should include a schedule for staff time, including position and job description, authorized for securing budget and funding for structural BMP implementation.

Subsequent reports should assess and describe the effectiveness of implementing the Bacteria Load Reduction Plan. Effectiveness assessments should be based on a program effectiveness assessment framework, such as the one developed by the California Stormwater Quality Association (CASQA, 2005). Using the CASQA framework as an example, the assessments should address the framework's outcome levels 1-5 on an annual basis, and outcome level 6 once every five years.[28] Methods used for assessing effectiveness should include the following or their equivalent: surveys, pollutant loading estimations, and receiving water quality monitoring. The long-term strategy should also discuss the role of monitoring data in substantiating or refining the assessment. Once water quality objectives have been attained, or the anthropogenic sources have been eliminated and pollutant loads can be attributed to only natural and background sources, a reduced level of monitoring may be appropriate.

In addition to these requirements, if load-based numerical WQBELs are included in the NPDES requirements, the monitoring requirements should include flow and bacteria density measurements to determine if bacteria loads in effluent are in compliance with WQBELs.

The BLRPs are the municipal dischargers' opportunity to propose methods for assessing compliance with WQBELs that implement TMDLs. The monitoring components included in the BLRPs should be formulated according to particular compliance assessment strategies. The monitoring components are expected to be consistent with, and support whichever compliance assessment methods are proposed. The San Diego Water Board will coordinate with the municipal dischargers during the development of their proposed monitoring components and associated compliance assessment methods.

If NPDES requirements are not likely to be issued, reissued or revised within 6 months of Office of Administrative Law approval of these TMDLs, the San Diego Water Board may issue an investigative/monitoring order to dischargers pursuant to sections 13267 or 13383 of the Water Code. This order would require assessment of current BMPs, possible planning for additional BMPs, and receiving water quality monitoring in adherence to performance measures described above.

The BLRPs may be re-evaluated at set intervals (such as 5-year renewal cycles for NPDES requirements, or upon request from named dischargers, as appropriate and in accordance with the San Diego Water Board priorities). Plans may be iterative and adaptive according to assessments and any special studies.

(3) Actions with Respect to Wastewater Collection Systems and Treatment Plants

The San Diego Water Board will conduct surveillance of and enforce the provisions of State Water Board Order No. 2006-0003-DWQ, and San Diego Water Board Order No. R9-2007-0005 as needed to ensure that collection systems for wastewater treatment plants do not overflow, leak, or otherwise discharge into MS4s or surface waters. If necessary, San Diego Water Board Order No. R9-2007-0005 can be revised to require more aggressive collection system monitoring, maintenance, and repair schedules.

[28] Outcome level 1 assesses compliance with activity-based permit requirements. Outcome level 2 assesses changes in attitudes, knowledge, and awareness. Outcome level 3 assesses behavioral change and BMP implementation. Outcome level 4 assesses pollutant load reductions. Outcome level 5 assesses changes in urban runoff and discharge water quality. Outcome level 6 assesses changes in receiving water quality. See CASQA "An Introduction to Stormwater Program Effectiveness Assessment."

(4) Actions with Respect to Marinas and Boats

If discharges from boats are shown to be a significant source of bacteria contributing to exceedances of water quality objectives, the San Diego Water Board will enforce the waste discharge prohibitions in the Basin Plan to ensure that illegal discharges from boats to surface waters do not occur. This may require issuing enforcement actions, such as Cease and Desist Orders, or issuing NPDES requirements or waste discharge requirements to the marina and harbor operators and/or the muncipalities requiring implementation of BMPs (e.g., public education and outreach, enforcing ordinances, and/or requiring dye tabs in boat sewage holding tanks) to eliminate illegal discharges of sewage, in addition to water quality monitoring and reporting.

(5) Additional Actions

Take Enforcement Actions

The San Diego Water Board shall consider enforcement actions,[29] as necessary and appropriate, against any discharger failing to comply with applicable waste discharge requirements or discharge prohibitions. Enforcement actions may be taken, as necessary and appropriate, to control the discharge of bacteria to impaired shorelines to attain compliance with the bacteria WLAs specified in Tables 7-26 through 7-31, or to attain compliance with the applicable water quality objectives.

Recommend High Priority for Grant Funds

The San Diego Water Board shall recommend that the State Water Board assign a high priority to awarding grant funding[30] for projects to implement the bacteria TMDLs. Special emphasis will be given to projects that can achieve quantifiable bacteria load reductions consistent with the specific bacteria TMDL WLAs and LAs.

Apply the Natural Sources Exclusion Approach[31]

Under the Natural Sources Exclusion Approach (NSEA), all anthropogenic sources of indicator bacteria to the water bodies subject to an indicator bacteria TMDL must be controlled. Dischargers must also demonstrate that all anthropogenic sources of indicator bacteria to the target water body are controlled and that residual indicator bacteria densities do not indicate a health risk.

Once control of all anthropogenic sources and demonstration of appropriate health risk levels have been achieved, the residual indicator bacteria loads in the waterbodies attributable to uncontrollable sources can be identified and measured. Likewise, the frequency that uncontrollable sources cause exceedances of indicator bacteria water quality objectives in the water body can be identified. The information can be used to establish an allowable indicator bacteria WQO exceedance frequency in the impaired water body based upon the residual exceedance frequency observed. This information can then be used to recalculate the TMDLs, WLAs, and LAs.

[29] An enforcement action is any formal or informal action taken to address an incidence of actual or threatened noncompliance with existing regulations or provisions designed to protect water quality. Potential enforcement actions including notices of violation (NOVs), notices to comply (NTCs), imposition of time schedules (TSO), issuance of cease and desist orders (CDOs) and cleanup and abatement orders (CAOs), administrative civil liability (ACL), and referral to the attorney general (AG) or district attorney (DA). The San Diego Water Board generally implements enforcement through an escalating series of actions to: (1) assist cooperative dischargers in achieving compliance; (2) compel compliance for repeat violations and recalcitrant violators; and (3) provide a disincentive for noncompliance.

[30] In most cases, the State Water Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act section 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL project implementation for non-point source pollution.

[31] After adoption of a Basin Plan amendment authorizing the use of the Natural Sources Exclusion Approach by the San Diego Water Board and approval by the Office of Administrative Law.

The use of the NSEA is contingent upon demonstration of control of all anthropogenic sources of indicator bacteria to the waterbodies subject to an indicator bacteria TMDL. Since this task is likely to be formidable, use of the NSEA is not expected to occur immediately. Rather, the NSEA would be used to recalculate TMDLs at some point after their initial adoption, following demonstration of control of all anthropogenic sources.

The dischargers are responsible for collecting and providing the data to support the application of the NSEA. If the data support the application of the NSEA, the San Diego Water Board will recalculate the TMDLs, WLAs, and LAs to allow for the exceedances of the REC-1 indicator bacteria WQOs due to uncontrollable sources.

(C) Coordination and Execution of Special Studies

The San Diego Water Board recognizes that coordination and execution of special studies by dischargers and other interested persons could result in improved TMDL analyses that more accurately protect beneficial uses. Areas of study that could benefit TMDL analysis include collection of data that can be used to improve model output, improved understanding of bacteria levels and the relationship to health effects, and identification of an appropriate and affordable method(s) to measure pathogens directly. Additionally, studies designed to measure BMP effectiveness and bacteria source identification will be useful for dischargers in identifying appropriate strategies to meet the requirements of this TMDL.

(1) Collect Data Useful for Model Improvement

Calibration and validation of the computer models used for TMDL analysis was based on limited data (water quality and/or flow) and assumed values for input parameters such as rates for bacteria die-off and re-growth. Limited data are available related to fecal bacteria that can be attributed to natural and background sources (e.g., waterfowl, terrestrial and aquatic wildlife, wrack line and aquatic plants, sediments, and other unidentified and unquantified sources within the waters). Studies designed to collect additional data that can be used for model improvement will result in more detailed TMDL results and allocations. Also, actual flow and loading data from each watershed and expanded receiving water data can be used to construct models that can more accurately reflect site-specific conditions.

(2) Improve Understanding Between Bacteria Levels and Health Effects

The San Diego Water Board recognizes that there are potential problems associated with using indicator bacteria WQOs to indicate the presence of human pathogens in receiving waters free of sewage discharges. The indicator bacteria WQOs were developed, in part, based on epidemiological studies in waters with sewage inputs. The risk of contracting a water-born illness from contact with urban runoff devoid of sewage, or human-source bacteria is not known. Some pathogens, such as *giardia* and *cryptosporidium* can be contracted from animal hosts. Likewise, domestic animals can pass on human pathogens through their feces. These and other uncertainties need to be addressed through special studies and, as a result, revisions to the TMDLs may be appropriate.

As information is gathered, initiating special studies to understand the uncertainties between bacteria levels and bacteria sources within the watersheds may be useful. Specifically, continuing research may be helpful to answer the following questions:

- What is the risk of illness from swimming in water contaminated with urban/stormwater runoff devoid of sewage?
- Do exceedances of the bacteria water quality objectives from animal sources (wildlife and domestic) increase the risk of illness?
- Are there other, more appropriate surrogates for measuring the risk of illness than the indicator bacteria WQOs currently used?

Addressing these uncertainties is needed to maximize effectiveness of strategies to reduce the risk of illness, which is currently measured by indicator bacteria densities. Dischargers may work with the San Diego Water Board to determine if such special studies are appropriate.

(3) Identification of Method for Direct Pathogen Measurement

Ultimately, the San Diego Water Board supports the idea of measuring pathogens (the agents causing impairment of beneficial uses) or an acceptable alternative indicator, rather than indicator bacteria (surrogates for pathogens). However, as stated previously, indicator bacteria have been used to measure water quality historically because measurement of pathogens is both difficult and costly. The San Diego Water Board is supportive of any efforts by the scientific community to perform epidemiological studies and/or investigate the feasibility of measuring pathogens directly. The San Diego Water Board further supports subsequent modification of WQOs as a result of such studies. Ultimately, TMDLs will be recalculated if WQOs are modified due to results from future studies.

(D) Compliance Schedule

Baby Beach Compliance Schedule

According to Tables 7-26 and 7-27, no wet weather wasteload reductions are required for total and fecal coliform indicator bacteria. This means that according to the wet weather models for Baby Beach, REC-1 water quality objectives for total and fecal coliform indicator bacteria are not expected to be exceeded due to discharges from the MS4s. The only wet weather wasteload reductions required for MS4s discharging into the receiving waters along the shoreline at Baby Beach is for *Enterococcus* indicator bacteria. The compliance schedule for Baby Beach to achieve wet weather TMDLs is as shown in Table 7-32.

Table7-32. Compliance Schedule for Baby Beach to Achieve Wet Weather TMDLs

Year (after OAL Approval)	Required Wasteload Reduction	TMDL Compliance Action
1	No reduction required	▪ Water Quality Monitoring ▪ Implement BMPs
2	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
3	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
4	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
5	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
6	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
7	50 percent *Enterococcus* reduction	▪ Water Quality Monitoring ▪ Implement BMPs
8	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
9	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
10	100 percent *Enterococcus* reduction	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)
10+	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier) ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)

At this time, control of bacteria loads for MS4s during wet weather is inherently difficult because the MS4 systems are traditionally designed to convey water quickly for flood control purposes. However, new approaches to storm water runoff management and BMP implementation can reduce the storm water runoff flow and associated pollutant loads. The phased compliance schedule to achieve wet weather TMDLs will provide the MS4 dischargers time to identify sources, develop plans and implement enhanced and expanded BMPs capable of achieving the mandated decreases in bacteria densities at the Baby Beach shoreline.

According to Tables 7-29, 7-30, and 7-31, dry weather wasteload reductions are required for total coliform, fecal coliform, and Enterococcus indicator bacteria. The trend in the water quality data from Baby Beach indicate that the number of exceedances of the REC-1 water quality objectives have declined significantly beginning in 2006. If the current trend continues, the San Diego Water Board expects that the dry weather TMDLs for Baby Beach can be achieved within the next 5 years. The compliance schedule for Baby Beach to achieve dry weather TMDLs is as shown in Table 7-33.

Table 7-33. Compliance Schedule for Baby Beach to Achieve Dry Weather TMDLs

Year (after OAL Approval)	Required Wasteload Reduction	TMDL Compliance Action
1	No reduction required	▪ Water Quality Monitoring ▪ Implement BMPs
2	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
3	50 percent reduction	▪ Water Quality Monitoring ▪ Implement BMPs
4	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs
5	100 percent reduction	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)
5+	Same as above	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier) ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)

For both of the Baby Beach compliance schedules, if the REC-1 water quality objectives cannot be met in the receiving waters, and if natural and background sources appear to be the sole source of continued impairment, the natural sources exclusion approach (NSEA) may be applied. However, the Municipal Dischargers are responsible for collecting the data to support the application of the NSEA to recalculate the TMDL.

<u>Shelter Island Shoreline Park Compliance Schedule</u>

According to Tables 7-26 through 7-31, there are no wasteload reductions required for MS4s discharging into the receiving waters along the shoreline at Shelter Island Shoreline Park under both wet weather and dry weather conditions. This means that according to the wet weather and dry weather models for Shelter Island Shoreline Park, REC-1 water quality objectives are not expected to be exceeded due to discharges from the MS4s.

Given that the modeled wasteload reductions for both wet weather and dry weather conditions for all indicator bacteria are zero percent, no compliance schedules were developed to meet wasteload reductions for Shelter Island Shoreline Park. However the existing wasteload cannot exceed the WLA and Shelter Island Shoreline Park will remain on the 303(d) List until enough data are collected to support removing it from the 303(d) List. Therefore, in order to comply with these TMDLs, the responsible municipalities must continue implementing BMPs and collecting data until there are enough data to support and maintain the removal of SISP from the 303(d) List. In addition, the reporting requirements for the Shelter Island Shoreline Park TMDL must also include a periodic demonstration, no less often than every 2 years, that wasteload allocations and water quality objectives are being met.

The trend in the water quality data from Shelter Island Shoreline Park indicate that the number of REC-1 WQO exceedances have declined significantly since 2003. If the current trend continues, the San Diego Water Board expects that Shelter Island Shoreline Park will have enough data to support removal of Shelter Island Shoreline Park from the 303(d) List by 2010, and no later than 2012. The compliance schedule for SISP to achieve wet weather and dry weather TMDLs is as shown in Table 7-34.

Table 7-34. Compliance Schedule for Shelter Island Shoreline Park to Achieve Wet Weather and Dry Weather TMDLs

Year	TMDL Compliance Action
2012	▪ Water Quality Monitoring ▪ Implement BMPs ▪ Submit request for TMDL revisions based on Natural Sources Exclusion Approach if supported by data (if not requested and recalculated earlier) ▪ Submit request for removal from 303(d) List (if not requested and removed earlier)

If the REC-1 water quality objectives cannot be met in the receiving waters by 2012, and if natural and background sources appear to be the source of continued impairment, the NSEA may be applied. However, the Municipal Dischargers are responsible for collecting the data to support the application of the NSEA to recalculate the TMDLs.

(E) TMDL Implementation Milestones

Accomplishing the goals of the implementation plan will be achieved by cooperative participation from all responsible parties, including the San Diego Water Board. Major milestones are described below in Table 7-35.

Table 7-35. TMDL Implementation Milestones

Item	Implementation Action	Responsible Parties	Date
1	Effective date of Baby Beach and Shelter Island Shoreline Park Bacteria TMDL Waste Load Allocations (WLAs).	▪ San Diego Water Board ▪ Phase I Municipal Dischargers	Effective date*
2	Issue, reissue, or revise Phase I Municipal NPDES WDRs to include WQBELs consistent with the WLAs.	▪ San Diego Water Board	Within 5 years of effective date
3	Submit annual Progress Report to San Diego Water Board.	▪ Phase I Municipal Dischargers	Annually after reissue of NPDES WDRs
4	Recommend TMDL-related projects as high priority for grant funds.	▪ San Diego Water Board	As needed after effective date
5	Coordination and execution of special studies.	▪ San Diego Water Board ▪ Phase I Municipal Dischargers	As needed after effective date
6	Meet 50% wasteload reductions.	▪ Baby Beach Phase I Municipal Dischargers	3 years after effective date for dry weather 7 years after effective date for wet weather
		▪ Shelter Island Shoreline Park Phase I Municipal Dischargers	No load reductions required. Removal from 303(d) List by 2012.
7	Meet 100% wasteload reductions.	▪ Baby Beach Phase I Municipal Dischargers	5 years after effective date for dry weather 10 years after effective date for wet weather
		▪ Shelter Island Shoreline Park Phase I Municipal Dischargers	No load reductions required. Removal from 303(d) List by 2012.
8	Take enforcement actions to attain compliance with the WLAs.	▪ San Diego Water Board	As needed after effective date
9	Issue NPDES requirements or waste discharge requirements to marina and harbor operators and/or the muncipalities to eliminate sewage discharges from boats	▪ San Diego Water Board	As needed after effective date
10	Apply NSEA and recalculate TMDLs	▪ Baby Beach Phase I Municipal Dischargers	As appropriate after effective date, if data are available to support the action.
		▪ Shelter Island Shoreline Park Phase I Municipal Dischargers	

* Effective date is date of approval of these TMDLs by the Office of Administrative Law

REVISED TOTAL MAXIMUM DAILY LOADS FOR INDICATOR BACTERIA, PROJECT I – TWENTY BEACHES AND CREEKS IN THE SAN DIEGO REGION (INCLUDING TECOLOTE CREEK)

On February 10, 2010, the San Diego Water Board adopted Resolution No. R9-2010-0001, *A Resolution Amending the Water Quality Control Plan for the San Diego Region (9) to Incorporate Revised Total Maximum Daily Loads for Indicator Bacteria, Project I – Twenty Beaches and Creeks in the San Diego Region (Including Tecolote Creek)* (referred to hereafter as Revised Bacteria TMDLs Project I). The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board (SWRCB)on December 14, 2010, the Office of Administrative Law on April 4, 2011, and the USEPA on June 22, 2011.

Bacteria TMDLs have been established for the following 20 waterbodies listed on the 2002 Clean Water Act Section 303(d) List of Water Quality Limited Segments:

Table 7-36. Beaches and Creeks Addressed by Revised Bacteria TMDLs Project I

Watershed	Type of Listing	Waterbody Name [a,c]	Number of Listings
San Joaquin Hills HSA (901.11)/ Laguna Beach HSA (901.12)	Shoreline	Pacific Ocean Shoreline, San Joaquin Hills HSA [b]	2
	Shoreline	Pacific Ocean Shoreline, Laguna Beach HSA [b]	
Aliso HSA (901.13)	Creek	Aliso Creek	3
	Estuary	Aliso Creek (mouth)	
	Shoreline	Pacific Ocean Shoreline, Aliso HSA [b]	
Dana Point HSA (901.14)	Shoreline	Pacific Ocean Shoreline, Dana Point HSA [b]	1
Lower San Juan HSA (901.27)	Creek	San Juan Creek	3
	Estuary	San Juan Creek (mouth)	
	Shoreline	Pacific Ocean Shoreline, Lower San Juan HSA [b]	
San Clemente HA (901.30)	Shoreline	Pacific Ocean Shoreline, San Clemente HA [b]	1
San Luis Rey HU (903.00)	Shoreline	Pacific Ocean Shoreline, San Luis Rey HU [b]	1
San Marcos HA (904.50)	Shoreline	Pacific Ocean Shoreline, San Marcos HA [b]	1
San Dieguito HU (905.00)	Shoreline	Pacific Ocean Shoreline, San Dieguito HU [b]	1
Miramar Reservoir HA (906.10)	Shoreline	Pacific Ocean Shoreline, Miramar Reservoir HA [b]	1
Scripps HA (906.30)	Shoreline	Pacific Ocean Shoreline, Scripps HA [b]	1
Tecolote HA (906.50)	Creek	Tecolote Creek	1
Mission San Diego HSA (907.11)/ Santee HSA (907.12)	Creek	Forester Creek	3
	Creek	San Diego River (Lower)	
	Shoreline	Pacific Ocean Shoreline, San Diego HU [b]	
Chollas HSA (908.22)	Creek	Chollas Creek.	1
Total Number of Listings on 2002 303(d) List in Revised Bacteria TMDLs Project I			**20**

Note: HSA = hydrologic subarea; HA = hydrologic area; HU = hydrologic unit
[a] Listed as impaired due to exceedances of REC-1 WQOs for fecal coliform, and/or total coliform, and/or enterococci.
[b] On the 2002 303(d) List, the Pacific Ocean Shoreline for a HSA, HA, or HU is listed, and specific beaches are noted under the listing. Beginning with the 2008 303(d) List, specific beaches are listed.
[c] Listings on the 2006 and 2008 303(d) List compared to listing shown above are provided in Appendix T to the Technical Report.

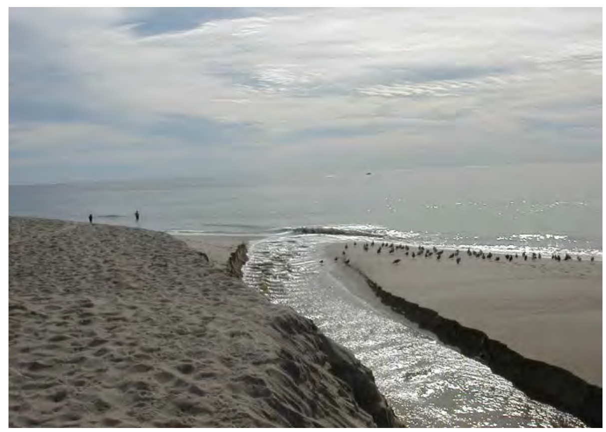
The TMDLs that have been developed for the Pacific Ocean shorelines are applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above. Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually. Specific beach segments from some of the Pacific Ocean shorelines listed in the above table have been delisted from the 2008 303(d) list that was approved by the San Diego Board on December 16, 2009, and therefore are not subject to any further action as long as monitoring data continues to support compliance with water quality standards.

PROBLEM STATEMENT

Bacteria densities in the Pacific Ocean at various beach and coastal creek mouth segments (referred to hereafter as "beaches") exceed water quality objectives (WQOs) for indicator bacteria. Bacteria densities in ocean water at these beaches unreasonably impair and threaten to impair the water quality needed to support the contact water recreation (REC-1)[32] designated beneficial use.

Bacteria densities in the waters of Aliso Creek, San Juan Creek, Tecolote Creek, Forrester Creek, the (lower) San Diego River, and Chollas Creek exceed WQOs for indicator bacteria. Bacteria densities in these creeks unreasonably impair and threaten to impair the water quality needed to support REC-1.

The federal Clean Water Act requires the establishment of Total Maximum Daily Loads (TMDLs) for pollutants that exceed the WQOs needed to support designated beneficial uses, i.e., that cause or contribute to exceedances of state "water quality standards."



Aliso Beach, Orange County

NUMERIC TARGET

When calculating TMDLs, one or more numeric targets are required. Numeric targets are typically selected based on water quality standards, which include beneficial uses and the WQOs that are established at levels sufficient to protect those beneficial uses. The numeric targets for these TMDLs are based primarily on the REC-1 WQOs for indicator bacteria contained in the Ocean Plan and/or Basin Plan.

Different REC-1 WQOs were used as the basis for wet weather[33] and dry weather[34] allowable load (i.e., TMDL) calculations because the bacteria transport mechanisms to receiving waters are different under wet and dry weather conditions. Because wet weather conditions, or storm flow, are episodic and short in duration, and characterized by rapid wash-off and transport of high bacteria loads, with short residence times, from all land use types to receiving waters, the single sample maximum WQOs were appropriate for use as wet weather numeric targets. For dry weather conditions, because dry weather runoff is not generated from storm flows, is not uniformly linked to every land use, and is more uniform than stormflow, with lower flows, lower loads, and slower transport, making die-off and/or amplification processes more important, the geometric mean WQOs were appropriate for use as dry weather numeric targets. Wet weather TMDL calculations were based on the REC-1 single sample maximum WQOs while dry weather TMDL calculations were based on REC-1 geometric mean WQOs.

[32] Water quality objectives for indicator bacteria in waters with non-water-contact recreation (REC-2) are less stringent than the water quality objectives for REC-1, therefore, attainment of REC-1 objectives through the implementation of TMDLs will, *a fortiori,* provide the requisite water quality for REC-2.
[33] Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.
[34] Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.

It is not the intent of these TMDLs to require treatment or diversion of natural waterbodies or to require treatment of natural sources of indicator bacteria. The Basin Plan authorizes the use of a reference system and antidegradation approach (RSAA) or natural sources exclusion approach (NSEA) during implementation of indicator bacteria water quality objectives within the context of a TMDL.

For these indicator bacteria TMDLs, the RSAA has been incorporated in the numeric targets as an allowable frequency that the REC-1 WQOs can be exceeded (i.e., allowable exceedance frequency). The purpose of the allowable exceedance frequency is to account for the natural, and largely uncontrollable sources of bacteria (e.g., bird and wildlife feces), which have been shown can, by themselves, cause exceedances of the REC-1 WQOs. The RSAA also incorporates antidegradation principles in that, if water quality is better than that of the reference system in a particular location, no degradation of existing bacteriological water quality is permitted.

Therefore, in addition to the REC-1 WQOs, the numeric targets used to calculate the indicator bacteria TMDLs include an allowable exceedance frequency. The numeric targets used to calculate of the wet weather TMDLs include a 22 percent allowable exceedance frequency of the REC-1 single sample maximum WQOs.[35] The numeric targets used to calculate dry weather TMDLs include a zero percent allowable exceedance frequency of the REC-1 geometric mean WQOs.[36]

The allowable load (i.e., TMDL) that is calculated based on these numeric targets consists of the sum of two parts: 1) the bacteria load that is calculated with the REC-1 WQOs and, 2) the bacteria load that is associated with the allowable exceedance frequency, calculated using the existing load in exceedance of the REC-1 WQOs on the allowable exceedance days. Allowable exceedance days are calculated based on the allowable exceedance frequency and total number of wet days in a year.

Different enterococci REC-1 WQOs were used to calculate TMDLs in watersheds modeled with the inland freshwater creeks (i.e., San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, (lower) San Diego River, and Chollas Creek) and watersheds modeled only with coastal saltwater beaches. The WQOs applicable to ocean waters are provided in the Ocean Plan. The Ocean Plan is applicable only to ocean waters and does not apply to marine bays, estuaries and lagoons. The WQOs applicable to all other surface waters in the San Diego Region (e.g., marine bays, estuaries and lagoons, and freshwater inland surface waters) are contained in the Basin Plan.

There are different enterococci REC-1 WQOs in the Ocean Plan compared to the Basin Plan. Specifically, the Ocean Plan contains REC-1 single sample maximum and 30-day geometric mean WQOs for ocean waters that do not vary. In the Basin Plan, however, the REC-1 single sample maximum WQOs for enterococci are dependent upon the type (e.g., freshwater or saltwater) and usage frequency (e.g., designated beach, moderately or lightly used area, or infrequently used area) of the waterbody, and the REC-1 geometric mean WQOs are dependent of the type (e.g., freshwater or saltwater) of waterbody. The enterococci saltwater REC-1 WQOs in the Basin Plan, for waters designated with “designated beach” usage frequency, are the same as the enterococci REC-1 WQOs in the Ocean Plan.

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[35] In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.

[36] Available water quality data from San Diego Region reference systems indicate that exceedances of the single sample WQOs during dry weather conditions are uncommon. Furthermore, if the exceedance of the single sample WQOs during dry weather is unlikely, exceedances of the geometric mean are even more unlikely.

For the application of the Basin Plan's enterococci REC-1 WQOs, unless otherwise specified in the Basin Plan, all waterbodies in the San Diego Region designated with REC-1 beneficial use are assumed to have a "designated beach" usage frequency. The "designated beach" usage frequency has the lowest and most stringent enterococci REC-1 WQOs in the Basin Plan. The enterococci REC-1 single sample maximum WQOs in the Basin Plan are more stringent for freshwater (61 MPN/100mL) than for saltwater (104 MPN/100mL) waterbodies. The enterococci REC-1 geometric mean WQOs in the Basin Plan are also more stringent for freshwater (33 MPN/100mL) than for saltwater (35 MPN/100mL) waterbodies. Since coastal saltwater beaches are downstream of inland freshwater creeks, TMDLs for coastal saltwater beaches are calculated using the more conservative enterococci REC-1 WQOs applicable to freshwater creeks (i.e., 61 MPN/100mL and 33 MPN/100mL). The numeric targets used in the calculation of the TMDLs for Tecolote Creek and Chollas Creek are also based on the enterococci REC-1 WQOs applicable to freshwater creeks.

In some cases, the "designated beach" category may be over-protective of water quality because of the infrequent recreational use in the impaired freshwater creeks. The recreational usage frequency in these freshwater creeks may correspond to the "moderately to lightly used areas" category, which has an enterococci freshwater REC-1 single sample maximum WQO of 108 MPN/100mL. In such cases, the "designated beach" enterococci saltwater REC-1 single sample maximum WQO (104 MPN/100mL) would also be protective of the "moderately to lightly used area" freshwater creek.

Before the less stringent enterococci single sample maximum saltwater REC-1 WQO may be applied to a freshwater creek, the Basin Plan must be amended to designate a lower usage frequency (i.e., "moderately to lightly used area") for each freshwater creek. If information and evidence are provided to justify the "moderately to lightly used area" usage frequency for a freshwater creek, and the designated usage frequency of the freshwater creek is amended to "moderately to lightly used area" in the Basin Plan, the wet weather TMDLs that were calculated in a watershed that was modeled with a freshwater creek using the enterococci saltwater REC-1 WQOs can be implemented instead.

The numeric targets for the scenarios described above are summarized in the following tables.

Table 7-37. Wet Weather Numeric Targets

Indicator Bacteria	Numeric Target (MPN/100mL)	Allowable Exceedance Frequency [a]
Fecal coliform	400 [b]	22%
Total coliform	10,000 [c]	22%
Enterococci	104[d] / 61[e]	22%

a. Percent of wet days (i.e., rainfall events of 0.2 inches or greater and the following 72 hours) allowed to exceed the wet weather numeric targets. Exceedance frequency based on reference system in the Los Angeles Region.
b. Fecal coliform single sample maximum WQO for REC-1 use in creeks and at beaches.
c. Total coliform single sample maximum WQO for REC-1 use at beaches and the point in creeks that discharges to beaches.
d. Enterococci single sample maximum WQO for REC-1 use in creeks established and designated as “moderately or lightly used” in the Basin Plan and at beaches downstream of those creeks, as well as all other beaches.
e. Enterococci single sample maximum WQO for REC-1 use in creeks not established and designated as “moderately or lightly used” in the Basin Plan and at beaches downstream of those creeks (“designated beach” frequency of use; applicable to San Juan Creek and downstream beach, Aliso Creek and downstream beach, Tecolote Creek, Forrester Creek, San Diego River and downstream beach, and Chollas Creek).

Table 7-38. Dry Weather Numeric Targets

Indicator Bacteria	Numeric Target (MPN/100mL)	Allowable Exceedance Frequency [a]
Fecal coliform	200 [b]	0%
Total coliform	1,000 [c]	0%
Enterococci	35 [d] / 33[e]	0%

a. Percent of dry days (i.e., days with less than 0.2 inch of rainfall observed on each of the previous 3 days) allowed to exceed the dry weather numeric targets.
b. Fecal coliform 30-day geometric mean WQO for REC-1 use in creeks and at beaches.
c. Total coliform 30-day geometric mean WQO for REC-1 at beaches and the point in creeks that discharges to beaches.
d. Enterococci 30-day geometric mean WQO for REC-1 at beaches.
e. Enterococci 30-day geometric mean WQO for REC-1 use in impaired creeks and beaches downstream of those creeks (applicable to San Juan Creek and downstream beach, Aliso Creek and downstream beach, Tecolote Creek, Forrester Creek, San Diego River and downstream beach, and Chollas Creek).

SOURCE ANALYSIS

Sources of bacteria are the same under both wet weather and dry weather conditions. Bacteria build up on the land surface as a result of various anthropogenic land uses (e.g., urban development and agriculture) and natural processes (e.g., birds and wildlife). Bacteria are washed off the land surface by surface runoff. In urban areas, bacteria are washed off the land surface by dry weather and wet weather flows and transported through pipes and conveyance channels of the municipal separate storm sewer systems (MS4s) to surface waters. Other significant point sources of bacteria include municipal wastewater treatment plants and industrial waste treatment facilities. In rural and undeveloped areas, bacteria are washed off the land surface primarily by wet weather flows directly to surface waters. Discharges from rural areas are typically considered nonpoint sources. These diffuse nonpoint sources (e.g., undeveloped land, agriculture, livestock, and horse ranch facilities) have multiple routes of entry into surface waters.

Nonpoint sources were separated into controllable and uncontrollable categories. Controllable nonpoint sources are identified by land use types and coverages. Controllable nonpoint sources include land uses associated with agriculture, dairy/intensive livestock, and horse ranches (collectively referred to as agriculture land uses). These were considered controllable because the land uses are anthropogenic in nature, and load reductions can be reasonably expected with the implementation of suitable management measures. Uncontrollable nonpoint sources include loads from open recreation, open space, and water land uses (collectively referred to as open space land uses). Loads from these areas are considered uncontrollable because they come from mostly natural sources (e.g. bird and wildlife feces).

In order to quantify bacteria loading from these various sources and transport mechanisms, 13 land-use types were identified in the TMDL analysis: Low Density Residential, High Density Residential, Commercial/Institutional, Industrial/Transportation, Military, Parks/Recreation, Open Recreation, Agriculture, Dairy/Intensive Livestock, Horse Ranches, Open Space, Water, and Transitional (Construction Activities). In the technical TMDL analysis, the 13 land use types were grouped into the following four land use categories: 1) owners/operators of municipal separate storm sewers (Municipal MS4s); 2) Caltrans (separated from other Municipal MS4s); 3) Agriculture; and 4) Open Space. Bacteria loads discharged from Low Density Residential, High Density Residential, Commercial/Institutional, Industrial/Transportation, Military, Parks/Recreation, and Transitional land use types are included in the Municipal MS4s category, which is considered a controllable point source. Bacteria loads discharged from the Industrial/Transportation land use type associated with Caltrans were separated into the Caltrans category, which is considered a controllable point source. Bacteria loads discharged from Agriculture, Dairy/Intensive Livestock, and Horse Ranch land use types are included in the Agriculture category, which is considered a controllable nonpoint source. Bacteria loads discharged from Open Recreation, Open Space, and Water land use types are included in the Open Space category, which is associated with natural and undeveloped areas and considered an uncontrollable nonpoint source.

CRITICAL CONDITIONS

The critical conditions are a set of environmental conditions for which controls designed to protect water quality will ensure attainment of the numeric targets for all other conditions. The critical conditions include the location and the period of time in which the waterbody is expected to exhibit the highest vulnerability.

To ensure that numeric targets are met throughout the impaired waterbodies, a critical location consisting of a node at the base of the watershed as it discharges to the ocean or bay was used as the point where the allowable load (i.e., TMDL) is calculated. A critical period associated with extreme rainfall conditions (i.e., critical wet year), and thus the highest potential bacteria load at the critical location, was selected for watershed modeling analysis. The year 1993 was selected as the critical wet period for assessment of extreme wet weather loading conditions because this year was the wettest year of the 12 years of record (1990 through 2002).

LINKAGE ANALYSIS

The purpose of the linkage analysis is to quantify the “existing” bacteria loads that are currently generated by the pollutant sources in the watershed under the critical conditions, and quantify the maximum allowable bacteria loading to each impaired waterbody that will result in attainment of numeric targets under the same critical conditions. This maximum allowable bacteria loading is, in other words, the TMDL.

The linkage analysis used mathematical modeling approaches to quantify the “existing” and allowable bacteria loadings for each impaired waterbody. Separate modeling approaches were used for the calculation of the wet weather TMDLs and dry weather TMDLs.

For the calculation of the wet weather TMDLs, the wet weather modeling approach chosen for the linkage analysis is based on the application of the USEPA's Loading Simulation Program in C++ (LSPC) model to estimate bacteria loading from streams and assimilation within the waterbodies. LSPC is a recoded C++ version of the USEPA's Hydrological Simulation Program–FORTRAN (HSPF) that relies on fundamental (and USEPA-approved) algorithms. In the wet weather linkage analysis, it is assumed that storm water flows wash off bacteria loads from the surface of all 13 land use types into the receiving waters. The LSPC model was used to predict flows and bacteria densities at the critical location during the wet days of the critical wet year, which were used to calculate the mass-based annual existing wet weather bacteria loads. The LSPC model-predicted wet weather flows at the critical location during the wet days of the critical wet year in combination with the numeric targets were used to calculate the mass-based annual allowable wet weather bacteria loads, or mass-based wet weather TMDLs.

For the calculation of the dry weather TMDLs, the dry weather modeling approach chosen for the linkage analysis consists of a steady-state mass balance model that was developed to simulate transport of bacteria in the impaired creeks and the creeks flowing to impaired shorelines. This predictive model represents the streams as a series of plug-flow reactors, with each reactor having a constant, steady-state flow and bacteria load. In the dry weather linkage analysis, it is assumed that dry weather non-storm water flows generated by anthropogenic activities wash off bacteria loads from the surface of specific land use types into the receiving waters. The dry weather steady-state model was used to predict flows and bacteria densities at the critical location during the dry weather days of the critical wet year, which were used to calculate the mass-based monthly existing dry weather bacteria loads. The dry weather steady-state model-predicted flows at the critical location during the dry days of the critical wet year in combination with the dry weather numeric targets were used to calculate the mass-based monthly allowable dry weather bacteria loads, or mass-based dry weather TMDLs.

TOTAL MAXIMUM DAILY LOADS AND ALLOCATIONS

TMDLs can be expressed as mass per time (i.e., mass-loading basis), or other appropriate measure (e.g., as a concentration).[37] For these TMDLs, the wet weather and dry weather TMDLs are expressed both in terms of concentration and on a mass loading basis. The concentration based TMDLs will be used to determine compliance with the TMDLs in the receiving waters. Mass-load based TMDLs were calculated for the impaired waterbodies in each watershed. The mass-load based TMDLs were allocated to the identified point and nonpoint sources and used to identify the controllable sources that need to reduce their bacteria loads in order for the concentration based TMDLs to be met in the receiving waters. The concentration based TMDLs, mass-load based TMDLs, and allocations are discussed below.

(1) Concentration Based TMDLs

The wet weather and dry weather concentration based TMDLs are based on meeting the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies) in the receiving waters. The numeric WQOs for REC-1 beneficial uses are the basis of the numeric targets used to calculate the TMDLs, expressed as number of bacteria colonies per volume. An allowable exceedance frequency is included as part of the numeric target to allow for exceedances that may be caused by natural sources, based on a reference system. Tables 7-39 and 7-40 summarize the concentration based TMDLs, which are expressed as numeric objectives and allowable exceedance frequencies in the receiving waters for each watershed, for wet weather and dry weather, respectively. Meeting the concentration based TMDLs in the receiving waters will be used to determine compliance with the TMDLs.

[37] Code of Federal Regulations Title 40 section 130.2(1) [40CFR130.2(i)]

(2) Mass-Load Based TMDLs

The numeric targets were used to calculate the TMDLs on a mass loading basis under a set of critical conditions. The TMDLs that were calculated in terms of mass loading were used to identify the bacteria loads from controllable sources that need to be reduced in order for the numeric targets to be met in the receiving waters.

On a mass loading basis, TMDLs are defined as the maximum mass of a pollutant the waterbody can receive and still protect the designated beneficial uses. Separate mass-load based TMDLs were calculated for wet weather and dry weather conditions to account for seasonal variations, and because the transport mechanism, flow, and bacteria loads are different between dry and wet weather conditions.

On a mass-loading basis, the TMDLs are expressed as number of bacteria colonies per unit time. The wet weather mass-load based TMDLs are expressed as "annual loads" in terms of number of bacteria colonies per year (billion MPN/yr). The dry weather mass-load based TMDLs are expressed as "monthly loads" in terms of number of bacteria colonies per month (billion MPN/mth). In order for bacteria loading to be calculated, both flow rates and bacteria densities must be measured at a point in time and location. When multiplied together, these two parameters result in bacteria mass loading, or the number of bacteria colonies measured per unit time.

$$Bacteria\ Loading = flow\ rate\ (volume / time) \times bacteria\ density(number\ of\ colonies / volume)$$

Calibrated models were used to simulate flow and bacteria densities. This information was used to calculate the "existing" mass of bacteria loads to, and allowable mass of bacteria loads (i.e., mass-load based TMDLs) for, each impaired segment under critical conditions (i.e., worst case loading conditions). The existing mass loads that were calculated represent the worst case flows and bacteria densities that are expected from the watershed during the critical wet year. The mass-load based TMDLs were calculated with the numeric targets and modeled flows expected during the critical wet year. Existing mass loads were compared to the mass-load based TMDLs. The difference between the existing mass loads and the mass-load based TMDLs is the load reduction required to meet the REC-1 WQOs and allowable exceedance frequencies in the receiving water.

Existing mass loads and mass-load based TMDLs were calculated for wet weather and dry weather. The calculation of the mass-load based TMDLs included the use of an allowable exceedance frequency of the REC-1 WQOs. The purpose of the exceedance frequency is to account for the natural, and largely uncontrollable sources of bacteria (e.g., bird and wildlife feces) generated in the watersheds and at the beaches, which can, by themselves, cause exceedances of WQOs.

All of the wet weather mass-load based TMDLs were calculated using a 22 percent allowable exceedance frequency.[38] All of the dry weather mass-load based TMDLs were calculated using a 0 percent allowable exceedance frequency. These allowable exceedance frequencies were used to calculate the number of wet and dry weather allowable exceedance days during the critical wet year.

[38] In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.

The mass-load based TMDLs are calculated as the sum of the allowable load associated with the numeric REC-1 WQO and the allowable load associated with the allowable exceedance frequency during the critical wet year. Tables 7-39 and 7-40 summarize the calculated existing bacteria mass loads, allowable mass loads based on the numeric REC-1 WQOs, allowable exceedance frequencies and days, allowable mass loads based on the allowable exceedance frequencies, and mass-load based TMDLs for each watershed, for wet weather and dry weather, respectively.

(3) Allocation of Mass-Load Based TMDLs

The mass-load based TMDLs were allocated among point sources (WLAs) and nonpoint sources (LAs) in each watershed. WLAs were assigned to discharges originating from urban land use areas (i.e., MS4s and Caltrans), all of which are considered controllable. LAs were assigned to discharges from rural and undeveloped land use areas (i.e., Agriculture and Open Space). Discharges from rural and undeveloped land use areas are separated into controllable and uncontrollable nonpoint sources. Agricultural land uses (e.g., agriculture, horse ranches, and intensive livestock) are considered controllable nonpoint source land use areas. Open space land uses (e.g., open space and open recreation) are considered uncontrollable nonpoint source land use areas.

Sources that are not identified are assumed to be assigned a zero allowable load as part of the mass-load based TMDL (i.e., WLA = 0 or LA = 0). In other words, discharges of pollutant loads from these sources are not allowed as part of the TMDLs. Sources that are assigned an allowable mass load equal to the existing mass load (i.e., WLA or LA = existing mass load) are not allowed to increase their pollutant loads over time.

Allocations of the mass-load based TMDLs were different for wet weather TMDLs and dry weather TMDLs, as discussed below.

(A) Wet Weather TMDL Allocations

The wet weather mass-load based TMDLs were divided and assigned to point sources as WLAs and nonpoint sources as LAs based on land uses. The portions of the wet weather mass-load based TMDLs assigned to WLAs and LAs were calculated based on the percent of the TMDL mass load generated by the urban, rural, and undeveloped land uses in each watershed as determined by the wet weather models under critical conditions.

The allocation of the wet weather mass-load based TMDLs assumes surface runoff discharge occurs from all land use categories, and allocated according to the following steps:

1) Sources are separated in to controllable and uncontrollable sources. Discharges from Municipal MS4, Caltrans, and Agriculture land use categories are assumed to be controllable (i.e., subject to regulation), and discharges from Open Space land use categories are assumed to be uncontrollable (i.e., not subject to regulation).
2) Because discharges from Open Space land use categories are uncontrollable (i.e., not subject to regulation), the LAs for Open Space land use categories are set equal to the existing mass loads calculated under the critical conditions.
3) For discharges from controllable land use categories that do not contribute more than 5 percent of the total existing mass load for all three indicator bacteria, the WLA or LA is set equal to the existing mass loads from those land uses calculated under the critical conditions.
4) After the WLAs and LAs are assigned based on steps 2 and 3, the remaining portion of the mass-load based TMDL is assigned to discharges from controllable land use categories that contribute more than 5 percent of the total existing mass load for all three indicator bacteria. The allowable mass load for each source (WLA or LA) is calculated based on the ratio of the existing mass loads from those sources relative to each other.

The total watershed wet weather existing mass loads and mass-load based TMDLs, point source existing mass loads and mass-load based WLAs, nonpoint source existing mass loads and mass-load based LAs, and load reductions required to achieve the mass-load based TMDLs, WLAs, and LAs are shown below in Tables 7-41, 7-42 and 7-43.

In comments, the municipal dischargers pointed out that, for the impaired creeks, the "designated beach" usage frequency WQO for enterococci may be over-protective of water quality because of the infrequent recreational use in the impaired creeks. The dischargers claim that the recreational usage frequency in these inland freshwater creeks more likely corresponds to the "moderately to lightly used area" category in the Basin Plan, which has an enterococci WQO of 108 MPN/100mL. In these cases, using a less stringent numeric target, based on the saltwater enterococci WQO of 104 MPN/100 mL ("designated beaches" usage frequency) would result in wet weather TMDLs protective of REC-1 uses in the inland freshwater creeks and at the downstream coastal saltwater beaches.[39] Therefore, the "moderately to lightly used area" usage frequency may be appropriate for the six impaired creeks, and the enterococci saltwater REC-1 single sample maximum WQO of 104 MPN/100 mL could be used as basis of the numeric target for the enterococci wet weather TMDLs.

The six creeks included in these TMDLs, however, have not been designated in the Basin Plan as "moderately to lightly used area" waterbodies as of the adoption of these TMDLs. If the Basin Plan does not specify the usage frequency of a waterbody, the most stringent and conservative WQOs are appropriate and applicable. For enterococci, the most stringent and conservative WQOs for the freshwater creeks are associated with the "designated beach" usage frequency and freshwater waterbody type. Thus, the enterococci WQOs associated with the freshwater "designated beach" usage frequency are applicable until sufficient evidence is provided to warrant an amendment to the Basin Plan that designates a lower usage frequency to one or more of the six creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and Chollas Creek).

According to the federal regulations,[40] usage frequencies are defined as follows:

- Designated Beach Area: those recreation waters that, during the recreation season, are heavily used (based upon a comparison of use within the state) and may have a lifeguard, bathhouse facilities, or public parking for beach access. States may include any other waters in this category even if the waters do not meet these criteria.

- Moderate Full Body Contact Recreation: those recreation waters that are not designated bathing beach waters but typically, during the recreation season, are used by at least half of the number of people as at typical designated bathing beach waters within the state. States may also include light use or infrequent use coastal recreation waters in this category.

- Lightly Used Full Body Contact Recreation: those recreation waters that are not designated bathing beach waters but typically, during the recreation season, are used by less than half of the number of people as at typical designated bathing beach waters within the state, but are more than infrequently used. States may also include infrequent use coastal recreation waters in this category.

[39] The enterococci WQOs in the Basin Plan are structured to reflect the frequency of recreational use. The enterococci freshwater REC-1 single sample maximum WQO for a "designated beach" area is 61 MPN/100 mL. For a "moderately or lightly used area," the REC-1 single sample maximum WQO is 108 MPN/100 mL. The saltwater REC-1 single sample maximum WQO for "designated beach" area is 104 MPN/100 mL. Where the "moderately or lightly used area" designation is appropriate for creeks, the saltwater REC-1 single sample maximum WQO of 104 MPN/100 mL could be used as the numeric target because it is also protective of both the freshwater creek and the downstream marine beach.

[40] Code of Federal Regulations Title 40 section 131.41 [40CFR131.41]

- Infrequently Used Full Body Contact: those recreation waters that are rarely or occasionally used.

If sufficient evidence can be provided to the San Diego Water Board that can demonstrate the usage frequency for one or more of the six impaired creeks falls under the “Lightly Used Full Body Contact Recreation” or “Infrequently Used Full Body Contact” usage frequency, the Basin Plan may be amended to designate one or more of the creeks with the “moderately to lightly used area” usage frequency.

If one or more of the six creeks (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) are designated in the Basin Plan with the “moderately to lightly used area” usage frequency, the enterococci wet weather TMDLs, WLAs, and LAs based on the 104 MPN/100mL (Table 7-44) can be implemented. Otherwise, the more stringent and conservative enterococci wet weather TMDLs, WLAs, and LAs based on the freshwater “designated beach” usage frequency WQO of 61 MPN/100mL (Table 7-43) must be implemented.

(B) Dry Weather TMDL Allocations

The dry weather mass-load based TMDLs were assigned entirely to discharges from MS4 land uses because the runoff that transports bacteria loads to surface waters during dry weather are expected to occur only in urban areas. The allocation of the dry weather mass-load based TMDLs assumes that no surface runoff discharge to receiving waters occurs from Caltrans, Agriculture, or Open Space land use categories (i.e., $WLA_{Caltrans} = 0$, $LA_{Agriculture} = 0$, and $LA_{OpenSpace} = 0$), meaning the entire dry weather mass-load based TMDL (i.e., allowable mass load) is allocated to Municipal MS4 land use categories (i.e., WLA_{MS4} = TMDL).

The total watershed dry weather existing mass loads and mass-load based TMDLs, point source existing mass loads and mass-load based WLAs, nonpoint source existing mass loads and mass-load based LAs, and load reductions required to achieve the mass-load based TMDLs, WLAs, and LAs are shown below in Tables 7-45, 7-46, and 7-47.

Because the wet weather and dry weather modeling approaches used to calculate the mass-load based TMDLs, WLAs, LAs, and existing mass wasteloads and loads were based on critical conditions (i.e., worst case loading scenario), the mass-loading numbers (i.e., existing mass loads, and mass-load based TMDLs, WLAs, and LAs expressed in terms of billion MPN/year for wet weather and billion MPN/month for dry weather) presented in Tables 7-39 through 7-47 represent conservative mass-load estimates expected to be protective of the beneficial uses under extreme conditions. The mass-loading numbers also provide a tool for identifying bacteria sources that need to be controlled and existing bacteria loads that need to be reduced to meet the TMDLs in the receiving waters.

Ultimately, controllable point and nonpoint sources must reduce their anthropogenic loads so the concentration based wet weather and dry weather TMDLs, which are based on the numeric REC-1 WQOs in the Basin Plan and allowable exceedance frequencies, can be met during wet weather and dry weather conditions during each year. Meeting the wet weather and dry weather numeric targets in the discharge and/or receiving water will indicate the TMDLs, WLAs, and/or LAs have been met.

MARGIN OF SAFETY

The numeric targets used for the mass-load based and concentration based TMDLs are assumed to be conservative by utilizing the most stringent REC-1 WQOs contained in the Ocean Plan and/or Basin Plan. Additionally, the mass-load based TMDLs were calculated under a set of critical conditions that assumed the highest potential mass loading would occur at a critical point during a critical wet year, which is expected to be protective of beneficial uses during extreme conditions. The conservative assumptions that were used result in conservative mass-load based and concentration based TMDLs that are expected to restore and protect the beneficial uses of the receiving waters.

Because bacteria in wet weather runoff and streamflows have a quick travel time, and therefore, a short residence time in the waterbodies, the REC-1 single-sample maximum WQOs were determined to be most appropriate for calculating the wet weather TMDLs. The numeric targets used for the wet weather mass-load based and concentration based TMDLs are assumed to be conservative by utilizing the most stringent REC-1 single sample maximum WQOs contained in the Ocean Plan and/or Basin Plan.

Because dry weather conditions have flows and bacteria loads much smaller in magnitude than wet weather conditions, do not occur from all land use types, and are more uniform than stormflow, the REC-1 30-day geometric mean WQOs were determined to be most appropriate for the dry weather TMDLs. The numeric targets used for the dry weather mass-load based and concentration based TMDLs are assumed to be conservative by utilizing the most stringent REC-1 30 day geometric mean WQOs contained in the Ocean Plan and/or Basin Plan.

Because of the numeric targets and critical conditions that were included in the calculation of the TMDLs, there was no explicit margin of safety included. Instead, the TMDLs include an implicit margin of safety (MOS). The implicit MOS is included via conservative estimates and assumptions (meaning worst-case scenarios were assumed in terms of existing bacteria loading) throughout the calculations and not as a separate, additional factor.

Table 7-39. Summary of Wet Weather Existing and Allowable Indicator Bacteria Loads

Watershed - Impaired Waterbody	Indicator Bacteria	Existing Bacteria Load (Billion MPN/year)	Single Sample Maximum Objective (MPN/100mL)	Allowable Numeric Objective Load (Billion MPN/year)	Total Wet Days in Critical Year	Allowable Exceedance Frequency	Allowable Wet Exceedance Days in Critical Year	Allowable Exceedance Load (Billion MPN/year)	Total Allowable Load [=TMDL] (Billion MPN/year)
San Joaquin Hills HSA (901.11)	Fecal Coliform	705,015	**400**	16,043				648,591	664,634
and Laguna Hills HSA (901.12)	Total Coliform	8,221,901	**10,000**	401,049	69	**22%**	15	7,044,601	7,445,649
- Pacific Ocean Shoreline	Enterococcus	852,649	**104**	4,175				778,624	782,799
Aliso HSA (901.13)	Fecal Coliform	1,752,096	**400**	84,562				1,494,512	1,579,073
- Pacific Ocean Shoreline - Aliso Creek	Total Coliform	23,210,774	**10,000**	2,109,600	69	**22%**	15	18,081,198	20,190,798
- Aliso Creek mouth	Enterococcus	2,230,206	**104***	22,682				1,929,834	1,952,517
		2,230,206	**61**	13,644				1,937,321	1,950,964
Dana Point HSA (901.14)	Fecal Coliform	403,911	**400**	14,894				362,419	377,313
- Pacific Ocean Shoreline	Total Coliform	6,546,962	**10,000**	372,328	69	**22%**	15	5,659,144	6,031,472
	Enterococcus	501,526	**104**	3,875				458,431	462,306
Lower San Juan HSA (901.27)	Fecal Coliform	15,304,790	**400**	358,410				14,356,423	14,714,833
- Pacific Ocean Shoreline - San Juan Creek	Total Coliform	130,258,863	**10,000**	8,947,114	76	**22%**	17	113,932,076	122,879,189
- San Juan Creek mouth	Enterococcus	12,980,098	**104***	95,357				12,063,781	12,159,138
		12,980,098	**61**	56,119				12,096,327	12,152,446
San Clemente HA (901.30)	Fecal Coliform	1,441,723	**400**	36,481				1,342,450	1,378,931
- Pacific Ocean Shoreline	Total Coliform	16,236,606	**10,000**	911,994	73	**22%**	16	14,235,609	15,147,603
	Enterococcus	1,663,100	**104**	9,491				1,553,696	1,563,187
San Luis Rey HU (903.00)	Fecal Coliform	33,120,012	**400**	640,595				31,803,647	32,444,242
- Pacific Ocean Shoreline	Total Coliform	231,598,677	**10,000**	15,993,384	90	**22%**	20	208,157,151	224,150,535
	Enterococcus	18,439,920	**104**	167,152				17,296,466	17,463,618
San Marcos HA (904.50)	Fecal Coliform	20,886	**400**	1,559				15,665	17,224
- Pacific Ocean Shoreline	Total Coliform	515,278	**10,000**	38,984	49	**22%**	11	386,099	425,083
	Enterococcus	40,558	**104**	406				32,559	32,966
San Dieguito HU (905.00)	Fecal Coliform	21,286,910	**400**	425,968				20,675,680	21,101,649
- Pacific Ocean Shoreline	Total Coliform	163,541,133	**10,000**	10,637,225	98	**22%**	22	149,176,959	159,814,184
	Enterococcus	14,796,210	**104**	113,253				14,193,834	14,307,087
Miramar Reservoir HA (906.10)	Fecal Coliform	10,392	**400**	312				9,943	10,256
- Pacific Ocean Shoreline	Total Coliform	212,986	**10,000**	7,809	94	**22%**	21	202,371	210,180
	Enterococcus	11,564	**104**	81				11,323	11,405

Table 7-39. Summary of Wet Weather Existing and Allowable Indicator Bacteria Loads (Cont'd)

Watershed - Impaired Waterbody	Indicator Bacteria	Existing Bacteria Load (Billion MPN/year)	Single Sample Maximum Objective (MPN/100mL)	Allowable Numeric Objective Load (Billion MPN/year)	Total Wet Days in Critical Year	Allowable Exceedance Frequency	Allowable Wet Exceedance Days in Critical Year	Allowable Exceedance Load (Billion MPN/year)	Total Allowable Load [=TMDL] (Billion MPN/year)
Scripps HA (906.30) - Pacific Ocean Shoreline	Fecal Coliform	204,057	**400**	10,329	57	**22%**	13	166,578	176,907
	Total Coliform	5,029,519	**10,000**	258,228				4,098,745	4,356,973
	Enterococcus	377,839	**104**	2,686				321,347	324,032
Tecolote HA (906.50) - Tecolote Creek	Fecal Coliform	261,966	**400**	25,080	57	**22%**	13	204,241	229,322
	Total Coliform	7,395,789	**10,000**	626,414				5,753,355	6,379,770
	Enterococcus	708,256	**104***	6,522				597,659	604,180
		708,256	**61**	3,825				599,936	603,761
Mission San Diego HSA (907.11) **and Santee HSA** (907.12) - Forrester Creek - San Diego River (lower) - Pacific Ocean Shoreline	Fecal Coliform	4,932,380	**400**	310,820	86	**22%**	19	4,370,018	4,680,838
	Total Coliform	72,757,569	**10,000**	7,752,284				58,352,938	66,105,222
	Enterococcus	7,255,759	**104***	80,899				6,514,309	6,595,208
		7,255,759	**61**	47,479				6,543,487	6,590,966
Chollas HSA (908.22) - Chollas Creek	Fecal Coliform	603,863	**400**	55,516	65	**22%**	14	464,924	520,440
	Total Coliform	15,390,608	**10,000**	1,386,037				11,861,589	13,247,626
	Enterococcus	1,371,972	**104***	15,008				1,138,590	1,153,599
		1,371,972	**61**	9,073				1,143,572	1,152,645

* Total Maximum Daily Load calculated using a Enterococcus numeric target of 61 MPN/mL that is conservatively protective of the REC-1 "designated beach" usage frequency for freshwater creeks and downstream beaches. If the usage frequency of the freshwater creeks can be established as "moderately to lightly used" in the Basin Plan, alternative Total Maximum Daily Loads calculated using an Enterococcus numeric target of 104 MPN/ml may be used.

Existing Bacteria Load = Predicted existing bacteria load discharged from the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993

Single Sample Maximum Objective = Target bacteria densities based on numeric single sample maximum water quality objectives that are protective of REC-1 beneficial uses
Allowable Numeric Objective Load = Allowable load from the watershed calculated by the LSPC model using modeled flows and the numeric single sample maximum water quality objective bacteria densities for all wet days during the critical year 1993

Total Wet Days in Critical Year = Number of wet days (i.e., rainfall events of 0.2 inches or greater and the following 72 hours) in the critical year 1993 (i.e., wettest year between 1990 and 2002)
Allowable Exceedance Frequency = Assumed to be 22 percent exceedance frequency. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.
Allowable Wet Exceedance Days = (Total Wet days in Critical Year) X (Allowable Exceedance Frequency)
Allowable Exceedance Load = Sum of exceedance loads from the allowable exceedance days with the highest exceedance loads calculated by the LSPC model using modeled flows and bacteria densities for all wet days during the critical year 1993

Total Allowable Load [i.e. TMDL] = (Allowable Numeric Objective Load) + (Allowable Exceedance Load)

Table 7-40. Summary of Dry Weather Existing and Allowable Indicator Bacteria Loads

Watershed - Impaired Waterbody	Indicator Bacteria	Existing Bacteria Load (Billion MPN/mth)	30-Day Geometric Mean Objective (MPN/100mL)	Allowable Numeric Objective Load (Billion MPN/mth)	Total Dry Days in Critical Year	Allowable Exceedance Frequency	Allowable Dry Exceedance Days in Critical Year	Allowable Exceedance Load (Billion MPN/mth)	Total Allowable Load [=TMDL] (Billion MPN/mth)
San Joaquin Hills HSA (901.11) **and Laguna Hills HSA** (901.12) - Pacific Ocean Shoreline	Fecal Coliform	2,741	**200**	227	296	**0%**	0	0	227
	Total Coliform	13,791	**1,000**	1,134				0	1,134
	Enterococcus	2,321	**35**	40				0	40
Aliso HSA (901.13) - Pacific Ocean Shoreline - Aliso Creek - Aliso Creek mouth	Fecal Coliform	5,470	**200**	242	296	**0%**	0	0	242
	Total Coliform	26,639	**1,000**	1,208				0	1,208
	Enterococcus	4,614	**33***	40				0	40
Dana Point HSA (901.14) - Pacific Ocean Shoreline	Fecal Coliform	1,851	**200**	92	296	**0%**	0	0	92
	Total Coliform	9,315	**1,000**	462				0	462
	Enterococcus	1,567	**35**	16				0	16
Lower San Juan HSA (901.27) - Pacific Ocean Shoreline - San Juan Creek - San Juan Creek mouth	Fecal Coliform	6,455	**200**	1,665	289	**0%**	0	0	1,665
	Total Coliform	30,846	**1,000**	8,342				0	8,342
	Enterococcus	5,433	**33***	275				0	275
San Clemente HA (901.30) - Pacific Ocean Shoreline	Fecal Coliform	3,327	**200**	192	292	**0%**	0	0	192
	Total Coliform	16,743	**1,000**	958				0	958
	Enterococcus	2,817	**35**	33				0	33
San Luis Rey HU (903.00) - Pacific Ocean Shoreline	Fecal Coliform	1,737	**200**	1,058	275	**0%**	0	0	1,058
	Total Coliform	8,549	**1,000**	5,289				0	5,289
	Enterococcus	1,466	**35**	185				0	185
San Marcos HA (904.50) - Pacific Ocean Shoreline	Fecal Coliform	149	**200**	26	316	**0%**	0	0	26
	Total Coliform	751	**1,000**	129				0	129
	Enterococcus	126	**35**	5				0	5
San Dieguito HU (905.00) - Pacific Ocean Shoreline	Fecal Coliform	1,631	**200**	1,293	267	**0%**	0	0	1,293
	Total Coliform	7,555	**1,000**	6,468				0	6,468
	Enterococcus	1,368	**35**	226				0	226
Miramar Reservoir HA (906.10) - Pacific Ocean Shoreline	Fecal Coliform	205	**200**	7	271	**0%**	0	0	7
	Total Coliform	1,030	**1,000**	36				0	36
	Enterococcus	173	**35**	1				0	1

Table 7-40. Summary of Dry Weather Existing and Allowable Indicator Bacteria Loads (Cont'd)

Watershed - Impaired Waterbody	**Indicator Bacteria**	**Existing Bacteria Load (Billion MPN/mth)**	**30-Day Geometric Mean Objective (MPN/100mL)**	**Allowable Numeric Objective Load (Billion MPN/mth)**	**Total Dry Days in Critical Year**	**Allowable Exceedance Frequency**	**Allowable Dry Exceedance Days in Critical Year**	**Allowable Exceedance Load (Billion MPN/mth)**	**Total Allowable Load [=TMDL] (Billion MPN/mth)**
Scripps HA (906.30)	Fecal Coliform	3,320	**200**	119				0	119
- Pacific Ocean Shoreline	Total Coliform	16,707	**1,000**	594	308	**0%**	0	0	594
	Enterococcus	2,811	**35**	21				0	21
Tecolote HA (906.50)	Fecal Coliform	4,329	**200**	234				0	234
- Tecolote Creek	Total Coliform	21,349	**1,000**	1,171	308	**0%**	0	0	1,171
	Enterococcus	3,657	**33***	39				0	39
Mission San Diego HSA (907.11)	Fecal Coliform	4,928	**200**	1,506				0	1,506
and Santee HSA (907.12)	Total Coliform	28,988	**1,000**	7,529	279	**0%**	0	0	7,529
- Forrester Creek (lower 1 mile) - San Diego River (lower 6 miles) - Pacific Ocean Shoreline	Enterococcus	4,106	**33***	248				0	248
Chollas HSA (908.22)	Fecal Coliform	5,068	**200**	398				0	398
- Chollas Creek	Total Coliform	25,080	**1,000**	1,991	300	**0%**	0	0	1,991
	Enterococcus	4,283	**33***	66				0	66

* Total Allowable Load [=TMDL] calculated using a Enterococcus numeric target of 33 MPN/mL that is conservatively protective of the REC-1 "designated beach" usage frequency for watersheds with impaired freshwater creeks.

Existing Bacteria Load = Predicted existing bacteria load discharged from the watershed calculated by the plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993

30-Day Geometric Mean Objective = Target bacteria densities based on numeric 30-day geometric mean water quality objectives that are protective of REC-1 beneficial uses
Allowable Numeric Objective Load = Allowable load from the watershed calculated by the plug-flow reactor model using estimated flows and the numeric 30-day geometric mean water quality objective bacteria densities for 30 dry days during the critical year 1993

Total Dry Days in Critical Year = Number of dry days (i.e., day not including rainfall events of 0.2 inches or greater and the following 72 hours) in the critical year 1993 (i.e., wettest year between 1990 and 2002)
Allowable Exceedance Frequency = Assumed to be zero; data collected from reference systems generally do not show exceedances of REC-1 water quality objectives
Allowable Wet Exceedance Days = (Total Dry Days in Critical Year) X (Allowable Exceedance Frequency)
Allowable Exceedance Load = Sum of exceedance loads from the allowable exceedance days for all dry days during the critical year 1993

Total Allowable Load [i.e. TMDL] = (Allowable Numeric Objective Load) + (Allowable Exceedance Load) for a 30-day period

Table 7-41. Wet Weather Fecal Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
Watershed	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	705,015	664,634	77,548	37,167	52.07%	179	179	0.00%	7,346	7,346	0.00%	619,942	619,942	0.00%
Aliso HSA (901.13)	1,752,096	1,579,073	650,092	477,069	26.62%	260	260	0.00%	26,508	26,508	0.00%	1,075,237	1,075,237	0.00%
Dana Point HSA (901.14)	403,911	377,313	179,043	152,446	14.86%	13	13	0.00%	0	0	0.00%	224,854	224,854	0.00%
Lower San Juan HSA (901.27)	15,304,790	14,714,833	1,326,469	1,156,419	12.82%	1,713	1,713	0.00%	3,275,477	2,855,570	12.82%	10,701,131	10,701,131	0.00%
San Clemente HA (901.30)	1,441,723	1,378,931	255,445	192,653	24.58%	335	335	0.00%	366	366	0.00%	1,185,577	1,185,577	0.00%
San Luis Rey HU (903.00)	33,120,012	32,444,242	943,501	914,026	3.12%	1,537	1,537	0.00%	20,687,954	20,041,659	3.12%	11,487,019	11,487,019	0.00%
San Marcos HA (904.50_	20,886	17,224	8,095	6,558	18.98%	8	8	0.00%	11,199	9,073	18.98%	1,585	1,585	0.00%
San Dieguito HU (905.00)	21,286,910	21,101,649	810,008	798,175	1.46%	1,310	1,310	0.00%	11,872,240	11,698,811	1.46%	8,603,352	8,603,352	0.00%
Miramar Reservoir HA (906.10)	10,392	10,256	6,839	6,703	1.99%	0	0	0.00%	0	0	0.00%	3,552	3,552	0.00%
Scripps HA (906.30)	204,057	176,907	128,403	101,253	21.14%	0	0	0.00%	0	0	0.00%	75,654	75,654	0.00%
Tecolote HA (906.5)	261,966	229,322	159,449	126,806	20.47%	553	553	0.00%	0	0	0.00%	101,963	101,963	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	4,932,380 +1,302**	4,680,838 +1,302*	472,660	221,117	53.22%	1,009	1,009	0.00%	414,721	414,721	0.00%	4,043,991	4,043,991	0.00%
Chollas HSA (908.22)	603,863	520,440	335,901	252,479	24.84%	892	892	0.00%	0	0	0.00%	267,070	267,070	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for fecal coliform (400 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Permitted existing fecal coliform bacteria load from Padre Dam Municipal Water District Water Reclamation Plant (Padre Dam), assigned as a separate point source wasteload allocation for discharges from Padre Dam equal to the permitted existing load

Watershed Existing Load = Predicted existing fecal coliform bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993

Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model

MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses

MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area

Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load

Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model

Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent

Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model

Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load

Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

Table 7-42. Wet Weather Total Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	8,221,901	7,445,649	1,656,904	880,652	46.85%	7,722	7,722	0.00%	50,774	50,774	0.00%	6,506,501	6,506,501	0.00%
Aliso HSA (901.13)	23,210,774	20,190,798	11,943,241	8,923,264	25.29%	11,003	11,003	0.00%	179,828	179,828	0.00%	11,076,702	11,076,702	0.00%
Dana Point HSA (901.14)	6,546,962	6,031,472	3,919,497	3,404,008	13.15%	634	634	0.00%	0	0	0.00%	2,626,830	2,626,830	0.00%
Lower San Juan HSA (901.27)	130,258,863	122,879,189	19,919,322	16,093,160	19.21%	60,480	60,480	0.00%	18,499,884	14,946,372	19.21%	91,779,178	91,779,178	0.00%
San Clemente HA (901.30)	16,236,606	15,147,603	4,566,742	3,477,739	23.85%	13,534	13,534	0.00%	2,370	2,370	0.00%	11,653,960	11,653,960	0.00%
San Luis Rey HU (903.00)	231,598,677	224,150,535	15,229,456	14,373,954	5.62%	54,508	54,508	0.00%	117,360,800	110,768,160	5.62%	98,953,913	98,953,913	0.00%
San Marcos HA (904.50_	515,278	425,083	366,021	298,430	18.47%	533	533	0.00%	122,414	99,809	18.47%	26,311	26,311	0.00%
San Dieguito HU (905.00)	163,541,133	159,814,184	17,406,569	16,660,538	4.29%	47,969	47,969	0.00%	69,551,416	66,570,499	4.29%	76,535,178	76,535,178	0.00%
Miramar Reservoir HA (906.10)	212,986	210,180	174,243	171,436	1.61%	9	9	0.00%	0	0	0.00%	38,734	38,734	0.00%
Scripps HA (906.30)	5,029,519	4,356,973	4,120,310	3,447,764	16.32%	0	0	0.00%	0	0	0.00%	909,209	909,209	0.00%
Tecolote HA (906.5)	7,395,789	6,379,770	6,152,484	5,136,598	16.51%	27,095	27,095	0.00%	0	0	0.00%	1,216,077	1,216,077	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	72,757,569	66,105,222	17,442,867	10,790,520	38.14%	53,141	53,141	0.00%	3,495,960	3,495,960	0.00%	51,765,601	51,765,601	0.00%
Chollas HSA (908.22)	15,390,608	13,247,626	12,023,766	9,880,784	17.82%	45,652	45,652	0.00%	0	0	0.00%	3,321,191	3,321,191	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for total coliform (10,000 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

Watershed Existing Load = Predicted existing total coliform bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993

Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting total coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model

MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses

MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Predicted exiting total coliform bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area

Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load

Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting total coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model

Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent

Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting total coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model

Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load

Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

Table 7-43. Wet Weather Enterococcus Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	852,649	782,799	136,267	66,417	51.26%	365	365	0.00%	3,201	3,201	0.00%	712,816	712,816	0.00%
Aliso HSA (901.13)	2,230,206	1,950,964**	1,014,732	735,490	27.52%	516	516	0.00%	11,245	11,245	0.00%	1,203,713	1,203,713	0.00%
Dana Point HSA (901.14)	501,526	462,306	258,747	219,528	15.16%	25	25	0.00%	0	0	0.00%	242,753	242,753	0.00%
Lower San Juan HSA (901.27)	12,980,098	12,152,446**	1,900,520	1,385,094	27.12%	2,823	2,823	0.00%	1,151,266	839,040	27.12%	9,925,490	9,925,490	0.00%
San Clemente HA (901.30)	1,663,100	1,563,187	395,581	295,668	25.26%	635	635	0.00%	148	148	0.00%	1,266,736	1,266,736	0.00%
San Luis Rey HU (903.00)	18,439,920	17,463,618	1,472,296	1,300,235	11.69%	2,397	2,397	0.00%	6,881,755	6,077,514	11.69%	10,083,473	10,083,473	0.00%
San Marcos HA (904.50_	40,558	32,966	29,784	23,771	20.19%	26	26	0.00%	7,825	6,246	20.19%	2,923	2,923	0.00%
San Dieguito HU (905.00)	14,796,210	14,307,087	1,911,170	1,763,603	7.72%	2,288	2,288	0.00%	4,423,566	4,082,010	7.72%	8,459,187	8,459,187	0.00%
Miramar Reservoir HA (906.10)	11,564	11,405	8,269	8,109	1.93%	0	0	0.00%	0	0	0.00%	3,295	3,295	0.00%
Scripps HA (906.30)	377,839	324,032	285,842	232,035	18.82%	0	0	0.00%	0	0	0.00%	91,997	91,997	0.00%
Tecolote HA (906.5)	708,256	603,761**	575,708	471,211	18.15%	1,266	1,266	0.00%	0	0	0.00%	131,284	131,284	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	7,255,759	6,590,966*	1,555,411	890,617	42.74%	2,430	2,430	0.00%	213,149	213,149	0.00%	5,484,770	5,484,770	0.00%
Chollas HSA (908.22)	1,371,972	1,152,645**	1,022,245	802,918	21.46%	2,062	2,062	0.00%	0	0	0.00%	347,665	347,665	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for enterococcus (104 MPN/100mL or 61 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Total Maximum Daily Load calculated using a Enterococcus numeric target of 61 MPN/mL that is conservatively protective of the REC-1 "designated beach" usage frequency for freshwater creeks and downstream beaches. If the usage frequency of the freshwater creeks can be established as "moderately to lightly used," alternative Total Maximum Daily Loads calculated using an Enterococcus numeric target of 104 MPN/ml presented in Table 7-44 may be used.

Watershed Existing Load = Predicted existing Enterococcus bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993

Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model

MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses

MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area

Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load

Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model

Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent

Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model

Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load

Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load))

Table 7-44. Alternative Wet Weather Enterococcus Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Annual Loads (Billion MPN/year)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
Aliso HSA (901.13)	2,230,206	1,952,517**	1,014,732	737,042	27.37%	516	516	0.00%	11,245	11,245	0.00%	1,203,713	1,203,713	0.00%
Lower San Juan HSA (901.27)	12,980,098	12,159,138**	1,900,520	1,389,261	26.90%	2,823	2,823	0.00%	1,151,266	841,564	26.90%	9,925,490	9,925,490	0.00%
Tecolote HA (906.50)	708,256	604,180**	575,708	471,630	18.08%	1,266	1,266	0.00%	0	0	0.00%	131,284	131,284	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	7,255,759	6,595,208**	1,555,411	894,859	42.47%	2,430	2,430	0.00%	213,149	213,149	0.00%	5,484,770	5,484,770	0.00%
Chollas HSA (908.22)	1,371,972	1,153,599**	1,022,245	803,871	21.36%	2,062	2,062	0.00%	0	0	0.00%	347,665	347,665	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the single sample maximum WQO for enterococcus (104 MPN/100mL) and a 22 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Total Maximum Daily Load calculated using a Enterococcus numeric target of 104 MPN/ml protective of the REC-1 “moderately to lightly used area” usage frequency that is protective freshwater creeks and downstream beaches. Acceptable evidence that impaired freshwater creeks can be considered “moderately to lightly used areas” must be provided before these alternative wet weather TMDLs, WLAs, and LAs can be implemented in these watersheds.

Watershed Existing Load Predicted existing Enterococcus bacteria loads discharged from all land use categories in the watershed calculated by the Loading Simulation Program in C++ (LSPC) model using modeled flows and bacteria densities for all wet days during the critical year 1993

Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed on an annual basis

MS4 Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the LSPC model

MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses

MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = = Predicted exiting Enterococcus bacteria loads discharged from Caltrans land use areas in the watershed calculated as a fraction of the discharge from industrial/transportation land use category area

Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to Caltrans Existing Load

Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) calculated by the LSPC model

Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to Agriculture Existing Load in watersheds with existing bacteria load contributions for all three indicator bacteria of less than 5 percent; calculated as a relative load percent of the TMDL minus Caltrans WLA and Open Space LA, based on existing load contributions from MS4 and Agriculture land use categories in watersheds with existing bacteria load contributions for all three indicator bacteria of greater than 5 percent

Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) calculated by the LSPC model

Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load

Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

Table 7-45. Dry Weather Fecal Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Monthly Loads (Billion MPN/month)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	2,741	227	2,741	227	91.72%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Aliso HSA (901.13)	5,470	242	5,470	242	95.58%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Dana Point HSA (901.14)	1,851	92	1,851	92	95.03%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Lower San Juan HSA (901.27)	6,455	1,665	6,455	1,665	74.21%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Clemente HA (901.30)	3,327	192	3,327	192	94.23%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Luis Rey HU (903.00)	1,737	1,058	1,737	1,058	39.09%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Marcos HA (904.50_	149	26	149	26	82.55%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Dieguito HU (905.00)	1,631	1,293	1,631	1,293	20.72%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Miramar Reservoir HA (906.10)	205	7	205	7	96.59%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Scripps HA (906.30)	3,320	119	3,320	119	96.42%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Tecolote HA (906.5)	4,329	234	4,329	234	94.59%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	4,928 +461**	1,506 +461*	4,928	1,506	69.44%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Chollas HSA (908.22)	5,068	398	5,068	398	92.15%	0	0	0.00%	0	0	0.00%	0	0	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the 30-day geometric mean WQO for fecal coliform (200 MPN/100mL) and a 0 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Permitted existing fecal coliform bacteria load from Padre Dam Municipal Water District Water Reclamation Plant (Padre Dam), assigned as a separate point source wasteload allocation for discharges from Padre Dam equal to the permitted existing load

Watershed Existing Load = Predicted existing fecal coliform bacteria loads discharged from all land use categories in the watershed calculated by a plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993

Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed for a 30-day period

MS4 Existing Load = Predicted exiting fecal coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the plug-flow reactor model

MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses

MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Fecal coliform bacteria loads discharged from Caltrans land use areas in the watershed assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather

Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to the Caltrans Existing Load

Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Fecal coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather

Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to the Open Space Existing Load

Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Fecal coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather

Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load

Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

Table 7-46. Dry Weather Total Coliform Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Monthly Loads (Billion MPN/month)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	13,791	1,134	13,791	1,134	91.78%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Aliso HSA (901.13)	26,639	1,208	26,639	1,208	95.47%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Dana Point HSA (901.14)	9,315	462	9,315	462	95.04%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Lower San Juan HSA (901.27)	30,846	8,342	30,846	8,342	72.96%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Clemente HA (901.30)	16,743	958	16,743	958	94.28%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Luis Rey HU (903.00)	8,549	5,289	8,549	5,289	38.13%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Marcos HA (904.50_	751	129	751	129	82.82%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Dieguito HU (905.00)	7,555	6,468	7,555	6,468	14.39%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Miramar Reservoir HA (906.10)	1,030	36	1,030	36	96.50%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Scripps HA (906.30)	16,707	594	16,707	594	96.44%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Tecolote HA (906.5)	21,349	1,171	21,349	1,171	94.51%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	28,988	7,529	28,988	7,529	74.03%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Chollas HSA (908.22)	25,080	1,991	25,080	1,991	92.06%	0	0	0.00%	0	0	0.00%	0	0	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the 30-day geometric mean WQO for total coliform (1,000 MPN/100mL) and a 0 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

Watershed Existing Load = Predicted existing total coliform bacteria loads discharged from all land use categories in the watershed calculated by a plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993

Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed for a 30-day period

MS4 Existing Load = Predicted exiting total coliform bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the plug-flow reactor model

MS4 WLA = Point source wasteload allocation (WLA) for discharges from Municipal MS4 land uses

MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Total coliform bacteria loads discharged from Caltrans land use areas in the watershed assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather

Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to the Caltrans Existing Load

Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Total coliform bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather

Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to the Open Space Existing Load

Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Total coliform bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather

Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load

Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

Table 7-47. Dry Weather Enterococcus Bacteria Existing Loads, TMDLs, WLA, LAs Expressed as Monthly Loads (Billion MPN/month)

Watershed	Total Watershed		Point Sources						Nonpoint Sources					
			Municipal MS4			Caltrans			Agriculture			Open		
	Existing Load	TMDL*	Existing Load	WLA*	Reduction Required	Existing Load	WLA*	Reduction Required	Existing Load	LA*	Reduction Required	Existing Load	LA*	Reduction Required
San Joaquin Hills/ Laguna Hills HSAs (901.11 and 901.12)	2,321	40	2,321	40	98.28%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Aliso HSA (901.13)	4,614	40**	4,614	40	99.13%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Dana Point HSA (901.14)	1,567	16	1,567	16	98.98%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Lower San Juan HSA (901.27)	5,433	275**	5,433	275	94.94%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Clemente HA (901.30)	2,817	33	2,817	33	98.83%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Luis Rey HU (903.00)	1,466	185	1,466	185	87.38%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Marcos HA (904.50_	126	5	126	5	96.03%	0	0	0.00%	0	0	0.00%	0	0	0.00%
San Dieguito HU (905.00)	1,368	226	1,368	226	83.48%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Miramar Reservoir HA (906.10)	173	1	173	1	99.42%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Scripps HA (906.30)	2,811	21	2,811	21	99.25%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Tecolote HA (906.5)	3,657	39**	3,657	39	98.94%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Mission San Diego/ Santee HSAs (907.11 and 907.12)	4,106	248**	4,106	248	93.96%	0	0	0.00%	0	0	0.00%	0	0	0.00%
Chollas HSA (908.22)	4,283	66**	4,283	66	98.46%	0	0	0.00%	0	0	0.00%	0	0	0.00%

* TMDLs, WLAs, and LAs calculated based on numeric targets consisting of the 30-day geometric mean WQO for enterococcus (35 MPN/100mL or 33 MPN/100mL) and a 0 percent allowable exceedance frequency. Meeting the numeric targets in the discharge and/or receiving water indicate the TMDLs, WLAs, and/or LAs have been met.

** Total Maximum Daily Load calculated using a Enterococcus numeric target of 33 MPN/mL that is conservatively protective of the REC-1 “designated beach” usage frequency for freshwater creeks and downstream beaches.

Watershed Existing Load = Predicted existing Enterococcus bacteria loads discharged from all land use categories in the watershed calculated by a plug-flow reactor model using estimated flows and bacteria densities for 30 dry days during the critical year 1993

Watershed TMDL = Total Maximum Daily Load (TMDL) or total allowable load (Allowable Numeric Objective Load + Allowable Exceedance Load) that can be discharged from all land uses in the watershed for a 30-day period

MS4 Existing Load = Predicted exiting Enterococcus bacteria loads discharged from Municipal Separate Storm Sewer System (MS4) land use categories in the watershed (i.e., commercial/institutional, high density residential, low density residential, parks/recreation, military, transitional, and industrial/transportation, not including Caltrans transportation) calculated by the plug-flow reactor model

MS4 WLA = Point source wasteload allocation (WLA) for discharges from MS4 land uses

MS4 Reduction Required = Percent of the MS4 Existing Load that must be reduced to meet the MS4 WLA = (MS4 Existing Load – MS4 WLA)/(MS4 Existing Load)

Caltrans Existing Load = Enterococcus bacteria loads discharged from Caltrans land use areas in the watershed assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather

Caltrans WLA = Point source wasteload allocation (WLA) for discharges from Caltrans land uses, assumed to be equal to the Caltrans Existing Load

Caltrans Reduction Required = Percent of the Caltrans Existing Load that must be reduced to meet the Caltrans WLA = (Caltrans Existing Load – Caltrans WLA)/(Caltrans Existing Load)

Agriculture Existing Load = Enterococcus bacteria loads discharged from Agriculture land use categories in the watershed (i.e., agriculture, dairy/livestock, horse ranch) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather

Agriculture LA = Non-point source load allocation (LA) for discharges from Agriculture land uses, assumed to be equal to the Open Space Existing Load

Agriculture Reduction Required = Percent of the Agriculture Existing Load that must be reduced to meet the Agriculture LA = (Agriculture Existing Load – Agriculture LA)/(Agriculture Existing Load)

Open Existing Load = Enterococcus bacteria loads discharged from Open Space land use categories in the watershed (i.e., open space, open recreation, water) assumed to be unlikely during dry weather conditions, or zero bacteria load during dry weather

Open LA = Non-point source load allocation (LA) for discharges from Open Space land uses, assumed to be equal to the Open Space Existing Load

Open Reduction Required = Percent of the Open Space Existing Load that must be reduced to meet the Open Space LA = (Open Space Existing Load – Open Space LA)/(Open Space Existing Load)

TMDL IMPLEMENTATION PLAN

The ultimate goal of the Implementation Plan is to restore the impaired beneficial uses of the waterbodies addressed by these TMDLs. Restoring the impaired beneficial uses will be accomplished by achieving the TMDLs in the receiving waters, and the wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources. The actions taken by the San Diego Water Board depends on the regulatory authority and the source. The regulatory authorities and actions that the San Diego Water Board will use to compel the controllable sources to implement these TMDLs are as follows.

(1) Basin Plan Waste Discharge Prohibitions

The San Diego Water Board may specify certain conditions or areas where the discharge of waste or certain types of waste is not permitted, known as "waste discharge prohibitions," in the Basin Plan.[41] Basin Plan waste discharge prohibitions that are applicable to the implementation of these TMDLs include the following:

- The discharge of waste to waters of the state in a manner causing, or threatening to cause a condition of pollution, contamination or nuisance as defined in Water Code section 13050, is prohibited.

- The discharge of waste to inland surface waters, except in cases where the quality of the discharge complies with applicable receiving water quality objectives, is prohibited. Allowances for dilution may be made at the discretion of the Regional Board. Consideration would include streamflow data, the degree of treatment provided and safety measures to ensure reliability of facility performance. As an example, discharge of secondary effluent would probably be permitted if streamflow provided 100:1 dilution capability.

- The dumping, deposition, or discharge of waste directly into waters of the state, or adjacent to such waters in any manner which may permit its being transported into the waters, is prohibited unless authorized by the Regional Board.

- Any discharge to a storm water conveyance system that is not composed entirely of "storm water" is prohibited unless authorized by the Regional Board. [The federal regulations, 40 CFR 122.26(b)(13), define storm water as storm water runoff, snow melt runoff, and surface runoff and drainage. 40 CFR 122.26(b)(2) defines an illicit discharge as any discharge to a storm water conveyance system that is not composed entirely of storm water except discharges pursuant to a NPDES permit and discharges resulting from fire fighting activities.] [Section 122.26 amended at 56 FR 56553, November 5, 1991; 57 FR 11412, April 2, 1992].

- The unauthorized discharge of treated or untreated sewage to waters of the state or to a storm water conveyance system is prohibited.

Existing discharges are violating one or more of these of these Basin Plan prohibitions. The existing Basin Plan prohibitions are consistent with the TMDLs, WLAs, and LAs. If necessary, the San Diego Water Board may amend the Basin Plan to revise current waste discharge prohibitions or include new waste discharge prohibitions. The controllable sources must comply with the Basin Plan waste discharge prohibitions.

(2) Waste Discharge Requirements

The primary regulatory authority used by the San Diego Water Board to protect water resources and water quality in the San Diego Region is the issuance of waste discharge requirements (WDRs).[42] The San Diego Water Board will issue, or revise and re-issue WDRs to point sources and/or nonpoint sources in the San Diego Region to be consistent with the TMDLs, WLAs, and LAs. The controllable sources regulated under WDRs

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[41] Authorized pursuant to Water Code section 13243

[42] Authorized pursuant to Water Code sections 13263 and 13264

must comply with the requirements to be consistent with the TMDLs, WLAs, and LAs. Specific San Diego Water Board actions with regard to WDRs for point sources and nonpoint sources are discussed in the following subsections.

(A) Point Sources

The San Diego Water Board regulates discharges from point sources to surface waters with WDRs that implement federal NPDES regulations (NPDES requirements). NPDES requirements must contain water quality-based effluent limitations (WQBELs) consistent with the assumptions and requirements of the WLAs of any applicable TMDL.[43]

When developing WQBELs to be incorporated in to NPDES requirements, the following summarizes the requirements and assumptions included in the calculation of the TMDLs, WLAs, and LAs that should be considered:

Numeric Targets

- The numeric targets consist of the numeric WQOs from the Basin Plan and/or Ocean Plan and an allowable exceedance frequency.
- The numeric targets for the wet weather TMDLs consist of the REC-1 single sample maximum WQOs and a 22 percent allowable exceedance frequency.
- The numeric targets for dry weather TMDLs consist of the REC-1 30-day geometric metric mean WQOs and a 0 percent allowable exceedance frequency.
- The TMDL calculations are based on either the single sample maximum WQO (for wet weather) or 30-day geometric mean WQOs (for dry weather), but both the single sample maximum and 30-day geometric mean numeric WQOs and allowable exceedance frequencies must be met in the receiving waters.
- The TMDLs, and in turn the WLAs for point sources and LAs for nonpoint sources, are assumed to be met when the numeric targets for all three indicator bacteria (fecal coliform, total coliform, and *Enterococcus*) are met in the receiving waters.

Critical Conditions

- The mass-load based TMDLs were calculated under critical conditions consisting of flows generated during a critical wet year and estimation of existing and allowable loads at a critical location.
- The flow from the critical wet year is a “worst case” annual wet weather flow and loading scenario. Actual annual wet weather flow and loading will vary from year to year.
- The mass-load based TMDLs calculated at the critical location are dependent on the flow, which can vary from year to year, but the numeric targets will not vary. When the numeric targets are met in the receiving water, the TMDLs are assumed to be met.
- The mass-load based TMDLs, WLAs, and LAs are calculated for the critical location, but the appropriate numeric targets (based on freshwater and/or saltwater REC-1 WQOs and allowable exceedance frequencies) must be met throughout the waterbodies addressed by these TMDLs.

[43] Code of Federal Regulations Title 40 section 122.44(d)(1)(vii)(B)

Linkage Analysis

- The linkage analysis was performed by utilizing calibrated and validated models to predict flow from surface runoff and predict bacteria densities under the critical conditions (i.e., during the critical wet year at the critical location). Existing mass loads and allowable mass loads (i.e., TMDLs) were calculated for each watershed. The existing mass loads were calculated based on model-predicted flow and model-predicted bacteria densities. The allowable mass loads (i.e., TMDLs) were calculated based on model-predicted flow and the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies).

- The wet weather existing mass loads and allowable mass loads (i.e., wet weather mass-load based TMDLs) are calculated assuming surface runoff is generated by rainfall from storm events and discharged from all land use categories to receiving waters.

- The dry weather existing mass loads and allowable mass loads (i.e., dry weather mass-load based TMDLs) are calculated assuming surface runoff is generated only by anthropogenic activities and discharged from specific land use categories to receiving waters. The possible contribution of subsurface or groundwater flows to bacteria loads in receiving waters during dry weather was not accounted for in any land use category.

Allocations

- Each mass-load based TMDL is allocated to known point sources and nonpoint sources. Wasteload allocations (WLAs) are assigned to point sources, and load allocations (LAs) are assigned to nonpoint sources. WLAs and LAs are the maximum load a source can discharge and still achieve the TMDL in the receiving water.

- The TMDLs, and in turn the WLAs for point sources and LAs for nonpoint sources, are assumed to be met when the numeric targets are met in the receiving waters.

- The sources were identified based on land use and grouped in to Municipal MS4, Caltrans MS4 (Caltrans), Agriculture, and Open Space categories. The Municipal MS4 and Caltrans land use categories are point sources, and the Agriculture and Open Space land use categories are nonpoint sources.

- Sources that are not identified are assumed to be assigned a zero allowable load as part of the mass-load based TMDL (i.e., WLA = 0 or LA = 0). In other words, discharges of pollutant loads from these sources are not expected or allowed as part of the TMDLs.

- Sources that are assigned an allowable load equal to the existing mass load as part of the mass-load based TMDL (i.e., WLA or LA = existing mass load) are not expected or allowed to increase their mass load in the future. In other words, discharges of pollutant loads (i.e., flows and bacteria densities) from these sources are not allowed to increase.

- The allocation of the dry weather mass-load based TMDLs assumes that no surface runoff discharge to receiving waters occurs from Caltrans, Agriculture, or Open Space land use categories (i.e., $WLA_{Caltrans} = 0$, $LA_{Agriculture} = 0$, and $LA_{OpenSpace} = 0$), meaning the entire dry weather mass-load based TMDL (i.e., allowable mass load) is allocated to Municipal MS4 land use categories (i.e., WLA_{MS4} = TMDL) (see Tables 7-45 through 7-47).

- The allocation of the wet weather mass-load based TMDLs assumes surface runoff discharge occurs from all land use categories, and allocated according to the following steps (see Tables 7-41 through 7-44):

  1) Sources are separated in to controllable and uncontrollable sources. Discharges from Municipal MS4, Caltrans, and Agriculture land use categories are assumed to be controllable (i.e., subject to regulation), and discharges from Open Space land use categories are assumed to be uncontrollable (i.e., not subject to regulation).

2) Because discharges from Open Space land use categories are uncontrollable (i.e., not subject to regulation), the LAs for Open Space land use categories are set equal to the existing mass loads calculated under the critical conditions.

3) For discharges from controllable land use categories that do not contribute more than 5 percent of the total existing mass load for all three indicator bacteria, the WLA or LA is set equal to the existing mass loads from those land uses calculated under the critical conditions.

4) After the WLAs and LAs are assigned based on steps 2 and 3, the remaining portion of the mass-load based TMDL is assigned to discharges from controllable land use categories that contribute more than 5 percent of the total existing mass load for all three indicator bacteria. The allowable mass load for each source (WLA or LA) is calculated based on the ratio of the existing mass loads from those sources relative to each other.

Load Reductions

- The load reductions required to meet the mass-load based TMDLs, WLAs, and LAs are based on reducing the loads compared to pollutant loads from 2001 to 2002.
- Load reductions for each source are calculated based on the difference between the existing mass load and the mass-load based WLA or LA for each source (see Tables 7-41 through 7-47).
- WLAs and LAs that are set equal to the existing mass loads do not require load reductions to be calculated, but this also means that existing mass loads from those sources cannot increase over time (i.e., pollutant loads should be less than or equal to pollutant loads relative to 2001 to 2002).
- The load reductions needed to meet the WLAs for point sources and LAs for nonpoint sources are assumed to be achieved when the numeric targets are met in the receiving waters.

The persons identified as responsible for point source discharges causing or contributing to bacteria impairments at the beaches and creeks addressed in these TMDLs include:

- Phase I MS4s,
- Phase II MS4s,
- Caltrans,
- POTWs and wastewater collection systems, and
- CAFOs.

According to Tables 7-41 through 7-47, Municipal (Phase I and Phase II) MS4s and Caltrans are the only point sources that have been assigned WLAs. POTWs,[44] CAFOs, and any other unidentified point sources were not assigned WLAs, which is equivalent to being assigned a WLA of zero. All these identified point sources are subject to NPDES regulations.

In order for the WDRs, NPDES requirements, and discharges from these point sources to be consistent with the TMDLs and WLAs, the San Diego Water Board will issue or revise and re-issue the WDRs for these point sources as follows:

[44] Not including Padre Dam, which has been allocated a fecal coliform TMDL based on the effluent limitations in the WDRs for Padre Dam

(i) Phase I MS4s

The TMDLs and Municipal MS4 WLAs, with respect to discharges from Phase I MS4s, will be implemented primarily by revising and re-issuing the existing NPDES requirements that have been issued for Phase I MS4 discharges.

The Phase I MS4s subject to these TMDLs are regulated under San Diego Water Board WDRs that implement NPDES requirements.[45] The NPDES requirements regulating the Phase I MS4s include discharge prohibitions and receiving water limitations that are applicable to the implementation of these TMDLs, as summarized below:

- Discharges from MS4s are subject to all Basin Plan prohibitions.
- Discharges from MS4s that cause or contribute to the violation of water quality standards (designated beneficial uses and water quality objectives developed to protect beneficial uses) are prohibited.
- Discharges into and from MS4s in a manner causing, or threatening to cause, a condition of pollution, contamination, or nuisance, in waters of the state are prohibited.
- Effectively prohibit all types of non-storm water discharges into the MS4 unless such discharges are either authorized by separate NPDES requirements, or not prohibited (i.e., exempted) by the NPDES requirements regulating the MS4. Exempted non-storm water discharges into the MS4 are not prohibited unless the discharge category is identified as a significant source of pollutants to waters of the United States.

The available data reported by the Phase I MS4s and the results of the technical TMDL analysis indicate that discharges into and from MS4s are in violation of the discharge prohibitions and receiving water limitations above. Enforcement of the current discharge prohibitions and receiving water limitations is an action that the San Diego Water Board can immediately implement to compel the MS4s to reduce discharge of bacteria to the receiving waters.

In addition to the discharge prohibitions and receiving water limitations, WQBELs consistent with the assumptions and requirements of the WLAs of any applicable TMDL must also be incorporated into the NPDES requirements. The San Diego Water Board will revise and re-issue the WDRs and NPDES requirements for Phase I MS4s to incorporate the following:

- WQBELs consistent with the requirements and assumptions of the Municipal MS4 WLAs. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a BMP program of expanded or better-tailored BMPs.[46]
- If the WQBELs include a BMP program, periodic reporting requirements on BMP planning, implementation, and effectiveness in improving water quality at impaired beaches and creeks (i.e., progress reports). Progress reports will also be required to include water quality monitoring results. Progress reports will be required as long as necessary to ensure that the beneficial uses of the impaired waterbodies have been restored and maintained.
- Compliance schedule for Phase I MS4s to attain the MS4 WLAs and TMDLs in the receiving waters.

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[45] Phase I MS4s in Orange County are regulated under San Diego Water Board Order No. R9-2002-0001 or subsequent orders; Phase I MS4s in San Diego County are regulated under San Diego Water Board Order No. R9-2007-0001 or subsequent orders.

[46] Code of Federal Regulations Title 40 section 122.44(k)(2)&(3)

The WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve the TMDLs in the receiving waters. The Phase I MS4s will be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving waters, acceptable to the San Diego Water Board, within 18 months after the effective date of these TMDLs.[47] The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. The BLRPs or CLRPs should be developed and incorporated as part of the Watershed Runoff Management Programs required under the Phase I MS4 NPDES requirements. Ideally, the Phase I MS4s and Caltrans will develop and coordinate the elements of their BLRPs or CLRPs together.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that the MS4s have met their WLAs. If, however, the receiving water limitations are not being met in the receiving waters, the Phase I MS4s will be responsible for reducing their bacteria loads and/or demonstrating that controllable anthropogenic discharges from the Phase I MS4s are not causing the exceedances, as outlined below in the Monitoring for TMDL Compliance section below.

(ii) Phase II MS4s

The TMDLs and MS4 WLAs, with respect to discharges from Phase II MS4s, will be implemented primarily by requiring compliance with the existing general WDRs and NPDES requirements that have been issued for Phase II MS4 discharges. Phase II MS4s are subject to regulation under State Water Board general WDRs implementing NPDES requirements.[48]

Owners and operators of Phase II MS4s in the watersheds subject to these TMDLs, identified by the San Diego Water Board as significant sources of bacteria discharging to the receiving waters and/or Phase I MS4s, will be required to submit a Notice of Intent[49] to comply with the NPDES requirements in the State Water Board general WDRs as soon as possible after the effective date of these TMDLs.[50] Once enrolled under the general WDRs, Phase II MS4 owners and operators are required to comply with the provisions of the State Water Board general WDRs and NPDES requirements to reduce the discharge of bacteria as specified in their Stormwater Management Plans/Programs (SWMPs).

For any individual Phase II MS4s that are identified as a significant source of pollutants, the San Diego Water Board may also issue individual WDRs requiring the implementation of WQBELs that are consistent with the requirements and assumptions of the Municipal MS4 WLAs. Upon issuance of such individual WDRs by the San Diego Water Board, the State Water Board general WDRs for Phase II MS4s shall no longer regulate the affected individual Phase II MS4s.[51]

Similarly, for any category of Phase II MS4s that are identified as a significant source of pollutants, the San Diego Water Board may issue general WDRs requiring the implementation of WQBELs that are consistent with the requirements and assumptions of the Municipal MS4 WLAs above. Upon issuance of such general WDRs by the San Diego Water Board, the State Water Board general WDRs for Phase II MS4s shall no longer regulate the affected category of Phase II MS4s.[52]

In the event that the San Diego Water Board issues individual or general WDRs for Phase II MS4s in the San Diego Region, the WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve the TMDLs in the receiving waters. The Phase II MS4s will likely be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load

[47] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.
[48] Phase II MS4s in the San Diego Region are subject to regulation under State Water Board Order No. 2003-0005-DWQ, or subsequent orders.
[49] The Notice of Intent, or NOI, is attachment 7 to Order No. 2003-0005-DWQ.
[50] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.
[51] As authorized under State Water Board Order No. 2003-0005-DWQ, section G.
[52] Ibid.

Reduction Plans (CLRPs) outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving water, acceptable to the San Diego Water Board. When and where possible, the San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale and have the Phase II MS4 BMP programs coordinate with the BMPs programs for Phase I MS4s and Caltrans.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that the Phase II MS4s have met their WLAs. If, however, the receiving water limitations are not being met in the receiving waters and one or more Phase II MS4 dischargers are identified as sources of bacteria causing exceedances, the specific Phase II MS4s will be responsible for reducing their bacteria loads and/or demonstrating that controllable anthropogenic discharges from those specific Phase II MS4s are not causing the exceedances, as outlined below in the Monitoring for TMDL Compliance section below.

(iii) Caltrans

The TMDLs and Caltrans WLAs will be implemented primarily by revising and re-issuing the existing NPDES requirements that have been issued for Caltrans discharges.

Caltrans is regulated under State Water Board general WDRs that implement NPDES requirements.[53] The San Diego Water Board will request the State Water Board to revise and re-issue the WDRs and NPDES requirements to incorporate the following for Caltrans discharges in the San Diego Region:

- WQBELs consistent with the requirements and assumptions of the Caltrans WLAs. WQBELs may be expressed as numeric effluent limitations, when feasible, and/or as a BMP program of expanded or better-tailored BMPs.[54]

- If the WQBELs include a BMP program, periodic reporting requirements on BMP planning, implementation, and effectiveness in improving water quality at impaired beaches and creeks (i.e., progress reports). Progress reports will also be required to include water quality monitoring results. Progress reports will be required as long as necessary to ensure that the beneficial uses of the impaired waterbodies have been restored and maintained.

- Compliance schedule for Caltrans to attain the Caltrans WLAs and TMDLs in the receiving waters.

The WQBELs will likely consist of receiving water limitations (based on the numeric targets) and require the implementation of a BMP program to achieve TMDLs in the receiving waters. Caltrans will be required to submit Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) outlining a proposed BMP program that will be capable of attaining the TMDLs in the receiving waters, acceptable to the San Diego Water Board, within 18 months after the effective date of these TMDLs.[55] The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. Ideally, Caltrans and the Phase I MS4s will develop and coordinate the elements of their BLRPs or CLRPs together.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that Caltrans has met its WLAs. If, however, the receiving water limitations are not being met in the receiving waters, and Caltrans MS4s are identified as a source of bacteria causing exceedances, Caltrans will be responsible for reducing its bacteria loads and/or demonstrating that controllable anthropogenic discharges from the Caltrans MS4s are not causing the exceedances, as outlined below in the Monitoring for TMDL Compliance section below.

[53] Caltrans is subject to regulation under State Water Board Order No. 99-06-DWQ, and subsequent orders.
[54] Code of Federal Regulations Title 40 section 122.44(k)(2)&(3)
[55] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.

(iv) Publicly Owned Treatment Works and Wastewater Collection Systems

The TMDLs, with respect to discharges from POTWs and wastewater collection systems, will be implemented primarily by requiring compliance with any existing individual and/or general WDRs and NPDES requirements that have been issued. POTWs are subject to regulation under individual WDRs that implement NPDES requirements. Wastewater collection systems are subject to regulation under general WDRs issued by the State Water Board and San Diego Water Board.[56]

Because POTWs and wastewater collection systems have been assigned WLAs of zero,[57] no discharges of bacteria are expected or allowed under the wet weather TMDLs or dry weather TMDLs. If discharges of bacteria from POTWs and/or wastewater collection systems do occur as a result of sanitary sewer overflows and result in WQO exceedances, these exceedances will not apply to the compliance status of other dischargers.

If necessary, individual WDRs for POTWs and/or the San Diego Water Board WDRs for wastewater collection systems can be revised to require more aggressive monitoring, maintenance, and repair schedules to ensure discharges of bacteria wasteloads to surface waters are eliminated.

(v) Concentrated Animal Feeding Operations

The TMDLs, with respect to discharges from CAFOs, will be implemented primarily by requiring compliance with any existing individual and/or general WDRs and NPDES requirements that have been issued. CAFOs that discharge to surface waters are subject to regulation under general WDRs that implement NPDES requirements.

Because CAFOs have been assigned WLAs of zero, no discharges of bacteria are expected or allowed under the wet weather TMDLs or dry weather TMDLs.

If necessary, the general WDRs and NPDES requirements for CAFOs can be revised to require more aggressive monitoring, maintenance, and repair schedules to ensure discharges of bacteria wasteloads to surface waters are minimized and/or eliminated.

(vi) Other Unidentified Point Sources

Unidentified point sources have not been assigned WLAs, which is equivalent to being assigned a WLA of zero. No discharges of bacteria are expected or allowed from unidentified point sources under the wet weather TMDLs or dry weather TMDLs.

Therefore, the TMDLs, with respect to discharges from unidentified point sources to surface waters, will be implemented primarily by issuing WDRs implementing NPDES requirements, or requiring the point sources to cease their discharges.

(B) Nonpoint Sources

The persons identified as responsible for controllable nonpoint source bacteria discharges causing or contributing to bacteria impairments at the beaches and creeks in these watersheds include the owners and operators of the following:

- agricultural facilities,
- nurseries,
- dairy/intensive livestock facilities,

[56] State Water Board Order No. 2006-0003-DWQ and San Diego Water Board Order No. R9-2007-0005
[57] With the exception of Padre Dam, which has a fecal coliform mass-load based WLA that is calculated based on numeric effluent limitations derived from the REC-1 WQOs in the Basin Plan.

- horse ranches,
- manure composting and soil amendment operations not regulated by NPDES requirements, and
- individual septic systems.

Agriculture (including nurseries), dairy/livestock, and horse ranch land uses (collectively called "agriculture" land uses) are controllable nonpoint sources that have been assigned LAs, as shown in Tables 7-41 through 7-47. Manure composting operations, soil amendment operations, and individual septic systems that are not part of agriculture land uses, and any other unidentified controllable nonpoint sources were not assigned LAs, which is equivalent to being assigned a LA of zero. Any controllable nonpoint source that has not been assigned a LA or has a LA of zero is not expected or allowed to discharge a pollutant load as part of the TMDL.

Controllable nonpoint source discharges are present in most watersheds, however, in only four watersheds do these discharges require load reductions to meet the Agriculture LAs. These watersheds are the Lower San Juan HSA, San Luis Rey HU, San Marcos HA, and San Dieguito HU watersheds (see Tables 7-41 through 7-44).

If individual or general WDRs are developed and issued to controllable nonpoint sources, the WDRs should incorporate one or more the following:

- Effluent limitations that are consistent with the requirements and assumptions of the nonpoint source LAs. Effluent limitations should be expressed as numeric effluent limitations, if feasible, and/or as a BMP program.
- Periodic reporting requirements on BMP planning, implementation, and effectiveness in improving the water quality of discharges from the nonpoint source (i.e., progress reports). Progress reports will also be required to include water quality monitoring results. Progress reports will be required as long as necessary to ensure that the beneficial uses of the impaired waterbodies have been restored and maintained.
- Compliance schedule and/or implementation milestones.

The San Diego Water Board will work with the nonpoint source dischargers and/or stakeholders when developing the WDRs. When and where possible, the San Diego Water Board will have the nonpoint source BMP programs coordinate with the BMPs programs for Phase I MS4s and Caltrans.

If the receiving water limitations (based on the numeric targets) are met in the receiving waters, the assumption will be that controllable nonpoint sources have met their LAs. If, however, the receiving water limitations are not being met in the receiving waters, and one or more controllable nonpoint source dischargers are identified as sources of bacteria causing exceedances, the San Diego Water Board may regulate those identified nonpoint sources, as needed, with WDRs or other enforcement actions, and those nonpoint sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those nonpoint sources are not causing the exceedances, as outlined below in the Monitoring for TMDL Compliance section below.

(3) Conditional Waivers of Waste Discharge Requirements

There are several types of point source discharges to land, as well as nonpoint source discharges to land and surface waters that may not have an adverse affect on the quality of the waters of the state, and/or are not readily amenable to regulation under WDRs. For these types of discharge, the San Diego Water Board has the authority to issue conditional waivers of WDRs.[58]

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[58] Authorized pursuant to Water Code section 13269

There are controllable nonpoint source land uses (agriculture, horse ranches, and dairies/intensive livestock) that were identified in 8 watersheds that are contributing to the bacteria impairments. Four of the 8 watersheds were identified as requiring load reductions (Lower San Juan HSA, San Luis Rey HU, San Marcos HA, and San Dieguito HU) to meet the assigned wet weather Agriculture LAs.

In general, the San Diego Water Board utilizes conditional waivers of WDRs to address the discharges from controllable nonpoint sources. Development and enforcement of waiver conditions that are protective of water quality will likely be sufficient to implement the Agriculture LAs. The controllable nonpoint sources eligible for conditional waivers must comply with the conditions of the waiver to be consistent with the TMDLs and Agriculture LAs. Controllable nonpoint sources that do not comply with the waiver conditions are no longer eligible for the waiver and must either come into compliance with the waiver conditions, become regulated under WDRs, or cease any discharge of wastes to waters of the state.

Currently, discharges from these controllable nonpoint sources may be eligible for one of the general conditional waivers of WDRs, which are currently provided in the Basin Plan.[59] Conditional waivers of WDRs may not exceed 5 years in duration, but may be revised and renewed, or may be terminated at any time.[60] The San Diego Water Board will implement the conditional waivers of WDRs applicable to the Agriculture land uses to be consistent with the TMDLs and Agriculture LAs.

Because the conditional waivers of WDRs that may be utilized to implement the Agriculture LAs are contained in the Basin Plan, any revision of the conditions will require a Basin Plan amendment. If needed, the San Diego Water Board may amend the Basin Plan to remove these conditional waivers of WDRs from the Basin Plan and re-issue the conditional waivers of WDRs as a general order to reduce the administrative requirements for revising waiver conditions.

As required, the effectiveness of the conditional waivers of WDRs must be evaluated at least once every 5 years. If the conditions in the waivers of WDRs are not sufficient to implement the TMDLs and Agriculture LAs, the San Diego Water Board will amend the waiver conditions to include more stringent conditions, including, but not limited to, additional BMP implementation, monitoring, and/or reporting.

If a conditional waiver of WDRs no longer appears to be effective in protecting water quality from discharges from specific nonpoint source facilities or category of nonpoint source facilities, the waiver may be terminated. For nonpoint source facilities that are no longer eligible for a conditional waiver of WDRs, they will need to be regulated under WDRs, or cease any discharges of waste to waters of the state.

(4) Enforcement Actions

The San Diego Water Board shall consider enforcement actions, as necessary, for any discharger failing to comply with applicable waiver conditions, WDRs, or Basin Plan waste discharge prohibitions.[61] Enforcement actions can also be taken, as necessary, to control the discharge of bacteria to impaired beaches and creeks, to attain compliance with the assumptions and requirements of the TMDLs, WLAs, and LAs.

In order for implementation of the TMDLs to begin as soon as possible, the San Diego Water Board may issue enforcement actions, in lieu of or before revising and re-issuing general WDRs and NPDES requirements, for Phase I MS4s and Caltrans, directing them to begin implementing additional measures to restore compliance with the bacteria WQOs. Enforcement actions may also be issued to require the submission of Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs) to the San Diego Water Board within 18 months after the effective date of these TMDLs,[62] or sooner. The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale.

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[59] The current general conditional waivers in the Basin Plan were adopted under San Diego Water Board Resolution No. R9-2007-0104. These waivers will expire December 31, 2012. Conditional Waiver No. 3 (Animal Operations) and Conditional Waiver No. 4 (Agriculture and Nursery Operations) may be utilized to implement the Agriculture LAs. Future iterations of these conditional waivers may be issued in a separate implementing order and removed from the Basin Plan.

[60] Pursuant to Water Code section 13269(a)(2)

[61] Authorized pursuant to Water Code sections 13300-13304, 13308, 13350, 13385, and/or 13399

[62] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.

The San Diego Water Board will also issue enforcement actions, as necessary, to any other discharger that is identified by the San Diego Water Board and/or other parties as a significant source causing or contributing to the bacteria impairments in the waterbodies addressed in these TMDLs.

(5) Investigative Orders

The San Diego Water Board has the authority to require any state or local agency to investigate and report on any technical factors involved in water quality control or to obtain and submit analyses of water.[63] The San Diego Water Board has the authority to require technical or monitoring program reports from persons who have discharged or are discharging waste that could affect the quality of the waters in the San Diego Region.[64] The San Diego Water Board also has the authority to establish monitoring and recordkeeping requirements for discharges regulated under NPDES requirements.[65]

Investigative orders may be issued requiring the submission of Bacteria Load Reduction Plans (BLRPs) or Comprehensive Load Reduction Plans (CLRPs), acceptable to the San Diego Water Board, within 18 months after the effective date of these TMDLs,[66] or sooner. The San Diego Water Board will require the BLRPs or CLRPs to be developed on a watershed or region wide scale. The San Diego Water Board may require the Phase I MS4s and Caltrans to develop and coordinate the elements of their BLRPs or CLRPs together. The BLRPs or CLRPs will be incorporated into the WDRs and NPDES requirements.

The San Diego Water Board may issue subsequent investigative orders to confirm items in the BLRPs or CLRPs. The BLRPs or CLRPs must be capable of achieving the WLAs for the bacteria TMDLs. The CLRPs must also be capable of restoring the beneficial uses in receiving waters for other impairing pollutants in the watershed, and achieving the goals and objectives of any other water quality improvement projects included in the CLRPs within the time frame of the compliance schedule.

The San Diego Water Board will also issue investigative orders requiring BLRPs or CLRPs, or other technical or monitoring program reports, as necessary, to any other discharger that is identified by the San Diego Water Board or other parties as a significant source causing or contributing to the bacteria impairments in the waterbodies addressed in these TMDLs.

(6) Basin Plan Amendments

As the implementation of these TMDLs progress, the San Diego Water Board recognizes that revisions to the Basin Plan may be necessary in the future. The San Diego Water Board will initiate a Basin Plan amendment project to revise the requirements and/or provisions for implementing these TMDLs within 5 years from the effective date of this Basin Plan amendment or earlier if all the following conditions are met:

- Sufficient data are collected to provide the basis for the Basin Plan amendment.
- A report is submitted to the San Diego Water Board documenting the findings from the collected data.
- A request is submitted to the San Diego Water Board with specific revisions proposed to the Basin Plan, and the documentation supporting such revisions.

The San Diego Water Board will work with the project proponents to ensure that the data and documentation will be adequate for the initiation of the Basin Plan amendment. The San Diego Water Board staff will be responsible for taking the Basin Plan amendment project through the administrative and regulatory processes for adoption by the San Diego Water Board, and approval by the State Water Board, OAL, and USEPA.

[63] Authorized pursuant to Water Code section 13225
[64] Authorized pursuant to Water Code section 13267
[65] Authorized pursuant to Water Code section 13383
[66] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.

If no Basin Plan amendment has been initiated within 5 years of the effective date of this TMDL Basin Plan amendment, and the Executive Officer determines, with Regional Board concurrence, that insufficient data exist to support the initiation of a Basin Plan amendment, a subsequent Basin Plan amendment to revise the requirements and/or provisions for the implementation of these TMDLs will not be initiated until the Executive Officer determines the conditions specified above are met.

(7) Other Actions

For these TMDLs, the San Diego Water Board shall recommend that the State Water Board assign a high priority to awarding grant funding[67] for projects to implement the bacteria TMDLs. Special emphasis will be given to projects that can achieve quantifiable bacteria load reductions consistent with the specific bacteria TMDLs, WLAs, and LAs.

Implementation of these TMDLs by the San Diego Water Board should not require any special studies to be conducted by the dischargers or other entities. The San Diego Water Board, however, will encourage and support any special studies proposed and undertaken by the dischargers or other entities that will provide information to refine and improve the implementation of these TMDLs. The San Diego Water Board may develop agreements (e.g., a Memorandum of Understanding) with one or more entities to support and use the findings from any special studies that may be conducted. Proposing a special study project and initiating an agreement with the San Diego Water Board to use the results of the study to modify this TMDL Implementation Plan is the responsibility of the project proponent(s).

(i) Monitoring for TMDL Compliance and Compliance Assessment

An essential component of implementation is water quality monitoring. Monitoring is needed to evaluate the progress toward attainment of the TMDLs and restoring the beneficial uses in the receiving waters. When all discharges from controllable sources meet their assigned WLAs and LAs, and the numeric targets (i.e., numeric WQOs and allowable exceedance frequencies) are also met in the receiving waters, , compliance with the TMDLs will be achieved. Additionally, sufficient water quality data are necessary to support the removal of a waterbody from the 303(d) List. Water quality data can also be used identify additional regulatory actions that may need to be implemented by the San Diego Water Board to restore and protect beneficial uses.

Monitoring for compliance will initially be conducted by the Phase I MS4s and Caltrans. The minimum components for any monitoring program that will be used to evaluate progress toward attainment of the TMDLs should include the following:

- For beaches addressed by these TMDLs, monitoring locations should consist of, at a minimum, the same locations used to collect data required under MS4 NPDES monitoring requirements and beach monitoring for Health and Safety Code section 115880.[68] If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

[67] The State Water Board administers the awarding of grants funded from Proposition 13, Proposition 50, Clean Water Act section 319(h) and other federal appropriations to projects that can result in measurable improvements in water quality, watershed condition, and/or capacity for effective watershed management. Many of these grant fund programs have specific set-asides for expenditures in the areas of watershed management and TMDL project implementation for non-point source pollution.

[68] Commonly referred to as AB 411 monitoring

- For creeks addressed by these TMDLs, monitoring locations should consist of, at a minimum, a location at or near the mouth of the creek (e.g., Mass Loading Station or Mass Emission Station) and one or more locations upstream of the mouth (e.g., Watershed Assessment Stations). If exceedances of the receiving water limitations are observed in the monitoring data, additional monitoring locations and/or other source identification methods must be implemented to identify the sources causing the exceedances. The additional monitoring locations and/or other source identification methods must also be used to demonstrate that the bacteria loads from the identified sources have been addressed and are no longer causing exceedances in the receiving waters.

- Because there are dry weather and wet weather TMDLs, monitoring under both conditions is needed. Wet weather[69] monitoring should occur at least once within 24 hours of the end of a storm event[70] that occurs during the rainy season (i.e., October 1 through April 30). Dry weather[71] monitoring should occur at least on a monthly basis, and may be required more often during the summer months (e.g., weekly) when the REC-1 and REC-2 beneficial uses occur most frequently in the creeks and at the beaches.

Compliance with the TMDLs, WLAs, and LAs will be assessed primarily by comparing receiving water indicator bacteria results from the monitoring locations outlined above with receiving water limitations expressed in terms of the appropriate numeric REC-1 WQOs and allowable exceedance frequencies of the appropriate numeric REC-1 WQOs. The appropriate numeric WQOs and allowable exceedance frequencies are dependent upon the type of receiving water (i.e., beach or creek) and weather conditions (i.e., dry weather or wet weather), as shown in Tables 7-48 and 7-49.

Table 7-48. Receiving Water Limitations for Beaches

	Wet Weather Days [a]		Dry Weather Days [b]	
Indicator Bacteria	**Wet Weather Numeric Objective [c] (MPN/100mL)**	**Wet Weather Allowable Exceedance [d] Frequency**	**Dry Weather Numeric Objective [e] (MPN/100mL)**	**Dry Weather Allowable Exceedance Frequency**
Fecal Coliform	400	22%	200	0%
Total Coliform	10,000	22%	1,000	0%
Enterococcus	104	22%	35	0%

a. Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.

b. Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.

c. Wet weather numeric objectives based on the single sample maximum water quality objectives in the California Ocean Plan (2005). Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met.

d. The wet weather allowable exceedance frequency is set at 22%. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.

e Dry weather numeric objectives based on the 30-day geometric mean water quality objectives in the California Ocean Plan (2005). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that the dry weather days in any given year exceed the dry weather numeric objective.

[69] Defined as days with a storm with at least 0.2 inches of rainfall and the 72 hour period after the storm event
[70] The end of a storm event is when there is no more precipitation
[71] Defined as days with less than 0.2 inches of rainfall on each of the previous three days

Table 7-49. Receiving Water Limitations for Creeks

Indicator Bacteria	Wet Weather Days [a]		Dry Weather Days [b]	
	Wet Weather Numeric Objective [c] (MPN/100mL)	Wet Weather Allowable Exceedance [d] Frequency	Dry Weather Numeric Objective [e] (MPN/100mL)	Dry Weather Allowable Exceedance Frequency
Fecal Coliform	400	22%	200	0%
Enterococcus	61 (104) [f]	22%	33	0%

a. Wet weather days defined as days with rainfall events of 0.2 inches or greater and the following 72 hours.

b. Dry weather days defined as days with less than 0.2 inch of rainfall observed on each of the previous 3 days.

c. Wet weather numeric objectives based on the single sample maximum (or equivalent) water quality objectives in the Water Quality Control Plan for the San Diego Basin (1994). Compliance with the wet weather TMDLs in the receiving water is based on the frequency that the wet weather days in any given year exceed the wet weather numeric objective, but 30-day geometric mean must also be met.

d. The wet weather allowable exceedance frequency is set at 22%. In the calculation of the wet weather TMDLs, the San Diego Regional Board chose to apply the 22 percent allowable exceedance frequency as determined for Leo Carillo Beach in Los Angeles County. At the time the wet weather watershed model was developed, the 22 percent exceedance frequency from Los Angeles County was the only reference beach exceedance frequency available. The 22 percent allowable exceedance frequency used to calculate the wet weather TMDLs is justified because the San Diego Region watersheds' exceedance frequencies will likely be close to the value calculated for Leo Carillo Beach, and is consistent with the exceedance frequency that was applied by the Los Angeles Regional Board.

e. Dry weather numeric objectives based on the 30-day geometric mean (or equivalent) water quality objectives in Water Quality Control Plan for the San Diego Basin (1994). Compliance with the dry weather TMDLs in the receiving water is based on the frequency that the dry weather days in any given year exceed the dry weather numeric objective.

f. A wet weather numeric objective for *Enterococcus* of 104 MPN/100mL may be applied as a receiving water limitation for creeks, instead of 61 MPN/100mL, if one or more of the creeks addressed by these TMDLs (San Juan Creek, Aliso Creek, Tecolote Creek, Forrester Creek, San Diego River, and/or Chollas Creek) is designated with a "moderately to lightly used area" or less frequent usage frequency in the Basin Plan. Otherwise, the wet weather numeric objective of 61 MPN/100mL for Enterococcus will be used to assess compliance with the wet weather allowable exceedance frequency.

At the end of the TMDL Compliance Schedules, which are given in the following section, the receiving waters must meet the receiving water limitations above to be considered in compliance with these TMDLs, WLAs, and LAs. Determination of compliance with the TMDLs will be assessed differently for dry weather and wet weather as follows:

1. *Compliance with Dry Weather TMDLs*: At the end of the dry weather TMDL compliance schedule, the bacteria densities in the receiving waters for all dry weather days[72] must be less than or equal to the 30-day geometric mean REC-1 WQOs 100 percent of the time (i.e., dry weather days in a 30-day period shall not exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time). In addition, the bacteria densities must be consistent with the single sample maximum REC-1 WQOs in the Ocean Plan for beaches, and the Basin Plan for creeks.

   The method and number of samples needed for calculating the 30-day geometric mean should be consistent with the number of samples required by the Ocean Plan for beaches, and the Basin Plan for creeks. Analysis of the monitoring results should also be consistent with the methods given in the Water Quality Control Policy For Developing California's Clean Water Act Section 303(d) List.

   Because the dry weather TMDLs are assigned entirely to the Municipal MS4s as WLAs, the Municipal MS4s are assumed to be the only source of bacteria during dry weather (i.e., dry weather TMDL = MS4 WLA). Discharges from other controllable sources (i.e., Caltrans, Agriculture) during dry weather are not expected and/or not allowed (i.e., WLA = 0 or LA = 0). If at the end of the dry weather TMDL compliance schedule the receiving waters exceed the 30-day geometric mean REC-1 WQOs more than

[72] Defined as days with less than 0.2 inches of rainfall on each of the previous three days

0 percent of the time, the municipal Phase I MS4s are responsible for demonstrating their discharges into the receiving waters are not causing the exceedances, or they will be considered out of compliance. If controllable sources other than the Phase I MS4s are identified as causing the exceedances, and the Phase I MS4s have demonstrated they are not causing or contributing to the exceedances, the Phase I MS4s will not be considered out of compliance.

The Phase I MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional boundaries, and/or by using other methods accepted by the San Diego Water Board. Otherwise, at the end of the dry weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the dry weather TMDL Compliance Schedule as causing the exceedances, those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not causing the exceedances. The San Diego Water Board shall implement additional actions (e.g., issue enforcement actions, amend existing NPDES requirements or conditional waivers), as needed, to bring all controllable sources into compliance with the dry weather TMDLs.

2. *Compliance with Wet Weather TMDLs*: At the end of the wet weather TMDL compliance schedule, the bacteria densities in the receiving waters for all wet weather days[73] cannot exceed the single sample maximum REC-1 WQOs more than the allowable exceedance frequency. In addition, the bacteria densities must be less than or equal to the 30-day geometric mean REC-1 WQOs 100 percent of the time (i.e., both dry and wet weather days in a 30-day period shall not exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time).

As described in the minimum monitoring components above, wet weather samples should be collected within 24 hours of the end of a storm event that occurs during the rainy season (i.e., October 1 through April 30). At least one wet weather sample per storm is expected to be collected for each waterbody in each watershed (i.e., Pacific Ocean shoreline, creek mouth, and/or creek). Because of the many issues related to collecting wet weather samples from multiple sites within a short time frame, dischargers are expected to develop a wet weather monitoring and sampling approach in their BLRPs or CLRPs. If only one sample is collected for a storm event, the bacteria density for every wet weather day associated with that storm event shall be equal to the results from that one sample. If more than one sample is collected for a storm event, but not on a daily basis, the bacteria density for all the wet weather days not sampled shall be equal to the highest bacteria density result reported from samples collected. The exceedance frequency shall be calculated by dividing the number of wet weather days that exceed the single sample maximum REC-1 WQOs by the total number of wet weather days during the rainy season. If at the end of the wet weather TMDL Compliance Schedule the receiving waters exceed the single sample maximum REC-1 WQOs more than the allowable exceedance frequency, all controllable sources are responsible for demonstrating their discharges into the receiving waters are not causing the exceedances, or they will be considered out of compliance.

The data collected for compliance with the dry weather TMDLs, described above, shall be used in addition to the data collected for wet weather with the wet weather TMDLs to calculate the wet weather 30-day geometric mean. If at the end of the wet weather TMDL Compliance Schedule the receiving waters exceed the 30-day geometric mean REC-1 WQOs at any time, all controllable sources are responsible for demonstrating their discharges into the receiving waters are not causing the exceedances, or they will be considered out of compliance.

Because the Phase I MS4s are located at the base of the watersheds and have been identified as the most significant controllable source of bacteria, the municipal Phase I MS4s will have the primary responsible for monitoring the receiving waters. Caltrans will also have monitoring responsibilities. Phase II MS4s, agricultural dischargers, and other sources that are identified as significant sources (i.e.,

[73] Defined as days with a storm with at least 0.2 inches of rainfall and the 72 hour period after the storm event

causing or contributing to exceedances in the receiving waters) will also be responsible for monitoring the receiving waters. The municipal Phase I MS4s and other dischargers are responsible for reducing their bacteria loads and/or demonstrating their discharges into the receiving waters are not causing the exceedances.

The municipal MS4s may demonstrate that their discharges are not causing the exceedances in the receiving waters by providing data from their discharge points to the receiving waters, by providing data collected at jurisdictional boundaries, and/or by using other methods accepted by the San Diego Water Board. Otherwise, at the end of the wet weather TMDL compliance schedule, the municipal Phase I MS4s will be held responsible and considered out of compliance unless other information or evidence indicates another controllable or uncontrollable source is responsible for the exceedances in the receiving waters. If controllable sources other than discharges from the municipal Phase I MS4s are identified before or after the end of the wet weather TMDL Compliance Schedules as causing the exceedances, those controllable sources will be responsible for reducing their bacteria loads and/or demonstrating that discharges from those sources are not causing the exceedances. If controllable sources other than the Phase I MS4s are identified as causing the exceedances, and the Phase I MS4s have demonstrated they are not causing or contributing to the exceedances, the Phase I MS4s will not be considered out of compliance. The San Diego Water Board shall implement additional actions (e.g., issue enforcement actions, amend existing NPDES requirements or conditional waivers), as needed, to bring all those controllable sources into compliance with the wet weather TMDLs.

Between the effective date of these TMDLs and the end of the TMDL Compliance Schedules, monitoring is also required to demonstrate progress toward achieving and complying with the TMDLs, WLAs, and LAs. Progress can be demonstrated with reductions in exceedance frequencies in the receiving waters until the allowable exceedance frequencies ultimately are achieved at the end of the TMDL Compliance Schedules. Demonstrating progress toward attaining the TMDLs in the receiving waters will be assessed differently for dry weather and wet weather as follows:

1. *Measuring Progress Toward Attaining Dry Weather TMDLs*: For the dry weather TMDLs, available historical monitoring data from the years 1996-2002 should be used to calculate the “existing” dry weather exceedance frequency of the 30-day geometric mean REC-1 WQOs for each watershed. “Existing” dry weather exceedance frequencies may be calculated separately for each impaired waterbody listed, or an “existing” dry weather exceedance frequency may be calculated that is applicable to the entire watershed.

   The “existing” dry weather exceedance frequencies should be reduced until the final allowable dry weather exceedance frequency is achieved by the end of the dry weather TMDL Compliance Schedule. If the TMDL Compliance Schedules include interim milestones that must be achieved to demonstrate progress toward attaining the dry weather TMDLs, reductions in the exceedance frequencies in the receiving water may be used. For example, if the “existing” dry weather exceedance frequency is 60 percent, the final dry weather exceedance frequency is 0 percent, and an interim milestone requires a 50 percent reduction, the exceedance frequency in the receiving water should be 30 percent or less by the interim milestone date. By the end of the dry weather TMDL Compliance Schedule, the final allowable dry weather exceedance frequency of the 30-day geometric mean REC-1 WQOs is 0 percent in the receiving waters for both beaches and creeks.

2. *Measuring Progress Toward Attaining Wet Weather TMDLs*: For the wet weather TMDLs, the number of wet days and number of wet exceedance days during the critical wet year from the wet weather model were used to calculate the "existing" wet weather exceedance frequency that needs to be reduced to the allowable wet weather exceedance frequency. For example, if a watershed had 69 wet weather days during the critical wet year, and the wet weather model predicted that all the subwatersheds had an average of 41 wet weather exceedance days during the critical wet year, the "existing" wet weather exceedance frequency is 41/69=59%. For the watershed addressed by these TMDLs, the number of wet weather exceedance days for each indicator bacteria predicted by the wet weather model for the critical wet year are summarized below in Table 7-50:

Table 7-50. Modeled Estimate of Critical Year "Existing" Wet Weather Exceedance Frequencies by Watershed

Watershed	Number of Wet Days in Critical Wet Year	"Existing" Wet Weather Exceedance Frequency of Single Sample Maximum REC-1 WQO [a]		
		Fecal Coliform	Total Coliform	Enterococcus
San Joaquin Hills HSA/ Laguna Beach HSA	69	52%	54%	55%
Aliso HSA	69	59%	59%	62% (62%) [b]
Dana Point HSA	69	50%	50%	50%
Lower San Juan HSA	76	66%	66%	74% (72%) [b]
San Clemente HA	73	47%	47%	50%
San Luis Rey HU	90	68%	66%	76%
San Marcos HA	49	57%	57%	59%
San Dieguito HU	98	43%	44%	49%
Miramar Reservoir HA	94	30%	30%	30%
Scripps HA	57	52%	52%	52%
Tecolote HA	57	75%	75%	81% (79%) [b]
Mission San Diego HSA/ Santee HSA	86	70%	63%	79% (76%) [b]
Chollas HSA	65	60%	60%	63% (63%) [b]

a. Calculated by taking the average number of wet days that are predicted by the wet weather model to exceed the single sample maximum REC-1 water quality objective (400 MPN/100mL for fecal coliform, 10,000 MPN/100mL for total coliform, and 61 or 104 MPN/100mL) divided by the total number of wet days in the critical wet year (1993).

b. Allowable exceedance frequency calculated based on an *Enterococcus* single sample maximum REC-1 water quality objective of 61 MPN/100mL. Allowable exceedance frequency in parenthesis calculated based on an Enterococcus single sample maximum REC-1 water quality objective of 104 MPN/100mL, which may be applicable if the usage frequency of the creeks in these watersheds are designated as "moderately to lightly used area" or less frequent usage frequency in the Basin Plan.

The "existing" wet weather exceedance frequencies should be reduced until the final allowable wet weather exceedance frequency is achieved by the end of the wet weather TMDL Compliance Schedule. If the TMDL Compliance Schedules include interim milestones that must be achieved to demonstrate progress toward attaining the wet weather TMDLs, reductions in the exceedance frequencies in the receiving water may be used. For example, if the "existing" wet weather exceedance frequency is 59 percent, the final wet weather exceedance frequency is 22 percent, and an interim milestone requires a 50 percent reduction, the exceedance frequency in the receiving water should be 41 percent or less by the interim milestone date. By the end of the wet weather TMDL Compliance Schedule, the allowable wet weather exceedance frequency is 22 percent in the receiving waters for both beaches and creeks.

The specific receiving waters (i.e., specific beaches and creek segments) identified on the 2002 303(d) List are shown in the TMDL Compliance Schedule in the following section. Because the REC-1 WQOs and allowable exceedance frequencies must be met throughout the 20 waterbodies addressed by these bacteria TMDLs, monitoring data from these locations and any other beach segments and/or creek monitoring points in the watersheds addressed by these TMDLs may be used to determine compliance.

Because the municipal MS4s are the most significant controllable sources of bacteria and the Phase I MS4s often discharge directly to the receiving waters addressed by these TMDLs, the municipal Phase I MS4s will be primarily responsible for conducting the monitoring. Caltrans will also have monitoring responsibilities. Phase II MS4s, agricultural dischargers, and other sources that are identified as significant sources (i.e., causing or contributing to exceedances in the receiving waters) will also be responsible for monitoring the receiving waters. Additional monitoring locations and frequency may be required to identify sources that need additional controls to reduce bacteria loads. While this TMDL Implementation Plan recommends monitoring at one or two locations for each waterbody, monitoring only one or two locations in the receiving waters may not provide the data to differentiate between and locate sources of bacteria in the watershed. Therefore, the municipal Phase I MS4s and other dischargers may wish to establish additional monitoring locations at key jurisdictional boundaries as part of their monitoring programs, especially in watersheds where Caltrans and Agriculture have been identified as sources contributing bacteria loads to the receiving waters.

Investigative orders, enforcement actions, WDRs, or conditional waiver of WDRs issued by the San Diego Water Board should require monitoring program plans that include, as applicable, the minimum monitoring locations and frequencies outlined above, but also provide the dischargers an opportunity to propose additional or alternative monitoring locations and frequency of monitoring events. The San Diego Water Board may also issue investigative orders, enforcement actions, WDRs, or conditional waiver of WDRs that specify additional or alternative monitoring, monitoring locations, and/or frequency of monitoring events.

The San Diego Water Board will coordinate, to the extent possible, the monitoring that is required by the dischargers, to minimize the monitoring resources required and maximize the temporal and spatial coverage of the data collection.

TMDL COMPLIANCE SCHEDULE

The purpose of these TMDLs is to restore the impaired beneficial uses of the waterbodies addressed through mandated reductions of bacteria from controllable point and nonpoint sources discharging to impaired waters. The requirements of these TMDLs mandate that the San Diego Water Board require dischargers improve water quality conditions in impaired waters by achieving the assigned WLAs and LAs. After the controllable sources achieve their assigned WLAs and LAs, the TMDLs in the receiving waters will be met and beneficial uses restored.

Until the dischargers achieve their assigned WLAs and LAs, the beneficial uses of the waterbodies addressed by this project will likely remain impaired, and the dischargers will continue violating one or more Basin Plan waste discharge prohibitions. The San Diego Water Board recognizes that restoring the beneficial uses of the waterbodies impaired by elevated bacteria levels will require time and multiple approaches to implement. Therefore, the bacteria TMDLs are expected to be implemented in a phased approach with a monitoring component to identify bacteria sources, determine the effectiveness of each phase, and guide the selection of BMPs, as outlined in the BMP programs proposed in the BLRPs or CLRPs that are accepted by the San Diego Water Board.

(1) Prioritization of Waterbodies

"Impaired" waters were prioritized based on several factors, because the waterbodies included in these TMDLs are numerous and diverse in terms of geographic location, swimmer accessibility and use, and degree of contamination.

Dischargers accountable for attaining load reductions in multiple watersheds may have difficulty providing the same level of effort simultaneously in all watersheds. In order to address these concerns a scheme for prioritizing implementation of bacteria reduction strategies in waterbodies within watersheds was developed. The prioritization scheme is largely based on the following criteria:

- Level of beach (marine or freshwater) swimmer usage;

- Frequency of exceedances of WQOs; and

- Existing programs designed to reduce bacteria loading to surface waters.

Dischargers were placed into one of three groups (North, Central, and South), based on geographic location. Group N consists of dischargers located in watersheds within Orange County, the northernmost region watersheds included in these TMDLs. Group C consists of dischargers located in watersheds in northern San Diego County, outside the City of San Diego limits, the central region watersheds included in these TMDLs. Group S consists of dischargers who are located in watersheds within and south of the City of San Diego limits, the southernmost region watersheds included in these TMDLs. Table 7-51 shows the dischargers in each of the three groups.

Table 7-51. Responsible Municipalities and Lead Jurisdictions†

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
San Joaquin Hills HSA (901.11) & Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Dr. - Riviera Way	City of Laguna Beach **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
		at Heisler Park – North		
	Pacific Ocean Shoreline	at Main Laguna Beach	City of Aliso Viejo **County of Orange** City of Laguna Beach City of Laguna Woods Orange County Flood Control District Caltrans Owners/operators of small MS4s*	
		Laguna Beach at Ocean Avenue		
		Laguna Beach at Laguna Avenue		
		Laguna Beach at Cleo Street		
		Arch Cove at Bluebird Canyon Road		
		Laguna Beach at Dumond Drive		
Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place/Blue Lagoon Place at Aliso Beach	City of Aliso Viejo City of Laguna Beach City of Laguna Hills City of Laguna Niguel City of Laguna Woods City of Lake Forest City of Mission Viejo **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
	Aliso Creek	The entire reach (7.2 miles) and associated tributaries Aliso Hills Channel, English Canyon Creek, Dairy Fork Creek, Sulphur Creek, and Wood Canyon Creek		
	Aliso Creek (mouth)	At creek mouth		
Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	City of Dana Point City of Laguna Beach City of Laguna Niguel **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
		Aliso Beach at Table Rock Drive		
		1000 Steps Beach at Pacific Coast Hwy at Hospital (9th Ave)		
		at Salt Creek (large outlet)		
		Salt Creek Beach at Salt Creek service road		
		Salt Creek Beach at Dana Strand Road		

Table 7-51. Responsible Municipalities and Lead Jurisdictions[†] (Cont'd)

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	At San Juan Creek	City of San Juan Capistrano City of Mission Viejo City of Laguna Hills City of Laguna Niguel City of Dana Point City of Rancho Santa Margarita **County of Orange** Orange County Flood Control District Caltrans Owners/operators of small MS4s*	N
	San Juan Creek	Lower 1 mile		
	San Juan Creek (mouth)	At creek mouth		
San Clemente HA (901.30)	Pacific Ocean Shoreline	Poche Beach	City of San Clemente **County of Orange** Orange County Flood Control District Dana Point Caltrans Owners/operators of small MS4s*	N
		Ole Hanson Beach Club Beach at Pico Drain		
		San Clemente City Beach at El Portal Street Stairs		
		San Clemente City Beach at Mariposa Street		
		San Clemente City Beach at Linda Lane		
		San Clemente City Beach at South Linda Lane		
		San Clemente City Beach at Lifeguard Headquarters		
		Under San Clemente Municipal Pier		
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)		
		San Clemente State Beach at Riviera Beach		
		San Clemente State Beach at Cypress Shores		
San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River Mouth	**City of Oceanside** City of Vista County of San Diego Caltrans Owners/operators of small MS4s* Controllable nonpoint sources	C

Table 7-51. Responsible Municipalities and Lead Jurisdictions† (Cont'd)

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	City of Carlsbad **City of Encinitas** City of Escondido City of San Marcos County of San Diego Caltrans Owners/operators of small MS4s* Controllable nonpoint sources	C
San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon Mouth	City of Del Mar **City of Escondido** City of Poway City of San Diego City of Solana Beach County of San Diego Caltrans Owners/operators of small MS4s* Controllable nonpoint sources	C/S
Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline	Torrey Pines State Beach at Del Mar (Anderson Canyon)	City of Del Mar **City of Poway** City of San Diego County of San Diego Caltrans Owners/operators of small MS4s*	S
Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande La Jolla Shores Beach at Caminito Del Oro La Jolla Shores Beach at Vallecitos La Jolla Shores Beach at Ave de la Playa at Casa Beach, Children's Pool South Casa Beach at Coast Blvd. Whispering Sands Beach at Ravina Street Windansea Beach at Vista de la Playa Windansea Beach at Bonair Street Windansea Beach at Playa del Norte Windansea Beach at Palomar Ave. at Tourmaline Surf Park Pacific Beach at Grand Ave.	**City of San Diego** Owners/operators of small MS4s*	S

Table 7-51. Responsible Municipalities and Lead Jurisdictions† (Cont'd)

Watershed	Waterbody***	Segment or Area**	Responsible Municipalities	Group
Tecolote HA (906.50)	Tecolote Creek	Tecolote Creek	**City of San Diego** Owners/operators of small MS4s*	S
Mission San Diego HSA (907.11) & Santee HSA (907.12)	Forrester Creek	Lower 1 mile	**City of El Cajon** City of Santee County of San Diego Caltrans Owners/operators of small MS4s*	S
	San Diego River, Lower	Lower 6 miles	**City of El Cajon** City of La Mesa City of San Diego City of Santee County of San Diego Caltrans Owners/operators of small MS4s* Padre Dam Water Treatment Facility	S
	Pacific Ocean Shoreline	At San Diego River Mouth at Dog Beach		
Chollas HSA (908.22)	Chollas Creek	Lower 1.2 miles	City of La Mesa City of Lemon Grove **City of San Diego** County of San Diego San Diego Unified Port District Caltrans Owners/operators of small MS4s*	S

† Developed based on the 2002 Clean Water Act Section 303(d) List
*Owners/operators of small MS4s are listed in Appendix Q.
** As listed on the 2002 Clean Water Act Section 303(d) List
*** Listings on the 2006 and 2008 303(d) List compared to listing shown above are provided in Appendix T to the Technical Report.

Impaired waters were given a priority number of 1, 2, or 3 with 1 being the highest priority. Priority 1 waters also included waterbodies likely to be removed from the Clean Water Act Section 303(d) List of Water Quality Limited Segments. Priority schemes are designated within watersheds. A prioritized list of impaired beaches and creeks included in this project is shown below in Table 7-52.

Table 7-52. Prioritized List of Impaired Waters for TMDL Implementation

Watershed	Waterbody[b]	Segment or Area[a]	Priority
San Joaquin Hills HSA (901.11) & Laguna Beach HSA (901.12)	Pacific Ocean Shoreline	Cameo Cove at Irvine Cove Dr. - Riviera Way	1
		at Heisler Park – North	1
	Pacific Ocean Shoreline	at Main Laguna Beach	1
		Laguna Beach at Ocean Avenue	1
		Laguna Beach at Laguna Avenue	1
		Laguna Beach at Cleo Street	1
		Arch Cove at Bluebird Canyon Road	1
		Laguna Beach at Dumond Drive	1
Aliso HSA (901.13)	Pacific Ocean Shoreline	Laguna Beach at Lagunita Place/Blue Lagoon Place at Aliso Beach	1
	Aliso Creek	The entire reach (7.2 miles) and associated tributaries Aliso Hills Channel, English Canyon Creek, Dairy Fork Creek, Sulphur Creek, and Wood Canyon Creek	3
	Aliso Creek (mouth)	At creek mouth	3
Dana Point HSA (901.14)	Pacific Ocean Shoreline	Aliso Beach at West Street	1
		Aliso Beach at Table Rock Drive	1
		1000 Steps Beach at Pacific Coast Hwy at Hospital (9th Ave)	1
		at Salt Creek (large outlet)	1
		Salt Creek Beach at Salt Creek service road	2
		Salt Creek Beach at Dana Strand Road	2
Lower San Juan HSA (901.27)	Pacific Ocean Shoreline	At San Juan Creek	1
	San Juan Creek	Lower 1 mile	3
	San Juan Creek (mouth)	At creek mouth	1

Table 7-52. Prioritized List of Impaired Waters for TMDL Implementation † (Cont'd)

Watershed	Waterbody[b]	Segment or Area[a]	Priority
San Clemente HA (901.30)	Pacific Ocean Shoreline	at Poche Beach (large outlet)	1
		Ole Hanson Beach Club Beach at Pico Drain	1
		San Clemente City Beach at Linda Lane	1
		San Clemente State Beach at Riviera Beach	1
		San Clemente City Beach at Mariposa Street	2
		San Clemente State Beach at Cypress Shores	2
		San Clemente City Beach at Lifeguard Headquarters	2
		Under San Clemente Municipal Pier	2
		San Clemente City Beach at El Portal Street Stairs	2
		San Clemente City Beach at South Linda Lane	3
		San Clemente City Beach at Trafalgar Canyon (Trafalgar Lane)	3
San Luis Rey HU (903.00)	Pacific Ocean Shoreline	at San Luis Rey River Mouth	2
San Marcos HA (904.50)	Pacific Ocean Shoreline	at Moonlight State Beach	1
San Dieguito HU (905.00)	Pacific Ocean Shoreline	at San Dieguito Lagoon Mouth	1
Miramar Reservoir HA (906.10)	Pacific Ocean Shoreline[a]	Torrey Pines State Beach at Del Mar (Anderson Canyon)	1
Scripps HA (906.30)	Pacific Ocean Shoreline	La Jolla Shores Beach at El Paseo Grande	1
		La Jolla Shores Beach at Caminito Del Oro	1
		La Jolla Shores Beach at Vallecitos	1
		La Jolla Shores Beach at Ave de la Playa	1
		at Casa Beach, Children's Pool	1
		South Casa Beach at Coast Blvd.	1
		Whispering Sands Beach at Ravina Street	1
		Windansea Beach at Vista de la Playa	1
		Windansea Beach at Bonair Street	1
		Windansea Beach at Playa del Norte	1
		Windansea Beach at Palomar Ave.	1
		at Tourmaline Surf Park	1
		Pacific Beach at Grand Ave.	1
Tecolote HA (906.10)	Tecolote Creek	The entire reach and associated tributaries	1

Table 7-52. Prioritized List of Impaired Waters for TMDL Implementation † (Cont'd)

Watershed	Waterbody[b]	Segment or Area[a]	Priority
Mission San Diego HSA (907.11) & Santee HSA (907.12)	San Diego River, Lower	Lower 6 miles	3
	Pacific Ocean Shoreline	At San Diego River Mouth at Dog Beach	3
	Forrester Creek	Lower 1 mile	3
Chollas HSA (908.22)	Chollas Creek	Bottom 1.2 miles	3

† Developed based on the 2002 Clean Water Act Section 303(d) List
a As listed on the 2002 Clean Water Act Section 303(d) List
b Listings on the 2006 and 2008 303(d) List compared to listing shown above are provided in Appendix T to the Technical Report.

Beginning with the 2008 303(d) List, specific beach segments of the Pacific Ocean shoreline are listed individually, and may not be identified in the same way as those segments listed in the table above. Several of the segments or areas in the list above have been delisted or redefined in the 2008 303(d) List. In addition, other segments or areas have been added to the Pacific Ocean shorelines listed above. The TMDLs that address the Pacific Ocean shorelines identified in the 2002 303(d) List are assumed to be applicable to all the beaches located on the shorelines of the hydrologic subareas (HSAs), hydrologic areas (HAs), and hydrologic units (HUs) listed above, or as listed individually in the 2008 and future 303(d) Lists.

The prioritized list above recognizes that there are segments or areas where bacterial water quality improvements are most likely to occur first (Priority 1), and segments or areas where bacterial water quality improvements are most likely to require more time to achieve (Priority 3). In some cases, receiving water limitations are already being met, resulting in the delisting of those segments or areas from the 2006 and/or 2008 303(d) Lists. The protection of the REC-1 beneficial use of those delisted segments or areas, however, must also be maintained, and those segments or areas must remain off future iterations of the 303(d) List.

The BLRPs or CLRPs that are developed are expected to focus on implementing BMP programs to reduce bacteria loads to those segments or areas where exceedances of the receiving water limitations continue to occur. The BMP programs that are included in the BLRPs or CLRPs should include short-term and long-term implementation strategies. The short-term strategies should be able to result in bacteria load reductions that can result in achieving the TMDLs for Priority 1 segments or areas. The long-term strategies should be able to result in bacteria load reductions that will result in achieving the TMDLs in all segments or areas by the end of the TMDL compliance schedules and maintain the protection of the REC-1 beneficial use after the end of the TMDL compliance schedules.

In the segments or areas where the receiving water limitations are being met, the BLRPs or CLRPs also need to include a monitoring component to ensure that protection of the REC-1 beneficial use is maintained. If receiving water limitations are exceeded in the future in those locations, the BLRPs or CLRPs must include the implementation of a BMP program that will ensure that the TMDLs will be achieved by the end of the TMDL compliance schedules.

(2) Compliance Schedule

Full implementation of the TMDLs for indicator bacteria shall be completed as soon as possible, but no later than 10 years[74] from the effective date[75] for both the dry weather and wet weather TMDLs, unless an alternative compliance schedule is approved as part of a Comprehensive Load Reduction Plan, as described in the following section. The effective date of these TMDLs is April 4, 2011.

The San Diego Water Board will require the Phase I MS4s to submit Bacteria Load Reduction Plan (BLRPs) outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the bacteria TMDLs in the receiving waters, acceptable to the Regional Board within 18 months after the effective date of these TMDLs. The Phase I MS4 BLRPs should be incorporated into their Watershed Runoff Management Programs. Caltrans will also be required to develop and submit BLRPs outlining a proposed BMP program that will be capable of achieving the necessary load reductions required to attain the TMDLs in the receiving waters, acceptable to the Regional Board, within 18 months after the effective date of these TMDLs. To the extent possible, the Phase I MS4s and Caltrans should develop and coordinate the elements of their BLRPs together. The BLRPs will allow the Phase I MS4s and Caltrans to propose a compliance schedule for WQBELs that implement the bacteria TMDLs. The compliance schedule for the Phase I MS4s and Caltrans to attain their respective WLAs and the TMDLs in the receiving waters will be based on the BMP program proposed in the BLRPs.

For watersheds in Table 7-52 where there are no longer any impairments listed on the 2008 303(d) List, the Phase I MS4s and Caltrans are not required to submit a BLRP or CLRP within 18 months of the effective date of these TMDLs. If, however, any segment of a waterbody for the watershed (Pacific Ocean shoreline, creek, or mouth as shown in Table7-36) is re-listed on a future 303(d) List for any type of indicator bacteria, the Phase I MS4s and Caltrans will be required to submit a BLRP or CLRP within 6 months of the adoption of the 303(d) List by the San Diego Regional Board.

If the Phase I MS4s and Caltrans choose to submit BLRPs that address only bacteria, the proposed schedule for compliance with the wet weather and dry weather TMDLs cannot extend beyond 10 years from the effective date, and must include at least a milestone for achieving a 50 percent exceedance frequency reduction. Additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent) are encouraged, but may also be required by the Regional Board. If the BLRPs do not include a proposed compliance schedule that is acceptable to the Regional Board, the compliance schedule will be as follows.

The compliance schedule for achieving the dry weather and wet weather bacteria TMDLs (Tables 7-53 and 7-54, respectively) are structured in a phased manner, with 100 percent of dry weather exceedance frequency reductions, and 100 percent of wet weather exceedance frequency reductions within 10 years from the effective date. At the end of the dry weather TMDL compliance schedule, the receiving waters must not exceed the 30-day geometric mean REC-1 WQOs more than 0 percent of the time. At the end of the wet weather TMDL compliance schedule, the receiving waters must not exceed the single sample maximum REC-1 WQOs more than the wet weather allowable exceedance frequency. All of these reductions are aimed at restoring water quality to a level that supports REC-1 beneficial uses in the ocean shoreline and in impaired creeks. These reductions required by the compliance schedule vary on the timeline based on the priority scheme described in Table 7-52. Intermediate milestone reductions in bacteria wasteloads are required sooner in the higher priority waters.

[74] If a Comprehensive Load Reduction Plan (CLRP) is developed to address several pollutants, including bacteria, the implementation of the wet weather bacteria TMDLs shall be completed as soon as possible, but no later than 20 years from the effective date. See Alternative Compliance Schedules under section (j)(3).

[75] The effective date is the date the Office of Administrative Law approves this Basin Plan amendment.

Table 7-53. Dry Weather Compliance Schedule and Milestones for Exceedance Frequency Reductions

Compliance Year (year after OAL approval)	Required Exceedance Frequency Reduction		
	Priority 1	Priority 2	Priority 3
5	50% (All Dry Weather)		
6		50% (All Dry Weather)	
7			50% (All Dry Weather)
10+	100% (All Dry Weather)	100% (All Dry Weather)	100% (All Dry Weather)

Table 7-54. Wet Weather Compliance Schedule and Milestones for Achieving Exceedance Frequency Reductions

Compliance Year (year after OAL approval)	Required Exceedance Frequency Reduction		
	Priority 1	Priority 2	Priority 3
5	50% (All Wet Weather)		
6		50% (All Wet Weather)	
7			50% (All Wet Weather)
10+	100% (All Wet Weather)	100% (All Wet Weather)	100% (All Wet Weather)

The first four years of the compliance schedules above do not require any exceedance frequency reductions from current conditions. These years will provide the dischargers time to identify sources, develop plans and implement enhanced and expanded BMPs capable of achieving the mandated decreases in exceedance frequencies of the REC-1 WQOs in the impaired beaches and creeks. The Regional Board may also include additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent).

If appropriate and acceptable to the Regional Board, the proposed compliance schedules included in the BLRPs will be incorporated into the various TMDL implementing orders, such as the municipal Phase I MS4 stormwater WDRs and NPDES requirements. Otherwise, the compliance schedules given above will be implemented.

(3) Alternative Compliance Schedules

The dischargers to Chollas Creek in the Chollas HSA watershed will have to address reductions from multiple water quality improvement projects in addition to bacteria, namely TMDLs for copper, lead, zinc, and diazinon,[76] and a trash reduction program. Addressing multiple pollutants (in addition to bacteria) will require the development and submittal of a Comprehensive Load Reduction Plan (CLRP) by the Phase I MS4s and Caltrans. The CLRP will allow the Phase I MS4s and Caltrans to propose a compliance schedule to address impairments due to loads from multiple pollutants, including bacteria.

[76] As described in *Total Maximum Daily Loads for Dissolved Copper, Lead, and Zinc in Chollas Creek, Tributary to San Diego Bay*, adopted under Resolution No. R9-2007-0043, and *Total Maximum Daily Load for Diazinon in Chollas Creek Watershed, San Diego County*, adopted under Resolution No. R9-2002-0123.

Full implementation of the TMDLs for indicator bacteria included under the CLRP for the Chollas HSA watershed shall be completed as soon as possible, but cannot extend beyond 10 years for the dry weather bacteria TMDLs and 20 years for the wet weather bacteria TMDLs. The proposed compliance schedules for the bacteria TMDLs included under the CLRP must include at least a milestone for achieving a 50 percent exceedance frequency reduction. Additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent) are encouraged. If the CLRP for the Chollas HSA watershed does not include a proposed compliance schedule, specifically for bacteria, the compliance schedule will be as given in Table 7-55.

Table 7-55. Alternative Compliance Schedule Chollas Creek

Compliance Year*	Exceedance Frequency Reduction Milestone**
7	50% for dry weather
10	100% for dry weather 50% for wet weather
20	100% for wet weather

* Year after effective date for the TMDL that initiated the development of the CLRP.
** The Regional Board may also include additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent).

Likewise, dischargers in other bacteria-impaired watersheds may also find that undertaking concurrent load reduction programs for other pollutant constituents (e.g. metals, pesticides, trash, nutrients, sediment, etc.) together with the bacteria load reduction requirements in these TMDLs, is more cost effective, and has fewer potential environmental impacts from structural BMP construction. In these cases, the dischargers may develop and submit a CLRP for all constituents of concern in lieu of the BLRP, and to propose an appropriately tailored alternative compliance schedule. Proposed alternative compliance schedules tailored under this provision may not extend beyond 10 years for the dry weather bacteria TMDLs and 20 years for the wet weather bacteria TMDLs from the effective date, and must include at least a milestone for achieving a 50 percent exceedance frequency reduction. Additional milestones for achieving exceedance frequency reductions (e.g., 25 and 75 percent) are encouraged, but may also be required by the Regional Board.

If appropriate and acceptable to the Regional Board, the proposed alternative compliance schedules included in the CLRPs will be incorporated into the various TMDL implementing orders. Otherwise, the alternative compliance schedule given above as an example for Chollas Creek will be implemented for a CLRP that is developed for any other watershed.

TMDL IMPLEMENTATION MILESTONES

Accomplishing the goals of the implementation plan will be achieved by cooperative participation from all responsible parties, including the San Diego Water Board. Major milestones are described in Table 7-56.

Table 7-56. TMDL Implementation Milestones

Item	Implementation Action	Responsible Parties	Date
1	Obtain approval of Beaches and Creeks Indicator Bacteria TMDLs from the State Water Board, OAL, and USEPA.	San Diego Water Board	Effective date[a] April 4, 2011
2	Issue investigative orders to Phase I MS4s and Caltrans requiring the development and submittal of BLRPs or CLRPs acceptable to the Regional Board within 18 months of effective date	San Diego Water Board	As soon as possible (if necessary)
3	Issue, reissue, or revise general WDRs and NPDES requirements for the Phase I MS4s to incorporate the requirements for complying with the TMDLs and MS4 WLAs.	San Diego Water Board	Within 5 years of effective date[b]
4	Issue, reissue, or revise general WDRs and NPDES requirements for Caltrans to incorporate the requirements for complying with the TMDLs and Caltrans WLAs.	San Diego Water Board, State Water Board	Within 5 years of effective date[b]
5	Issue, reissue, or revise the WDRs and NPDES requirements for POTWs and wastewater collection systems to incorporate new requirements for sewer line surveillance and maintenance, consistent with the zero WLA.	San Diego Water Board	Within 5 years of effective date[b]
6	Meet 50% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 1 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	5 years after effective date[b]
7	Meet 50% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 1 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	5 years after effective date[b]
8	Meet 50% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 2 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	6 years after effective date[b]
9	Meet 50% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 2 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	6 years after effective date[b]
10	Meet 50% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 3 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	7 years after effective date[b]
11	Meet 50% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in Priority 3 watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	7 years after effective date[b]
12	Meet 100% Dry Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in all watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	10 years after effective date[b,c]
13	Meet 100% Wet Weather exceedance frequency reductions required to achieve TMDLs in receiving waters in all watersheds.	Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	10 to 20 years after effective date[b,c]

Item	Implementation Action	Responsible Parties	Date
14	Amend discharge conditions of appropriate waivers to be consistent with the requirements for complying with the TMDLs and Agriculture LAs.	San Diego Water Board	As needed after effective date
15	Issue individual or general WDRs or Basin Plan prohibitions consistent with the TMDLs and LAs for controllable nonpoint source discharges not eligible conditional waivers.	San Diego Water Board	As needed after effective date
16	Submit BLRP or CLRP Progress Reports to San Diego Water Board	Phase I MS4s, Phase II MS4s, Caltrans	In accordance with BLRPs or CLRPs accepted by the Regional Board
17	Enroll Phase II MS4s identified as significant sources of bacteria to receiving waters under State Water Board general WDRs and NPDES requirements.	San Diego Water Board	As needed after effective date
18	Issue individual or general WDRs and NPDES requirements consistent with the TMDLs and WLAs for specific Phase II MS4s or category of Phase II MS4s.	San Diego Water Board	As needed after effective date
19	Take enforcement actions against controllable point sources and nonpoint sources to attain compliance with the WLAs and LAs.	San Diego Water Board	As needed after effective date
20	Recommend TMDL-related projects as high priority for grant funds.	San Diego Water Board	As needed after effective date
21	Amend the Basin Plan and/or provisions of these TMDLs (e.g., usage frequency or creeks or watershed-specific allowable exceedance frequency) based on evidence provided by dischargers and/or other entities	San Diego Water Board, Municipal Dischargers,[d] Caltrans, Agriculture/Livestock Dischargers	Within 5 years after effective date [e]

[a] Effective date = date of approval by OAL

[b] May defer to alternative compliance schedule proposed in BLRPs or CLRPs that have been incorporated into implementing orders (e.g., WDRs, cleanup and abatement orders)

[c] Compliance schedules for dry weather and wet weather TMDLs proposed in BLRPs cannot extend beyond 10 years from the effective date. Compliance schedules proposed in CLRPs for dry weather TMDLs cannot extend beyond 10 years and for wet weather TMDLs cannot extend beyond 20 years from the effective date.

[d] Because there are no Phase II MS4s enrolled under the State General Permit for Small MS4s, discharges from Phase II MS4s are not permitted (i.e., WLA = 0) and Municipal Dischargers are only the Phase I MS4s in this Implementation Milestone item. When a Phase II MS4 is enrolled under the State General Permit for Small MS4s or issued an individual NPDES permit, the Municipal Dischargers will be both the Phase I MS4s and Phase II MS4s in this Implementation Milestone item.

[e] If no Basin Plan amendment has been initiated within 5 years of the effective date of this TMDL Basin Plan amendment, and the Executive Officer determines, with Regional Board concurrence, that insufficient data exist to support the initiation of a Basin Plan amendment, a subsequent Basin Plan amendment to revise the requirements and/or provisions for the implementation of these TMDLs will not be initiated until the Executive Officer determines the conditions to initiate a Basin Plan amendment are met.

TOTAL MAXIMUM DAILY LOADS FOR SEDIMENT IN LOS PEÑASQUITOS LAGOON

On June 13, 2012, the San Diego Water Board adopted *Resolution No. R9-2012-0033, A Resolution Amending the Water Quality Control Plan For The San Diego Basin (9) to Incorporate the Sediment Total Maximum Daily Load for Los Peñasquitos Lagoon.* The TMDL Basin Plan Amendment was subsequently approved by the State Water Resources Control Board (State Board) on January 21, 2014, the Office of Administrative Law (OAL) on July 14,2014 and the USEPA on October 30, 2014. For purposes of state law, Resolution No. R9-2012-0033 became effective following OAL approval on October 30, 2014.

PROBLEM STATEMENT

Under section 303(d) of the Clean Water Act (CWA), states are required to identify waters whose beneficial uses have been impaired due to specific constituents. Los Peñasquitos Lagoon was placed on the Section 303(d) list of Water Quality Limited Segments in 1996 for sedimentation and siltation with an estimated 469 acres affected. The Lagoon is subject to the development of a total maximum daily load (TMDL) (US EPA, 2009).

The Lagoon is an estuarine system that is part of the Torrey Pines State Natural Reserve. In addition to its marine influence, the Lagoon receives freshwater inputs from an approximately 60,000-acre watershed comprised of three major canyons (Carroll Canyon, Los Peñasquitos Canyon, and Carmel Canyon). Given the status of “Natural Preserve” by the California State Parks, the Lagoon is one of the few remaining native saltmarsh lagoons in southern California, providing a home to several endangered species (California State Parks, 2009). The Lagoon is ecologically diverse, supporting a variety of plant species, and provides nursery grounds and habitat for numerous bird, fish, and small mammal populations. The Lagoon also serves as a stopover for the Pacific Flyway, offering migratory birds a safe place to rest and feed, as well as providing refuge for coastal marine species that use the Lagoon to feed and hide from predators.

The San Diego Basin Plan states, “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.” Beneficial uses listed in the Basin Plan for the Lagoon include contact water recreation; non-contact water recreation (although access is not permitted in some areas per California State Parks); preservation of biological habitats of special significance; estuarine habitat; wildlife habitat; rare, threatened or endangered species; marine habitat; migration of aquatic organisms; spawning, reproduction and/or early development; and shellfish harvesting. The beneficial uses that are most sensitive to increased sedimentation are estuarine habitat (EST) and preservation of biological habitats of special significance (BIOL). Estuarine uses may include preservation or enhancement of estuarine habitats, vegetation, fish, shellfish, or wildlife (such as marine mammals or shorebirds).

Impacts associated with increased and rapid sedimentation include: reduced tidal mixing within Lagoon channels, degraded and (in some cases) net loss of saltmarsh vegetation, increased vulnerability to flooding for surrounding urban and industrial developments, increased turbidity associated with siltation in Lagoon channels, and constricted wildlife corridors.

The Los Peñasquitos Lagoon Enhancement Plan and Program (1985), San Diego Basin Plan, and Clean Water Act section 303(d) highlight sedimentation as a significant impact associated with urban development and a leading cause in the rapid loss of saltmarsh habitat in the Lagoon. Sediment reduction is a management priority.

The Lagoon's 565 acres include 262 acres of tidal saltmarsh (including salt panne, tidal channels, and mudflats) and non-tidal saltmarsh and 132 acres of freshwater marsh, herbaceous wetland, and woody riparian (for example southern willow scrub and mulefat scrub) habitats. The remaining 171 acres of saltmarsh and brackish marsh vegetation are impaired by excessive sedimentation, which converted the coastal saltmarsh to *Lolium perenne* infested non-tidal saltmarsh, freshwater marsh, and woody riparian habitats. (California State Parks, 2011) The environmental processes that support wetland habitats in the Lagoon have been altered by urban development in three ways:

1) Increase in the volume and frequency of freshwater input,
2) Increase in sediment deposition, and
3) Decrease in the tidal prism.

These factors have led to decreases in tidal and non-tidal saltmarsh habitats and increases in freshwater habitats and the abundance of non-native species.

NUMERIC TARGET

The sediment water quality standard applies to sediment loading to the Lagoon and the accumulation of sediment in the Lagoon. The minimum protective target would be to reduce watershed sediment loads to non-anthropogenic levels and return the Lagoon to non-anthropogenic conditions with consideration given to background loading and other factors that also lend to impairment of beneficial uses. The numeric targets are calculated upon the historic condition (mid-1970s) when the sediment water quality standard was once met.

A historic coverage for the Los Peñasquitos watershed was developed for this period using US Geological Survey topographic maps from the 1970s. This land-use distribution was used to calculate the watershed numeric target using the LSPC watershed model. This historic (mid-1970s) sediment load of 12,360 tons per critical wet period (211 days), or 58.6 tons per day, represents the sediment TMDL watershed numeric target.

An analysis of the vegetation types present in the Lagoon was developed for the mid-1970s using historic aerial photographs from which the Lagoon numeric target was calculated. The Lagoon numeric target is expressed as an increasing trend in the total area of tidal and non-tidal saltmarsh toward 346 acres. This target acreage represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973.

WATERSHED POINT AND NON-POINT SEDIMENT SOURCES

Sources of sediment include erosion of canyon banks, exposed soils, bluffs, scouring stream banks, and tidal influx. Some of these processes are exacerbated by anthropogenic disturbances, such as land development within the watershed. Land development transforms the natural landscape by exposing sediment and converting pervious surfaces to impervious surfaces, which increases the volume and velocity of runoff resulting in scouring of sediment, primarily below storm water outfalls that discharge into canyon areas. Sediment loads are transported downstream to the Lagoon during storm events causing deposits on the salt flats and in Lagoon channels. These sediment deposits have gradually built-up over time due to increased sediment loading and inadequate flushing, which directly and indirectly affects Lagoon functions and salt marsh characteristics.

There are two broad categories of sediment sources to the Lagoon: 1) watershed sources, and 2) the Pacific Ocean. The watershed sources consist of all of point and non-point sources of sediment in the watershed area draining to Los Peñasquitos Lagoon. The total sediment contribution from all watershed sources, currently, is presented as the total wasteload allocation (WLA). The watershed sources of sediment due to past historical activities that have resulted in accumulated sediment in the Lagoon over time are presented as the Watershed

Load Allocation (LA). This source also includes, but is not limited to, in-Lagoon erosion and scouring. Since this loading could not be estimated given the limited data, the Lagoon numeric target is set as the compliance point for meeting this Watershed Load Allocation. The sediment contributions from the Pacific Ocean are considered a background source and are presented as the Load Allocation from the Ocean (LA). Hence, the responsible parties were assigned the total WLA and are jointly responsible for meeting the wasteload reductions required in this TMDL project.

RESPONSIBLE PARTIES

Responsible parties include the following: Phase I Municipal Separate Storm Sewer Systems (MS4s) copermittees (the County of San Diego, City of San Diego, City of Del Mar, and City of Poway), Phase II MS4 permittees, Caltrans, general construction storm water NPDES permittees, and general industrial storm water NPDES permittees.

LINKAGE ANALYSIS

Reducing watershed sediment loads from the year 2000 levels to historic levels is a necessary component for restoring and providing long-term protection of the Lagoon's beneficial uses. Deposition of watershed sediment contributes to elevation increases within the Lagoon, leading to an increase in height relative to mean sea level. Elevation is a critical variable that determines the productivity, diversity, and stability of saltmarshes. The long-term existence of the saltmarsh depends on the success of the dominant plants, such as Sarcoconia pacifica (also referred to as Salicornia virginica) and Frankenia salina, and their close relationship to sediment supply, soil salinity, sea level change, and tidal range.

Reduced sediment loading consistent with the watershed numeric target will encourage the establishment of native vegetation in degraded areas. To represent the linkage between source contributions and receiving water response, models were developed to simulate source loadings and transport of sediment into the Lagoon. The models provide an important tool to evaluate year 2000 conditions, to evaluate historic conditions, and to calculate TMDL load reductions.

The Lagoon was capable of assimilating these historic sediment loads under historic Lagoon conditions. Because the Lagoon has evolved through time and accumulated over 40 years of watershed sediment loads, it cannot be assumed that the Lagoon, in the year 2010 conditions, can assimilate the same historic sediment loads. Evaluation of the extent of vegetation types in the Lagoon provides the necessary tool to assess how the Lagoon responds to watershed sediment load reductions and to establish a target Lagoon condition under which the Lagoon can again assimilate the historic sediment loads.

TMDL, ALLOCATIONS, AND LOAD REDUCTIONS

TMDL = 12,360 tons of sediment per year

The maximum load of sediment that Los Peñasquitos Lagoon can receive from all sources and still meet the sediment water quality objective is 12,360 tons per year.

Wasteload Allocations to Watershed = 2,580 tons/year

As the primary point source to the Lagoon, a wasteload allocation (WLA) of 2,580 tons/year was assigned to the responsible parties. A 67 percent sediment load reduction from the Year 2000 load to the historical (mid-1970s) load is required of the responsible parties.

Load Allocations to Ocean = 9,780 tons/year

The ocean is a nonpoint source of sediment to the Lagoon and was assigned a load allocation (LA) of 9,780 tons/year. Because the ocean is a natural background source, load reductions are not required of the ocean.

Watershed Load Allocations to Lagoon

Past historical watershed loading has led to accumulated sediment, erosion, and scouring in the Lagoon causing impairment to the Lagoon habitats. The Lagoon numeric target is set as the compliance for this LA: maintain at least 346 acres of tidal and non-tidal saltmarsh, represents 80 percent of the total acreage of tidal and non-tidal saltmarsh present in 1973.

Margin of Safety = Implicit

Conservative assumptions were used in selecting the TMDL numeric targets to provide an implicit margin of safety.

Critical Location

Due to the variability and dynamic nature of conditions within the Lagoon (e.g., mouth closures, tidal fluctuations, sediment fate and transport, etc.), the entire modeled Lagoon area was assessed as the critical location. Load reductions for sediment were based on achieving the numeric TMDL target across the Lagoon.

Critical Condition

The wet season that includes the 1993 El Nino storm events (October 1, 1992 April 10, 1993) was selected as the critical condition time period for TMDL development. This is one of the wettest periods on record over the past several decades. Because of the large amount of rainfall, sediment loads were significantly higher during this period than in other years with less rainfall.

Seasonal Considerations

Sources of sediment are similar for both dry and wet weather seasons (the two general seasons in the San Diego region). Despite the similarity of wet/dry sources, transport mechanisms can vary between the two seasons. Throughout the TMDL monitoring period, the greatest transport of sediment occurred during rainfall events. It is recognized that dry weather will contribute a de minimis discharge of sediment; however, model calibration and TMDL development focused on wet weather conditions as sediment transport is dramatically higher during wet weather.

MARGIN OF SAFETY (MOS)

An implicit MOS was incorporated through application of conservative assumptions.

IMPLEMENTATION PLAN

Actions San Diego Water Board May Take

The San Diego Water Board may exercise any of its authorities under the Water Code to compel responsible parties to comply with this TMDL.

Responsible Parties Identification

Under this TMDL, the responsible parties are collectively assigned a single WLA, which they are responsible for meeting. An aggregate WLA allows for flexibility in achieving the load reduction required to meet the TMDL and improve Lagoon conditions. Responsible parties include: Phase I MS4 copermittees (the County of San Diego, City of San Diego, City of Del Mar, and the City of Poway), Phase II MS4 permittees, Caltrans, and the General Construction and General Industrial Storm Water NPDES permittees.

The San Diego Water Board encourages cooperation among all the responsible parties. All the responsible parties in the Los Peñasquitos watershed must reduce their collective sediment load. Responsible parties include, but are not limited to, specific identification of General construction and industrial stormwater permittees, such as sand and gravel operation facilities in the watershed *that have capacity for long-term potential loadings into the watershed*.

The San Diego Water Board recommends all parties enter into a Memorandum of Understanding (MOU), or a similar formal joint effort, to collaboratively and more successfully implement the adaptive management framework.

All responsible entities identified must submit a Comprehensive Load Reduction Plan (CLRP) or SWPPP as appropriate and are strongly encouraged to jointly submit a CLRP to the San Diego Water Board within 18 months of the effective date of the TMDL.

The San Diego Water Board expects responsible parties to cooperate in TMDL implementation (e.g., load reduction, lagoon monitoring, lagoon restoration) as necessary to achieve compliance with this TMDL. Responsible Parties that have or are likely to cause or contribute to the CWA Section 303(d) listed impairment for sediment, and are not participating in TMDL implementation, shall be compelled to meet their compliance obligations through other regulatory authorities of the San Diego Water Board.

Any Responsible Party identified is required to develop pollutant reduction plan that includes description and schedule for implementing BMPs to reduce sediments from being discharged from their facility, property, etc. The plan must describe how the facility plans to meet the water quality objectives and pollutant reductions set forth in the TMDL.

Any Responsible Party as identified for this TMDL shall contribute information regarding the amount of sediments/sedimentation from their facility/entity. This may be produced from existing monitoring plans or by developing a monitoring plan for those entities that currently do not have any discharge monitoring on site. The TMDL has identified a "collective" wasteload allocation that includes several sources of sediments into the watershed. By developing individual site/permitee monitoring plans for flow and TSS discharges, it will be feasible to estimate individual site contributions in the future. Monitoring should address, at minimum, representative values of flow rates and TSS concentrations from the individual permittee's site(s) whenever long-term discharges occur.

Individual industrial facilities and construction sites are subject to regulation on two levels: (1) The San Diego Water Board is responsible for ensuring MS4 copermittees comply with the MS4 requirements in the MS4 storm water permit; and (2) each local municipality is responsible, under the MS4 storm water permit, for enforcing its own ordinances and permits (for violations of its ordinances/permits by an individual industrial facility or construction site within its jurisdiction). The San Diego Water Board is also responsible for enforcing the statewide General Industrial and Construction Storm Water NPDES Permits within its jurisdiction. The San Diego Water Board relies upon the municipality to enforce its ordinances/permits and then work with the municipality to coordinate information and actions to compel compliance.

Phased Implementation via the Adaptive Management Approach

A common problem in natural resource management involves a temporal sequence of decisions (or implementation actions), in which the best action at each decision point depends on the state of the managed system. Adaptive management is a structured iterative implementation process that offers flexibility for responsible parties to monitor implementation actions, determine the success of such actions and ultimately, base future management decisions upon the measured results of completed implementation actions and the current state of the system. This process enhances the understanding and estimation of predicted outcomes and ensures refinement of necessary activities to better guarantee desirable results. In this way, understanding of the resource can be enhanced over time, and management can be improved.

Adaptive management entails applying the scientific method to the TMDL. A National Research Council review of US EPA's TMDL program strongly suggests that the key to improving the application of science in the TMDL program is to apply the scientific method to TMDL implementation (NRC 2001). For a TMDL, applying the scientific method involves 1) taking immediate actions commensurate with available information, 2) defining and implementing a program for refining the information on which the immediate actions are based, and 3) modifying actions as necessary based on new information. This approach allows the Lagoon to make progress toward attaining water quality standards while regulators and stakeholders improve the understanding of the system through research and observation of how it responds to the immediate actions.

Implementation actions to achieve the required WLA and improve the specified numeric targets will be implemented via an iterative process, whereby the information collected at each step will be used to inform the implementation of the next phase. The project will be adjusted, as necessary, based on the latest information collected to optimize the efficiency of implementation efforts. Ultimately, the path moving forward is to create the physical conditions related to remediating sediment impacts associated with this TMDL. The implementation effort can be divided into three primary phases for this TMDL, as described below:

- Phase I Implementation includes elements to reduce the amount of sediment that is transported from the watershed to the Lagoon. An important component of Phase I will be to secure the relationships and agreements between cooperating parties and to develop a detailed scope of work with priorities.

  Phase I includes the following elements:

  - Incorporate interim limits into WDRs and NPDES permits;
  - Implement structural and nonstructural BMPs throughout the watershed; and
  - Develop and initiate a comprehensive monitoring program, which includes compliance monitoring and targeted special studies.

  If appropriate, the TMDL will be reconsidered by the San Diego Water Board at the end of Phase I to consider completed special studies or policy.

- Phase II includes the implementation of additional watershed actions that are targeted to reducing sediment loads from high priority areas, as well as lagoon-specific actions that may be needed to facilitate recovery of beneficial uses that have been affected by various complex processes, including sedimentation, nuisance flows, reduced tidal circulation, and other factors. These actions may include Lagoon sediment remediation efforts, re-connecting the Lagoon's historic tidal channels, and maintenance of the Lagoon inlet in collaboration with State Parks, the San Diego Water Board, the Los Angeles-San Diego-San Luis Obispo (LOSSAN) Rail Corridor Agency, US EPA, and the watershed responsible parties. Phase II may also include additional upstream protections and BMP implementation to further reduce watershed sediment contributions. Responsible parties will develop, prioritize, and implement Phase II elements based on data from compliance monitoring and special studies.

- Phase III includes implementation of secondary and additional remediation actions, as necessary, to be in compliance with the required WLA allocation by the end of the compliance schedule.

Develop and Submit a Load Reduction Plan

Responsible parties are required to prepare and submit for San Diego Water Board review, comment, and revision, a Load Reduction Plan that demonstrates how they will comply with this TMDL. The San Diego Water Board expects that Load Reduction Plans will be developed collaboratively by the responsible parties within the watershed. The Load Reduction Plan shall be submitted to the San Diego Water Board within 18 months of the TMDL effective date, and reviewed by the San Diego Water Board Executive Officer within six months of submittal (this period will likely include a round of revisions by the responsible parties based on San Diego Water Board staff comments).

The Load Reduction Plan shall establish a watershed-wide, programmatic, adaptive management approach for implementation and include a detailed description of implementation actions, identified and planned by the responsible parties, to meet the requirements of this TMDL. Implementation actions identified by the Load Reduction Plan may include source control techniques, structural and/or non-structural storm water BMPs, and/or special studies that refine the understanding of sediment and pollutant sources within the watershed. The Load Reduction Plan shall include a description and objective of each implementation action, potential BMP locations, a timeline for project or BMP completion, and a monitoring plan to measure the effectiveness of implementation actions.

Storm Water Pollution Prevention Plans (SWPPPs) prepared by Phase II MS4s, Industrial Permittees, and Construction Permittees pursuant to their respective statewide general NPDES permits fulfill these entities responsibility to prepare a Load Reduction Plan. Permittees within the Los Peñasquitos watershed shall update their SWPPPs within 12 months of the TMDL effective date with any additional BMPs, monitoring, etc. to account for their site's potential to impact the receiving waterbody with respect to sediment. Sites identified through monitoring data or site inspections as posing an increased risk to the receiving water body may be directed to perform additional monitoring by the San Diego Water Board Executive Officer to quantify sediment load contributions to the receiving waterbody.

Comprehensive Approach

The comprehensive approach to the Load Reduction Plan requires that implementation efforts address all current TMDLs, current 303(d) listed waterbody/pollutant combinations, and other targeted impairments within the Los Peñasquitos watershed. A comprehensive approach to the Load Reduction Plan is consistent with implementation planning currently underway to address all of the impaired segments that were included in the approved bacteria TMDLs for San Diego Region Beaches and Creeks (San Diego Water Board, 2010).

The comprehensive approach to the Load Reduction Plan allows the responsible parties to proactively address other listed impairments within the watershed, which requires special studies to investigate sources and the water quality improvements needed to address these pollutants. Such special studies may significantly alter current understanding and refine the TMDL loading and/or allocations. This can impact the selection of subsequent implementation actions and how they are prioritized by responsible parties. A comprehensive approach to development of the Load Reduction Plan will provide a more cost effective and efficient approach for TMDL implementation and will have fewer potential environmental impacts associated with construction of structural BMPs (San Diego Water Board, 2010).

Load Reduction Plan Framework

With increased land development and inadequate management of runoff from impervious areas, increasing amounts of sediment are deposited into the Lagoon annually. To minimize the effects of runoff, proper sediment control can be achieved through the execution of implementation actions such as BMPs. Sediment implementation actions can be grouped into the four categories as summarized below.

1) *Preservation and Restoration*
   Significant areas of land have been set aside for open space. Such land acquisition and preservation prevents natural areas from being developed and disturbed. Additionally, the restoration of riparian buffers and wetlands can include the stabilization of steep slopes with native riparian vegetation. This not only helps restore the habitat but also the natural function of the stream.

2) *Education & Outreach*
   As a source control technique, education and outreach can function as pollution prevention to reduce or eliminate the amount of sediment generated at its source. Education and outreach can be targeted at specific land user groups and/or staff involved with site maintenance. As an example, implementation actions such as municipal incentives can be used to encourage proper irrigation and landscaping and can significantly reduce volumes of runoff.

3) *Retrofitting, New Development, & Site Management*
   Land development (MS4 contribution) is the primary source of anthropogenic sediment contribution above historical conditions. Development can expose sediment and contribute excessive amounts of sediment to the Lagoon. Additionally, increased imperviousness associated with development can lead to increased storm water runoff and soil erosion or gullying within the MS4 and receiving waters. Appropriate site management can partially or fully mitigate the effects of development. The Load Reduction Plan must identify and prioritize BMPs based on an analysis of opportunities and cost/benefit considerations. Furthermore, the Load Reduction Plan must detail BMP projects and locations. Storm water BMPs can be implemented to reduce the effects of pollutant loading and increased storm water flows from development. Structural BMPs include incorporation of low impact development (LID) and storm flow hydrograph matching into new projects. The same structural BMPs can be utilized to retrofit existing sites or be applied as regional MS4 BMPs to treat pollutants and/or flows prior to discharge into receiving waters.

4) *Monitoring:*
   A coordinated monitoring plan is needed to establish existing watershed conditions (baseline conditions) from which future changes and anticipated improvement in water quality can be measured. Additional monitoring could focus on sensitive species, areas of saltmarsh coverage, extent of invasive plant species, BMP effectiveness, and/or reduction in impervious coverage. Additionally, monitoring is crucial in the assessment of implementation actions to gain an understanding of performance for future adaptive management actions.

Load Reduction Plan Implementation

The Load Reduction Plan must be implemented within 90 days upon receipt of San Diego Water Board comments and recommendation, but in any event, no later than 6 months after submittal.

MONITORING

Monitoring is required to measure the progress of pollutant load reductions and improvements in water and saltmarsh habitat acreage. The information presented below is intended to be a brief overview of the goals of the monitoring. Special studies may be planned to improve understanding of key aspects related to achievement of WLAs and LAs, restore the beneficial uses, and to assist in the modification of structural and non-structural BMPs if necessary. The goals of monitoring include:

1) To determine compliance with the assigned wasteload and load allocations.

2) To monitor the effect of implementation actions proposed by responsible parties to improve water and saltmarsh habitat quality including proposed structural and non-structural BMPs to reduce storm water run-off and sediment loading, and remediation actions to remove sediment from the Lagoon.

3) To monitor the extent of vegetation habitat acreages in the Lagoon and determine if additional implementation action should be required.

4) To implement the monitoring in a manner consistent with other TMDL implementation plans and regulatory actions within the Los Peñasquitos watershed.

The proposed monitoring program shall be included in the Load Reduction Plan submitted to the San Diego Water Board Executive Officer for review.

Watershed Monitoring

Responsible parties must conduct suspended sediment, bedload, and flow monitoring to calculate total sediment loading to the Lagoon for each wet period (October 1 thru April 30) throughout the 20-year compliance period. The responsible parties must monitor enough storm events throughout to quantify sediment loading over each wet period. The compliance point for the WLA shall be the Lagoon as measured through the cumulative sediment loading from Los Peñasquitos, Carroll Canyon, and Carmel Creeks prior to entering the Lagoon. The responsible parties must monitor as many stations as necessary to quantify sediment loading to the Lagoon. Because of the natural variability in sediment delivery rates, sediment loading shall be evaluated using a 3-year, weighted rolling average. The first average must be calculated following the third critical wet period after the TMDL effective date.

Responsible parties are encouraged to collaborate or coordinate their efforts with other regional and local monitoring programs to avoid duplication and reduce associated costs.

Lagoon Monitoring

The responsible parties shall monitor the Lagoon annually in the Fall for changes in extent of the vegetation types. Aerial photos of the Lagoon must be acquired, digitized onscreen (at an approximate 1:2,500 scale), interpreted, and mapped into generalized classifications. Vegetation types must be classified as saltmarsh, non-tidal saltmarsh, freshwater marsh, non-tidal saltmarsh – *Lolium perrene* infested, freshwater marsh, southern willow scrub/mulefat scrub, herbaceous wetland, or upland land cover (urban, beach, dune, upland vegetation, etc.). Vegetation type classifications are described in the *Sediment TMDL for Los Peñasquitos Lagoon Staff Report*. Ground truthing may be performed after aerial photo interpretation to distinguish between vegetation types.

COMPLIANCE SCHEDULE

The implementation schedule for this TMDL follows the form of an adaptive management strategy, tracks implementation progress with established milestones or interim goals, and sets forth a final compliance date. It is impractical for land managers to actually measure sediment loading on a daily basis; thus, compliance with the TMDL is most appropriately expressed as an average annual load and should be evaluated as a long-term running average to account for natural fluctuations and inaccuracies in estimating sediment loads.

Pursuant to State Board Resolution No. 2000-015 and 2000-030 a TMDL compliance schedule must be as short as practicable, but in no case shall it exceed 20 years from the effective date of the Basin Plan amendment. This timeline in Table {Insert Table number} takes into consideration the planning needs of the responsible parties and other stakeholders to establish a Load Reduction Plan, time needed to address multiple impairments, and provides adequate time to measure temporal disparities between reductions in upland loading and the corresponding Lagoon water quality response. Current studies and other implementation actions or projects are underway to reduce sediment loading to the Lagoon and to gain a better understanding of source contributions. A variety of such projects will continue throughout the development of the Load Reduction Plan, ensuring there are no gaps in implementation efforts throughout the process.

At the end of the TMDL compliance schedule, as outlined in Table 7-57, waters must meet the Lagoon's sediment water quality standard and therefore, the Lagoon numeric target. The final lagoon numeric target requires the successful restoration of tidal and non-tidal salt marsh to achieve a lagoon total of 346 acres. This can either mean:

1. Successful restoration of 80 percent of the 1973 acreage of lagoon salt marsh habitat (346 acres); or

2. Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement.

If at any point during the implementation plan, monitoring data or special studies indicate that WLAs or LAs will be attained but the Lagoon numeric target may not be achieved, the San Diego Water Board shall reconsider the TMDL to modify WLAs and LAs to ensure that the Lagoon numeric target is attained.

Table 7-57. Los Peñasquitos Lagoon Sediment TMDL Implementation Compliance Schedule

Item	Implementation Action	Responsible Party	Date
1	Obtain approval by OAL of Los Peñasquitos Lagoon Sediment TMDL = Establishes effective date of TMDL	San Diego Water Board, San Diego County, City of San Diego, City of Poway, City of Del Mar, Caltrans, General Storm Industrial and Construction permittees	Estimated June 2013
2a	Issue, reissue, or revise general WDRs and NPDES requirements for Phase I MS4s, including Caltrans, to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.
2b	Issue, reissue, or revise general WDRs and NPDES requirements for Construction and Industrial NPDES to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.

Item	Implementation Action	Responsible Party	Date
2c	Issue, reissue, or revise general WDRs and NPDES requirements for Phase II NPDES permittees to incorporate requirements for complying with TMDL and WLAs	San Diego Water Board and State Water Board	Completed during permit renewal - within 5 years of applicable permit date, and every 5 years thereafter.
3a	Completion of Load Reduction Plans	Phase 1 MS4s and Caltrans	Within 18 months of OAL effective date for sediment TMDL
3b	Approval of Load Reduction Plan	San Diego Water Board Executive Officer	Within 6 months of submittal
3c	Phased, adaptive implementation of Load Reduction Plan	Phase 1 MS4s and Caltrans	In accordance with Load Reduction Strategy – ongoing throughout the implementation
3d	Revision of SWPPPs	Construction, industrial, and Phase II Permittees	Within 12 months of OAL effective date for sediment TMDL
4a	Submit annual Progress Report to the San Diego Water Board due January 31 each year	Phase 1 MS4s	Annually after reissuance of NPDES WDR
4b	Submit annual Progress Report to the San Diego Water Board due April 1 each year	Caltrans	Annually after reissuance of NPDES WDR
5	Enforcement Actions	San Diego Water Board	As needed
6	Refine Load Reduction Plan	Phase 1 MS4s and Caltrans	As warranted by completion of special studies, additional monitoring and data compilation.
7	Reopen and reconsider TMDL	San Diego Water Board	As defensible through the collection of additional data and significant findings by the watershed stakeholders.
8	Meet Interim Milestone #1: Attain 20 percent required reduction in sediment loading (equivalent to 6691 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 5 years of approved TMDL
9	Meet Interim Milestone #2: Attain 40 percent required reduction in sediment loading (equivalent to 5663 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 9 years of approved TMDL

Item	Implementation Action	Responsible Party	Date
10	Meet Interim Milestone #3: Attain 60 percent required reduction in sediment loading (equivalent to 4636 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 13 years of approved TMDL
11	Meet Interim Milestone #4: Attain 80 percent required reduction in sediment loading (equivalent to 3608 tons of sediment per year) and/or show progress in improving Lagoon conditions consistent with the specified targets	MS4s and NPDES permittees	Within 15 years of approved TMDL
12	Meet Final Milestone: Achieve Lagoon numeric target: the successful restoration of tidal and non-tidal salt marsh to achieve a lagoon total of 346 acres.[77]	All Phase I, Phase II MS4s, Caltrans, and general construction and industrial NPDES enrollees, and other WDR and NPDES permittees in the watershed[78]	Within 20 years of approved TMDL

Note: TMDL implementation schedule may be altered due to TMDL reconsideration; additionally, enforcement actions by the San Diego Water Board will be taken as necessary.

[77] This can either mean:
1. Successful restoration of 80 percent of the 1973 acreage of lagoon salt marsh habitat (346 acres); or
2. Demonstrate that implementation actions are active on and/or affecting 346 acres with continued monitoring to ensure 80 percent target achievement.

[78] For general construction and industrial permittees and other NPDES/WDR permittees, this applies to those facilities that have potential for long-term loadings into the watershed.

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GLOSSARY

Areas of Special Biological Significance (ASBS) - ASBS are those areas designated by the State Board as ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable. All Areas of Special Biological Significance are also classified as a subset of State Water Quality Protection Areas.

Basin Plan - The plan for the protection of water quality prepared by the Regional Water Quality Control Board in response to the Porter-Cologne Water Quality Control Act. The Basin Plan for the San Diego Region is also known as the Water Quality Control Plan for the San Diego Basin (9) and contains Water Quality Standards for the federal Clean Water Act.

Beneficial Uses - The uses of water necessary for the survival or well being of man, plants, and wildlife. These uses of water serve to promote the tangible and intangible economic, social, and environmental goals "Beneficial Uses" of the waters of the State that may be protected against include, but are not 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. Existing beneficial uses are uses that were attained in the surface or ground water on or after November 28, 1975; and potential beneficial uses are uses that would probably develop in future years through the implementation of various control measures. "Beneficial Uses" are equivalent to "Designated Uses" under federal law. [California Water Code section 13050(f)].

Best Management Practices (BMPs) - The practice or combination of practices that are determined to be the most effective, practicable means of preventing or reducing the amount of pollution generated by nonpoint sources to a level compatible with water quality goals (including technological, economic, and institutional considerations).

Bioaccumulation - The accumulation of contaminants in the tissues of organisms through any route, including respiration, ingestion, or direct contact with contaminated water, sediment, food, or dredged material.

California Water Code, Division 7 - a.k.a. Porter Cologne Water Quality Control Act.

Capping - The controlled, accurate placement of contaminated material at an open-water site, followed by a covering or cap of clean isolating material.

CEQA - California Environmental Quality Act of 1970.

Clean Water Act - a.k.a. Federal Water Pollution Control Act.

Confined Disposal - Placement of dredged material within dikes nearshore or upland confined disposal facilities that enclose the disposal area above any adjacent water surface, isolating the dredged material from adjacent waters during placement. Confined disposal does not refer to subaqueous capping or contained aquatic disposal.

Contaminant - A chemical or biological substance in a form that can be incorporated into, onto, or be ingested by and that harms aquatic organisms, consumers of aquatic organisms, or users of the aquatic environment.

GLOSSARY (continued)

Contaminated Sediment or Contaminated Dredged Material - Contaminated sediments or contaminated dredged materials are defined as those that have been demonstrated to cause an unacceptable adverse effect on human health or the environment

Contamination – This means an impairment of the quality of the waters of the state by waste to a degree which creates a hazard to the public health through poisoning or through the spread of disease. "Contamination" includes any equivalent effect resulting from the disposal of waste, whether or not waters of the state are affected.

Dredged Material - Material excavated from waters of the United States or ocean waters. The term dredged material refers to material which has been dredged from a water body, while the term sediment refers to material in a water body prior to the dredging process.

Dredged Material Discharge - The term dredged material discharge means any addition of dredged material into waters of the United States or ocean waters. The term includes open-water discharges; discharges resulting from unconfined disposal operations (such as beach nourishment or other beneficial uses); discharges from confined disposal facilities that enter waters of the United States (such as effluent, surface runoff, or leachate); and overflow from dredge hoppers, scows, or other transport vessels.

Effluent Limitations - Limitations on the volume of each waste discharge, and the quantity and concentrations of pollutants in the discharge. The limitations are designed to ensure that the discharge does not cause water quality objectives to be exceeded in the receiving water and does not adversely affect beneficial uses.

Ephemeral - Water bodies, or segments thereof, that contain water only for a short period following precipitation events.

Hydrologic Area - A major logical subdivision of a hydrologic unit which includes both water-bearing and nonwater-bearing formations. It is best typified by a major tributary of a stream, a major valley, or a plain along a stream containing one or more ground water basins and having closely related geologic, hydrologic, and topographic characteristics. Area boundaries are based primarily on surface drainage boundaries. However, where strong subsurface evidence indicates that a division of ground water exists, the area boundary may be based on subsurface characteristics.

Hydrologic Subarea - A major logical subdivision of a hydrologic area which includes both water-bearing and nonwater-bearing formations.

Hydrologic Unit - A classification embracing one of the following features which are defined by surface drainage divides: (1) in general, the total watershed area, including water-bearing and nonwater-bearing formations, such as the total drainage area of the San Diego River Valley; and (2) in coastal areas, two or more small contiguous watersheds having similar hydrologic characteristics, each watershed being directly tributary to the ocean and all watersheds emanating from one mountain body located immediately adjacent to the ocean.

Implementation Plan - Basin Plan chapter which describes the actions by the Regional Board and others that are necessary to achieve and maintain the designated beneficial uses and water quality objectives of the Region's waters.

Intermittent - Water bodies, or segments thereof, that contain water for extended periods during the year, but not at all times.

Interrupted - Water bodies or streams that contain perennial segments or pools, with intervening intermittent or ephemeral segments.

GLOSSARY (continued)

Leachate - Water or any other liquid that may contain dissolved (leached) soluble materials, such as organic salts and mineral salts, derived from a solid material. For example, rainwater that percolates through a confined disposal facility and picks up dissolved contaminants is considered leachate.

Major Federal Action - Includes actions with effects that may be major and that are potentially subject to federal control and responsibility. Major refers to the context (meaning that the action must be analyzed in several contexts, such as the effects on the environment, society, regions, interests, and locality) and intensity (meaning the severity of the impact). It can include (a) new and continuing activities, projects, and programs entirely or partly financed, assisted, conducted, regulated, or approved by federal agencies; (b) new or revised agency rules, regulations, plans, policies, or procedures; and (c) legislative proposals. Action does not include funding assistance solely in the form of general revenue-sharing funds where there is no federal agency control over the subsequent use of such funds. Action does not include judicial or administrative civil or criminal enforcement action.

National Pollution Discharge Elimination System (NPDES) - These permits pertain to the discharge of waste to surface waters only. All State and Federal NPDES permits are also WDRs.

Nonpoint Sources - This refers to pollutants from diffuse sources that reach water through means other than a discernable, confined, and discrete conveyance.

Non-Storm Water Discharge - Any discharge to a storm water conveyance system that is not composed entirely of storm water.

Nuisance - Means anything which meets all of the following requirements: (1) Is injurious to health, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property; (2) Affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal; and (3) Occurs during or as a result of the treatment or disposal of waste.

Open-Water Disposal - Placement of dredged material in rivers, lakes, estuaries, or oceans via pipeline or surface release from hopper dredges or barges.

Person - Also includes any city, county, district, the state or any department or agency thereof. "Person" includes the United States, to the extent authorized by federal law.

pH - Term used to refer to the hydrogen ion concentration of water. The acidity or alkalinity of water is measured by the pH factor.

Point Sources - This refers to pollutants discharged to water through any discernable, confined, and discrete conveyance.

Pollution - Means an alteration of the quality of the waters of the state by wastes to a degree which unreasonably affects either of the following: (1) The waters for beneficial uses, or (2) Facilities which serve those beneficial uses. "Pollution" may include "contamination."

Porter-Cologne Water Quality Control Act (Porter-Cologne Act) - This is also known as the California Water Code.

Quality of the Water – "Quality of the water(s)" refers to chemical, physical, biological, bacteriological, radiological, and other properties and characteristics of water which affect its use.

GLOSSARY (continued)

Reclaimed water – a.k.a. "recycled water" means water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource.

Regional Board - a.k.a. California Regional Water Quality Control Board.

Region - a.k.a., San Diego Basin (9).

Sewage, Domestic - Waste and wastewater from humans or household operations that is discharged to or otherwise enters a treatment works. [40 CFR 503.9(g)]

Sewage Sludge - A solid, semi-solid, or liquid residue generated during the treatment of domestic sewage in a treatment works. Sewage sludge includes, but is not limited to, domestic septage; scum or solids removed in primary, secondary, or advanced wastewater treatment processes; and a material derived from sewage sludge. Sewage sludge does not include ash generated during the firing of sewage sludge in a sewage incinerator or grit and screenings generated during preliminary treatment of domestic sewage in a treatment works [40 CFR 503.9(w)].

State Board - a.k.a. State Water Resources Control Board.

State Water Quality Protection Areas (SWQPAs) – These are nonterrestrial marine or estuarine areas designated to protect marine species or biological communities from an undesirable alteration in natural water quality. All Areas of Special Biological Significance (ASBS) that were previously designated by the State Board in Resolutions No. 74-28, 74-32, and 75-61 are also classified as a subset of State Water Quality Protection Areas and require special protections afforded by this Plan.

Statewide Plan - A water quality control plan adopted by the State Water Resources Control Board in accordance with the provisions of Water Code sections 13240 through 13244, for waters where water quality standards are required by the Federal Water Pollution Control Act. Such plans supersede regional water quality control plans for the same waters to the extent of a conflict [California Water Code section 13170].

Triennial Review - Review of the Basin Plan which is required to be done every three years by the federal Clean Water Act [section 303(c)(1)].

Waste - Includes sewage and any and all other waste 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 waste placed within containers of whatever nature prior to, and for purposes of, disposal.

Waste Discharge Requirements (WDRs) - The name of permits issued by the Regional Board for the discharge of waste to land. The discharge of waste to land may potentially impact ground water quality. These permits require that waste not be discharged in a manner that would cause an exceedance of applicable water quality objectives or adversely affect beneficial uses designated in the Basin Plan.

Water Quality Criteria - Numerical or narrative limits for constituents or characteristics of water designed to protect specific designated uses of the water. When criteria are met, water quality will generally protect the designated use [40 CFR section 131.3(b)]. This term is also used to describe scientific information on the relationship that the effect of a constituent concentration has on human health, aquatic life, or other uses of water, such as the criteria in the USEPA "Gold Book". California's water quality criteria are called "water quality objectives". See "water quality standard".

Water Quality Control - Means the regulation of any activity or factor which may affect the quality of the water of the state and includes the prevention and correction of water pollution and nuisance.

Water Quality Control Plans - There are two types of water quality control plans - Basin Plans and Statewide Plans. Regional Boards adopt Basin Plans for each region based upon surface water hydrologic basin boundaries. The Regional Basin Plans designates or describes (1) existing and potential beneficial uses of ground and surface water; (2) water quality objectives to protect the beneficial uses; (3) implementation programs to achieve these objectives; and (4) surveillance and monitoring activities to evaluate the effectiveness of the water quality control plan. The Statewide Plans address water quality concerns for surface waters that overlap Regional Board boundaries, are statewide in scope, or are otherwise considered significant and contain the same four elements. Statewide Water Quality Control Plans include the Ocean Plan, the Enclosed Bays and Estuaries Plan, the Inland Surface Waters Plan, and the Thermal Plan. A 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 [California Water Code section 13050(j)].

Water Quality Goal - The most stringent, applicable, numerical water quality limit for a constituent or parameter of concern in a specific body of ground or surface water at a specific site that is chosen to protect either (1) existing water quality or (2) beneficial uses of water. In the first case, the water quality goal is set equal to the background level in the body of water. In the second case, the water quality goal is set at the less stringent of either (a) the numerical limit which implements all applicable water quality objectives or (b) the background level.

Water Quality Objectives - Numerical or narrative limits on constituents or characteristics of water designed to protect designated beneficial uses of the water. [California Water Code section 13050(h)]. California's water quality objectives are established by the State and Regional Water Boards in the Water Quality Control Plans. See "water quality standards".

Water Quality Standards - Provisions of State or federal law which consist of a designated use or uses for waters of the United States and water quality criteria for such waters based upon such uses. Water quality standards are to protect the public health or welfare, enhance the quality of water and serve the purposes of the Act [40 CFR section 131.3(i)]. A water quality standard under the Federal Clean Water Act is equivalent to a beneficial use designation plus a water quality objective. n California, water quality standards are promulgated by the State and Regional Water Boards in Water Quality Control Plans. Water quality standards are enforceable limits for the bodies of surface or ground waters for which they are established.

Waters of the State - Any water, surface or underground, including saline waters within the boundaries of the State [California Water Code section 13050(e)].

ACRONYMS

ACL .... Administrative Civil Liability

Adj. SAR .... adjusted sodium adsorption ratio

AF .... acre-foot (acre-feet)

af/y .... acre-foot (acre-feet) per year

AG........................ attorney general

AGR .... beneficial use of agricultural supply

AQUA .... beneficial use of aquaculture

ASBS .... beneficial use of Area of Special Biological Significance

BAT .... Best Available Technology

BCT .... Best Control Technology

BEP .... Bays and Estuaries Plan

BIOL .... beneficial use of preservation of biological habitats of special significance

BMP .... Best Management Practice

BOD .... Biological Oxygen Demand

BPTCP .... Bay Protection and Toxic Cleanup Program

º C .... degrees Centigrade

Ca .... Calcium

Cal-EPA's .... California Environmental Protection Agency

CAOs .... Cleanup and Abatement Orders

CBOD.. .... carbonaceous biochemical oxygen demand

CCR .... California Code of Regulations

CDFFP .... California Department of Forestry and Fire Protection, Rainbow Conservation Camp

CDOs .... Cease and Desist Orders

CEQA .... California Environmental Quality Act

CERCLA .... Comprehensive, Environmental Response, Compensation, and Liability Act, commonly referred to as Superfund

CFR .... Code of Federal Regulations

CIWMB .... California Integrated Waste Management Board

COLD .... Beneficial use of cold freshwater habitat

COMM .... Beneficial use of commercial and sport fishing

CTR .... California Toxics Rule

Cu .... copper

CWA .... federal Clean Water Act

CWS .... Clean Water Strategy

CZARA .... Coastal Zone Act Reauthorization Amendments

DA .... district attorney

DDE Dichlorodiphenyldichloroethylene

DDT .... Dichlorodiphenyltrichloroethane

DFG .... Department of Fish and Game

DoD .... Department of Defense

DHS .... Department of Health Services

DPR .... Department of Pesticide Regulation

DTSC .... Department of Toxic Substance Control

DWR .... Department of Water Resources

E. coli .... *Escherichia coli*

EIR .... Environmental Impact Report

EIS .... Environmental Impact Statement

EST .... beneficial use of estuarine habitat

ACRONYMS (continued)

ET .... evapotranspiration

ETI .... evapotranspiration-infiltration

°F .... degrees Fahrenheit

FFA .... Federal Facility Agreement

FRSH .... beneficial use of freshwater replenishment

ft .... foot (feet)

GIS .... geographic information system

Gold Book .... Quality Criteria for Water, 1986

GWR .... beneficial use of ground water recharge

HA .... hydrologic area

HCO_3 .... bicarbonate

HEP .... Health Evaluation Plan

HSA .... hydrologic subarea

HU .... hydrologic unit

IND .... beneficial use of industrial service supply

ISWP .... Inland Surface Waters Plan

K .... potassium

kg/yr..................... kilogram per year

kg N/yr .... kilogram nitrogen per year

kg P/yr .... kilogram phosphorus per year

L .... liter

LA .... Load Allocation

m .... meter(s)

mg .... milligram

MAA .... Management Agency Agreement

MAR .... beneficial use of marine habitat

MBAS .... Methylene Blue-Activated Substances

MEP .... Maximum Extent Practicable

mg .... milligram(s)

Mg .... magnesium

mg/L .... milligram(s) per liter

mg N/L .... milligram(s) nitrogen per liter

mg P/L................. milligram(s) phosphorus per liter

MGD .... Million Gallons per Day

MIGR .... beneficial use of migration of aquatic organisms

MPRSA .... Marine Protection, Research and Sanctuaries Act of 1972

ml .... milliliter(s)

MLLW .... Mean Lower Low Water

MMs .... Management Measures

MOS.................... Margin of Safety

MOU .... Memorandum of Understanding

MPs..................... Management Practices

MRCD .... Mission Resource Conservation District

MS4..................... Municipal Separate Storm Sewer System

MSD .... Marine Sanitation Device

MUN .... beneficial use of municipal and domestic supply

Mussel Watch .... State Mussel Watch

MWD .... Metropolitan Water District of Southern California

NASSCO............. National Steel and Shipbuilding Company

Na .... sodium

NAV .... beneficial use of navigation

ND .... Negative Declaration

NEPA .... National Environmental Policy Act of 1969

ng/l .... nanograms per liter

No .... number(s)

NO_3 .... nitrate

NPDES .... National Pollutant Discharge Elimination System

ACRONYMS (continued)

NPSMP .... Nonpoint Source Management Plan

NRCS .... Natural Resources Conservation Service

NRMP.................. Nutrient Reduction and Management Plan

NOV .... Notice of Violation

NTO .... Notice to Comply

NTU .... turbidity unit

O,P'-DDD .... O,P'-Dichlorodiphenyldichloroethane

O,P'-DDE .... O,P'-Dichlorodiphenyldichloroethylene

OWTS .... onsite wastewater treatment system(s)

P,P'-DDD .... P,P'-Dichlorodiphenyldichloroethane

P,P'-DDE .... P,P'-Dichlorodiphenyldichloroethylene

P,P'-DDMS .... P,P'-Dichloroiphenylmonochlorosaturatedethan

PAH .... polyaromatic hydrocarbon

PCB .... polychlorinated biphenyl

pH .... hydrogen ion concentration

POTW .... Publicly Owned Treatment Works

POW .... beneficial use of hydropower generation

ppb .... part(s) per billion (ng/g)

ppm .... part(s) per million (ug/g)

Primary Network.. Primary Water Quality Monitoring Network

PROC .... beneficial use of industrial process supply

QA .... Quality Assurance

QAPP .... Quality Assurance Program Plan

RARE .... beneficial use of rare, threatened, or endangered species

RCD .... Resource Conservation District

RCRA .... Resource Conservation and Recovery Act of 1976

REC-1 .... beneficial use of contact water recreation

REC-2 .... beneficial use of non-contact water recreation

ROWD .... Report of Waste Discharge

RV .... Recreational Vehicle

SAL .... beneficial use of inland saline water habitat

SANDAG............. San Diego Association of Governments

SAR .... sodium adsorbtion ratio

SCE .... Southern California Edison

SDG&E .... San Diego Gas and Electric Company

SHELL .... beneficial use of shellfish harvesting

SIYB.................... Shelter Island Yacht Basin

SOCs .... synthetic organic chemicals

SONGS .... San Onofre Nuclear Generating Station

SPWN .... beneficial use of spawning, reproduction, and/or early development

SRF .... State Revolving Fund

SWAT .... Solid Waste Assessment Test

SWP .... State Water Project

SWRCB .... California State Water Resources Control Board

TBT .... tributyl tin

TDS .... total dissolved solids

TKN..................... total Kjeldahl nitrogen

TMDL .... Total Maximum Daily Load

TSM .... Toxic Substances Monitoring

TSO..................... time schedules

TSS .... total suspended solids

ACRONYMS (continued)

UCCE .... University of California Cooperative Extension

µg .... microgram(s)

µg/l .... micrograms per liter

UHC .... underwater hull cleaning

USCG .... United States Coast Guard

USEPA .... United States Environmental Protection Agency

USGS .... United States Geologic Survey

UST .... underground storage tank

WARM .... beneficial use of warm freshwater habitat

WDR .... Waste Discharge Requirement

WILD .... beneficial use of wildlife habitat

WLA .... Waste Load Allocation

WQA .... Water Quality Assessment

WQLS .... Water Quality Limited Segment

WQLZ .... Water Quality Limited Zone

WRR .... Water Reclamation Requirement

APPENDIX B

REGIONAL GROWTH FORECASTS

APPENDIX B - 1. SUMMARY OF THE REGIONAL GROWTH FORECAST FOR VARIOUS LAND USES WITHIN THESAN DIEGO ASSOCIATION OF GOVERNMENTS' (SANDAG) SPHERE OF INFLUENCE FOR THE SAN DIEGO REGION.

HU 901 - 911	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	1,895,749	1,895,749	1,895,749	1,895,749
Developed Acres	395,746	428,622	539,895	660,646
Low Density Single Family	52,556	61,663	127,357	227,763
Single Family	141,512	159,132	194,286	207,021
Multiple Family	24,068	26,288	31,139	33,564
Mobile Homes	5,344	5,127	4,774	4,468
Other Residential	1,095	1,095	1,095	1,095
Industrial	35,043	36,167	38,790	40,034
Retail	24,850	25,733	27,238	28,084
Office	2,642	2,756	3,135	3,327
Schools	10,309	10,624	11,130	11,359
Agriculture	3,544	3,546	3,546	3,546
Parks	83,119	83,119	83,119	83,119
Roads & Freeways	11,665	13,372	14,288	17,267

APPENDIX B - 2. SUMMARY OF THE REGIONAL GROWTH FORECAST FOR VARIOUS LAND USES WITHIN THE SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS' SPHERE OF INFLUENCE.

HU 901 - 911	Year 1994
TOTAL ACRES	460,572
Developed Acres	121,766
Low Density Single Family	3,793
Single Family	24,395
Multiple Family	6,388
Mobile Homes	1,045
Other Residential	9,484
Industrial	3,087
Retail	20,060
Office	1,262
Schools	1,291
Agriculture	46,887
Parks	2,523
Roads & Freeways	1,551

APPENDIX B - 3. REGIONAL GROWTH FORECAST FOR VARIOUS LAND USES WITHIN SANDAG'S SPHERE OF INFLUENCE BY HYDROLOGIC UNITS.

*San Juan Hydrologic Unit (Hydrologic Unit Basin 901)**

HU 901	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	100,823	100,823	100,823	100,823
Developed Acres	6,137	6,137	6,137	6,137
Low Density Single Family	0	0	0	0
Single Family	152	152	152	152
Multiple Family	100	100	100	100
Mobile Homes	142	142	142	142
Other Residential	27	27	27	27
Industrial	2,816	2,816	2,816	2,816
Retail	0	0	0	0
Office	0	0	0	0
Schools	8	8	8	8
Agriculture	0	0	0	0
Parks	2,487	2,487	2,487	2,487
Roads & Freeways	405	405	405	405

*Santa Margarita Hydrologic Unit (Hydrologic Unit Basin 902)**

HU 902	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	122,902	122,902	122,902	122,902
Developed Acres	8,600	9,011	11,957	13,362
Low Density Single Family	2,090	2,340	5,137	5,965
Single Family	727	879	1,013	1,548
Multiple Family	459	460	464	470
Mobile Homes	61	61	61	61
Other Residential	11	11	11	11
Industrial	4,573	4,580	4,585	4,588
Retail	330	332	337	340
Office	0	0	0	0
Schools	50	50	50	50
Agriculture	0	0	0	0
Parks	148	148	148	148
Roads & Freeways	151	151	151	182

* This is the Regional Growth Forecast for the area within SANDAG's Sphere of Influence only; that portion covered within SCAG's Sphere of Influence is not shown.

APPENDIX B - 3 (continued)

San Luis Rey Hydrologic Unit (Hydrologic Unit Basin 903)

HU 903	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	351,640	351,640	351,640	351,640
Developed Acres	37,262	42,289	60,999	79,877
Low Density Single Family	14,985	16,599	29,134	44,539
Single Family	5,019	8,196	13,963	17,066
Multiple Family	1,722	1,889	2,057	2,077
Mobile Homes	620	392	391	391
Other Residential	86	86	86	86
Industrial	1,531	1,543	1,634	1,653
Retail	1,068	1,144	1,295	1,364
Office	60	66	78	75
Schools	360	369	374	384
Agriculture	161	161	161	161
Parks	11,005	11,005	11,005	11,005
Roads & Freeways	646	786	825	1,052

Carlsbad Hydrologic Unit (Hydrologic Unit Basin 904)

HU 904	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	132,554	132,554	132,554	132,554
Developed Acres	56,749	64,927	79,666	92,898
Low Density Single Family	6,834	8,348	12,617	19,299
Single Family	27,365	32,713	40,582	46,007
Multiple Family	5,385	5,863	7,097	7,181
Mobile Homes	1,715	1,715	1,448	1,389
Other Residential	103	103	103	103
Industrial	4,133	4,330	5,059	5,483
Retail	4,274	4,496	4,944	5,183
Office	376	420	556	612
Schools	1,517	1,568	1,759	1,841
Agriculture	274	274	274	274
Parks	3,387	3,387	3,387	3,387
Roads & Freeways	1,386	1,710	1,840	2,140

APPENDIX B - 3 (continued)

San Dieguito Hydrologic Unit (Hydrologic Unit Basin 905)

HU 905	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	217,586	217,586	217,586	217,586
Developed Acres	38,210	42,855	62,662	83,105
Low Density Single Family	9,559	12,482	24,900	42,295
Single Family	14,271	15,802	22,695	24,991
Multiple Family	1,146	1,220	1,379	1,492
Mobile Homes	140	140	140	140
Other Residential	8	8	8	8
Industrial	904	941	1,066	1,098
Retail	2,385	2,413	2,468	2,493
Office	142	147	218	269
Schools	442	466	481	488
Agriculture	770	772	772	772
Parks	8,011	8,011	8,011	8,011
Roads & Freeways	432	453	526	1,049

Penasquitos Hydrologic Unit (Hydrologic Unit Basin 906)

HU 906	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	92,823	92,823	92,823	92,823
Developed Acres	47,609	50,663	56,484	61,032
Low Density Single Family	988	1,071	2,110	4,910
Single Family	20,740	22,441	25,240	25,484
Multiple Family	4,081	4,532	5,313	5,786
Mobile Homes	322	333	273	210
Other Residential	67	67	67	67
Industrial	4,736	4,954	5,701	6,051
Retail	3,641	3,882	4,107	4,243
Office	714	726	766	783
Schools	2,628	2,715	2,835	2,888
Agriculture	745	745	745	745
Parks	7,353	7,353	7,353	7,353
Roads & Freeways	1,595	1,844	1,974	2,515

APPENDIX B - 3 (continued)

San Diego Hydrologic Unit (Hydrologic Unit Basin 907)

HU 907	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	289,243	289,243	289,243	289,243
Developed Acres	82,095	84,372	99,269	118,659
Low Density Single Family	8,802	9,399	18,364	36,328
Single Family	27,121	26,068	33,000	33,468
Multiple Family	4,187	4,342	4,688	4,959
Mobile Homes	1,178	1,178	1,178	1,170
Other Residential	96	96	96	96
Industrial	5,524	5,524	5,823	6,001
Retail	5,079	5,168	5,347	5,408
Office	713	749	831	877
Schools	2,098	2,124	2,157	2,188
Agriculture	216	216	216	216
Parks	24,521	24,521	24,521	24,521
Roads & Freeways	2,590	2,936	3,049	3,427

Pueblo San Diego Hydrologic Unit (Hydrologic Unit Basin 908)

HU 908	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	44,368	44,368	44,368	44,368
Developed Acres	33,226	33,402	34,177	34,374
Low Density Single Family	0	0	0	0
Single Family	15,950	15,902	15,780	15,548
Multiple Family	3,817	3,967	4,797	5,233
Mobile Homes	151	151	133	102
Other Residential	162	162	162	162
Industrial	4,340	4,373	4,394	4,399
Retail	4,235	4,251	4,289	4,296
Office	415	416	419	421
Schools	1,178	1,179	1,194	1,196
Agriculture	0	0	0	0
Parks	1,641	1,641	1,641	1,641
Roads & Freeways	1,337	1,361	1,368	1,376

APPENDIX B - 3 (continued)

Sweetwater Hydrologic Unit (Hydrologic Unit Basin 909)

HU 909	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	147,593	147,593	147,593	147,593
Developed Acres	56,400	59,870	73,470	90,120
Low Density Single Family	5,686	6,262	16,882	32,718
Single Family	22,859	25,084	27,149	27,329
Multiple Family	2,004	2,273	2,686	2,962
Mobile Homes	443	443	436	436
Other Residential	90	90	90	90
Industrial	1,229	1,302	1,364	1,380
Retail	2,380	2,500	2,644	2,712
Office	141	152	174	182
Schools	1,262	1,278	1,356	1,388
Agriculture	164	164	164	164
Parks	19,036	19,036	19,036	19,036
Roads & Freeways	1,104	1,285	1,490	1,723

Otay Hydrologic Unit (Hydrologic Unit Basin 910)

HU 910	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	100,465	100,465	100,465	100,465
Developed Acres	15,762	19,416	30,411	45,290
Low Density Single Family	2,198	2,818	8,514	21,814
Single Family	4,729	6,785	11,040	11,628
Multiple Family	799	1,152	1,849	2,418
Mobile Homes	466	466	466	377
Other Residential	338	338	338	338
Industrial	3,664	3,737	3,897	3,964
Retail	1,044	1,106	1,239	1,354
Office	17	17	32	40
Schools	429	498	523	537
Agriculture	1,155	1,155	1,155	1,155
Parks	665	665	665	665
Roads & Freeways	257	679	692	998

APPENDIX B - 3 (continued)

Tijuana Hydrologic Unit (Hydrologic Unit Basin 911)

HU 911	Year 1990	Year 2000	Year 2010	Year 2015
TOTAL ACRES	295,751	295,751	295,751	295,751
Developed Acres	13,695	15,731	24,661	35,792
Low Density Single Family	1,411	2,344	9,700	19,895
Single Family	2,578	3,109	3,672	3,801
Multiple Family	398	489	710	885
Mobile Homes	108	108	108	51
Other Residential	107	107	107	107
Industrial	1,593	2,016	2,450	2,602
Retail	414	440	569	671
Office	62	63	63	64
Schools	339	370	393	393
Agriculture	57	57	57	57
Parks	4,866	4,866	4,866	4,866
Roads & Freeways	1,763	1,763	1,967	2,399

APPENDIX C

WATER QUALITY CRITERIA

The literature contains many different water quality criteria designed to protect specific beneficial uses of water. A summary of the specific numerical water quality criteria considered by the Regional Board for designation as water quality objectives is described in Table C-1, Water Quality Criteria - Inorganic Constituents; and Table C-2, Water Quality Criteria - Organic Constituents. The water quality criteria summarized in Tables C-1 and C-2 provided the basis for the Regional Board's designation of many of the specific numerical water quality objectives described earlier in this Chapter.

The water quality criteria presented in Tables C-1 and C-2 are not enforceable water quality objectives. The purpose of presenting the information summarized in these tables is to allow interested persons to compare available water quality criteria to the specific water quality objectives designated by the Regional Board described in Chapter 3.

A summary of the available types of numerical water quality criteria considered by the Regional Board for designation as numerical water quality objectives are summarized below.

- ***Maximum Contaminant Levels (MCLs):***

MCLs are part of the drinking water standards adopted both by the California Department of Health Services (DHS), Office of Drinking Water in Title 22 of the California Code of Regulations (CCR), Division 4, Chapter 15, "*Domestic Water Quality and Monitoring*" and by the USEPA under the Safe Drinking Water Act. The State MCL drinking water standards must be at least as stringent as those adopted by USEPA. Primary MCLs are derived from the one in a million incremental cancer risk estimate for carcinogens and from threshold toxicity levels for non-carcinogens. Secondary MCLs are derived from human welfare considerations (e.g., taste or odor).

- ***Maximum Contaminant Level Goals (MCL Goals):***

MCL Goals are promulgated by USEPA under the National Primary Drinking Water Regulations as the first step in establishing MCLs. MCL Goals are set at levels which represent no adverse health risks.

- ***State "Action" Levels:***

Action levels are published by the DHS's Office of Drinking Water and are based mainly on health effects. The 10-6 incremental cancer risk estimates are used for carcinogens and threshold toxicity limits are used for other constituents.

- ***Proposition 65 Regulatory Limits:***

Proposition 65 limits are established under the California Safe Drinking Water and Toxic Enforcement Act of 1986 for known human carcinogens and reproductive toxins. For carcinogens the No-Significant-Risk-Levels are set at the one-in-100,000 incremental cancer risk level. 1/1000 of the No-Observable-Effect Level (NOEL) is used for reproductive toxicants.

- ***National Ambient Water Quality Criteria:***

These criteria are published by USEPA under the federal Clean Water Act to protect human health and welfare and freshwater and marine aquatic life. These criteria are found in: *Quality Criteria for Water, 1986* - the "*Gold Book*"; the Ambient Water Quality Criteria volumes (1980, 1984, 1986, 1987, and 1989); Quality Criteria for Water (1976) - the "*Red Book*"; and Water Quality Criteria, 1972 - the "*Blue Book*".

- ***Health Advisories and Water Quality Advisories:***

These advisories are published by USEPA's Office of Water. Short-term (10 days or less), long-term (7 years or less), and lifetime exposure health advisories for non-carcinogens and suspected human health carcinogens are included where sufficient data exist.

- ***Suggested No-Adverse-Response Levels (SNARLS):***

These human health-related criteria are published by the National Academy of Sciences in the Drinking Water and Health Volumes. Incremental cancer risk estimates are presented separately for carcinogens.

- ***Water Quality for Agriculture:***

Water Quality for Agriculture was published by the Food and Agriculture Organization of the United Nations in 1985, which contains criteria protective of agricultural uses of water.

- ***Water Quality Criteria:***

Water Quality Criteria was written by McKee and Wolf and published by the State Water Resources Control Board in 1963 and 1978. It contains criteria for human health and welfare, aquatic life, agricultural use, industrial use, and various other beneficial uses.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	BASIN PLAN				Drinking Water Standards (California & Federal) Maximum Contaminant Levels (MCLs)		
	Ocean Waters (1) "‡" = carcinogen	Bays and Estuaries	Inland Surface Waters	Ground Water	California Dept.of Health Services		USEPA Primary MCL
					Primary MCL	Secondary MCL	
Ammonia	600 (2)	NH_3 not > 0.025 mg/l	NH_3 not > 0025 mg/l				
Antimony	1,200						6 (8)
Arsenic	8				50		50
Beryllium	0.033 ‡						4 (8)
Boron			0.5 mg/l or as noted in Table 3-1	0.5 mg/l or as noted in Table 3-2			
Bromide							
Cadmium	1				10		5
Chloride			250 mg/l or as noted in Table 3-1	60 mg/l or as noted in Table 3-2		250,000 (7)	
Chlorine	2 (3)						
Chromium (III)	190,000						
Chromium (VI)	2 (4)						
Chromium (total)	2 (4)				50		100
Color			20 units or as noted in Table 3-1	15 units or as noted in Table 3-2		15 units	
Copper	3					1,000	1,300 (9)
Cyanide	1						200 (8)
Fluoride			1.0 mg/l or as noted in Table 3-1	1.0 mg/l or as noted in Table 3-2	1,400 to 2,400 (5)		4,000
Iron			0.3 mg/l or as noted in Table 3-1	0.3 mg/l or as noted in Table 3-2		300	
Lead	2				50		15 (9)
Manganese			0.05 mg/l or as noted in Table 3-1	0.05 mg/l or as noted in Table 3-2		50	
Mercury (inorganic)	0.04				2		2
Nickel	5						100 (8)
Nitrate			5 mg/l or as noted in Table 3-1	5 mg/l or as noted in Table 3-2	45,000 (6)		10,000 (10)
Oxygen, dissolved	Shall not be depressed >10%	Shall not be less than 5.0 mg/l with designated MAR. The annual mean DO shall not be less than 7 mg/l more than 10% of the time.	Shall not be less than 5.0 mg/l in inland surface waters with WARM or less than 6.0 m/l in waters with COLD beneficial use The annual mean D.O. conc. shall not be less than 7 mg/l more than 10% of the time.				

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	BASIN PLAN				Drinking Water Standards (California & Federal) Maximum Contaminant Levels (MCLs)		
	Ocean Waters (1) "‡" = carcinogen	Bays and Estuaries	Inland Surface Waters	Ground Water	California Dept.of Health Services		USEPA Primary MCL
					Primary MCL	Secondary MCL	
pH	Shall not be +/- 0.2 units of natural pH	Shall not be depressed below 7.0; nor raised above 9.0. Changes in normal ambient pH shall not exceed 0.2 units.	Shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 units in fresh waters with designated COLD or WARM beneficial uses.				
Phosphorus			Shall not exceed 0.05 mg/l in any steam at the point where it enters any standing body of water, nor 0.025 mg/l in any standing body of water; for flowing waters, shall not exceed 0.1 mgl total P. These values not to be exceeded more than 10% of the time.				
Radioactivity, Gross Alpha					15 pCi/l		15 pCi/l (12)
Radioactivity, Gross Beta					50 pCi/l		4 mrem/yr
Radium 226 + 228					5 pCi/l		5 pCi/l / 20 pCi/l (13)
Selenium	15				10		50
Settleable solids			Shall not contain suspended and settleable solids in concentrations that result in the deposition of solids that cause nuisance or adversely affect beneficial uses.				
Silver	0.7				50		100
Sodium			60% Na; or as noted in Table 3-1	60% Na; or as noted in Table 3-2			
Strontium-90					8 pCi/l		
Sulfate			65 mg/l; or as noted in Table 3-1	60 mg/l; or as noted in Table 3-2		250,000 (7)	400,000 - 500,000 (13)
Total dissolved solids (TDS)			300 mg/l; or as noted in Table 3-1	350 mg/l; or as noted in Table 3-2		500,000 (11)	
Thallium	14						2 (8)
Tritium					20,000 pCi/l		
Turbidity		Shall not be less than 50% of the depth at locations where measurement is made by means of a standard Secchi disk, or as noted in Chapter 3 page 30.	20 NTU; or as noted in Table 3-1. Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.	5 NTU; or as noted in Table 3-2. Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses.		5 units	1 to 5 units
Uranium					20 pCi/l		20 μg/l = 30 pCi/l (13)
Zinc	20					5,000	

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	Drinking Water Standards (Federal) Maximum Contaminant Levels		California Recommended Public Health Level (RPHL) Department of Health Services	Health Advisories or Suggested No-Adverse-Response Levels (SNARLs) for toxicity other than cancer risk		US EPA Integrated Risk Information System (IRIS) Reference Dose as a Water Quality Criterion (16)	One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water			California Proposition 65 Regulatory Level as a Water Quality Criterion (19)	Agricultural Water Quality Goals (21)
	USEPA						Cal/EPA Cancer Potency Factor as a Water Quality Criterion (17)	USEPA Integrated Risk Information System (IRIS)	USEPA Health Advisory or SNARL		
	Secondary MCL	MCL Goal		USEPA	National Academy of Sciences (NAS)						
Ammonia				30,000 (14)					(D)		
Antimony		6 (8)		3		2.8			(D)		
Arsenic								0.02	0.02 (A,14)	5	100
Beryllium		4 (8)		4,000 / 20,000 (7-yr,14,15)				0.008	0.008 (B,14)	(18)	100
Boron				600 (14)		630			(D)		750 (22) /700
Bromide					2,300						
Cadmium		5		5	5	3.5	(18)		(D)	(18)	10
Chloride	250,000										106,000
Chlorine						1,050			(D)		
Chromium (III)											
Chromium (VI)							0.083		(A)	(18)	100
Chromium (total)		100		100		35			(D)		
Color	15 units										
Copper	1,000	1,300							(D)		200
Cyanide		200 (8)		200		150			(D)		
Fluoride	2,000	4,000				840			(D)		1,000
Iron	300										5,000
Lead		zero							(B)	0.25 (20)	5,000
Manganese	50					980					200
Mercury (inorganic)		2	2 (13)	2		2.1			(D)		
Nickel		100 (8)		100		140	(18)		(D)	(18)	200
Nitrate		10,000 (2)		10,000 (2)		11,000 (2)			(D)		
Oxygen, dissolved											

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	Drinking Water Standards (Federal) Maximum Contaminant Levels		California Recommended Public Health Level (RPHL)	Health Advisories or Suggested No-Adverse-Response Levels (SNARLs) for toxicity other than cancer risk		US EPA Integrated Risk Information System (IRIS) Reference Dose	One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water			California Proposition 65 Regulatory Level as a Water Quality Criterion (19)	Agricultural Water Quality Goals (21)
	USEPA						Cal/EPA Cancer Potency Factor	USEPA Integrated Risk Information	USEPA Health Advisory or SNARL		
	Secondary MCL	MCL Goal	Department of Health Services	USEPA	National Academy of Sciences (NAS)	as a Water Quality Criterion (16)	as a Water Quality Criterion (17)	System (IRIS)			
pH	6.5 to 8.5 unts										
Phosphorus				0.1 (23)					(D)		
Radioactivity, Gross Alpha		zero							(A)		
Radioactivity, Gross Beta		zero							0.04 mrem/yr (A,14)		
Radium 226 + 228		zero (13)							0.22–0.26 pCi/l (A,14)		
Selenium		50				35					20
Settleable solids											
Silver				100 (14)		35			(D)		
Sodium				2,000 (24)							
Strontium-90									(A)		
Sulfate	250,000	400,000 - 500,000 (13)									
Total dissolved solids (TDS)	500,000										450,000
Thallium		0.5 (8)		0.4		0.5					
Tritium									(A)		
Turbidity											
Uranium		zero (13)			35				1.7 pCi/l (A)		
Zinc	5,000			2,000		2,100			(D)		2,000

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	USEPA National Ambient Water Quality Criteria									
	Health and Welfare Protection			Freshwater Aquatic Life Protection						
				Recommended Criteria				Additional Toxicity Information		
	Non-Cancer Public Health Effects	One-in-a-Million Incremental Cancer Risk Estimate	Taste & Odor or Welfare	Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)	Maximum (Instantaneous)	Acute	Chronic	Other
Ammonia				(26)		(26)				
Antimony	14 / 4300 (25)			30 (13,27)		88 (13,27)		9,000	1,600	610 (42)
Arsenic		0.018 / 0.14 (25)		190 (27)		360 (27)		850 (41)		48 (43)
Beryllium								130	5.3	
Boron										
Bromide										
Cadmium				0.55 (28,29)		1.4 (28,36)				
Chloride	250,000			230,000 (30)		860,000 (30)				
Chlorine				11 (31)		19 (31)				
Chromium (III)				98 (28,32)		820 (28,37)				
Chromium (VI)				11		16				
Chromium (total)										
Color										
Copper			1000	5.4 (28,33)		7.5 (28,38)				
Cyanide	700 / 220,000 (25)			5.2		22				
Fluoride										
Iron			300				1000			
Lead				0.99 (28,34)		25 (28,39)				
Manganese			50							
Mercury (inorganic)	0.14 / 0.15 (25)			0.012		2.4				
Nickel	610 / 4600 (25)			73 (28,35)		653 (28,40)				
Nitrate	10,000 (2)									
Oxygen, dissolved				(22)	(22)					

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	USEPA National Ambient Water Quality Criteria									
	Health and Welfare Protection			Freshwater Aquatic Life Protection						
				Recommended Criteria				Additional Toxicity Information		
	Non-Cancer Public Health Effects	One-in-a-Million Incremental Cancer Risk Estimate	Taste & Odor or Welfare	Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)	Maximum (Instantaneous)	Acute	Chronic	Other
pH			5 to 9 units				6.5 to 9.0 units			
Phosphorus										
Radioactivity, Gross Alpha										
Radioactivity, Gross Beta										
Radium 226 + 228										
Selenium				5		20				
Settleable solids										
Silver				0.12 (13)		0.84 (28,44)			0.12	
Sodium										
Strontium-90										
Sulfate			250,000							
Total dissolved solids (TDS)										
Thallium	1.7 / 6.3 (25)							1,400	40	20 (46)
Tritium										
Turbidity										
Uranium										
Zinc						54 (28,45)				

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	USEPA National Ambient Water Quality Criteria Saltwater Aquatic Life Protection						California Ocean Plan Numerical Water Quality Objectives					
	Recommended Criteria			Additional Toxicity Information			Human Health Protection (30-day Average) "‡" = carcinogen	Marine Aquatic Life Protection				
	Continuous Concentration (4-day Average)	Maximum Concentration (1-hour)	Maximum (Instantaneous)	Acute	Chronic	Other		6-month Median	30-day Average	7-day Average	Daily Maximum	Instantaneous Maximum
Ammonia	35 (47)	233 (47)						600 (2)			2,400 (2)	6,000 (2)
Antimony	500 (13,27)	1,500 (13,27)					1,200					
Arsenic	36 (27)	69 (27)		2,319 (41)		13 (43)		8			32	80
Beryllium							0.033 ‡					
Boron												
Bromide												
Cadmium	9.3	43						1			4	10
Chloride												
Chlorine	7.5 (48)	13 (48)						2 (3)			8 (3)	60 (3)
Chromium (III)				10,300 (49)			190,000					
Chromium (VI)	50	1,100						2 (4)			8 (4)	20 (4)
Chromium (total)								2 (4)			8 (4)	20 (4)
Color												
Copper	2.9	2.9						3			12	30
Cyanide	1	1						1			4	10
Fluoride												
Iron												
Lead	5.6	140						2			8	20
Manganese			100									
Mercury (inorganic)	0.025	2.1						0.04			0.16	0.4
Nickel	8.3	75						5			20	50
Nitrate												
Oxygen, dissolved												

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

Table C-1. WATER QUALITY CRITERIA - INORGANIC CONSTITUENTS

Inorganic Constituent	USEPA National Ambient Water Quality Criteria Saltwater Aquatic Life Protection						California Ocean Plan Numerical Water Quality Objectives					
	Recommended Criteria			Additional Toxicity Information			Human Health Protection	Marine Aquatic Life Protection				
	Continuous Concentration (4-day Average)	Maximum Concentration (1-hour)	Maximum (Instantaneous)	Acute	Chronic	Other	(30-day Average) "‡" = carcinogen	6-month Median	30-day Average	7-day Average	Daily Maximum	Instantaneous Maximum
pH			6.5 to 8.5 units									6.0 to 9.0 units
Phosphorus			0.1 (50)									
Radioactivity, Gross Alpha												15 pCi/l (12)
Radioactivity, Gross Beta												50 pCI/l
Radium 226 + 228												5 pCi/l
Selenium	71	300						15			60	150
Settleable solids									1,000	1,500		3,000
Silver	0.92 (13)	2.3						0.7			2.8	7
Sodium												
Strontium-90												8 pCi/l
Sulfate												
Total dissolved solids (TDS)												
Thallium				2,130			14					
Tritium												20,000 pCi/l
Turbidity									75 NTU	100 NTU		225 NTU
Uranium												20 pCi/l
Zinc	86	95						20			80	200

Table C-1 -- Values are in ug/l (ppb) unless otherwise indicated. Numbers in parenthesis indicate endnotes following the tables.

ENDNOTES FOR TABLE C-1 - INORGANICS

(7-day)	For exposure of 7 days or less.
(10-day)	For exposure of 10 days or less.
(24-hr)	For exposure of 24 hours or less.
(7-yr)	For "longer-term" exposure (7 years or less, EPA).
(A)	Known human carcinogen; sufficient epidemiologic evidence in humans.
(B)	Probable human carcinogen; sufficient evidence from animal studies; no or inadequate human data.
(C)	Possible human carcinogen; limited evidence from animal studies; no human data.
(D)	Not classified as to human carcinogenicity; no data or inadequate evidence.
(E)	Evidence of non-carcinogenicity for humans.
(1)	Or as noted in the California Ocean Plan (Reference 28)
(2)	Expressed as nitrogen.
(3)	For total chlorine residual; for intermittent chlorine sources see Reference 26, Chapter IV, Table B.
(4)	Value developed for chromium VI; may be applied to total chromium if valence unknown.
(5)	MCL varies with air temperature; 2.4 mg/l (S 53.7 °F); 2.2 mg/l (53.8 – 58.3 °F); 2.0 mg/l (58.4 – 63.8 °F); 1.8 mg/l (63.9 – 70.6 °F); 1.6 mg/l (70.0 – 79.2 °F); 1.4 mg/l (79.3 – 90.5 °F).
(6)	As NO_3.
(7)	Recommended level; Upper level = 500 mg/l; Short-term level = 600 mg/l.
(8)	Effective 17 January 1994.
(9)	MCL includes this "Action level", to be exceeded in no more than 10 percent of samples.
(10)	As nitrogen; in addition, MCL for total nitrate and nitrite = 10,000 μg/l (as N).
(11)	Recommended level; Upper level = 1,000; Short-term level = 1,500 mg/l.
(12)	Includes Radium 226 but excludes Radon and Uranium.
(13)	Proposed.
(14)	Draft / tentative / provisional.
(15)	Calculated for child / for adult
(16)	Assumes 70 kg body weight, 2 liters/day water consumption, and 20% relative source contribution. An additional uncertainty factor of 10 is used for Class C carcinogens.
(17)	Assumes 70 kg body weight and 2 liters/day water consumption.
(18)	Determined not to pose a risk of cancer through ingestion (Title 22, CCR, Division 2).
(19)	Regulatory dose level divided by 2 liters per day average consumption; represents a 1-in-100,000 incremental cancer risk estimate unless otherwise noted.
(20)	Based on reproductive toxicity
(21)	Reference 19 unless noted otherwise.
(22)	See Reference 16.
(23)	For white phosphorus.
(24)	Guidance level (Reference 3) assumes relative source contribution of 10% from drinking water.
(25)	For consumption of water and aquatic organisms / for consumption of aquatic organisms only.
(26)	Varies with pH and temperature.
(27)	For the trivalent form.
(28)	Value based on hardness of 40 mg/l; value increases with increasing hardness.
(29)	For hardness in mg/l as CaCO3, criterion = e(0.7852 [ln (hardness)] −3.490) μg/l.
(30)	For dissolved chloride associated with sodium; criterion probably will not be adequately protective when chloride is associated with potassium, calcium, or magnesium, rather than sodium.
(31)	For total residual chlorine.
(32)	For hardness in mg/l as CaCO3, criterion = e(0.8190 [ln (hardness)] + 1.561) μg/l.
(33)	For hardness in mg/l as CaCO3, criterion = e(0.8545 [ln (hardness)] − 1.465) μg/l.
(34)	For hardness in mg/l as CaCO3, criterion = e(1.273 [ln (hardness)] − 4.705) μg/l.
(35)	For hardness in mg/l as CaCO3, criterion = e(0.8460 [ln (hardness)] + 1.1645) μg/l.
(36)	For hardness in mg/l as CaCO3, criterion = e(1.128 [ln (hardness)] − 3.828) μg/l.
(37)	For hardness in mg/l as CaCO3, criterion = e(0.8190 [ln (hardness)] + 3.688) μg/l.
(38)	For hardness in mg/l as CaCO3, criterion = e(0.9422 [ln (hardness)] − 1.464) μg/l.
(39)	For hardness in mg/l as CaCO3, criterion = e(1.273 [ln (hardness)] − 1.460) μg/l.
(40)	For hardness in mg/l as CaCO3, criterion = e(0.8460 [ln (hardness)] + 3.3612) μg/l.
(41)	For the pentavalent form.
(42)	Toxicity to algae occurs.
(43)	Based on reproductive toxicity.
(44)	For hardness in mg/l as $CaCO_3$, criterion = e(1.72 [ln (hardness)] −6.52) μg/l.
(45)	For hardness in mg/l as $CaCO_3$, criterion = e(0.8473 [ln (hardness)] + 0.8604) μg/l.
(46)	Toxicity to one species of fish after 2,600 hours of exposure.
(47)	Unionized ammonia concentrations.
(48)	For sum of chlorine-produced oxidants.
(49)	EC50 for eastern oyster embryos.
(50)	For elemental phosphorus; marine or estuarine.

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	BASIN PLAN				Drinking Water Standards (California & Federal) Maximum Contaminant Levels (MCLs)					California Recommended Public Health Level (RPHL) Department of Health Services	California State Action Levels Department of Health Services		Other Taste and Odor Thresholds	Health Advisories or Suggested No-Adverse Response Levels (SNARLS) for toxicity other than cancer risk	
	Ocean Waters (1) ‡ = carcinogen	Bays and Estuaries	Inland Surface Waters and Ground Waters		California Dept. of Health Services		US Environmental Protection Agency							USEPA	National Academy of Sciences
			Primary MCL	Secondary MCL	Primary MCL	Secondary MCL	Primary MCL	Secondary MCL	MCL Goal		Toxicity	Taste & Odor			
Acenaphthylene	0.0088 ‡ (2)														
Acenaphthylene	220														
Acrylonitrile	0.10 ‡													1 / 4 (7-yr,13,14)	
Aldrin	0.000022 ‡										0.05 (LOQ)			0.3 (10-day,14)	
Anthracene	0.0088 ‡ (2)														
Atrazine			3		3		3		3	3 (11)				3	150
Bentazon			18		18					18 (11)				20	
Benz(a)anthracene	0.0088 ‡ (2)						0.1 (11)		zero (11)						
Benzene	5.9 ‡		1		1		5		zero	0.35 (11)				200 (10-day)	
Benzidine	0.000069 ‡														
Benzo(b)fluoranthene	0.0088 ‡ (2)						0.2 (11)		zero (11)						
Benzo(k)fluoranthene	0.0088 ‡ (2)						0.2 (11)		zero (11)						
Benzo(g,h,i)perylene	0.0088 ‡ (2)														
Benzo(a)pyrene	0.0088 ‡ (2)						0.2 (12)		zero (12)						
alpha-BHC	0.008 (3)										0.7				500 (7-day,3)
beta-BHC	0.008 (3)										0.3				500 (7-day,3)
Gamma-BHC (Lindane)	0.008 (3)		4		4		0.2		0.2					0.2	500 (7-day,3)
delta-BHC	0.008 (3)														500 (7-day,3)
technical-BHC	0.008 (3)														500 (7-day)
Bis(2-chloroethoxy) methane	4.4														
Bis(2-chloroethyl) ether	0.045 ‡														
Bis(2-chloroisopropyl) ether	1200													300	
Bromodichloromethane	130 ‡ (4)		100 (10)		100 (10)		100 (10)							400 / 1,300 (7-yr,13,14)	
Bromoform	130 ‡ (4)		100 (10)		100 (10)		100 (10)							2,000 (10-day)	
Bromomethane	130 ‡ (4)													10	
Carbofuran			18		18		40		40	18 (11)				40	
Carbon tetrachloride	0.90 ‡		0.5		0.5		5		zero	0.5 (11)				200 (10-day)	200 (7-day)
Catechol	30 (5)														2,200 (24-hr)
Chlordane	0.000023 ‡ (6)		0.1		0.1		2		zero	0.03 (11)				60 (10-day)	
Chlorobenzene	570		30		30		100		100	30 (11)				100	
4-Chloro-m-cresol	1 (7)														
4-Chloro-o-cresol	1 (7)														
6-Chloro-m-cresol	1 (7)														
Chloroform	130 ‡		100 (10)		100 (10)		100 (10)							4,000 (10-day)	
Chloromethane	130 ‡ (4)													3	
2-Chlorophenol	1 (7)													40 (14)	
3-Chlorophenol	1 (7)														
4-Chlorophenol	1 (7)														
Chrysene	0.0088 ‡ (2)						0.2 (11)		zero (11)						
2,4-D			100		100		70		70					70	87.5
DBCP			0.2		0.2		0.2		zero	0.002 (11)				50 (10-day)	
DDD	0.00017 ‡ (8)														
DDE	0.00017 ‡ (8)														
DDT	0.00017 ‡ (8)														
Dibenz(a,h)anthracene	0.0088 ‡ (2)						0.3 (11)		zero (11)						
Dibromochloromethane	130 ‡ (4)		100 (10)		100 (10)		100 (10)							60 (14)	18,000 (24-hr)
Dibutyl phthalate	3,500														770
1,2-Dichlorobenzene	5,100 (9)						600	10 (11)	600		130 (9)	10		600	300 (15)
1,3-Dichlorobenzene	5,100 (9)						600		600		130 (9)	20		600	

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	BASIN PLAN				Drinking Water Standards (California & Federal) Maximum Contaminant Levels (MCLs)					California Recommended Public Health Level (RPHL) Department of Health Services	California State Action Levels Department of Health Services		Other Taste and Odor Thresholds	Health Advisories or Suggested No-Adverse Response Levels (SNARLS) for toxicity other than cancer risk	
	Ocean Waters (1) ‡ = carcinogen	Bays and Estuaries	Inland Surface Waters and Ground Waters		California Dept. of Health Services		US Environmental Protection Agency							USEPA	National Academy of Sciences
			Primary MCL	Secondary MCL	Primary MCL	Secondary MCL	Primary MCL	Secondary MCL	MCL Goal		Toxicity	Taste & Odor			
1,4-Dichlorobenzene	18 ‡		5		5		75	5 (11)	75	5 (11)				75	94 (15)
3,3'-Dichlorobenzidine	0.0081 ‡														
1,1-Dichloroethane			5		5					5 (11)					
1,2-Dichloroethane	130 ‡		0.5		0.5		5		zero	0.3 (11)				700 (10-day)	
1,1-Dichloroethylene	7,100		6		6		7		7	6 (11)				7	100
cis-1,2-Dichloroethylene			6		6		70		70	6 (11)				70	
trans-1,2-Dichloroethylene			10		10		100		100	10 (11)				100	
Dichloromethane	450 ‡						5 (12)		zero (12)		40			2,000 (10-day)	5000 (7-day)
2,3-Dichlorophenol	1 (7)														
2,4-Dichlorophenol	1 (7)													20	2000 / 7000 (13)
2,5-Dichlorophenol	1 (7)														
2,6-Dichlorophenol	1 (7)														
3,4-Dichlorophenol	1 (7)														
1,2-Dichloropropane			5		5		5		zero	5 (11)				90 (10-day)	
1,3-Dichloropropene	8.9 ‡		0.5		0.5					0.2 (11)				30 (10-day)	
Dieldrin	0.000040 ‡										0.05 (LOQ)			0.5 (10-day)	
Di(2-ethylhexyl)phthalate	3.5 ‡		4		4		6 (12)		zero (12)	4 (11)					4,200
Diethyl phthalate	33,000								5,000 (11)					5,000	
2,4-Dimethylphenol	30 (5)											400			
Dimethyl phthalate	820,000														
4,6-Dinitro-o-cresol	30 (5)														
Dinitrophenol															110
2,4-Dinitrophenol	4														110
2,4-Dinitrotoluene	2.6 ‡													500 (10-day)	
1,2-Diphenylhydrazine	0.16 ‡														
Endosulfan	9 (16)														
Endosulfan sulfate	9 (16)														
Endrin	0.002		0.2		0.2		2 (12) / 0.2		2 (12)					2	
Ethylbenzene	4,100		680		680		700	30 (11)	700	680 (11)			29 (18)	700	
Ethylene dibromide (EDB)			0.02		0.02		0.05		zero	0.01 (11)				8 (10-day)	
Fluoranthene	15														
Fluorene	0.0088 ‡ (2)														
Glyphosate			700		700		700 (12)		700 (12)	700 (11)				700	
Heptachlor	0.00072 ‡ (17)		0.01		0.01		0.4		zero	0.01 (11)				10 (10-day)	
Heptachlor epoxide	0.00072 ‡ (17)		0.01		0.01		0.2		zero	0.007 (11)				0.1 (7-yr)	
Hexachlorobenzene	0.00021 ‡						1 (12)		zero (12)					50 (10-day)	30 (7-day)
Hexachlorobutadiene	14 ‡													1	
Hexachlorocyclopentadiene	58						50 (12)	8 (11)	50 (12)						
Hexachloroethane	2.5 ‡													1	
Indeno(1,2,3-c,d)pyrene	0.0088 ‡ (2)						0.4 (11)		zero (11)						
Isophorone	150,000													100	
Methanes, halo-	130 ‡ (4)						100 (10)								
Methoxychlor			100		100		40		40					40	700
Molinate			20		20					20 (11)					
Nitrobenzene	4.9														5 (7-day)
2-Nitrophenol	30 (5)														290 (7-day,19)
Nitrophenol	30 (5)														290 (7-day)
4-Nitrophenol	30 (5)													60 (14)	290 (7-day,19)

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	BASIN PLAN				Drinking Water Standards (California & Federal) Maximum Contaminant Levels (MCLs)					California Recommended Public Health Level (RPHL) Department of Health Services	California State Action Levels Department of Health Services		Other Taste and Odor Thresholds	Health Advisories or Suggested No-Adverse Response Levels (SNARLS) for toxicity other than cancer risk	
	Ocean Waters (1) ‡ = carcinogen	Bays and Estuaries	Inland Surface Waters and Ground Waters		California Dept. of Health Services		US Environmental Protection Agency							USEPA	National Academy of Sciences
			Primary MCL	Secondary MCL	Primary MCL	Secondary MCL	Primary MCL	Secondary MCL	MCL Goal		Toxicity	Taste & Odor			
N-Nitrosodimethylamine	7.3 ‡														
N-Nitrosodiphenylamine	2.5 ‡														
trans-Nonachlor	0.000023 ‡ (6)														
Oil & grease	25,000														
Oxychlordane	0.000023 ‡ (6)														
PAHs	0.0088 ‡ (2)						see individual chemicals		see individual chemicals					see individual chemicals	
Pentachlorophenol	1 (7)						1		zero		30			300 (10-day)	6 / 21 (13)
Phenanthrene	0.0088 ‡ (2)														
Phenol	30 (5)											5.0 (22)		4000	
Phenols, chlorinated	1														
Phenols, nitro-	30 (5)														
Phenols, non-chlorinated	30														
Phthalate esters			see individual chemicals		see individual chemicals		see individual chemicals		see individual chemicals					see individual chemicals	see individual chemicals
Phenanthrene	0.0088 ‡ (2)		1												
Phenazopyridine			1												
Phenazopyridine hydrochloride			1												
Phenesterin			1												
Phenobarbital			1												
Phenol	30 (5)		1									5.0 (22)		4,000	
Phenols, chlorinated	1		1												
Phenols, nitro-	30 (5)		1												
Phenols, non-chlorinated	30		1												
Phenoxybenzamine			1												
Phenoxybenzamine hydrochloride			1												
Phenyl glycidyl ether			1												
o-Phenylphenate, sodium			1												
Polychlorinated biphenyls	0.000019 ‡						0.5 (21)		zero (21)						50 (7-day)
Pyrene	0.0088 ‡ (2)														
Resorcinol	30 (5)														500 (7-day)
Simazine			10		10		4 (12)		4 (12)					4	1,505
2,3,7,8-TCDD (Dioxin)	0.0000000039 ‡ (20)						0.00003 (12)		zero (12)					0.0001 (10-day)	0.0007
1,1,2,2-Tetrachloroethane	1,200		1		1					1 (11)					
Tetrachloroethylene (PCE)	99 ‡		5		5		5		zero	0.7 (11)				2,000 (10-day)	
2,3,4,6-Tetrachlorophenol	1 (7)														
2,3,5,6-Tetrachlorophenol	1 (7)														
Thiobencarb			70	1	70	1				70 (11)					
Toluene	85,000						1,000	40 (11)	1,000		100		42 (18)	1,000	340
Toxaphene	0.00021 ‡		5		5		3		zero					40 (10-day)	8.75
2,4,5-TP (Silvex)			10		10		50		50					50	5.25
Tributyltin	0.0014														
1,1,1-Trichloroethane	540,000		200		200		200		200	200 (11)				200	3800
1,1,2-Trichloroethane	43,000		32		32		5 (12)		3 (12)					3	
Trichloroethylene (TCE)	27 ‡		5		5		5		zero	2.5 (11)					
Trichlorofluoromethane			150		150					150 (11)				2,000	8,000 (7-day)
2,4,5-Trichlorophenol	1 (7)														
2,4,6-Trichlorophenol	0.29 ‡														2,500 (7-day)
1,1,2-Trichloro-1,2,2-trifluoroethane			1,200		1,200					1,200 (11)					
Trinitrophenol	30 (5)														200 (7-day)
Vinyl chloride	36 ‡		0.5		0.5		2		zero	0.15 (11)				3,000 (10-day)	
Xylene(s)			1,750		1,750		10,000	20 (11)	10,000	1,750 (11)			17 (18)	10,000	

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	USEPA Integrated Risk Information System (IRIS) Reference Dose as a Water Quality Criterion (23)	One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water				California Proposition 65 Regulatory Level as a Water Quality Criterion	Agricultural Water Quality Goals (28)	USEPA National Ambient Water Quality Criteria					
								Health and Welfare Protection			Freshwater Aquatic Life Protection Recommended Criteria		
		Cal/EPA Cancer Potency Factor as a Water Quality Criterion (23)	USEPA Integrated Risk Information System (IRIS)	USEPA Health Advisory or SNARL	National Academy of Sciences (NAS) Drinking Water and Health			Non-Cancer Public Health Effects	One-in-a-Million Incremental Cancer Risk Estimate	Taste and Odor or Welfare	Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)
Acenaphthylene													
Acenaphthylene				(C)				320 / 780 (29)					
Acrylonitrile		0.035	0.07	0.07 (B1)	0.38	0.35			0.059 / 0.66 (29)				
Aldrin		0.0021	0.002	0.002 (B2,14)	0.003	0.02			0.00013 / 0.00014 (29)				
Anthracene	2,100			(D)				9,600 / 110,000 (29)					
Atrazine	3.5		0.14	(C)				25 (30)					
Bentazon	18			(D)									
Benz(a)anthracene				(B2)					0.0028 / 0.031 (32)				
Benzene		0.35	1	1.0 (A)		3.5			1.2 / 71 (29)				
Benzidine		0.00007		(A)		0.0005			0.00012 / 0.00054 (29)				
Benzo(b)fluoranthene				(B2)					0.0028 / 0.031 (32)				
Benzo(k)fluoranthene				(B2)					0.0028 / 0.31 (32)				
Benzo(g,h,i)perylene				(D)									
Benzo(a)pyrene		0.0029	0.003	(B2)		0.03			0.0028 / 0.031 (32)				
alpha-BHC					0.33	0.15			0.0039 / 0.013 (29)				
beta-BHC					0.12	0.25			0.014 / 0.046 (29)				
Gamma-BHC (Lindane)	0.2	0.032		0.03 (C)	0.054	0.3			0.019 / 0.063 (29)			0.08	
delta-BHC													
technical-BHC		0.0088				0.1			0.0123				
Bis(2-chloroethoxy) methane													
Bis(2-chloroethyl) ether		0.014			0.42	0.15			0.031 / 1.4 (29)				
Bis(2-chloroisopropyl) ether	280			(D)				1,400 / 170,000 (29)					
Bromodichloromethane		0.27	1.4	0.6 (B2,14)		2.5			0.27 / 22 (29)				
Bromoform			4	4 (B2,14)					4.3 / 360 (29)				
Bromomethane	7			(D)				48 / 4,000 (29)					
Carbofuran	35			(E)									
Carbon tetrachloride		0.23	0.3	0.3 (B2)	4.5	2.5			0.25 / 4.4 (29)				
Catechol													
Chlordane		0.029 / 0.027	0.03	0.03 (B2)	0.028	0.25			0.00057 / 0.00059 (29)			0.0043	
Chlorobenzene	140			(D)	2.3 (25)			680 / 21,000 (29)		20			
4-Chloro-m-cresol										3,000			
4-Chloro-o-cresol										1,800			
6-Chloro-m-cresol										20			
Chloroform		1.1 / 0.43	6	6.0 (B2,14)	0.26 / 5.6 (26)	10			5.7 / 470 (29)				
Chloromethane	2.8			(C)									
2-Chlorophenol	35			(D)						0.1			
3-Chlorophenol										0.1			
4-Chlorophenol										0.1			
Chrysene				(B2)					0.0028 / 0.31 (32)				
2,4-D	70			(D)				100					
DBCP		0.005	0.03	0.03 (B2)	0.051	0.05			0.025				
DDD		0.15				1 (8)			0.00083 / 0.00084 (29)				
DDE		0.1				1 (8)			0.00059 / 0.00059 (29)				
DDT		0.1	0.1	(B2)	0.042	1 (8)			0.00059 / 0.00059 (29)			0.0010	
Dibenz(a,h)anthracene				(B2)		0.1			0.0028 / 0.031 (32)				
Dibromochloromethane	14			(C)	0.6	3.5			0.41 / 34 (29)				
Dibutyl phthalate	700			(D)				2700 / 12,000 (29)					
1,2-Dichlorobenzene	620			(D)				2700 / 17,000 (29)					
1,3-Dichlorobenzene	620			(D)				400 / 2,600 (31)					

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	USEPA Integrated Risk Information System (IRIS) Reference Dose as a Water Quality Criterion (23)	One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water				California Proposition 65 Regulatory Level as a Water Quality Criterion	Agricultural Water Quality Goals (28)	USEPA National Ambient Water Quality Criteria					
								Health and Welfare Protection			Freshwater Aquatic Life Protection Recommended Criteria		
		Cal/EPA Cancer Potency Factor as a Water Quality Criterion (23)	USEPA Integrated Risk Information System (IRIS)	USEPA Health Advisory or SNARL	National Academy of Sciences (NAS) Drinking Water and Health			Non-Cancer Public Health Effects	One-in-a-Million Incremental Cancer Risk Estimate	Taste and Odor or Welfare	Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)
1,4-Dichlorobenzene	70	0.88		(C)		10		400 / 2,600 (31)					
3,3'-Dichlorobenzidine		0.029				0.3			0.04 / 0.077 (29)				
1,1-Dichloroethane						50							
1,2-Dichloroethane		0.5	0.4	0.4 (B2)	0.71	5			0.38 / 99 (29)				
1,1-Dichloroethylene	6.3		0.06	0.06 (C)					0.057 / 3.2 (29)				
cis-1,2-Dichloroethylene	70			(D)									
trans-1,2-Dichloroethylene	140			(D)									
Dichloromethane		2.5	5	5 (B2)		25			4.7 / 1,600 (29)				
2,3-Dichlorophenol										0.04			
2,4-Dichlorophenol	21			(D)				93 / 790 (29)		0.3			
2,5-Dichlorophenol										0.5			
2,6-Dichlorophenol										0.2			
3,4-Dichlorophenol										0.3			
1,2-Dichloropropane		0.56	0.5	0.5 (B2)									
1,3-Dichloropropene		0.19	0.2	0.2 (B2)	0.45			10 / 1,700 (29)					
Dieldrin		0.0022	0.002	0.002 (B2)	0.0019	0.02			0.00014 / 0.00014 (29)			0.0019	
Di(2-ethylhexyl)phthalate		4.2	3	3 (B2)	2.4	40			1.8 / 5.9 (29)		360 (11)		400 (11)
Diethyl phthalate	5,600			(D)				23,000 / 120,000 (29)					
2,4-Dimethylphenol	140									400			
Dimethyl phthalate				(D)				313,000 / 2,900,000(29)					
4,6-Dinitro-o-cresol								13.4 / 765 (29)					
Dinitrophenol								70					
2,4-Dinitrophenol								70 / 14,000 (29)					
2,4-Dinitrotoluene		0.11	50	0.05 (B2)		1			0.11 / 9.1 (29)				
1,2-Diphenylhydrazine						0.4			0.040 / 0.54 (29)				
Endosulfan								0.93 / 2.0 (29)				0.056	
Endosulfan sulfate								0.93 / 2.0 (29)				0.056 (35)	
Endrin	2.1			(D)				0.76 / 0.81 (33,29)				0.0023	
Ethylbenzene	700			(D)				3,100 / 29,000 (29)					
Ethylene dibromide (EDB)		0.0097	0.0004	0.0004 (B2)	0.055	0.1							
Fluoranthene				(D)				300 / 370 (29)					
Fluorene	280			(D)				1,300 / 14,000 (29)					
Glyphosate	700			(D)									
Heptachlor		0.0061 / 0.0078	0.008	0.008 (B2)	0.012	0.1			0.00021 / 0.00021 (29)			0.0038	
Heptachlor epoxide		0.0027 / 0.0038	0.004	0.004 (B2)		0.04			0.00010 / 0.00011 (29)			0.0038	
Hexachlorobenzene		0.019		0.02 (B2)	0.017	0.2			0.00075 / 0.00077 (29)		3.68 (11)		6 (11)
Hexachlorobutadiene	1.4			(C)					0.44 / 50 (29)				
Hexachlorocyclopentadiene	49			(D)				240 / 17,000 (29)		1			
Hexachloroethane				(C)		10			1.9 / 8.9 (29)				
Indeno(1,2,3-c,d)pyrene				(B2)					0.0028 / 0.031 (32,29)				
Isophorone	140			40 (C)					8.4 / 600 (29)				
Methanes, halo-													
Methoxychlor	35			(D)				100					
Molinate	14												
Nitrobenzene								17 / 1,900 (29)		30			
2-Nitrophenol													
Nitrophenol													
4-Nitrophenol				(D)									

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	USEPA Integrated Risk Information System (IRIS) Reference Dose as a Water Quality Criterion (23)	One-in-a-Million Incremental Cancer Risk Estimates for Drinking Water				California Proposition 65 Regulatory Level as a Water Quality Criterion	Agricultural Water Quality Goals (28)	USEPA National Ambient Water Quality Criteria					
								Health and Welfare Protection			Freshwater Aquatic Life Protection Recommended Criteria		
		Cal/EPA Cancer Potency Factor as a Water Quality Criterion (23)	USEPA Integrated Risk Information System (IRIS)	USEPA Health Advisory or SNARL	National Academy of Sciences (NAS) Drinking Water and Health			Non-Cancer Public Health Effects	One-in-a-Million Incremental Cancer Risk Estimate	Taste and Odor or Welfare	Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)
N-Nitrosodimethylamine		0.0022				0.02			0.00069 / 8.1 (29)				
N-Nitrosodiphenylamine		3.9				40			5.0 / 16 (29)				
trans-Nonachlor													
Oil & grease													
Oxychlordane													
PAHs									0.0028 / 0.31 (29)				
Pentachlorophenol		1.9	0.3	0.3 (B2)		20			0.28 / 8.2 (29)	30	(34)		(36)
Phenanthrene											6.3 (11)		30 (11)
Phenol	4,200			(D)				21,000 / 4,600,000 (29)		300			
Phenols, chlorinated													
Phenols, nitro-													
Phenols, non-chlorinated													
Phthalate esters				see individual chemicals		see individual chemicals		see individual chemicals					
Phenanthrene											6.3 (11)		30 (11)
Phenazopyridine						2							
Phenazopyridine hydrochloride						2.5							
Phenesterin						0.0025							
Phenobarbital						1							
Phenol	4,200			(D)				21,000 / 4,600,000 (29)		300			
Phenols, chlorinated													
Phenols, nitro-													
Phenols, non-chlorinated													
Phenoxybenzamine						0.1							
Phenoxybenzamine hydrochloride						0.15							
Phenyl glycidyl ether						2.5 (11)							
o-Phenylphenate, sodium						100							
Polychlorinated biphenyls		0.0045	0.005	0.005 (B2)	0.16 (37)	0.045			0.000044/0.000045(29)			0.014	
Pyrene	210 (14)			(D)				960 / 11,000 (29)					
Resorcinol													
Simazine	3.5			(C)									
2,3,7,8-TCDD (Dioxin)		0.00000027	0.0000002	0.0000002 (B2)		0.0000025			1.3E–8 / 1.4E–8 (29)				
1,1,2,2-Tetrachloroethane				(C)		1.5			0.17 / 11 (29)				
Tetrachloroethylene (PCE)		0.69	0.7	0.7 (B2)	3.6	7			0.8 / 8.85 (29)				
2,3,4,6-Tetrachlorophenol										1			
2,3,5,6-Tetrachlorophenol													
Thiobencarb													
Toluene	1,400			(D)		3,500 (38)		6,800 / 200,000 (29)					
Toxaphene		0.029	0.03	0.03 (B2)		0.3			0.00073 / 0.00075 (29)		0.0002		0.73
2,4,5-TP (Silvex)	53			(D)				10					
Tributyltin													
1,1,1-Trichloroethane	250			(D)	17 (25)								
1,1,2-Trichloroethane	2.8		0.6	0.6 (C)		5			0.60 / 42 (29)				
Trichloroethylene (TCE)		2.3 (11)	3	3 (B2)	1.5 (25)	25			2.7 / 81 (29)				
Trichlorofluoromethane	2,100			(D)					0.19				
2,4,5-Trichlorophenol								2,600		1	63 (100)		100 (11)
2,4,6-Trichlorophenol		0.5	3	3 (B2,14)		5			2.1 / 6.5 (29)	2			
1,1,2-Trichloro-1,2,2-trifluoroethane													
Trinitrophenol													
Vinyl chloride		0.13	0.015	0.015 (A)	1.1	1.5			2 / 525 (29)				
Xylene(s)	14,000			(D)									

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	USEPA Ambient Water Quality Criteria (cont.) Freshwater Aquatic Life Protection (cont.) Recommended Criteria (cont.)				California Ocean Plan Numerical Water Quality Objectives						USEPA National Ambient Water Quality Criteria Saltwater Aquatic Life Protection						
	Maximum (Instantaneous)	Additional Toxicity Information			Human Health Protection (30-day Average)	Marine Aquatic Life Protection					Recommended Criteria				Additional Toxicity Information		
		Acute	Chronic	Other	"‡" = carcinogen	6-month Median	30-day Average	7-day Average	Daily Maximum	Instantaneous Maximum	Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)	Maximum (Instantaneous)	Acute	Chronic	Other
Acenaphthylene					0.0088 ‡ (2)										300 (32)		
Acenaphthylene		68	21		220										55		
Acrylonitrile		7,550		2,600 (44)	0.10 ‡												
Aldrin	3				0.000022 ‡									1.3			
Anthracene					0.0088 ‡ (2)										300 (32)		
Atrazine	1.0 (30)																
Bentazon																	
Benz(a)anthracene					0.0088 ‡ (2)										300 (32)		
Benzene		5,300			5.9 ‡										5,100		700 (47)
Benzidine		2,500			0.000069 ‡												
Benzo(b)fluoranthene					0.0088 ‡ (2)										300 (32)		
Benzo(k)fluoranthene					0.0088 ‡ (2)										300 (32)		
Benzo(g,h,i)perylene					0.0088 ‡ (2)										300 (32)		
Benzo(a)pyrene					0.0088 ‡ (2)										300 (32)		
alpha-BHC						0.004 (3)			0.008 (3)	0.012 (3)							
beta-BHC						0.004 (3)			0.008 (3)	0.012 (3)							
Gamma-BHC (Lindane)	2.0					0.004 (3)			0.008 (3)	0.012 (3)				0.16			
delta-BHC						0.004 (3)			0.008 (3)	0.012 (3)							
technical-BHC		100				0.004 (3)			0.008 (3)	0.012 (3)					0.34		
Bis(2-chloroethoxy) methane					4.4												
Bis(2-chloroethyl) ether		238,000 (39)	122 (43)		0.045 ‡												
Bis(2-chloroisopropyl) ether		238,000 (39)	122 (43)		1200												
Bromodichloromethane		11,000 (40)			130 ‡ (4)										12,000 (40)	6,400 (40)	11,500 (40,48)
Bromoform		11,000 (40)			130 ‡ (4)										12,000 (40)	6,400 (40)	11,500 (40,48)
Bromomethane		11,000 (40)			130 ‡ (4)										12,000 (40)	6,400 (40)	11,500 (40,48)
Carbofuran																	
Carbon tetrachloride		35,200			0.90 ‡										50,000	6,400 (40)	11,500 (40,48)
Catechol						30 (5)			120 (5)	300 (5)							
Chlordane	2.4				0.000023 ‡ (6)							0.004		0.09			
Chlorobenzene		250 (41)		50 (41,45)	570										160 (41)	129 (41)	
4-Chloro-m-cresol		30				1 (7)			4 (7)	10 (7)							
4-Chloro-o-cresol						1 (7)			4 (7)	10 (7)							
6-Chloro-m-cresol						1 (7)			4 (7)	10 (7)							
Chloroform		28,900	1,240		130 ‡										12,000 (40)	6,400 (40)	11,500 (40,48)
Chloromethane		11,000 (40)			130 ‡ (4)										12,000 (40)	6,400 (40)	11,500 (40,48)
2-Chlorophenol		4,380		2,000 (46)		1 (7)			4 (7)	10 (7)							
3-Chlorophenol						1 (7)			4 (7)	10 (7)							
4-Chlorophenol						1 (7)			4 (7)	10 (7)					29,700		
Chrysene					0.0088 ‡ (2)										300 (32)		
2,4-D																	
DBCP																	
DDD		0.6			0.00017 ‡ (8)										3.6		
DDE		1,050			0.00017 ‡ (8)										14		
DDT	1.1				0.00017 ‡ (8)							0.001		0.13			
Dibenz(a,h)anthracene					0.0088 ‡ (2)										300 (32)		
Dibromochloromethane		11,000 (40)			130 ‡ (4)										12,000 (40)	6,400 (40)	11,500 (40,48)
Dibutyl phthalate		940 (42)	3 (42)		3,500										2,944 (42)		3.4 (49,42)
1,2-Dichlorobenzene		1,120 (31)	763 (31)		5,100 (9)										1,970 (31)	129 (41)	
1,3-Dichlorobenzene		1,120 (31)	763 (31)		5,100 (9)										1,970 (31)	129 (41)	

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	USEPA Ambient Water Quality Criteria (cont.) Freshwater Aquatic Life Protection (cont.) Recommended Criteria (cont.)				California Ocean Plan Numerical Water Quality Objectives						USEPA National Ambient Water Quality Criteria Saltwater Aquatic Life Protection						
						Marine Aquatic Life Protection					Recommended Criteria						
	Maximum (Instantaneous)	Additional Toxicity Information			Human Health Protection (30-day Average)						Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)	Maximum (Instantaneous)	Additional Toxicity Information		
		Acute	Chronic	Other	"‡" = carcinogen	6-month Median	30-day Average	7-day Average	Daily Maximum	Instantaneous Maximum					Acute	Chronic	Other
1,4-Dichlorobenzene		1,120 (31)	763 (31)		18 ‡										1,970 (31)	129 (41)	
3,3'-Dichlorobenzidine					0.0081 ‡												
1,1-Dichloroethane																	
1,2-Dichloroethane		118,000	20,000		130 ‡										113,000		
1,1-Dichloroethylene		11,600 (50)			7100										224,000 (50)		
cis-1,2-Dichloroethylene		11,600 (50)													224,000 (50)		
trans-1,2-Dichloroethylene		11,600 (50)													224,000 (50)		
Dichloromethane		11,600 (50)			450 ‡										12,000 (40)	6,400 (40)	11,500 (40,48)
2,3-Dichlorophenol						1 (7)			4 (7)	10 (7)							
2,4-Dichlorophenol		2,020	365	70 (56)		1 (7)			4 (7)	10 (7)							
2,5-Dichlorophenol						1 (7)			4 (7)	10 (7)							
2,6-Dichlorophenol						1 (7)			4 (7)	10 (7)							
3,4-Dichlorophenol						1 (7)			4 (7)	10 (7)							
1,2-Dichloropropane		23,000 (51)	5,700 (51)												10,300 (51)	3,040 (51)	
1,3-Dichloropropene		6,060 (52)	244 (52)		8.9 ‡										790 (52)		
Dieldrin	2.5				0.000040 ‡							0.0019		0.71			
Di(2-ethylhexyl)phthalate		940 (42)	3 (42)		3.5 ‡						360 (11)		400 (11)		2,944 (42)		3.4 (49,42)
Diethyl phthalate		940 (42)	3 (42)		33,000										2,944 (42)		3.4 (49,42)
2,4-Dimethylphenol		2120				30 (5)			120 (5)	300 (5)							
Dimethyl phthalate		940 (42)	3 (42)		820,000										2,944 (42)		3.4 (49,42)
4,6-Dinitro-o-cresol		230 (53)		150 (49,53)	220	30 (5)			120 (5)	300 (5)					4,850 (53)		
Dinitrophenol		230 (53)		150 (49,53)		30 (5)			120 (5)	300 (5)					4,850 (53)		
2,4-Dinitrophenol		230 (53)		150 (49,53)	4	30 (5)			120 (5)	300 (5)					4,850 (53)		
2,4-Dinitrotoluene		330 (54)	230 (54)		2.6 ‡										590 (54)		370 (54,48)
1,2-Diphenylhydrazine		270 (9)			0.16 ‡												
Endosulfan	0.22					9 (16)			18 (16)	27 (16)		0.0087		0.034			
Endosulfan sulfate						9 (16)			18 (16)	27 (16)		0.0087 (35)					
Endrin	0.18					0.002			0.004	0.006		0.0023		0.037			
Ethylbenzene		32,000			4100										430		
Ethylene dibromide (EDB)																	
Fluoranthene		3,980			15										40	16	
Fluorene					0.0088 ‡ (2)										300 (32)		
Glyphosate																	
Heptachlor	0.52				0.00072 ‡ (17)							0.0036		0.053			
Heptachlor epoxide	0.52				0.00072 ‡ (17)							0.0036		0.053			
Hexachlorobenzene		250 (41)		50 (41,45)	0.00021 ‡										160 (41)	129 (41)	
Hexachlorobutadiene		90	9.3		14 ‡										32		
Hexachlorocyclopentadiene		7.0	5.2		58										7		
Hexachloroethane		980	540		2.5 ‡										940		
Indeno(1,2,3-c,d)pyrene					0.0088 ‡ (2)										300 (32)		
Isophorone		117,000			150,000										12,900		
Methanes, halo-		11,000			130 ‡ (4)										12,000	6,400	11,500 (48)
Methoxychlor	0.03													0.03			
Molinate																	
Nitrobenzene		27,000			4.9										6,680		
2-Nitrophenol		230 (53)		150 (49,53)		30 (5)			120 (5)	300 (5)					4,850 (53)		
Nitrophenol		230 (53)		150 (49,53)		30 (5)			120 (5)	300 (5)					4,850 (53)		
4-Nitrophenol		230 (53)		150 (49,53)		30 (5)			120 (5)	300 (5)					4,850 (53)		

Table C-2. WATER QUALITY CRITERIA - ORGANIC CONSTITUENTS

Organic Constituent	USEPA Ambient Water Quality Criteria (cont.) Freshwater Aquatic Life Protection (cont.) Recommended Criteria (cont.)				California Ocean Plan Numerical Water Quality Objectives						USEPA National Ambient Water Quality Criteria Saltwater Aquatic Life Protection						
	Maximum (Instantaneous)	Additional Toxicity Information			Human Health Protection (30-day Average)	Marine Aquatic Life Protection					Recommended Criteria				Additional Toxicity Information		
		Acute	Chronic	Other	"‡" = carcinogen	6-month Median	30-day Average	7-day Average	Daily Maximum	Instantaneous Maximum	Continuous Concentration (4-day Average)	24-hour Average	Maximum Concentration (1-hour Average)	Maximum (Instantaneous)	Acute	Chronic	Other
N-Nitrosodimethylamine		5,850 (55)			7.3 ‡										3,300,000 (55)		
N-Nitrosodiphenylamine		5,850 (55)			2.5 ‡										3,300,000 (55)		
trans-Nonachlor					0.000023 ‡ (6)												
Oil & grease							25,000	40,000		75,000							
Oxychlordane					0.000023 ‡ (6)												
PAHs					0.0088 ‡ (2)										300		
Pentachlorophenol				1.74 (57)		1 (7)			4 (7)	10 (7)	7.9		13				
Phenanthrene					0.0088 ‡ (2)						4.6 (11)		7.7 (11)		300 (32)		
Phenol		10,200	2,560			30 (5)			120 (5)	300 (5)					5,800		
Phenols, chlorinated						1			4	10							
Phenols, nitro-		230		150 (49)		30 (5)			120 (5)	300 (5)					4,850		
Phenols, non-chlorinated						30			120	300							
Phthalate esters		940	3												2,944		3.4 (49,42)
Phenanthrene					0.0088 ‡ (2)						4.6 (11)		7.7 (11)		300 (32)		
Phenazopyridine																	
Phenazopyridine hydrochloride																	
Phenesterin																	
Phenobarbital																	
Phenol		10,200	2,560			30 (5)			120 (5)	300 (5)					5,800		
Phenols, chlorinated						1			4	10							
Phenols, nitro-		230		150 (49)		30 (5)			120 (5)	300 (5)					4,850		
Phenols, non-chlorinated						30			120	300							
Phenoxybenzamine																	
Phenoxybenzamine hydrochloride																	
Phenyl glycidyl ether																	
o-Phenylphenate, sodium																	
Polychlorinated biphenyls		> 2			0.000019 ‡							0.03			>10		
Pyrene					0.0088 ‡ (2)										300 (32)		
Resorcinol						30 (5)			120 (5)	300 (5)							
Simazine	10 (58)																
2,3,7,8-TCDD (Dioxin)					0.0000000039 ‡ (20)												
1,1,2,2-Tetrachloroethane		9,320 (59)	2,400		1,200										9,020		
Tetrachloroethylene (PCE)		5,280	840		99 ‡										10,200	450	
2,3,4,6-Tetrachlorophenol						1 (7)			4 (7)	10 (7)							
2,3,5,6-Tetrachlorophenol						1 (7)			4 (7)	10 (7)					440		
Thiobencarb																	
Toluene		17,000			85,000										6,300	5,000	
Toxaphene					0.00021 ‡						0.0002		0.21				
2,4,5-TP (Silvex)																	
Tributyltin	0.026 (30)				0.0014									0.010 (30)			
1,1,1-Trichloroethane		18,000		200 (60)	540,000										31,200		
1,1,2-Trichloroethane		18,000	9,400		43,000												
Trichloroethylene (TCE)		45,000		21,900 (61)	27 ‡										2,000		
Trichlorofluoromethane		11,000 (40)													12,000 (40)	6,400 (40)	11,500 (40,48)
2,4,5-Trichlorophenol						1 (7)			4 (7)	10 (7)	11 (11)		240 (11)				
2,4,6-Trichlorophenol			970		0.29 ‡	1 (7)			4 (7)	10 (7)							
1,1,2-Trichloro-1,2,2-trifluoroethane																	
Trinitrophenol		230 (53)		150 (49,53)		30 (5)			120 (5)	300 (5)					4,850 (53)		
Vinyl chloride					36 ‡												
Xylene(s)																	

ENDNOTES FOR TABLE C-2 – ORGANICS

(7-day) For exposure of 7 days or less.
(10-day) For exposure of 10 days or less.
(24-hr) For exposure of 24 hours or less.
(7-yr) For "longer-term" exposure (7 years or less, EPA).
(A) Known human carcinogen; sufficient epidemiologic evidence in humans.
(B) Probable human carcinogen; sufficient evidence from animal studies; no or inadequate human data.
(C) Possible human carcinogen; limited evidence from animal studies; no human data.
(D) Not classified as to human carcinogenicity; no data or inadequate evidence.
(E) Evidence of non-carcinogenicity for humans.
(1) For hardness in mg/l as $CaCO_3$, criterion = e(0.8473[ln(hardness)] + 0.8604) μg/l.
(2) For sum of acenaphthylene, anthrancene, benz(a)anthrancene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, fluorene, indeno(1,2,3-c,d)pyrene, phenanthrene, and pyrene.
(3) For hardness in mg/l as $CaCO_3$, criterion = e(1.273[ln(hardness)] – 1.460) μg/l.
(4) For sum of bromoform, bromomethane, chloromethane, dibromochloromethane, and bromodichloromethane.
(5) For sum of nonchlorinated phenolic compounds.
(6) For the sum of oxychlordane and alpha and gamma isomers of chlordane, chlordene and nonachlor.
(7) For sum of chlorinated phenolic compounds.
(8) Instantaneous maximum.
(9) For sum of 1,2- and 1-3-dichlorobenzenes.
(10) From Reference 30.
(11) Proposed.
(12) Effective 17 January 1994.
(13) For hardness in mg/l as $CaCO_3$, criterion = e(0.8473[ln(hardness)] + 0.7614) μg/l.
(14) MCL varies with air temperature; 2.4 mg/l (Š 53.7°F); 2.2 mg/l (53.8 – 58.3 °F); 2.0 mg/l (58.4 – 63.8°F); 1.8 mg/l (63.9 – 70.6 °F); 1.6 mg/l (70.0 – 79.2°F); 1.4 mg/l (79.3 – 90.5 °F).
(15) Based on organoleptic considerations (taste, odor, color, laundry staining, etc.)
(16) For hardness in mg/l as CaCO3, criterion = e(1.273[ln(hardness)] – 4.705) μg/l.
(17) As $CaCO_3$; minimum concentration except where natural concentrations are less.
(18) Toxicity to algae occurs.
(19) For hardness in mg/l as $CaCO_3$, criterion = e(0.8190[ln(hardness)] + 1.561) μg/l.
(20) For "TCDD equivalents" calculated as the sum of 2,3,7,8-chlorinated dibenzodioxin and dibenzofuran concentrations multiplied by their respective USEPA Toxicity Equivalency Factors.
(21) Expressed as decachlorobiphenyl.
(22) For hardness in mg/l as $CaCO_3$, criterion = e(0.8190 [ln(hardness)] + 3.688) μg/l.
(23) Assumes 70 kg body weight, 2 liters/day water consumption, and 20% relative source contribution. An additional uncertainty factor of 10 is used for Class C carcinogens.
(24) Assumes 70 kg body weight and 2 liters/day water consumption.
(25) For sum of dichloropropanes.
(26) Draft / tentative / provisional.
(27) For sum of halomethanes.
(28) Reference 19 unless noted otherwise.
(29) For the sum of oxychlordane and alpha and gamma isomers of chlordane, chlordene and nonachlor.
(30) For hardness in mg/l as $CaCO_3$, criterion = e(0.7852[ln(hardness)] – 3.490) μg/l.
(31) For hardness in mg/l as $CaCO_3$, criterion = e(1.128[ln(hardness)] – 3.828) μg/l.
(32) For hardness in mg/l as $CaCO_3$, criterion = e(0.9422[ln(hardness)] – 1.464) μg/l.
(33) For sum of dichlorobenzenes.
(34) For total trihalomethanes (sum of bromoform, bromodichloromethane, chloroform and dibromochloromethane); based largely on technology and economics.
(35) Based on endosulfan; USEPA Water Quality Advisory (Reference 13).
(36) Determined not to pose a risk of cancer through ingestion (Title 22, CCR, Division 2).
(37) Includes Radium 226 but excludes Radon and Uranium.
(38) Pentavalent arsenic [As(V)] effects on plants.
(39) Recommended level; Upper level = 500 mg/l; Short-term level = 600 mg/l.
(40) For sum of dichloroethylenes.
(41) For sum of dichloropropenes.
(42) As NO_3.
(43) Effective 17 January 1994.
(44) Toxicity to a fish species exposed for 7.5 days.
(45) Adverse behavioral effects occur to one species.
(46) For hardness in mg/l as $CaCO_3$, criterion = e(1.72 [ln(hardness)] – 6.52) μg/l.
(47) Adverse effects on a fish species exposed for 168 days.
(48) A decrease in the number of algal cells occurs.
(49) Guidance level (Reference 3) assumes reletive source contribution of 10% from drinking water.
(50) For chlorinated systems.
(51) For white phosphorus.
(52) For sum of carcinogenic polynuclear aromatic hydrocarbons.
(53) For sum of nitrophenols.
(54) For hardness in mg/l as $CaCO_3$, criterion = e(0.8460[ln(hardness)] + 3.3612) μg/l.
(55) For total chlorine residual; for intermittent chlorine sources see Reference 26, Chapter IV, Table B.
(56) For consumption of water and aquatic organisms / for consumption of aquatic organisms only.
(57) MCL includes this "Action level," to be exceeded in no more than 10 percent of samples.
(58) For sum of nonchlorinated phenolic compounds.
(59) Recommended level; Upper level = 1,000; Short-term level = 1,500 mg/l.
(60) For sum of tetrachloroethanes.
(61) Calculated from corn oil gavage animal study / from drinking water animal study.

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22. U.S. Environmental Protection Agency, Federal Register, Volume 57, No. 246 (Tuesday, 22 December 1992).

23. U.S. Environmental Protection Agency, "Ambient Water Quality Criteria" documents (various dates).

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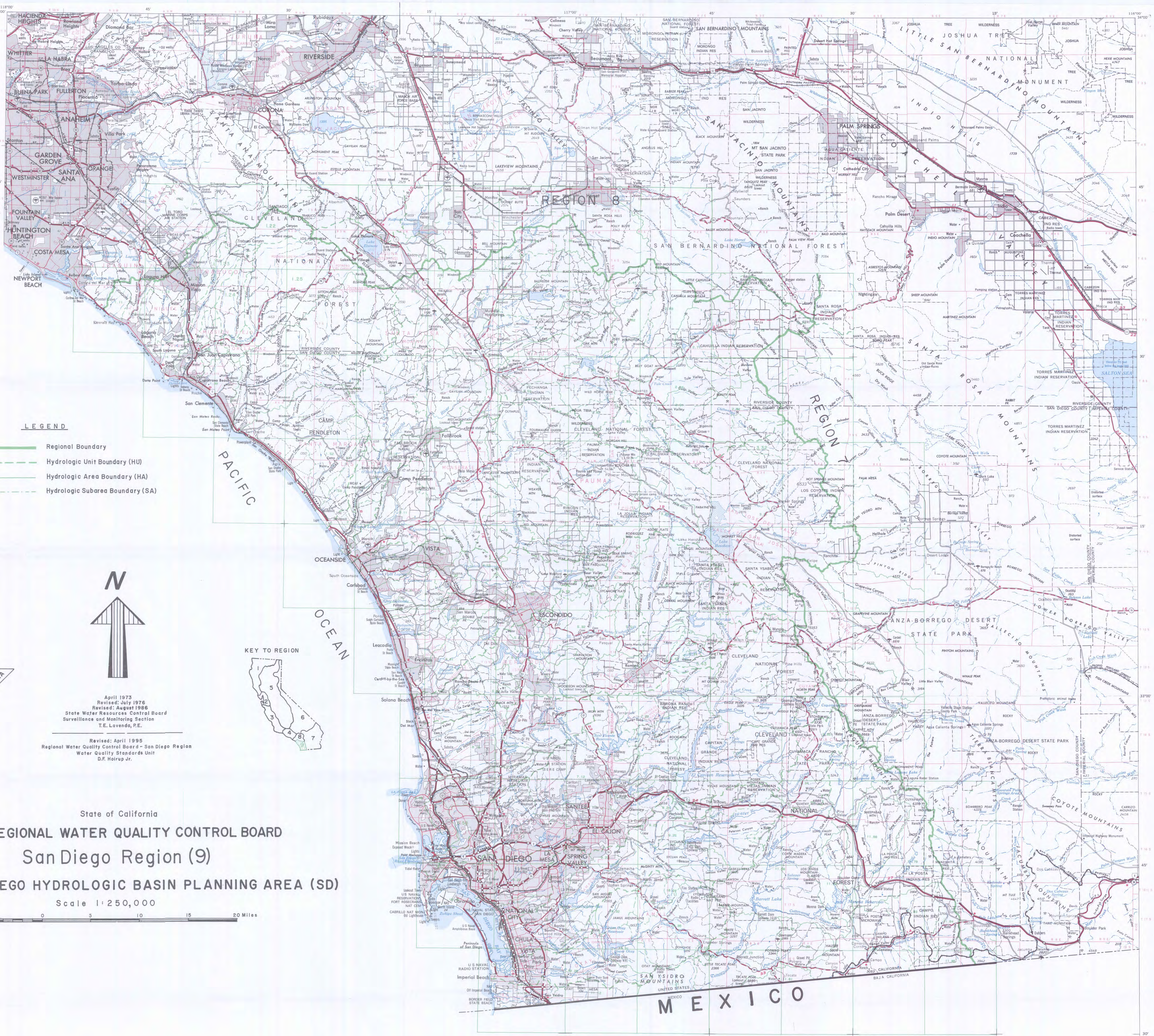
11.81	Tecate HSA
11.82	Canyon City HSA
11.83	Clover Flat HSA
11.84	Hill HSA
11.85	Hipass HSA

NOTE:

1. *The names and areas shown on this map are the same as used by the Department of Water Resources (DWR) in their Bulletin 130 Series.*
2. *The numbering system used on this map is an adaption of the numbering system used in the 130 Series.*
3. *The 1986 updated names and boundaries shown on the map are in accordance with an agreement with DWR and US Geological Survey.*
4. *The 1995 revision of this map includes newly recognized hydrologic subareas within the Mission Viejo HA (901.20). Notes 1 & 3 do not apply to these subareas.*



LEGEND

- Regional Boundary
- Hydrologic Unit Boundary (HU)
- Hydrologic Area Boundary (HA)
- Hydrologic Subarea Boundary (SA)

REGION NO. / HYDROLOGIC UNIT / HYDROLOGIC AREA / HYDROLOGIC SUBAREA

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April 1973
Revised: July 1976
Revised: August 1986
State Water Resources Control Board
Surveillance and Monitoring Section
T.E. Lavenda, P.E.

Revised: April 1995
Regional Water Quality Control Board - San Diego Region
Water Quality Standards Unit
D.F. Hoirup Jr.

State of California

REGIONAL WATER QUALITY CONTROL BOARD

San Diego Region (9)

SAN DIEGO HYDROLOGIC BASIN PLANNING AREA (SD)

Scale 1:250,000

5 0 5 10 15 20 Miles