CHAPTER 5

IMPLEMENTATION

SELECTED CHAPTER CONTENTS

Introduction 5-1
Implementation through Waste Discharge Requirements 5-1
National Pollutant Discharge Elimination System (NPDES) 5-1
Compliance Schedules / 2000 Amendment 5-3
Waste Discharge Requirements 5-4
Waivers 5-5
Water Reclamation Requirements 5-5
Waste Discharge Prohibitions 5-6
Quail Valley On-site Septic Tank-Subsurface Disposal System Prohibition / 2006 Amendment 5-8
Water Quality Certification 5-10
Monitoring and Enforcement..... 5-11
TDS and Nitrogen Management / 2004 Amendment 5-12
- Background 5-12
- Update of the TDS/Nitrogen Management Plan 5-14
- TDS/Nitrogen Management Plan 5-15
  - Salt Assimilative Capacity 5-17
  - Mineral Increments 5-20
  - Nitrogen Loss Coefficients 5-20
  - TDS & Nitrogen Wasteload Allocations for the Santa Ana River 5-22
  - Wastewater Reclamation 5-29
  - Special Considerations – Subsurface Disposal Systems 5-33
- Other Projects and Programs 5-34
- Salt Management Plan Monitoring Program 5-39
- Maximum Benefit Implementation for Salt Management 5-44
  - Chino Basin and Cucamonga Basin 5-45
  - San Timoteo Watershed 5-56
  - San Jacinto Upper Pressure Management Zone 5-88

Recreation Water Quality Standards 5-94
Nonpoint Source (NPS) Program 5-120
Nonpoint Source (NPS) Management Plan 5-120
Stormwater Program 5-122
Animal Confinement Facilities (Dairies) 5-124
Impacts of Past Dairy Operations 5-128
Dairy Operations Outside the Chino Basin 5-129
Minimum Lot Size Requirements 5-126
Bay Protection and Toxic Cleanup 5-133
Groundwater Contamination from Volatile Organic Compounds 5-135
Department of Defense Facilities 5-138
Leaking Underground Storage Tanks 5-140
Aboveground Storage Tanks 5-142
Disposal of Hazardous and Nonharzardous Waste to Land 5-142
References 5-147

INTRODUCTION

This chapter describes the implementation plan, the actions that are necessary to achieve the water quality objectives specified in Chapter 4 and thereby protect the beneficial uses of the region's surface and groundwaters (Chapter 3). These actions will require the coordinated efforts of the Regional Board and numerous water supply and wastewater management agencies, as well as city and county governments and other planning entities within the Region.

The Implementation chapter of the 1983 Basin Plan focused largely on the mineral imbalance problem in the region and the management of total dissolved solids (TDS) through waste discharges requirements, wastewater reclamation requirements, improvements in water supply quality, recharge projects, and other measures. Since the adoption of the 1983 Basin Plan, the Regional Board's knowledge of the water quality problems in the Santa Ana Region has increased considerably, and the number and variety of water quality programs undertaken to address those problems have increased accordingly. Several new programs are being implemented statewide by each regional board, including broad new responsibilities related to landfill operations and closure, oversight of leaking underground storage tank cleanup activities, and control of nonpoint sources such as urban runoff and stormwater from industrial facilities and construction sites. These new programs are part of the Board's implementation plan and are described in this chapter.

IMPLEMENTATION THROUGH WASTE DISCHARGE REQUIREMENTS

The Regional Board's principal means of achieving the water quality objectives and protecting the beneficial uses specified in this plan is the development, adoption, issuance and enforcement of waste discharge requirements. By regulating the quality of wastewaters discharged, and in other ways controlling the discharge of wastes which may impact surface and groundwater quality, the Regional Board works to protect the Region's water resources.

The Regional Board's regulatory tools include National Pollutant Discharge Elimination System permits, Waste Discharge Requirements, Water Reclamation Requirements, Water Quality Certification and Waste Discharge Prohibition.

National Pollutant Discharge Elimination System (NPDES)

National Pollutant Discharge Elimination System (NPDES) permits are required for discharges of pollutants to "navigable waters" of the United States, which includes any discharge to surface waters – lakes, rivers, streams, bays, the ocean, dry streambeds, wetlands and storm sewers that are tributary to any surface water body. NPDES permits are issued under the federal Clean Water Act, Title IV "Permits and Licenses," Section 402 (33 USC 466 *et seq*.). The Regional Board issues these permits in lieu of direct issuance by the US EPA, subject to review and approval by the US EPA Regional Administrator (EPA Region IX). The terms of these NPDES permits implement pertinent

provisions of the federal Clean Water Act and the Act's implementing regulations including pretreatment, sludge management, effluent limitations for specific industries and antidegradation. In general, the discharge of pollutants is to be eliminated or reduced as much as practicable so as to achieve the Clean Water Act's goal of "fishable and swimmable" navigable (surface) waters. Technically, all NPDES permits issued by the Regional Board are also Waste Discharge Requirements issued under the authority of the California Water Code.

In addition to regulating discharges of wastewater to surface waters, NPDES permits also require municipal sewage treatment facilities to implement and monitor industrial pretreatment programs if their design capacity is greater than five million gallons per day (MGD). Smaller municipal treatment systems may also be required to conduct pretreatment programs if there are significant industrial contributions to their systems. The pretreatment programs must comply with the federal regulations specified in 40 CFR 403.

At this time, there are approximately 2,000 NPDES permits in effect in the Santa Ana Region. As shown in Table 5-1, these NPDES permits regulate discharge from publicly owned treatment works (POTWs, or sewage treatment plants), industrial discharges, stormwater runoff, dewatering operations, and groundwater cleanup discharges. NPDES permits are issued for five years or less and are therefore to be updated regularly. The rapid and dramatic population and urban growth in the Santa Ana Region has caused a significant increase in NPDES permit applications for new waste discharges. Because of staff resource limitations, the Board generally focuses its permitting efforts on the issuance of permits for these new discharges. NPDES permit updates are done to the extent feasible, particularly for the more significant discharges. In some cases, if the discharge does not change substantially over the permitting period, administrative extensions of the existing permits are issued by the Regional Board's Executive Officer.

To expedite the permit issuance process, the Regional Board has adopted several general NPDES permits, each of which regulates numerous discharges of similar types of wastes. These general permits address discharges from groundwater cleanup projects (Order No. 91-63) and dewatering activities (Order No. 93-49). Proponents of groundwater cleanup or dewatering projects are required to file individual permit applications, which are reviewed by Regional Board staff to determine whether the requirements of the general permits apply and are sufficient to assure water quality protection. If so, the applicants are authorized by the Regional Board's Executive Officer to discharge in conformance with the general permit. A general permit for boatyard operations is being drafted. Additional general permits will be developed and adopted as appropriate to streamline the permitting process.

Similarly, the State Board has issued general permits for stormwater runoff from industrial facilities and construction sites statewide (see discussion on stormwater runoff). Stormwater discharges from industrial and construction activities in the Santa

Ana Region can be covered under these general permits, which are administered jointly by the State Board and Regional Boards.

Compliance Schedules (The following text was added under Resolution No. 00-27)

Where the Regional Board determines that it is infeasible to achieve immediate compliance with an effluent limitation specified to implement a new, revised or newly interpreted water quality objective, whether numeric or narrative, adopted by the Regional Board or State Water Resources Control Board, or with a new, revised or newly interpreted water quality criterion promulgated by the U.S. Environmental Protection Agency, the Regional Board may establish a schedule of compliance in a discharger's waste discharge requirements (NPDES permit). The schedule of compliance shall include a time schedule for completing specific actions that demonstrate reasonable progress toward attainment of the effluent limitation and, thereby, the objective or criterion. The schedule shall contain a final compliance date, based on the shortest practicable time (determined by the Regional Board at a public hearing) required to achieve compliance. In no event shall an NPDES permit include a schedule of compliance that allows more than ten years from the date of adoption or interpretation of the applicable objective or criterion. Schedules of compliance are authorized by this provision only for those effluent limitations that implement objectives and criteria adopted, revised or newly interpreted after the effective date of this provision, July 15, 2002.

To document the need for and justify the duration of any such compliance 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) documentation of source control efforts currently underway or completed, including compliance with any Pollution Prevention programs that have been established; (3) a proposed schedule for additional source control measures or waste treatment; (4) the discharge quality that can reasonably be achieved until final compliance is attained; and (5) a demonstration that the proposed schedule is as short as possible, 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.

(End of text adopted under Resolution No. 00-27)

Table 5-1
Representative NPDES Permitted Facilities in the Santa Ana Region
(as of November 3, 1993)[1]

Facility Type	Number Requested
Boatyards	10
Dewatering Operations	31
Groundwater Cleanup Projects	150
Stormwater Discharges 39 individually regulated by RWQCB; 1800 regulated by SWRCB's general permits	1839
Publicly Owned Treatment Works	24
TOTAL	**2054**

1 The list of facilities is regulated under NPDES permits is updated periodically and is available at the Regional Board office.

Table 5-2
Representative WDR Permitted Facilities in the Santa Ana Region
(as of November 3, 1993) [2]

Facility Type	Number Regulated
Brine Evaporation	24
Composting	19
Groundwater Cleanup	32
Dairies	468
Landfills	43
Mobile Home Parks (community septic systems)	22
Publicly Owned Treatment Works	37
TOTAL	**645**

2 The list of facilities regulated under WDR permits is updated periodically and is available at the Regional Board office.

Where the terms of these general permits are not sufficient to protect water quality, the Board issues individual permits for these discharges.

Waste Discharge Requirements

Waste Discharge Requirements (WDRs) are issued by the Regional Board under the provisions of the California Water Code, Division 7 “Water Quality,” Article 4 “Waste Discharge Requirements.” These requirements regulate the discharge of wastes which are not made to surface waters but which may impact the region’s water quality by affecting underlying groundwater basins. Such WDRs are issued for POTWs’ wastewater reclamation operations, discharges of wastes from industries, subsurface waste discharges such as septic systems, sanitary landfills, dairies and a variety of other activities which can affect water quality. There are approximately 650 WDRs in place, as indicated in Table 5-2.

Table 5-2 shows that most WDRs have been issued to dairies. To streamline the permit process, the Regional Board has developed a general permit for dairies and other animal confinement facilities (Order No. 94-7). To implement the federal stormwater requirements, this permit will be issued as an NPDES permit.

Waivers

The California Water Code allows Regional Boards to waive waste discharge requirements (WDRs) for a specific discharge or types of discharges where it is not against the public interest (Section 13269). These waivers are conditional and may be terminated at any time.

On May 11, 1984, the Regional Board adopted Resolution No. 84-48, which waives WDRs for certain types of discharges. Resolution No. 84-48 was amended by Resolution No. 91-75 in 1991. Resolution No. 84-48 and Resolution No 91-75 are incorporated into the Basin Plan by reference and are included in Appendix IV. Only discharges which comply with the conditions contained in Resolution No. 84-48 as amended by Resolution No. 91-75, qualify for this waiver. Even though a discharge may qualify for a waiver, dischargers are still required to file Reports of Waste Discharge (ROWD), together with the appropriate filing fees. Regional Board staff determines if the effort expended in reviewing the ROWD justifies retaining any portion of the fee. If not, the fee is fully refunded.

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 and is therefore considered a valuable resource. The State Board adopted the Reclamation Policy to encourage development of water reclamation facilities to increase the availability of reclaimed water to help meet the growing water requirements of the State (Chapter 2). The State Board is authorized to provide loans for the development of water reclamation facilities, or for studies and investigations in connection with water reclamation.

Section 13521 of the California Water Code requires the State Department of Health Services to establish statewide reclamation criteria for each type of use of reclaimed water, where such use involves the protection of public health. These regulations, contained in Title 22 of the California Code of Regulations, are the basic regulations governing the use of reclaimed water in California. The existing Title 22 regulations were adopted in 1978; proposed new regulations are currently under review.

The Regional Board implements the provisions of Title 22 by issuing Water Reclamation Requirements (WRRs) to the producer, the user of reclaimed water, or both. WRRs are issued for a variety of uses, including, but not limited to, landscape irrigation, fodder crop irrigation, duck ponds, freeway landscape irrigation, groundwater recharge,

injection for seawater intrusion barriers, use in toilet flushing, and other non-domestic uses in high rises or nonresidential buildings.
The Santa Ana Regional Board currently has 76 WRRs issued to producers and/or users of reclaimed water. Some of the producers have received or applied for Master Reclamation Requirements (MRR) which would allow the producer to distribute their reclaimed water to various users without additional user reclamation requirements from the Regional Board. With the water shortage in southern California, there is an increase in the demand for reclaimed water. With sophisticated treatment technologies, reclaimed water could be used for almost anything, except domestic supply.

The detailed requirements, conditions, prohibitions, and other specifications included within NPDES, WDR, and WRR permits are developed on the basis of existing state and federal law, State Board Water Quality Control Plans and Policies (*e.g.*, the Ocean Plan), and the contents of this Basin Plan. The foremost consideration is the protection of water quality. The quality of the discharge specified through the limitations in the permit is calculated to allow the water quality objectives of the receiving water to be met or maintained, and in some cases, the water quality is improved.

When the limits included in the NPDES, WDR or WRR permits cannot be met because treatment facilities are inadequate or the water supply is inferior, these permits may include a time schedule for compliance and interim discharger a period of time to make the necessary changes and/or improvements.

Waste Discharge Prohibitions

The Regional Board also implements this Basin Plan through the adoption of waste discharge prohibitions as necessary. Section 13243 of the California Water Code states that a Regional Board may specify certain conditions or areas where the discharge of waste, or certain types of waste, will not be permitted. The Regional Board implements this section of the Water Code by adopting waste discharge requirements issued to individual discharges and in the Basin Plan itself.

A. General Prohibitions

1. Unless regulated by appropriate waste discharge requirements, the discharge to surface or groundwaters of waste which contains the following substances is prohibited.

    - Toxic substances or materials;
    - Pesticides;
    - PCB’s (polychlorinated biphenyls);
    - Mercury or mercury compounds;
    - Radioactive substances or material in excess of levels allowed by the California Code of Regulations.

This list is not necessarily all-inclusive. The Regional Board may modify or update this list as appropriate.

B. Prohibitions Applying to Inland Surface Waters

1. The discharge of untreated sewage to any surface water stream, natural or man-made, or to any drainage system intended to convey stormwater runoff to surface water streams is prohibited.

2. The discharge of treated sewage to streams, lakes or reservoirs, or to tributaries thereto, which are designated **MUN** and which are used as a domestic water supply is prohibited unless approved by the California Department of Health Services. The discharge of treated sewage to waterbodies which are excepted from **MUN** (see Table 3-1) but which are tributary to waters designated **MUN** and are used as a domestic water supply is prohibited unless the discharge of treated sewage to the drinking water supply is precluded or approved by the California Department of Health Services.

C. Prohibitions Applying to Oceans, Bays, and Estuary Waters

The prohibitions included in the California Ocean Plan, Thermal Plan, and the Policy for Enclosed Bays and Estuaries are hereby incorporated into this plan by reference.

D. Prohibitions Applying to Groundwaters

1. The discharge of the following materials to the ground, other than into impervious facilities, is prohibited:

   a. Acids or caustics, whether neutralized or not, and

   b. Excessively saline wastes (electrical conductivity greater than 2000 µmhos/cm)

2. Prohibitions Applying to Subsurface Leaching Percolation Systems

In 1973, the Regional Board adopted prohibitions on the use of subsurface disposal systems in the following areas:

a. Grand Terrace (CSA 70, Improvement Zone H);
b. Yucaipa-Calimesa (Yucaipa Valley County Water District);
c. Lytle Creek above 2600 foot elevation;
d. Mill Creek above 2600 foot elevation; and
e. Bear Valley (includes Baldwin Lake Drainage Area);

In 1982, the Regional Board adopted prohibitions on the use of subsurface disposal systems for the Homeland-Green Acres area and Romoland areas (exact boundaries for these prohibition areas are shown on maps on file at the Regional Board office).

The Board adopted specified dates for final compliance with these prohibitions. In some cases, these dated have been revised via Basin Plan amendments. The compliance dates are as follows:

a. Grand Terrace: February 1, 1988
b. Yucaipa-Calimesa – February 1, 1988
c. Lytle Creek – July 1, 1978
d. Mill Creek - July 1, 1978
e. Bear Valley – July 1, 1980
f. Homeland-Green Acres – July 1, 1990
g. Romoland – July 1, 1990

Exemptions from these prohibitions may be granted if certain criteria are satisfied (exemption criteria are described in Appendix V).

Quail Valley On-site Septic Tank-Subsurface Disposal System Prohibition (The following was added under Resolution No. R8-2006-0024)

On October 3, 2006, the Board adopted a Basin Plan amendment prohibiting the use of septic tank-subsurface disposal systems in the Quail Valley area of Riverside County in accordance with the following:

Effective Date: August 20, 2007

(1) The discharge of waste from new on-site septic tank-subsurface disposal systems in the Quail Valley area of Riverside County is prohibited, if a sewer system is available to serve the lot. Except as provided in (2) below, the discharge of waste from existing on-site septic tank-subsurface disposal systems in the Quail Valley area of Riverside County is prohibited, if a sewer system is available to serve the lot.

(2) All existing septic tank-subsurface disposal systems shall connect to the sewer designed to serve the lot within one year of sewer installation. New septic tank-subsurface disposal systems shall not be permitted in Quail Valley if a sewer system is available to serve the lot.

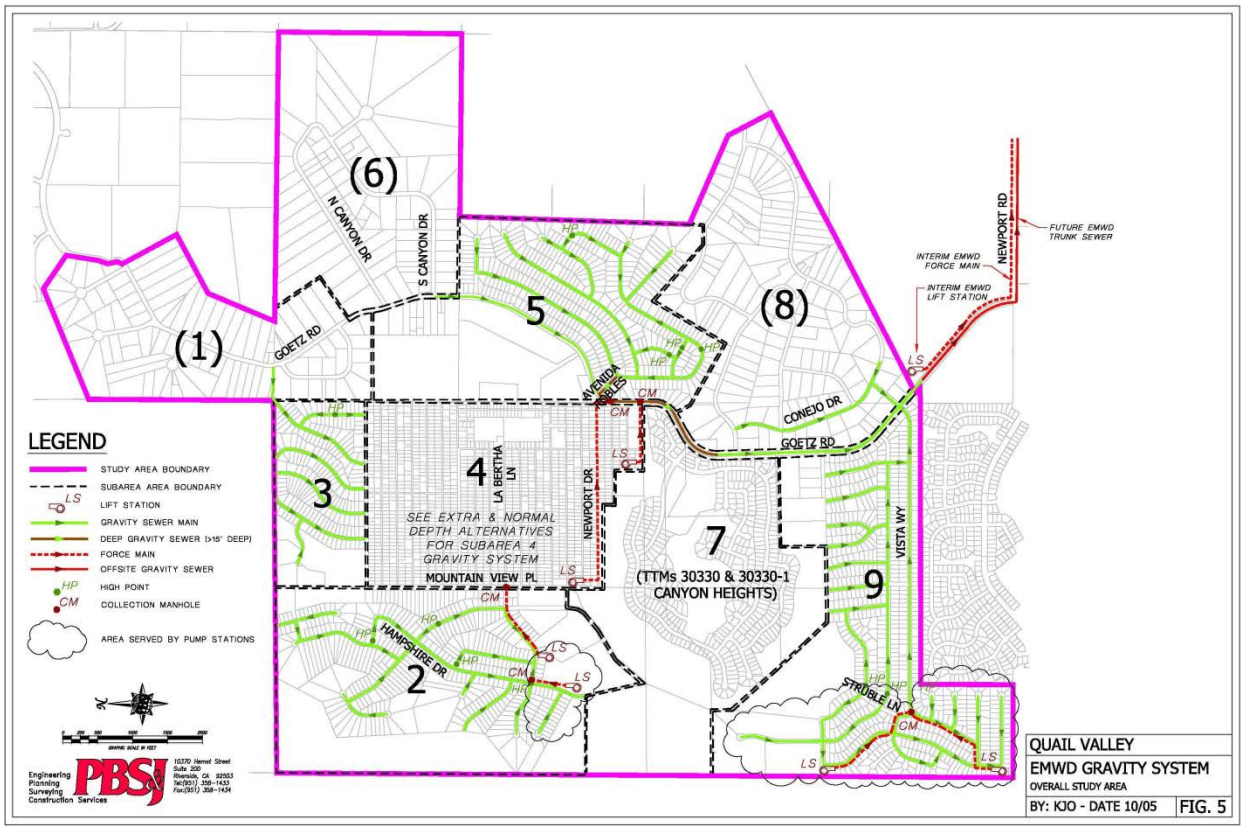
(3) This prohibition applies to all areas within Quail Valley as depicted on a detailed map maintained in the Regional Board office (Quail Valley Septic Tank Prohibition Boundary Map). A copy of the boundary map is attached as Attachment “A”.

(4) Upon the effective date of this prohibition, new septic systems in Quail Valley (see Attachment "A") shall not be permitted, except as follows:

(a) For areas in Quail Valley other than areas 4 and 9, new systems may be permitted, provided the Regional Board finds that the sewering agency proposes, and is on schedule, to provide sewer service for areas 4 and 9 within five years of the effective date of this amendment, and if the lot proposed for a septic system meets all Board and Riverside County requirements.

(b) If the Board finds that the sewering agency cannot meet the schedule identified in 1(4)(a), above, but that design of the project proceeds nonetheless, then, upon completion of the sewer system design, new systems may be permitted in areas other than 4 and 9, if all Board and Riverside County requirements are met.

ATTACHMENT "A": MAP OF QUAIL VALLEY PROHIBITION AREA
FIGURE 5-1a



(End of amendment adopted under Resolution No. R8-2006-0024)

Water Quality Certification (Section 401)

In addition to the issuance of NPDES permits or waste discharge requirements, the Regional Board acts to protect the quality of surface waters through water quality certification as specified in Section 401 of the Clean Water Act (33 USC 466 *et seq.*). Section 401 requires that any person applying for a federal permit or license for an activity which may result in a discharge of pollutants into waters of the nation must obtain a state water quality certification verifying that the activity complies with the state's water quality standards.

No license or permit can be granted until certification required by Section 401 has been obtained or waived. Further, no license or permit can be granted if certification has been denied by the state. Similarly, coastal states must concur that the activity meets the requirements of the Coastal Zone Management Program of the state or waive their right to concur by not taking action by a specified time.

The following permits or licenses require 401 Certification:

- NPDES permits issued by US EPA under Section 402 of the CWA (33 USC 466 *et seq.*);
- CWA Section 404 (33 USC 466 *et seq.*) permits issued by the U.S. Army Corps of Engineers;
- Permits issued under Sections 9 and 10 of the Rivers and Harbors Act (33 USC 466 *et seq.*) (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.

To date, 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 U.S. Army Corps of Engineers (Section 404 permits) subject to any conditions imposed by the Regional Board.

The Section 404 program is administered at the federal level by the U.S. Army Corps of Engineers and the US EPA. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service have important advisory roles. The U.S. Army Corps of Engineers 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. US EPA developed the regulations under which permits may be granted. States may assume the responsibility for implementation of the 404 permit program, however, California has not done so.

The Regional Board evaluates the projects for which 404 permits are requested and determines whether to deny water quality certification, issue a certification with conditions, or waive the certification. A certification is usually denied if the activity violates any water quality standard; if the activity may violate standards, a conditional certification is given; when the activity does not violate any standard, a 401 waiver may be given.

Presently, the executive Director of the State Board issues all water quality certifications in accordance with recommendations from the Regional Board.

MONITORING AND ENFORCEMENT

Waste discharge requirements issued by the Regional Board include requirements for monitoring of discharges. In some cases, the receiving waters must 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 waste discharge requirements (see Chapter 7).

The California Water Code provides the Regional Board with a number of enforcement remedies for violations of requirements. Enforcement actions include Time Schedules, Cease and Desist Orders, Cleanup and Abatement Orders, and the issuance of Administrative Civil Liability Complaints.

Time Schedules

When a discharge is taking place or threatening to occur that will cause a violation of a Regional Board requirement, a discharger may be required to submit a detailed compliance plan and schedule (California 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 Schedules are adopted by the Regional Board after a public hearing or by the Executive Officer pursuant to his or her authority.

Cease and Desist Order

If discharge prohibitions or requirements of the State Board or Regional Board are violated or threatened to be violated, the Regional Board may adopt a Cease and Desist order (California Water Code Section 13301) requiring the discharger 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.

Cleanup and Abatement Order

The Board may order *any* person who has discharged, is discharging or is threatening to discharge wastes that will result in a violation of waste discharge requirements or other order or prohibition of the State Board or Regional Board, to cleanup and abate the effects of the discharge or to take appropriate remedial action (California Water Code 13304). The Regional Board has delegated issuance of these orders to its Executive Officer; Cleanup and Abatement orders do not require Board action but are often brought before the Regional Board for consideration.

Administrative Civil Liability

The Regional Board may also issue Administrative Civil Liability complaints (ACLs) to those 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 (California Water Code Sections 13350). ACLs may also be issued in cases where a person fails to submit reports requested by the Board (California Water Code Sections 13261 and13268) or when a person discharges waste without first having filed the appropriate Report of Waste Discharge (ROWD) (California Water Code Section113265). ACLs may be issued pursuant to California 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, without showing intent or negligence. Issuance of ACLs is delegated to the Board's Executive Officer, but, all administrative civil liability settlements must be affirmed by the Board. 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.

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. 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 (California Water Code Sections 13331 and 13340).

TOTAL DISSOLVED SOLIDS AND NITROGEN MANAGEMENT
(The following has been modified under Resolution No. R8-2004-0001, No. R8-2010-0039, No. R8-2012-0002, R8-2014-0005 and R8-2017-0036

I. Background

The 1975 and 1983 Basin Plans for the Santa Ana River Basin reported that the most serious problem in the basin was the build up of dissolve minerals, or salts, in the

ground and surface waters. Sampling and computer modeling of groundwaters showed that the levels of dissolved minerals, generally expressed as total dissolved solids (TDS) or total filterable residue (TFR), were exceeding water quality objectives or would do so in the future unless appropriate controls were implemented. Nitrogen levels in the Santa Ana River, largely in the form of nitrate, were likewise projected to exceed objectives. As was discussed in Chapter 4, high levels of TDS and nitrate adversely affect the beneficial uses of ground and surface waters. The mineralization of the Region's waters, and its impact on beneficial uses, remains a significant problem.

Each use of water adds an increment of dissolved minerals. Significant increments of salts are added by municipal and industrial use, and the reuse and recycling of the wastewater generated as it moves from the hydrologically higher areas of the Region to the ocean. Wastewater and recycled water percolated into groundwater management zones is typically pumped and reused a number of times before reaching the ocean, resulting in increased salt concentrations. The concentration of dissolved minerals can also be increased by evaporation or evapotranspiration. One of the principal causes of the mineralization problem in the Region is historic irrigated agriculture, particularly citrus, which in the past required large applications of water to land, causing large losses by evaporation and evapotranspiration. TDS and nitrate concentrations are increased both by this reduction in the total volume of return water and by the direct application of these salts in fertilizers. Dairy operations, which began in the Region in the 1950's and continue today, also contribute large amounts of salts to the basin.

The implementation chapters of the 1975 and 1983 Basin Plans focused on recommended plans to address the mineralization problem. The 1975 Plan initiated a total watershed approach to salt source control. Both Plans called for controls on salt loadings from all water uses including residential, commercial, industrial and agricultural (including dairies). The plans included: measures to improve water supply quality, including the import of high quality water from the State Water Project; waste discharge regulatory strategies (e.g., wasteload allocations, allowable mineral increments for uses of water); and recharge projects and other remedial programs to correct problems in specific areas. These Plans also carefully limited reclamation activities and the recycling of wastewaters into the local groundwater basins.

These salt management plans were developed using a complex set of groundwater computer models and programs, known collectively as the Basin Planning Procedure (BPP).

The modeling work focused on the upper Santa Ana Basin and, to a lesser extent, on the San Jacinto Basin, where the BPP was less developed and refined. The constituent modeled in those Plans was TDS.

For the salt management plan specified initially in the 1995 Basin Plan, when the Plan was adopted and approved in 1994 and 1995, modeling was conducted with the BPP for both the upper Santa Ana and San Jacinto Basins. However, most of the attention was again directed to the upper Santa Ana Basin, for which significant improvements to

the BPP were made under a joint effort by the Santa Ana Watershed Project Authority, the Santa Ana River Dischargers Association, the Metropolitan Water District of Southern California, and the Regional Board. The most significant change to the BPP was the addition of a nitrogen modeling component so that projections of the nitrogen (nitrate) quality of groundwaters could be made, in addition to TDS. This enabled the development of a management plan for nitrogen, as well as TDS.

The BPP has not been used to model groundwater quality conditions in the lower Santa Ana Basin. For that Basin, the Regional Board's TDS and nitrogen management plans have relied, in large part, on the control of the quality of the Santa Ana River flows, which are a major source of recharge in the Basin. As discussed in Chapter 4, most of the baseflow (80-90%) is composed of treated sewage effluent; it also includes nonpoint source inputs and rising groundwater. Baseflow generally provides 70% or more of the water recharged in the Orange County Management Zone. In rare wet years, baseflow accounts for a smaller, but still significant, percentage (40%) of the recharge on an annual basis. Therefore, to protect Orange County groundwater, it is essential to control the quality of baseflow. To do so, baseflow TDS and nitrogen objectives are specified in this Plan for Reach 3 of the River. Wasteload allocations have been established and periodically revised to meet those and other Santa Ana River objectives.

For the 1983 Basin Plan, QUAL-II, a surface water model developed initially by the US EPA, was calibrated for the Santa Ana River and used to make detailed projections of River quality (TDS and nitrogen) and flow. The model was used to develop wasteload allocations for TDS and nitrogen discharges to the River that were approved as part of that Plan. (Wasteload allocations are discussed in detail in Section III of this Chapter). An updated version of the model, QUAL-2e, was used to revise these wasteload allocations, which were included as part of the initial salt management plan in the 1995 Basin Plan. The models were used to integrate the quantity and quality of inputs to the River from various sources, including the headwaters, municipal wastewater treatment plant discharges, and rising groundwater, based on the water supply and wastewater management plans used in the BPP. Data on rising groundwater quality and quantity were provided to the QUAL-II/2e models by the BPP. As with the BPP, the QUAL-II/2e model projections were used to identify water quality problems and to assess the effectiveness of changes in TDS and nitrogen management strategies.

II. Update of the Total Dissolved Solids/Nitrogen Management Plan

The studies conducted to update the TDS/Nitrogen Management Plans in the 1983 and 1995 Basin Plans were not designed to validate or revise the TDS or nitrate-nitrogen objectives for groundwater. Rather, the focus of the studies was to determine how best to meet those established objectives. During public hearings to consider adoption of the 1995 Basin Plan, a number of water supply and wastewater agencies in the region commented that the TDS and nitrate-nitrogen objectives for groundwater should be reviewed, considering the estimated cost of complying with them (several billion dollars). In response, the Regional Board identified the review of these objectives as a

high Basin Plan triennial review priority, and stakeholders throughout the Region agreed to provide sufficient resources to perform the necessary studies. In December 1995, these agencies, under the auspices of the Santa Ana Watershed Project Authority (SAWPA), formed the Nitrogen/Total Dissolved Solids (TDS) Task Force (Task Force) to undertake a watershed-wide study (Nitrogen/TDS Study) to review the groundwater objectives and the TDS/Nitrogen Management Plan in the Basin Plan as a whole. SAWPA managed the study, and Risk Sciences and Wildermuth Environmental, Inc., served as project consultants. Major tasks included review of the groundwater subbasin boundaries, development of recommendations for revised boundaries, development of appropriate TDS and nitrate-nitrogen objectives for the subbasins (management zones), and update of the TDS and TIN wasteload allocations to ensure compliance with both the established objectives for the Santa Ana River and tributaries and the recommended groundwater objectives. A complete list of all tasks completed in Phases 1A & 1B and 2A & 2B is included in the Appendix. The Task Force effort resulted in substantive proposed changes to the Basin Plan, including new groundwater management zones (Chapter 3) and new nitrate-nitrogen and TDS objectives for the management zones (Chapter 4). These changes necessitated the update and revision of the TDS/Nitrogen Management Plan, which is described below.
The Task Force studies, including the technical methods employed, are documented in a series of reports (Ref. 1-5). The Task Force studies differed from prior efforts to review the TDS and nitrogen management plans in that the BPP was not utilized. A revised model approach, not involving use of the QUAL-2e model, was used to update the wasteload allocations for the Santa Ana River. The Task Force concluded that the BPP no longer remained a viable tool for water quality planning purposes, and also concluded that the development of a new model was beyond the scope and financial capabilities of the Task Force. The efficacy of modeling to formulate and update salt management plans in this Region has been well demonstrated; in the future, priority should be given to the development of a new model that would assist with future Basin Plan reviews.

III. TDS/Nitrogen Management Plan

TDS and nitrogen management in this Region involves both regulatory actions by the Regional Board and actions by other agencies to control and remediate salt problems. Regulatory actions include the adoption of appropriate TDS and nitrogen limitations in requirements issued for waste disposal and municipal wastewater recycling, and the adoption of waste discharge prohibitions. These regulatory steps are described earlier in this Chapter. Actions by other agencies include projects to improve water supply quality and the construction of groundwater desalters and brine lines to remove highly saline wastes from the watershed. The following sections discuss these programs in greater detail.

A. Water Supply Quality

Water supply quality has a direct affect on the quality of discharges from municipal wastewater treatment plants, discrete industrial discharges, returns to groundwater from

homes using septic tank systems, returns from irrigation of landscaping in sewered and unsewered areas, and returns to groundwater from commercial irrigated agriculture. Water supply quality is an important determinant of the extent to which wastewater can be reused and recycled without resulting in adverse impacts on affected receiving waters. This is particularly true for TDS, since it is a conservative constituent, less likely than nitrogen to undergo transformation and loss as wastewater is discharged or recycled, and typically more difficult than nitrogen to treat and remove.

Water supplies cannot be directly regulated by the Regional Board; however, limitations in waste discharge requirements, including NPDES permits, may necessitate efforts to improve source water quality. These efforts may include drilling new wells, implementing alternative blending strategies, importing higher quality water when it is available, and constructing desalters to create or augment water supplies.

Imported water supplies are an important part of salt management strategies in the region from both a quantity and quality standpoint. Imported water is needed by many agencies to supplement local sources and satisfy ever-increasing demands. The import of high quality State Water Project water, with a long-term TDS average less than 300 mg/L, is particularly essential. The use of State Water Project water allows maximum reuse of water supplies without aggravating the mineralization problem. It is also used for recharge and replenishment to improve the quality of local water supply sources, which might otherwise be unusable. Thus, the use of high quality State Water Project water in the Region has water supply benefits that extend far beyond the actual quantity imported.

In some cases, the TDS quality of water supplies in a wastewater treatment service area may make it infeasible for the discharger to comply with TDS limits specified in waste discharge requirements. In other cases, the discharger may add chemicals that enable compliance with certain discharge limitations, but also result in TDS concentrations in excess of waste discharge requirements. The Board recognizes these problems and incorporates provisions in waste discharge requirements to address them. These and other aspects of the Board's regulatory program are described next.

B. TDS and Nitrogen Regulation

As required by the Water Code (Section 13263), the Regional Board must assure that its regulatory actions implement the Basin Plan. Waste discharge requirements must specify limitations that, when met, will assure that water quality objectives will be achieved. Where the quality of the water receiving the discharge is better than the established objectives, the Board must assure that the discharge is consistent with the state's antidegradation policy (SWRCB Resolution No. 68-16). The Regional Board must also separately consider beneficial uses, and where necessary to protect those uses, specify limitations more stringent than those required to meet established water quality objectives. Of course, these obligations apply not only to TDS and nitrogen but also to other constituents that may adversely affect water quality and/or beneficial uses.

As indicated previously, the Regional Board's regulatory program includes the adoption of waste discharge prohibitions. The Board has established prohibitions on discharges of excessively saline wastes and, in certain areas, on discharges from subsurface disposal systems (see "Waste Discharge Prohibitions," above). The Board has also adopted other requirements pertaining to the use of subsurface disposal system use, both to assure public health protection and to address TDS and nitrogen-related concerns. These include the Regional Board's "Guidelines for Sewage Disposal from Land Developments" [Ref. 6], which are hereby incorporated by reference, and the minimum lot size requirements for septic system use (see Nonpoint Source section of this Chapter).

However, the principal TDS and nitrogen regulatory tool employed by the Regional Board is the issuance of appropriate discharge requirements, in conformance with the legal requirements identified above. Several important aspects of this permitting program warrant additional discussion:

1. Salt assimilative capacity
2. Mineral increments
3. Nitrogen loss coefficients
4. TDS and nitrogen wasteload allocations
5. Wastewater reclamation
6. Special considerations – subsurface disposal systems

1. Salt Assimilative Capacity

Some waters in the Region have assimilative capacity for additions of TDS and/or nitrogen; that is, wastewaters with higher TDS/nitrogen concentrations than the receiving waters are diluted sufficiently by natural processes, including rainfall or recharge, such that the TDS and nitrogen objectives of the receiving waters are met. The amount of assimilative capacity, if any, varies depending on the individual characteristics of the waterbody in question and must be reevaluated over time.

The 2004 adoption of new groundwater management zone boundaries (Chapter 3) and new TDS and nitrate-nitrogen objectives for these management zones (Chapter 4), pursuant to the work of the Nitrogen/TDS Task Force, necessitated the re-evaluation of the assimilative capacity findings initially incorporated in the 1995 Basin Plan. To conduct this assessment, the Nitrogen-TDS study consultant calculated current ambient TDS and nitrate-nitrogen water quality using the same methods and protocols as were used in the calculation of historical ambient quality (see Chapter 4). The analysis focused on representing current water quality as a 20-year average for the period from 1978 through 1997. [Ref. 1]. For each management zone, current TDS and nitrate-nitrogen water quality were compared to water quality objectives (historical water quality)[1]. Assimilative capacity was also assessed relative to the "maximum benefit"

[1] As noted in Chapter 4, ammonia-nitrogen and nitrite-nitrogen data were also included in the analysis, where available. This occurred for a very limited number of cases and ammonia-nitrogen and nitrite-nitrogen concentrations were insignificant.

objectives established for certain management zones. If the current quality of a management zone is the same as or poorer than the specified water quality objectives, then that management zone does not have assimilative capacity. If the current quality is better than the specified water quality objectives, then that management zone has assimilative capacity. The difference between the objectives and current quality is the amount of assimilative capacity available. Since adoption of the 2004 Basin Plan amendment and per Basin Plan requirements, ambient quality and assimilative capacity findings have been, and will continue to be, updated every three years. Following Regional Board approval at a duly noticed Public Hearing, the updated findings of ambient quality and assimilative capacity will be posted on the Regional Board's web-site and will be used for regulatory purposes.

As described in Chapter 4 and later in this Chapter, the application of the "maximum benefit" objectives is contingent on the implementation of certain projects and programs by specific dischargers as part of their maximum benefit demonstrations. Assimilative capacity created by these projects/programs will be allocated to the party(-ies) responsible for implementing them.

Chapter 3 delineates the Prado Basin Management Zone, and Chapter 4 identifies the applicable TDS and nitrogen objectives for this Zone (the objectives for the surface waters that flow in this Zone). No assimilative capacity exists in this zone.

These assimilative capacity findings are significant from a regulatory perspective. If there is assimilative capacity in the receiving waters for TDS, nitrogen or other constituents, a waste discharge may be of poorer quality than the objectives for those constituents for the receiving waters, as long as the discharge does not cause violation of the objectives and provided that antidegradation requirements are met. However, if there is no assimilative capacity in the receiving waters, the numerical limits in the discharge requirements cannot exceed the receiving water objectives or the degradation process would be accelerated.[2] This rule was expressed clearly by the State Water Resources Control Board in a decision regarding the appropriate TDS discharge limitations for the Rancho Caballero Mobilehome park located in the Santa Ana Region (Order No. 73-4, the so called "Rancho Caballero decision") [Ref. 7]. However, this rule is not meant to restrict overlying agricultural irrigation, or similar activities, such as landscape irrigation. Even in management zones without assimilative capacity, groundwater may be pumped, used for agricultural purposes in the area and returned to the management zone from which it originated.

In regulating waste discharges to waters with assimilative capacity, the Regional Board will proceed as follows. (see also Section III.B.6., Special Considerations – Subsurface Disposal Systems).

---

[2] A discharger may conduct analyses to demonstrate that discharges at levels higher than the objectives would not cause or contribute to the violation of the established objectives. See, for example, the discussion of wasteload allocations for discharges to the Santa Ana River and its tributaries (Section III. B. 4.) If the Regional Board approves this demonstration, then the discharger would be regulated accordingly.

If a discharger proposes to discharge wastes that are at or below (i.e., better than) the current ambient TDS and/or nitrogen water quality, then the discharge will not be expected to result in the lowering of water quality, and no antidegradation analysis will be required. TDS and nitrogen objectives are expected to be met. Such discharges clearly implement the Basin Plan and the Board can permit them to proceed. Of course, other pertinent requirements, such as those of the California Environmental Quality Act (CEQA) must also be satisfied. For groundwater management zones, current ambient quality will be determined every three years pursuant to the detailed monitoring program to be conducted by dischargers in the watershed (see Section V., Salt Management Plan – Monitoring Program Requirements).

Again, discharges to waters without assimilative capacity for TDS and/or nitrogen must be held to the objectives of the affected receiving waters (with the caveat identified in footnote 2 previous page). In some cases, compliance with management zone TDS objectives for discharges to waters without assimilative capacity may be difficult to achieve. Poor quality water supplies or the need to add certain salts during the treatment process to achieve compliance with other discharge limitations (e.g., addition of ferric chloride) could render compliance with strict TDS limits very difficult. The Regional Board addresses such situations by providing dischargers with the opportunity to participate in TDS offset programs, such as the use of desalters, in lieu of compliance with numerical TDS limits. These offset provisions are incorporated into waste discharge requirements. Provided that the discharger takes all reasonable steps to improve the quality of the waters influent to the treatment facility (such as through source control or improved water supplies), and provided that chemical additions are minimized, the discharger can proceed with an acceptable program to offset the effects of TDS discharges in excess of the permit limits.

Similarly, compliance with the nitrate-nitrogen objectives for groundwaters specified in this Plan would be difficult in many cases. Offset provision may apply to nitrogen discharges as well.

An alternative that dischargers might pursue in these circumstances is revision of the TDS or nitrogen objectives, through the Basin Plan amendment process. Consideration of less stringent objectives would necessitate comprehensive antidegradation review, including the demonstrations that beneficial uses would be protected and that water quality consistent with maximum benefit to the people of the State would be maintained. As discussed in Chapter 4 and later in this Chapter, a number of dischargers have pursued this “maximum benefit objective” approach, leading to the inclusion of “maximum benefit” objectives and implementation strategies in this Basin Plan. Discharges to areas where the “maximum benefit” objectives apply will be regulated in conformance with these implementation strategies. Any assimilative capacity created by the maximum benefit programs will be allocated to the parties responsible for implementing them.

2. Mineral Increments

The fundamental philosophy of TDS management plans in Santa Ana Region Basin Plans to date has been to allow a reasonable use of the water, to treat the wastewater generated appropriately, and to allow it to flow downstream (or to lower groundwater basins) for reuse. “Reasonable use” is defined in terms of appropriate mineral increments that can be applied to water supply quality in setting discharge limitations.

The Department of Water Resources has recommended values for the maximum use incremental additions of specific ions that should be allowed through use, based on detailed study of water supplies and wastewater quality in the Region [Ref. 8]. Their recommendations are as follows:

Sodium	70 mg/L
Sulfate	40 mg/L
Chloride	65 mg/L
TDS	250 mg/L
Total Hardness	30 mg/L

These mineral increments were incorporated into the 1983 Basin Plan. They will be incorporated into waste discharge requirements when appropriate and necessary.

3. Nitrogen Loss Coefficients

The Regional Board’s regulatory program has long recognized that some nitrogen transformation and loss can occur when wastewater is discharged to surface waters or reused for landscape irrigation. For example, the Total Inorganic Nitrogen (TIN) wasteload allocation adopted for the Santa Ana River in 1991 included unidentified nitrogen losses in the surface flows in Reach 3 of the River. Waste discharge requirements have allowed for nitrogen losses due to plant uptake when recycled water is used for irrigation.

In contrast, nitrogen has been considered a conservative constituent in the subsurface, not subject to significant transformation or loss, and no such losses have been identified or assumed for regulatory purposes.

One of the tasks included in the Nitrogen/TDS Task Force studies leading to the 2004 update of the N/TDS Management Plan was the consideration of subsurface transformation and loss. One objective of this task was to determine whether dischargers might be required to incur costs for additional treatment to meet the new groundwater management zone nitrate-nitrogen objectives (Chapter 4), or whether natural, subsurface nitrogen losses could achieve any requisite reductions. The second objective was to develop a nitrogen loss coefficient that could be used with certainty to develop appropriate limits for nitrogen discharges throughout the Region.
To meet these objectives, the Nitrogen/TDS study consultant, Wildermuth Environmental, Inc. (WEI), evaluated specific recharge operations (e.g., the Orange

County Water District recharge ponds overlying the Orange County Forebay), wastewater treatment wetlands (e.g., the Hidden Valley Wildlife Area, operated by the City of Riverside) and Santa Ana River recharge losses (for the Santa Ana River, water quality in reaches where recharge is occurring ("losing" reaches) was compared with local well data). In each case, WEI evaluated long-term (1954 to 1997) nitrogen surface water quality data and compared those values to long-term nitrogen data for adjacent wells.

Based on this evaluation, a range of nitrogen loss coefficients was identified. [Ref. 1] In light of this variability, the N/TDS Task Force recommended that a conservative approach to be taken in establishing a loss coefficient. The Task Force recommended that a region-wide default nitrogen loss of 25% be applied to all discharges that affect groundwater in the Region. The Task Force also recommended that confirmatory, follow-up monitoring be required when a discharger requested and was granted the application of a nitrogen loss coefficient greater than 25%, based on site-specific data submitted by that discharger.

The City of Riverside presented data to the Task Force regarding nitrogen transformation and losses associated with wetlands. These data support a nitrogen loss coefficient of 50%, rather than 25%, for the lower portions of Reach 3 of the Santa Ana River that overlie the Chino South groundwater management zone. [Ref. 9]. In fact, the data indicate that nitrogen losses from wetlands in this part of Reach 3 can be greater than 90%. However, given the limited database, the Task Force again recommended a conservative approach, i.e., 50% in this area, with confirmatory monitoring.

Eastern Municipal Water District also presented data that support a 60% nitrogen loss coefficient in the San Jacinto Basin [Ref 10F]. This 60% nitrogen loss is only applicable to discharges to the following management zones that overlie the San Jacinto Basin: Perris North, Perris South, San Jacinto Lower Pressure, San Jacinto Upper Pressure, Lakeview-Hemet North, Menifee, Canyon and Hemet South.

The 25% and, where appropriate, 50% nitrogen loss coefficients will be used in developing nitrogen discharge limits. These coefficients will be applied to discharges that affect groundwater management zones with and without assimilative capacity.

For discharges to groundwater management zones with assimilative capacity, the TIN discharge limitation would be calculated as follows:

$$\text{TIN Discharge Limit (mg/L)} = \frac{\text{management zone nitrate-nitrogen current ambient water quality}}{(1 - \text{nitrogen loss coefficient})}$$

The Regional Board will employ its discretion in specifying a higher TIN limit that would allocate some of the available assimilative capacity.
For discharges to groundwater management zones without assimilative capacity, the TIN discharge limitation would be calculated as follows:

$$\text{TIN Discharge Limit (mg/L)} = \frac{\text{management zone nitrate-nitrogen water water quality objective}}{(1 - \text{nitrogen loss coefficient})}$$

These coefficients do not apply to discharges specifically addressed by the TIN wasteload allocation, described in the next section, since surface and subsurface nitrogen losses were accounted for in developing this allocation.

4. TDS and Nitrogen Wasteload Allocations for the Santa Ana River

Wasteload allocations for regulating discharges of TDS and total inorganic nitrogen (TIN) to the Santa Ana River, and thence to groundwater management zones recharged by the River, are an important component of salt management for the Santa Ana Basin. As described earlier, the Santa Ana River is a significant source of recharge to groundwater management zones underlying the River and, downstream, to the Orange County groundwater basin. The quality of the River thus has a significant effect on the quality of the Region's groundwater, which is used by more than 5 million people. Control of River quality is appropriately one of the Regional Board's highest priorities.

Sampling and modeling analyses conducted in the 1980's and early 1990's indicated that the TDS and total nitrogen water quality objectives for the Santa Ana River were being violated or were in danger of being violated. Under the Clean Water Act (Section 303(d)(1)(c); 33 USC 466 *et seq*.), violations of water quality objectives for surface waters must be addressed by the calculation of the maximum wasteloads that can be discharged to achieve and maintain compliance. Accordingly, TDS and nitrogen wasteload allocations were developed and included in the 1983 Basin Plan. The nitrogen wasteload allocation was updated in 1991; an updated TDS wasteload allocated was included in the 1995 Basin Plan when it was adopted and approved in 1994/1995.

The wasteload allocations distribute a share of the total TDS and TIN wasteloads to each of the discharges to the River or its tributaries. The allocations are implemented principally through TDS and nitrogen limits in waste discharge requirements issued to municipal wastewater treatment facilities (Publicly Owned Treatment Works or POTWs) that discharge to the River, either directly or indirectly[3]. Nonpoint source inputs of TDS and nitrogen to the River are also considered in the development of these wasteload allocations. Controls on these inputs are more difficult to identify and achieve and may be addressed through the areawide stormwater permits issued to the counties by the Regional Board or through other programs. For example, the Orange County Water District has constructed and operates more than 400 acres of wetlands ponds in the

[3] With some exceptions that may result from groundwater pumping practices, the ground and surface waters in the upper Santa Ana Basin (upstream of Prado Dam) eventually enter the Santa Ana River and flow through Prado Dam. Discharges to these waters will therefore eventually affect the quality of the River and must be regulated so as to protect both the immediate receiving waters and other affected waters, including the River.

Prado Basin Management Zone to remove nitrogen in flows diverted from, and then returned to, the Santa Ana River.

Because of the implementation of these wasteload allocations, the Orange County Water District wetlands and other measures, the TDS and TIN water quality objectives for the Santa Ana River at Prado Dam are no longer being violated, as shown by annual sampling of the River at the Dam by Regional Board staff [Ref. 10A]. However, as part of the Nitrogen/TDS Task Force studies to update the TDS/nitrogen management plan for the Santa Ana Basin, a review of the TDS and TIN wasteload allocations initially contained in this Basin Plan was conducted. In part, this review was necessary in light of the new groundwater management zones and TDS and nitrate-nitrogen objectives for those zones recommended by the N/TDS Task Force (and now incorporated in Chapters 3 and 4). The wasteload allocations were evaluated and revised to ensure that the POTW discharges would assure compliance with established surface water objectives and would not cause or contribute to violation of the groundwater management zone objectives. The Task Force members also recognized that this evaluation was necessary to determine the economic implications of assuring conformance with the new management zone objectives. Economics is one of the factors that must be considered when establishing new objectives (Water Code Section 13241).

WEI performed the wasteload allocation analysis for both TDS and TIN [Ref. 3, 5]. In contrast to previous wasteload allocation work, the QUAL-2e model was not used for this analysis. Further, the Basin Planning Procedure (BPP) was not used to provide relevant groundwater data. Instead, WEI developed a projection tool using a surface water flow/quality model and a continuous-flow stirred-tank reactor (CFSTR) model for TDS and TIN.The surface water Waste Load Allocation Model (WLAM) is organized into two major components – RUNOFF (RU) and ROUTER (RO). RU computes runoff from the land surface and RO routes the runoff estimated with RU through the drainage system in the upper Santa Ana watershed. Both the RU and RO models contain hydrologic, hydraulic and water quality components.

To ensure that all hydrologic regimes were taken into account, hydrologic and land use data from 1950 through 1999 were used in the analysis. The analysis took into account the TDS and nitrogen quality of wastewater discharges, precipitation and overland runoff, instream flows and groundwater. Off-stream and in-stream percolation rates, rising groundwater quantity and quality, and the 25% and 50% nitrogen loss coefficients described in the preceding section were also factored into the analysis. The purpose of the modeling exercise was to estimate discharge, TDS and TIN concentrations in the Santa Ana River and tributaries and in stream bed recharge. These data were then compared to relevant surface and groundwater quality objectives to determine whether changes in TDS and TIN regulation were necessary.

Discharges from POTWs to the Santa Ana River or its tributaries were the focus of the analysis. POTW discharges to percolation ponds were not considered. The wasteload allocation analysis assumed, correctly, that these direct groundwater discharges will be

regulated pursuant to the management zone objectives, findings of assimilative capacity and nitrogen loss coefficients identified in Chapter 4 and earlier in this chapter.

The surface waters evaluated included the Santa Ana River, Reaches 3 and 4, ChinoCreek, Cucamonga/Mill Creek and San Timoteo Creek. Management zones that are directly under the influence of these surface waters and that receive wastewater discharges were evaluated. These included the San Timoteo, Riverside A, Chino South, and Orange County Management Zones[4]. In addition, wastewater discharges to the Prado Basin Management Zone were also evaluated.

WEI performed three model evaluations in order to assess wasteload allocation scenarios through the year 2010. These included a “baseline plan” and two alternative plans (“2010-A” and “2010-B”). The baseline plan generally assumed the TDS and TIN limits and design flows for POTWs specified in waste discharge requirements as of 2001. These limits implemented the wasteload allocations specified in the 1995 Basin Plan when it was approved in 1995. A TDS limit of 550 mg/L was assumed for the Rapid Infiltration and Extraction Facility (RIX) and the analysis assumed a 540 mg/L TDS for the City of Beaumont. The baseline plan also assumed reclamation activities at the level specified in the 1995 Basin Plan, when it was approved. The purpose of the baseline plan assessment was to provide an accurate basis of comparison for the results of evaluation of the two alternative plans. For alternative 2010-A, it was generally assumed that year 2001 discharge effluent limits for TDS and TIN applied to POTW discharges, but projected year 2010 surface water discharge amounts were applied. TDS limits of 550 mg/L and 540 mg/L were again assumed for RIX and the City of Beaumont discharges. The same limited reclamation and reuse included in the baseline plan was assumed (see R8-2014-0001, 2004 Salt Plan Amendments, Table 5-7 in Section III.B.5.). For alternative 2010-B, POTW discharges were also generally limited to the 2001 TDS and TIN effluent limits (RIX was again held to 550 mg/L and Beaumont to 540 mg/L). However, in this case, large increases in wastewater recycling and reuse were assumed (R8-2014-0001, 2004 Salt Plan Amendments Table 5-7), resulting in the reduced surface water discharges projected for 2010.

Analysis of the model results demonstrated that the TDS and nitrogen objectives of affected surface waters would be met and that water quality consistent with the groundwater management zone objectives would be achieved under both alternatives. It is likely that water supply and wastewater agencies will implement reclamation projects with volumes that are in the range of the two alternatives. The wasteload allocations would be protective throughout the range of surface water discharges identified. The year 2010 flow values are not intended as limits on POTW flows; rather, these flows were derived from population assumptions and agency estimates and are

[4] The City of Beaumont discharges to Coopers Creek in a subunit of the Beaumont Management Zone. However, for analytical and regulatory purposes, it is considered a discharge to the San Timoteo Management Zone since it enters that Management Zone essentially immediately. Recharge of wastewater discharges by YVWD and Beaumont in downgradient management zones that may be affected by surface water discharges (e.g., Bunker Hill B, Colton) is not expected to be significant. Therefore, these management zones were not evaluated as part of the wasteload allocation analysis.

used in the models for quality projections. Surface water discharges significantly different than those projected will necessitate additional model analyses to confirm the propriety of the allocations.

The wasteload allocations for TDS and TIN are specified in Table 5-5. Allocations based on the 2010-A and 2010-B alternatives are shown for both TDS and TIN to reflect the expected differences in surface water discharge flows that would result from variations in the amount of wastewater recycling actually accomplished in the Region. As shown in this Table, irrespective of these differences, the TDS and TIN allocations remain the same.

It is essential to point out that the wasteload allocations in Table 5-5 will be not be used to specify TDS and TIN effluent limitations for wastewater recycling (reuse for irrigation) and recharge by the listed POTWs, but will be applied only to the surface water discharges by these POTWs to the Santa Ana River and its tributaries. TDS and TIN limitations for wastewater recycling and recharge by these POTWs will be based on the water quality objectives for affected groundwater management zones or, where appropriate, surface waters. These limitations are likely to be different than the wasteload allocations specified in Table 5-5.

For most dischargers, the allocations specified in Table 5-5 are the same as those specified in the prior 1995 Basin Plan TDS and TIN wasteload allocations. However, for certain dischargers, two sets of TDS and TIN wasteload allocations are shown in Table 5-5. One set is based on the assumption that the “maximum benefit” objectives defined in Chapter 4 for the applicable groundwater management zones are in effect. The other set of wasteload allocations applies if maximum benefit is not demonstrated and the antidegradation objectives for these management zones are therefore in effect. Maximum benefit implementation is described in Section VI. of this Chapter.

In addition, in contrast to the prior wasteload allocations, a single wasteload allocation for TDS and TIN that would be applied on a flow-weighted average basis to all of the treatment plants operated by the Inland Empire Utilities Agency as a whole is specified. These allocations are based on the water quality objectives for Chino Creek, Reach 1B (550 mg/L TDS and 8 mg/L TIN), to which the IEUA discharges occur, directly or indirectly. As described in Section VI, IEUA proposes to implement a “maximum benefit” program to support the implementation of the “maximum benefit” TDS and nitrate-nitrogen objectives for the Chino North and Cucamonga Management Zones. Separate “maximum benefit” and “antidegradation” wasteload allocations are not necessary for IEUA, as they are for YVWD and Beaumont. This is because the IEUA wasteload allocations are based solely on the Chino Creek objectives and are not contingent on “maximum benefit” objectives or implementation. The IEUA surface water discharges do not affect the groundwater management zones for which “maximum benefit” objectives are to be implemented.

Finally, the TDS wasteload allocation for the RIX facility is less stringent (550 mg/L) than the prior wasteload allocation. The new allocation will assure beneficial use

protection and will not result in a significant lowering of water quality. As such, it is consistent with antidegradation requirements. Given this, the less stringent effluent limitation can be specified pursuant to the exception to the prohibition against backsliding established in the Clean Water Act, Section 303(d)(4)(a).

In most cases, the surface water discharges identified in Table 5-5 will affect or have the potential to affect groundwater management zones without assimilative capacity for TDS and/or nitrogen. As discussed earlier in this section, the lack of assimilative capacity normally dictates the application of the water quality objectives of the affected receiving waters as the appropriate waste discharge limitations. However, as shown in Table 5-5, the TIN and, in some cases, TDS wasteload allocations for these discharges exceed the objectives for these management zones. This is because the wasteload allocation analysis conducted by WEI demonstrated that POTW discharges at these higher-than-objective levels will not result in violations of the TDS and nitrate-nitrogen objectives of the affected management zones, or surface waters. Accordingly, these wasteload allocations will be used for surface water discharge regulatory purposes, rather than the underlying groundwater management zone objectives. If the extensive monitoring program to be conducted by the dischargers (see Salt Management Plan – Monitoring Program Requirements, below) indicates that this strategy is not effective, then this regulatory approach will be revisited and revised accordingly.

Table 5-5

Alternative Wasteload Allocations through 2010 based on "Maximum Benefit" or "Antidegradation" Water Quality[1]

Publicly Owned Treatment Works (POTW)	Alternative 2010A – Reclamation in 1995 Basin Plan			Alternative 2010B – Reclamation Plans Advocated by POTWs/others		
	Surface Water Discharge (MGD)	TDS (mg/L)	TIN (mg/L)	Surface Water Discharge (MGD)	TDS (mg/L)	TIN (mg/L)
Beaumont – "max benefit" [2]	2.3	490	6.0	1.0	490	6.0
Beaumont – "antideg" [2, 3]	2.3	320[3]	4.1[3]	1.0	320[3]	4.1[3]
YVWD – Wochholz – "max benefit"	5.7	540	6.0	0.0	540	6.0
YVWD – Wochholz – "antideg" [3]	5.7	320[3]	4.1[3]	0.0	320[3]	4.1[3]
Rialto	12.0	490	10.0	10.0	490	10.0
RIX	49.4	550	10.0	28.2	550	10.0
Riverside Regional WQCP	35.0	650	13.0	26.1	650	13.0
Western Riverside Co. WWTP	4.4	625	10.0	3.3	625	10.0
EMWD[4]	43	650	10.0	6.0	650	10.0
EVMWD – Lake Elsinore Regional	7.2	700	13.0	2.0	700	13.0
Lee Lake WRF	1.6	650	13.0	1.6	650	13.0
Corona WWTP # 1	3.6	700	10.0	2.0	700	10.0
Corona WWTP # 2	0.2	700	10.0	0.5	700	10.0
Corona WWTP # 3	2.0	700	10.0	0.5	700	10.0
IEUA Facilities [5]	80.0	550	8.0	37.4	550	8.0

1. "Antidegradation" wasteload allocation is the default allocation if the Regional Board determines that "maximum benefit" commitments are not being met.
2. Beaumont discharges to Coopers Creek, a tributary of San Timoteo Creek, Reach 4, it is a de facto discharge to San Timoteo Creek/San Timoteo Management Zone.
3. "Antidegradation" wasteload allocations for City of Beaumont and YVWD based on additional model analysis performed by WEI (WEI, October 2002).
4. EMWD discharges are expected to occur only during periods of wet weather.
5. IEUA facilities include the RP#1, Carbon Canyon WRP, RP#4 and RP#5; These facilities are to be regulated as a bubble (see text).

Ammonia

Total inorganic nitrogen is used for regulatory purposes in wasteload allocations and surface water discharge limits. It is the sum of nitrate, nitrite and ammonia. Ammonia dissociates under certain conditions to the toxic un-ionized form. Thus, nitrogen discharges to the Santa Ana River and other surface waters pose a threat to aquatic life and instream beneficial uses, as well as to the beneficial uses of affected groundwater.

Un-ionized ammonia objectives are specified in Chapter 4 of this Basin Plan for warmwater aquatic habitats, such as the Santa Ana River system. Table 5-6 specifies the ammonia limits necessary to achieve these objectives. These limits were derived using QUAL2E, the Colorado Ammonia Model, water quality data on the River and effluent quality.

The un-ionized ammonia objectives have not been approved by the United States Environmental Protection Agency (USEPA), which recommends that the objectives be reviewed and revised based on the Agency's revised national ammonia criteria. A review of the un-ionized ammonia objectives is included in the Regional Board's 2002 Triennial Review Priority List. Any revised objectives and revised ammonia effluent limits needed to achieve the revised objectives will be incorporated in future amendments to this Plan once the requisite review is completed.

Table 5-6
Effluent Limits for Total Ammonia Nitrogen[1]

Discharge Location	**Effluent Limit - Total Ammonia Nitrogen[2] (mg/L)**	
	Year 1995	Year 2000
San Timoteo Wash	5.0	4.5
Santa Ana River - Reach 4	5.0	4.5
Santa Ana River - Reach 3	5.0	5.0
Chino Creek	5.0	4.5
Mill Creek (Prado Area)	5.0	4.5
Temescal Creek	5.0	4.5
Other **WARM** designated waterbodies	Determined on a case-by-case basis	

1 Total Ammonia Nitrogen Wasteload Allocation is specified in order to meet the site-specific Santa Ana River un-ionized ammonia objective (See Chapter 4).

2 Total Ammonia Nitrogen = Un-ionized Ammonia Nitrogen (NH_3-N) + Ammonium Nitrogen (NH_4 + -N).

5. Wastewater Reclamation

Reclamation of wastewater for reuse (recycled water) is an important feature of wastewater and water management for the Santa Ana Region. The California Legislature has declared the primary interest of the people of California in the development of facilities to recycle wastewater to supplement existing water supplies and to meet future water demands (Water Code Section 13510-13512). State policy (State Board Resolution No. 77-1) affirms this commitment to encourage recycled water use. However, because reclamation projects tend to add to the salt balance problem in the Region, they must be carefully planned and implemented. The significant benefits that result from such projects include:

- The total water supply can be effectively increased, reducing the need for imports;
- Wastewater treatment costs can be reduced in some cases. Meeting the level of treatment required for discharge to surface waters may be more expensive than treating the effluent for use in irrigation;
- Stream flows can be established or enhanced, providing aquatic riparian habitat and allowing recreation and other beneficial uses of the stream;
- Downstream delivery commitments can often be met by discharges of appropriately treated wastewater.

Concerns related to wastewater reclamation projects include:

1. Mineral Quality Effects

The mineral quality of the receiving water (surface or groundwater) can be adversely affected. Each cycle of water use increases the salinity of the water. The amount of the increase depends on the type of use; normal domestic use generally adds 200-300 mg/L of TDS to the initial concentration. Agricultural use generally doubles the salinity, while industrial uses most often degrade water quality to a level where it may be unsuitable for discharge. Therefore, it is important that the type of reclaimed wastewater use and the likely effects on water quality be evaluated carefully prior to initiating such reuse. Certain waters in the upper Santa Ana Basin do not have assimilative capacity to accept the additional salinity that would be expected to result from reclamation.

2. Public Health Effects

Municipal wastewaters contain significant concentrations of bacteria, viruses, and organics. These wastewaters must be treated extensively to remove pathogens before they can be reclaimed. Stable organics in reclaimed water are also cause for considerable concern. Chlorination of treated wastewater effluents can produce

chlorinated hydrocarbons, some of which are carcinogenic. For this reason, the California State Department of Health Services is concerned with proposals that would return a high proportion of treated wastewater effluent into domestic water supply aquifers. Adequate treatment and dilution of the wastewater is essential. The Department is developing guidelines for the purposed use of reclaimed wastewater for groundwater recharge.

Because of the high percentage of wastewater in river baseflow, the Santa Ana River Water Quality and Health (SARWQH) Study was initiated by OCWD in 1994 to evaluate the use of the Santa Ana River to recharge the Orange County groundwater basin. The goal of the SARWQH Study was to characterize the quality of the Santa Ana River water and the quality of the groundwater basin it recharges. The study included an examination of hydrogeology, microbiology, water chemistry, toxicology and public health. The results of the study indicate that current recharge practices using Santa Ana River water are protective of public health.

3. Land Use Considerations

One of the major problems facing the future of wastewater reclamation is a decrease in the total amount of agricultural land in the basin. As the population of the basin increases, commercial and residential developments eliminate agricultural land and the need for irrigation waters. Some reclaimed wastewater may be used for irrigating landscaping in the new developments, but the volume utilized will almost certainly be reduced.

4. The Prado Settlement

On October 18, 1963, the Orange County Water District filed a class action lawsuit against the water users in the upper Santa Ana Basin, seeking an adjudication of water rights against substantially all the water users in the area tributary to Prado Dam in the Santa Ana River watershed. As a result of the 1969 settlement of this case, the wastewater dischargers in the upper basin are required to provide 42,000 acre-feet at Prado Dam. This can consist of treated wastewater effluent or imported water as well as certain natural flows (*e.g.,* rising water); stormflows are not included. The amount of flow delivered is subject to adjustment based upon the TDS content of the water. Reclamation uses within the upper basin are thus limited to a degree by the need to ensure compliance with this settlement.

Wastewater is presently being reclaimed in the Santa Ana Watershed in a number of different ways:

1. Irrigation of Agricultural Land and Landscaping

Most of the direct reclamation of wastewater in the Region occurs as part of commercial agricultural and landscape irrigation, although this will change as recharge projects using recycled water are implemented (see below). This use is

conducted under water reclamation requirements issued by the Regional Board, typically as part of Waste Discharge Requirements and NPDES permits. In the San Jacinto Watershed, most of the wastewater is reclaimed for agricultural uses.

2. Discharge to the Santa Ana River

Although it is not widely considered as such, discharges of treated wastewater to Reaches 3, 4 and 5 of the Santa Ana River constitute the largest single reclamation activity in the Region. These discharges make up as much as 95 percent of the river's dry weather flow and enhance the in-stream beneficial uses of the river throughout its 26-mile length (San Bernardino to Prado Dam). Essentially all of this water is recharged into the groundwater basin in Orange County

3. Groundwater Recharge by Percolation

This type of reclamation is common throughout the Region. Most wastewater treatment plants that do not discharge directly to the River discharge their effluent to percolation ponds. All of the treated wastewater in the upper Santa Ana Basin that is not directly reclaimed for commercial agricultural and landscape irrigation purposes, or discharged directly to the Santa Ana River, is returned to local or downstream groundwater management zones by percolation. In Orange County, reclaimed water is used for greenbelt and landscape irrigation, and injected into coastal aquifers to control sea water intrusion.

Significant additional reclamation activities are planned in the Region. The Chino Basin Watermaster, Inland Empire Utilities Agency, Yucaipa Valley Water District, the City of Beaumont and the City of Banning propose to implement extensive groundwater recharge projects using recycled water. To accommodate these projects and other water and wastewater management strategies, these agencies have made the requisite demonstrations necessary to support the "maximum benefit" TDS and nitrate-nitrogen water quality objectives specified in this Plan for certain groundwater management zones (see Chapter 4). The recharge projects will provide reliable sources of additional water supply needed to support expected development within the agencies' areas of jurisdiction. These agencies' "maximum benefit" programs are described in detail in Section VI. of this Chapter.

The Yucaipa Valley Regional Brine line and a reverse osmosis facility at the Water Purification Facility, located at the Wochholz Regional Water Recycling Facility will facilitate groundwater replenishment reuse in the upper groundwater management zones of the Santa Ana Watershed. Treated wastewater will receive extensive advanced treatment, including microfiltration, reverse osmosis and disinfection using ultraviolet light. The recharge of recycled water will enhance both the quality of and quantity of groundwater resources, the major source of water supply in the area.

In Orange County, significant reclamation activities include the implementation of the Groundwater Replenishment System (GWRS), a joint effort of the Orange County Water District and Orange County Sanitation District. Treated wastewater provided by the Sanitation District will receive extensive advanced treatment, including microfiltration, reverse osmosis, and disinfection using ultraviolet light and hydrogen peroxide. In the first phase of the project, approximately 70,000 acre-feet per year of highly treated recycled water will be produced and distributed to groundwater recharge facilities and to injection wells used to maintain a seawater intrusion barrier. The GWRS will enhance both the quality and quantity of groundwater resources, the major source of water supply in the area. It will reduce the need for imported water and prevent, or at least delay, the need for an additional ocean outfall for disposal of the wastewater treated by the Sanitation District. Implementation of the GWRS and operation of Phase 1 began in 2008. Future phases to expand the capacity of the GWRS are planned.

4. Dual Water Supply Systems

Given increasing demands for water supply but diminishing resources, there is great interest in using reclaimed water in office buildings and the like for flushing toilets and urinals. Clearly, the addition of this water supply source must be carefully planned and overseen to prevent public health problems. No dual systems have been implemented as yet in the upper basin; in Orange County, the Irvine Ranch Water District has implemented dual systems (a reclaimed water system in addition to a potable supply) in a number of office buildings in its service area, with the approval of the Department of Health Services and the Regional Board.

The Salt Management Plan draws a balance between the benefits and problems of reclamation by including carefully planned reclamation activities in the watershed. The Recommended Plan provides for reclamation within the upper basin. All recycled water recharge projects will be regulated pursuant to the process identified in the discussion regarding assimilative capacity, and in accordance with the “maximum benefit” implementation strategies identified later in this Chapter (see section VI. Maximum Benefit Implementation Plans for Salt Management).

Recycled water used for landscape irrigation deserves special regulatory consideration. As discussed in the section on nitrogen loss coefficients, the Regional Board does not regulate nitrogen in recycled water used for landscape irrigation, recognizing the nitrogen losses that will occur as the result of plant uptake. The Nitrogen /TDS Task Force sponsored update of the TDS/Nitrogen Management Plan demonstrated that it is appropriate also to apply a 25 percent nitrogen loss coefficient to recycled water discharges applied to land to account for subsurface transformation and loss. Nitrogen losses due to plant uptake and subsurface transformation justify the Board’s regulatory approach. With respect to TDS, the water quality effects of recycled water used for landscape irrigation will be evaluated on a case-by-case basis and regulated accordingly.

6. Special Considerations – Subsurface Disposal Systems

In addition to establishing prohibitions and minimum lot size requirements for the use of subsurface disposal systems for sanitary wastes, the Regional Board issues waste discharge requirements where necessary to assure the protection of water quality and public health. In most cases, these requirements have been issued for commercial and industrial facilities, including mobile home parks, RV parks and truck washing operations, where the volume of waste is high and/or there is the potential for the discharge of wastes other than domestic sewage. Waste discharge requirements for individual residential systems and low volume (less than 500 gallons per day) domestic waste discharges from industrial and commercial facilities have been largely waived, pursuant to the waiver provisions of the Water Code (see discussion of waivers in the "Implementation through Waste Discharge Requirements" section, above). These waivers are conditional and may be revoked by the Regional Board at any time.

The Board has included TDS limitations in these waste discharge requirements in order to assure that the discharges are consistent with the TDS objectives of the affected receiving waters. These limits are expressed as both a maximum value that is based on the TDS objective of the receiving water, and a value that allows a reasonable use increment of 250 mg/L TDS above water supply quality. The more restrictive of the two TDS limits controls the allowed quality of the discharges.

TDS and nitrogen contributions from domestic waste discharges to existing commercial, industrial and residential subsurface disposal systems are reflected in the determinations of current ambient ground water quality and assimilative capacity (see preceding section – B.1.) on salt assimilative capacity). These determinations were made as part of the N/TDS Task Force sponsored update of the TDS/nitrogen management plan in this Basin Plan. These contributions are expected to decline over time as these discharges are eliminated through the expansion of regional sewer systems.

Compliance with TDS limits by these facilities is particularly problematic, since these facilities typically have little or no control over the TDS quality of water supplied to them, unlike POTWs. Further, sewering of the discharges is often not an option, at least at the present time, although this is changing as rapid new development in many parts of the region continues to drive the expansion of sewer facilities. As systems expand, many of these discharges will be eliminated as they are connected to the sewers. Finally, the offset provisions that are applied to POTWs are unnecessary for existing residential commercial and industrial domestic waste discharges, given that they are addressed as part of the Regional Board's minimum lot size program for subsurface disposal systems and through the updated TDS and nitrogen management plan in this Basin Plan as part of the overlying land-use considerations and ambient water quality determinations.

Taking these factors into consideration, the waste discharge requirements that have been issued and will be updated periodically for domestic waste discharges from these existing residential, commercial and industrial facilities will include TDS requirements that specify a maximum mineral increment of 250 mg/L TDS to the water supply quality. This will assure

reasonable use and prevent the disposal of highly saline wastes. Existing facilities are defined as those for which waste discharge requirements have been issued, or that have been built as of December 23, 2004.

IV. Other Projects and Programs

In addition to the regulatory efforts of the Regional Board described in the preceding section, water and wastewater purveyors and other parties in the watershed have implemented, and propose to implement, facilities and programs designed to address salt problems in the groundwater of the Region. These include the construction of brine lines, groundwater desalters, recycled water demineralization systems, implementation of programs to enhance the recharge of high quality stormwater and imported water, where available, and re-injection of recycled water to maintain salt water intrusion barriers in coastal areas. These projects and programs are motivated by the need to protect and augment water supplies, as well as to facilitate compliance with waste discharge requirements.

A. Brine Lines

There are two brine line systems in the Region, the Inland Empire Brine Line, formerly known as the Santa Ana Regional Interceptor (SARI) and the older Chino Basin Non-Reclaimable Waste Line (NRWL). These lines are used to transport brine wastes out of the basin for treatment and disposal to the ocean. They are a significant part of industrial waste management and essential for operation of desalters in the upper watersheds.

1. Inland Empire Brine Line

The Inland Empire Brine Line (Brine Line) was constructed and is owned by SAWPA. It is approximately 93 miles of 16 inch to 84 inch pipeline connected to the Orange County Sanitation District treatment facilities. SAWPA owns capacity rights in the Brine Line downstream of Prado Dam. The line extends from the Orange County Line near Prado Dam northeast to the San Bernardino area. The Brine Line has been extended southerly to serve the San Jacinto Watershed. Brine Line Reach 5 extends up the Temescal Canyon from the City of Corona to the Eastern Municipal Water District (EMWD) brine line terminus in the Lake Elsinore area. EMWD's Menifee Desalter and other high salinity discharges from EMWD and Western Municipal Water District now have access to the brine line.
The Brine Line, Reach IVE has been extended to the east about 15 miles from the City of San Bernardino to Yucaipa Water District's Wochholz Regional Water Recycling Facility. The Brine Line will be utilized by Yucaipa Valley Water District and the Mountainview Power Plant for brine disposal.

2. Chino Basin Non-Reclaimable Waste Line

The Chino Basin Non-Reclaimable Waste Line (NRWL) is connected to the Los Angeles County Sanitation District sewer system in the Pomona area. The NRWL,

which is owned and operated by Inland Empire Utilities Agency, exports non-reclaimable industrial wastes and brine from the Chino Basin. It extends eastward from the Los Angeles County Line to the City of Fontana. It was originally built to serve industries including the Kaiser Steel Company and Southern California Edison Power Plants.

B. Groundwater Desalters

The studies leading to the development of the TDS/Nitrogen management plan included in this Basin Plan when it was approved in 1995 demonstrated that it was not realistic to achieve compliance with all the nitrogen and TDS objectives for the groundwater subbasins then identified within the Region. Long-term historic land use practices, particularly agriculture, have left an enormous legacy of salts that are now in the unsaturated soils overlying the groundwater subbasins (now, newly defined groundwater management zones). A significant amount of these salts will, over time, degrade groundwater quality. The programs of groundwater extraction, treatment, and replenlishment needed to completely address these historic salt loads were shown to far exceed the resources available to implement them.

While the boundaries of the groundwater management zones have been revised and new TDS and nitrate-nitrogen water quality objectives established, the salt legacy problem remains. The construction and operation of groundwater desalters to extract and treat poor quality groundwater continues to be an essential component of salt management in the Region. Such projects will be increasingly important to protect local water supplies and to provide supplemental, reliable sources of potable supplies.

A number of groundwater desalters have already been constructed, and more are planned. These facilities are described below.

1. Upper Santa Ana Basin

In the Upper Santa Ana Basin, the Santa Ana Watershed Project Authority (SAWPA) constructed the Arlington desalter, which is now owned and operated by Western Municipal Water District. This desalter, with a capacity of about 7 MGD, treats water extracted from the Arlington Management Zone, which was heavily impacted by historic agricultural activities.

In the Chino Basin, the Chino Desalter Authority operates the Chino 1 desalter, which is planned for expansion from 8 MGD to 13 MGD capacity. Additional desalters and desalter capacity will be constructed as part of a “maximum benefit” proposal by the Chino Basin Watermaster and the Inland Empire Utilities Agency (see Section VI., Maximum Benefit Implementation Plans for Salt Management).

The City of Corona began operation of the Temescal desalter in late 2001 with product water capacity of 10 MGD. In 2004, the City expanded the desalter plant capacity by adding a fourth train to increase the product water capacity by 5 MGD

for a current total of 15 MGD. The product water is used to supplement other municipal supplies as a blending source. The improved TDS quality of these supplies is an important part of the City's efforts to assure compliance with waste discharge requirements.

In the San Timoteo Watershed areas, desalters will be implemented as necessary for the Yucaipa and Beaumont areas, as discussed in detail in Section VI., Maximum Benefit San Timoteo Watershed Salt Management Plan.

2. San Jacinto Watershed

EMWD operates the Menifee desalter, which has a capacity of about 3 MGD. Product water is added to the EMWD municipal supply system, and the waste brine is discharged to a non-reclaimable waste disposal system that is ultimately connected to the SAWPA Inland Empire Brine Line. The desalter extracts groundwater from the Perris South and Menifee Management Zones, both of which are adversely affected by historic salt loads contributed largely by agricultural activities.

EMWD plans to construct a desalter with capacity of about 4.5 MGD to treat poor quality water extracted from the Perris South and Lakeview/Hemet North Management Zones. The purpose of this facility is to stop subsurface migration of poor quality groundwater from the Perris South Management Zone into the Lakeview/Hemet North Management Zone.

3. Orange County

The Tustin Seventeenth Street Desalter, which began operation in 1996 reduces high nitrate and TDS concentrations from groundwater pumped by Tustin's Seventeenth Street wells, adding approximately 3,000 acre-feet of water annually to Tustin's domestic water supply. A second facility, Tustin's Main Street Treatment Plant, began operating in 1989 with a yield of 2,000 acre-feet per year. The plant reduces nitrate levels from groundwater produced by Tustin's Main Street wells, employing reverse osmosis and ion exchange. The Orange County Water District and Irvine Ranch Water District (IRWD) cooperated to build the Irvine Desalter, a dual-purpose regional groundwater remediation and water supply project located in the City of Irvine and its sphere of influence. The project consists of an extensive seven-well groundwater extraction and collection system, a treatment system, a five-mile brine disposal pipeline, a finished water delivery system, and ancillary facilities. While providing approximately 8,000 acre-feet per year to IRWD for potable and non-potable supply, the desalter extracts and treats brackish groundwater and captures an overlapping regional plume of TCE-contaminated groundwater demonstrated to have originated from the former U.S. Marine Corps Air Station-El Toro.

C. Recharge of Storm Water and/or Imported Water

The Orange County Water District, San Bernardino Valley Water Conservation District and other agencies in the Region operate extensive facilities designed to enhance the capture and recharge of high quality storm water. More such facilities are planned as part of "maximum benefit" proposals by the Chino Basin Watermaster/Inland Empire Utilities Agency, and agencies implementing the maximum benefit programs in the San Timoteo watershed (Section VI., Maximum Benefit Implementation Plans for Salt Management). These proposals also include efforts to import and recharge high quality State Water Project water, when it is available. These activities increase both the quantity and quality of available groundwater resources.

D. Sea Water Intrusion Barriers

The Orange County Water District operates advanced facilities designed to provide significantly enhanced tertiary treatment of secondary treated municipal wastewater from the Orange County Sanitation District's (Sanitation District) Fountain Valley Reclamation Plant No. 1. The recycled water is injected into a series of wells located along Ellis Avenue in the City of Fountain Valley to maintain the Talbert Gap Seawater Intrusion Barrier. The treatment facility, the Groundwater Replenishment System (GWRS) was constructed jointly by Orange County Water District and the Sanitation District (see preceding section on wastewater reclamation).

V. Salt Management Plan -- Monitoring Program Requirements

California Water Code Section 13242 specifies that Basin Plan implementation plans must contain a description of the monitoring and surveillance programs to be undertaken to determine compliance with water quality objectives. The adoption of new groundwater TDS and nitrate-nitrogen water quality objectives (Chapter 4) in response to the studies sponsored by the N/TDS Task Force triggered the need to develop and implement a new, watershed-wide nitrogen/TDS monitoring program. The Task Force provided additional impetus for this comprehensive monitoring program. The Task Force recommended that future review and update of the salt management plan, including findings of assimilative capacity, appropriate changes to the wasteload allocations, etc., should be based on real-time data obtained through a rigorous monitoring program, rather than on model projections. As discussed earlier (see Section II., Update of the Total Dissolved Solids/Nitrogen Management Plan), the Task Force concluded that the development of new, workable modeling tools to assist in this review was beyond the scope and financial capability of the Task Force.

The monitoring program must consist of both surface water and groundwater components. Some of these are already being implemented, including the annual sampling of the Santa Ana River, Reach 3 at Prado Dam by Regional Board staff (see Chapter 4 and below). Certain agencies have committed to conduct monitoring of specific water bodies as part of their "maximum benefit" proposals (see Section VI., Maximum Benefit Implementation Plans for Salt Management, below). The N/TDS Task Force members, and other parties

as appropriate, will be required to propose a comprehensive monitoring program that would integrate these existing commitments with other monitoring recommendations. These parties will be required to implement this program upon approval by the Regional Board.

A. Surface Water Monitoring Program Requirements for TDS and Nitrogen

Implementation of a surface water monitoring program is needed to determine compliance with the nitrogen and TDS objectives of the Santa Ana River, and thereby, the effectiveness of the wasteload allocations. It is also needed to provide data required to evaluate the effects of surface water discharges on affected groundwater management zones. In particular, data are needed to confirm the validity of the 50% nitrogen loss coefficient that will be applied in regulating discharges to that part of Reach 3 of the River that overlies the Chino South groundwater management zone (see Section III.B.3., Nitrogen loss coefficients).

As discussed in Chapter 4, the Basin Plan specifies baseflow TDS and total nitrogen objectives for Reach 3 of the River. For Reach 2, a TDS objective based on a five-year moving average of the annual TDS concentration is specified. Use of this moving average allows the effects of wet and dry years to be integrated over the five-year period and reflects the actual long-term quality of water recharged by Orange County Water District downstream of Prado Dam.

The Basin Plan specifies a monitoring program to determine compliance with the Reach 3 baseflow objectives at Prado Dam (see Chapter 4). As noted above, Regional Board staff conducts this program on an annual basis. Measurement of baseflow quality, rather than the quality of flows in Reach 2, has long been used to indicate the effects of recharge of Santa Ana River flows on Orange County groundwater. The efficacy of this approach was evaluated as part of the 2004 update of the TDS/nitrogen management plan in the Basin Plan. Insufficient data were available to draw a direct correlation between the long-term TDS and nitrogen quality of River flows at Prado Dam and that of affected Orange County groundwater. However, the conclusion drawn was that reliance on the Reach 3 baseflow objectives to protect Orange County groundwater, and the existing monitoring program designed to measure compliance, is adequate.
In addition to this baseflow sampling program and the surface water monitoring commitments associated with certain agencies' "maximum benefit" programs, the comprehensive monitoring program to be proposed and implemented by the Task Force members, and other agencies as appropriate, must include an evaluation of compliance with the TDS and nitrogen objectives for Reaches 2, 4 and 5 of the Santa Ana River. Compliance with the Reach 2 TDS objective can be determined by evaluation of data collected by the Santa Ana River Watermaster, Orange County Water District, the United States Geological Survey, and others.

Surface water monitoring program requirements for TDS and nitrogen are as follows:

1. No later than March 23, 2005, Orange County Water District, Inland Empire Utilities Agency, Chino Basin Watermaster, City of Riverside, City of Corona, Elsinore Valley Municipal Water District, Eastern Municipal Water District, City of Colton, City of San Bernardino Municipal Water Department, Jurupa Community Services District, Western Riverside County Regional Wastewater Authority, Lee Lake Water District, Yucaipa Valley Water District, City of Beaumont, the San Timoteo Watershed Management Authority and the City of Rialto shall submit to the Regional Board for approval, a proposed surface water TDS and nitrogen monitoring program that will provide an evaluation of compliance with the TDS and nitrogen objectives for Reaches 2, 4 and 5 of the Santa Ana River.

In lieu of this coordinated monitoring plan, one or more of the parties identified in the preceding paragraph may submit an individual or group monitoring plan. Any such individual or group monitoring plan shall also be submitted no later than March 23, 2005.

2. By August 1st of each year, the Orange County Water District, Inland Empire Utilities Agency, City of Riverside, City of Corona, Elsinore Valley Municipal Water District, Eastern Municipal Water District, Lee Lake Water District, City of Colton, City of San Bernardino Municipal Water Department, Jurupa Community Services District, Western Riverside County Regional Wastewater Authority, Yucaipa Valley Water District, City of Beaumont, and the City of Rialto, shall submit an annual report of Santa Ana River, Reach 2 , 4 and 5 water quality. Data evaluated shall include that collected by the Santa Ana River Watermaster, Orange County Water District, and the US Geologic Survey, at a minimum.

In lieu of this coordinated annual report, one or more of the parties identified in the preceding paragraph may submit an individual or group annual report. Any such individual or group report shall also be submitted by August 15th of each year.

Additional surface water monitoring programs may be specified by the Regional Board depending upon watershed conditions, waste discharge specifications and/or any special studies related to TDS and nitrogen.

B. Groundwater Monitoring Program for TDS and Nitrogen

Implementation of a watershed-wide TDS/nitrogen groundwater monitoring program is necessary to assess current water quality, to determine whether TDS and nitrate-nitrogen water quality objectives for management zones are being met or exceeded, and to update assimilative capacity findings. Groundwater monitoring is also needed to fill data gaps for those management zones with insufficient data to calculate TDS and nitrate-nitrogen historical quality and current quality. Finally,

groundwater monitoring is needed to assess the effects of POTW discharges to surface waters on affected groundwater management zones.
Groundwater monitoring requirements for TDS and nitrogen are as follows:

> No later than June 23, 2005, Orange County Water District, Irvine Ranch Water District, Inland Empire Utilities Agency, Chino Basin Watermaster, City of Riverside, City of Corona, Elsinore Valley Municipal Water District, Eastern Municipal Water District, City of Colton, City of San Bernardino Municipal Water Department, City of Redlands, Jurupa Community Services District, Western Riverside County Regional Wastewater Authority, Lee Lake Water District, Yucaipa Valley Water District, City of Beaumont, the San Timoteo Watershed Management Authority and the City of Rialto shall submit to the Regional Board for approval, a proposed watershed-wide TDS and nitrogen monitoring program that will provide data necessary to review and update the TDS/nitrogen management plan. Data to be collected and analyzed shall address, at a minimum: (1) determination of current ambient quality in groundwater management zones; (2) determination of compliance with TDS and nitrate-nitrogen objectives for the management zones; (3) evaluation of assimilative capacity findings for groundwater management zones; and (4) assessment of the effects of recharge of surface water POTW discharges on the quality of affected groundwater management zones. The determination of current ambient quality shall be accomplished using methodology consistent with that employed by the Nitrogen/TDS Task Force (20-year running averages) to develop the TDS and nitrogen water quality objectives included in this Basin Plan. [Ref. 1] The determination of current ambient groundwater quality throughout the watershed must be reported by July 1, 2005, and, at a minimum, every three years thereafter.

In lieu of this coordinated monitoring plan, one or more of the parties identified in the preceding paragraph may submit an individual or group monitoring plan. Any such individual or group monitoring plan shall also be due no later than June 23, 2005. Details to be included in the proposed monitoring program shall include, but not be limited to, the following:

- monitoring program goals
- responsible agencies
- groundwater water sampling locations
- surface water sampling locations (if appropriate)
- water quality parameters
- sampling frequency
- quality assurance/quality control
- database management
- data analysis and reporting

Within 30 days of Regional Board approval of the proposed monitoring plan, the monitoring plan must be implemented.

Additional groundwater monitoring programs may be specified by the Regional Board depending upon watershed conditions, waste discharge specifications and/or any special studies related to TDS and nitrogen.

Basin Monitoring Program Task Force

Subsequent to the approval of the Region's Salt and Nutrient Management Plan in 2004, a new task force, the "Basin Monitoring Program Task Force" (BMPTF) was formed to implement the requisite nitrogen/TDS monitoring and analyses programs described previously. SAWPA serves as the administrator for the BMPTF.

The Task Force includes the following agencies:

- Eastern Municipal Water District
- Inland Empire Utilities Agency
- Orange County Water District
- City of Riverside
- Lee Lake Water District
- Elsinore Valley Municipal Water District
- Irvine Ranch Water District
- Colton/San Bernardino Regional Tertiary Treatment and Wastewater Reclamation Authority
- Chino Basin Watermaster
- Yucaipa Valley Water District
- City of Beaumont
- City of Corona
- City of Redlands
- City of Rialto
- Jurupa Community Services District
- Western Riverside Co. Regional Wastewater Authority

The Santa Ana Regional Water Quality Control Board and SAWPA are also signatories to the BMPTF agreement.

As indicated above (Section V.A and V.B), the task force agencies are required to conduct the following investigations:

1. Recomputation of the Ambient Water Quality – every three years

2. Preparation of a Water Quality Report for the Santa Ana River – annually

Declaration of Conformance

Another major activity that the BMPTF completed in March 2010 was the development of a "Declaration of Conformance" for approval by the Regional Board and the State Water Resources Control Board. With the Declaration, the Task Force and Regional Board declared conformance with the then-new State Board Recycled Water Policy requirements for the completion of a salt and nutrient management plan for the Santa Ana Region, and other requirements of this Policy. This finding of conformance was based on the work of the Nitrogen/TDS Task Force. That work resulted in the 2004 adoption of Basin Plan amendments to incorporate a revised salt and nutrient management plan for the Region (Resolution No. R8-2004-0001). Further, the Declaration documented conformance with

the emerging constituents monitoring requirements in the Policy through the “Emerging Constituents Sampling and Investigation Program”, submitted to the Regional Board on an annual basis by the Emerging Constituents Program Task Force. The Sampling and Investigation Program will be reviewed annually and revised as necessary and will integrate the State Board's recommendations when they become available. Finally, the Declaration of Conformance documents the analyses and procedures that will be used to streamline the permitting process for recycled water projects, as required by the Policy.

The Declaration of Conformance was formally adopted by resolution of the Regional Board on March 18, 2010 (Resolution No. R8-2010-0012) and formally submitted to the State Board on April 12, 2010.

Salt Monitoring Cooperative Agreement

In January 2008, the Regional Board entered into a Cooperative Agreement with several water and wastewater agencies in the Santa Ana River Watershed to analyze and report the amount of salt and nitrates entering local groundwater aquifers as a consequence of recharging imported water in the region. The “Cooperative Agreement to Protect Water Quality and Encourage the Conjunctive Use of Imported Water in the Santa Ana River Basin” is Attachment A to Resolution No. R8-2008-0019.

As with the BMPTF effort underwritten by local stakeholders, the Cooperative Agreement obligates signatories to assess current groundwater quality every three years. In addition, the signatories have agreed to estimate every six years the changes that are likely to occur in groundwater quality as a result of on-going and expected projects that recharge imported water. By emphasizing the use of "real-time" monitoring, rather than complex fate and transport models, the Regional Board is better able to evaluate the effects of these recharge projects.
The parties of the Cooperative Agreement execute the terms of the agreement through a workgroup that meets regularly under the administration of SAWPA. As the informal administrator, SAWPA assists in coordination among the signatories of the necessary basin salinity monitoring and modeling reports, along with final compilation and submittal of the reports to the Regional Board by the deadlines defined in the agreement.

VI. Maximum Benefit Implementation Plans for Salt Management

As discussed in Chapter 4, with some limited exceptions, TDS and nitrate-nitrogen objectives for groundwater management zones in the Santa Ana Region were established to ensure that historical quality is maintained, pursuant to the State’s antidegradation policy (State Board Resolution No. 68-16). However, alternative, less stringent “maximum benefit” objectives are also specified in Chapter 4 for certain groundwater management zones. These “maximum benefit” objectives, which would allow the lowering of water quality, were established based on demonstrations by the agencies recommending them that antidegradation requirements were satisfied. First, these agencies demonstrated that beneficial uses would continue to be protected. Second, these agencies showed that water quality consistent with maximum benefit to the people of the state would be

maintained. Other factors, such as economics, the need to use recycled water, and the need to develop housing in the area were also taken into account in establishing the objectives (see Chapter 4).

The demonstrations of “maximum benefit” by these agencies are contingent on the implementation of specific projects and programs by the agencies. As discussed in Chapter 4, if these projects and programs are not implemented to the Regional Board’s satisfaction, then the alternative “antidegradation” objectives apply to these waters for regulatory purposes.

This section identifies the specific commitments by the Chino Basin Watermaster and Inland Empire Utilities Agency, the Yucaipa Valley Water District, the City of Beaumont and the San Timoteo Water Management Authority to implement projects and programs to support the “maximum benefit” objectives established for groundwater management zones affected by their wastewater and water management practices.

A. Salt Management – Chino Basin and Cucamonga Basin (The following was updated under Resolution No. R8-2012-0002)

As shown in Chapter 4, both “antidegradation” and “maximum benefit” objectives for TDS and nitrate-nitrogen are specified in this Plan for certain parts of the Chino Basin and the Cucamonga groundwater Management Zone. The application of the “maximum benefit” objectives relies on the implementation by the Chino Basin Watermaster and the Inland Empire Utilities Agency of a specific program of projects and requirements [Ref. 10B], which are an integral part of the Chino Basin Optimum Basin Management Program (OBMP) [Ref. 10C]. The OBMP was developed by the Watermaster under the supervision of the San Bernardino County Superior Court. The OBMP is a comprehensive, long-range water management plan for the Chino Basin as a whole, including the Chino North (or Chino 1, 2, and 3) and Cucamonga Management Zones. The OBMP includes the use of recycled water for basin recharge, initially in the Chino North Management Zone. Recycled water recharge in the Cucamonga Management Zone may be pursued in the future. The OBMP also includes the capture of increased quantities of high quality storm water runoff, recharge of imported water when its TDS concentrations are low, improvement of water supply by desalting poor quality groundwater, and enhanced wastewater pollutant source control programs. The OBMP maps a strategy that will provide for enhanced yield for the Chino Basin and seeks to provide reliable water supplies for development expected to occur within the Basin. The OBMP also includes the implementation of management activities that would result in the hydraulic isolation of Chino Basin groundwater from the Orange County Management Zone, thus insuring the protection of downstream beneficial uses and water quality.

Table 5-8a identifies the projects and requirements that must be implemented to demonstrate that water quality consistent with maximum benefit to the people of the state will be maintained. An implementation schedule is also specified. The Regional Board will revise IEUA’s waste discharge requirements, issue appropriate permits to the Chino Basin Watermaster, and utilize the authority provided by Section 13267 of the Water Code as

necessary to require that these commitments be met. It is assumed that maximum benefit is demonstrated, and that the “maximum benefit” TDS and nitrate-nitrogen objectives apply to the Chino North and Cucamonga Management Zones as long as the schedule is being met. If the Regional Board determines that the maximum benefit program is not being implemented effectively in accordance with the schedule shown in Table 5-8a, then maximum benefit is not demonstrated, and the “antidegradation” TDS and nitrate-nitrogen objectives for the Chino 1, 2, and 3 and Cucamonga Management Zones apply. In this situation, the Regional Board will require mitigation for TDS and nitrate-nitrogen discharges to these management zones that took place in excess of limits based on the “antidegradation” objectives.

This space intentially left blank

Table 5-8a

Chino Basin Maximum Benefit Commitments
(revised in 2012; see text)

Description of Commitment	Compliance Date – as soon as possible, but no later than
1. Surface Water Monitoring Program	
a. Submit Draft Monitoring Program to Regional Board	a. January 23, 2005
b. Implement Monitoring Program	b. With 30 days from date Regional Board approval of monitoring plan
c. Submit Draft Revised Monitoring Program to Regional Board	c. December 21, 2012
d. Implement Revised Monitoring Program	d. Upon Regional Board approval
e. Submit Draft Revised Monitoring Program(s) (subsequent to that required in "c" above) to Regional Board	e. Upon notification of the need to do so from the Regional Board Executive Officer an in accordance with sechdule prescribed by the Executive Officer
f. Implement Revised Monitoring Program(s)	f. Upon Regional Board approval
g. Annual data report submittal	g. April 15th
2. Groundwater Monitoring Program	
a. Submit Draft Monitoring Program to Regional Borad	a. January 23, 2005
b. Implement Monitoin Program	b. Within 30 days from date of Regional Board approval of monitoring plan
c. Plan and schedule for demonstrating hydraulic control	c. By December 31, 2013
d. Implemement hydraulic control demonstration plan and schedule	d. Upon Regional Board approval
e. Submit Draft Revised Monitoring Progrms(s) (subsequent to that required in "a" above) to Regional Board	e. Uponnotification of the need to do so from the Regional Board Executive Officer and in accordance with the schedule prescribed by the Executuve Officer
f. Implement revised monitoring plan(s)	f. Upon Regional Board approval
g. Annual data report submittal	g. April 15th

Table 5-8a

Chino Basin Maximum Benefit Commitments
(revised in 2012; see text)

Description of Commitment	Compliance Date – as soon as possible, but no later than
3. Chino Desalters a. Chino 1 desalter expansion to 10 MGD b. Chino 2 desalter at 10 MGD design	a. Prior to recharge of recycle water b. Recharge of recycled water allowed once award of contract and notice to proceed issued for construction of desalter treatment plant.
4. Future desalters plan and schedule submittal	October 1, 2005 Implement plan and schedule upon Regional Board approval
5. Recharge facilities (17) built and in operation	June 30, 2005
6. IEUA wastewater quality improvement plan and schedule submittal	60 days after agency-wide 12 month running average effluent TDS quality equals or exceeds 545 mg/L for 3 consecutive months or agency-wide 12 month running average TIN equals or exceeds 8 mg/L in any month. Implement plan and schedule upon approval by Regional Board.
7. Recycled water will be blended with other recharge sources so that the 5-year running average TDS and nitrate-nitrogen concentrations of water recharged are equal to or less than the "maximum benefit" water quality objectives for the affected Management Zone (Chino North or Cucamonga). a. Submit a report that documents the location, amount of recharge, and TDS and nitrogen quality of stormwater recharge before the OBMP recharge improvements were constructed and what is projected to occur after the recharge improvements are completed b. Submit documentation of amount, TDS and nitrogen quality of all sources of recharge and recharge locations. For stormwater recharge used for blending, submit documentation that the recharge is the result of CBW/IEUA enhanced recharge facilities.	Compliance must be achieved by end of 5th year after initiation of recycled water recharge operations. a. Prior to initiation of recycled water recharge b. Annually, by April 15th, after initiation of construction of basin/other facilities to support enhanced stormwater recharge

Table 5-8a
Chino Basin Maximum Benefit Commitments
(revised in 2012; see text)

Description of Commitment	Compliance Date – as soon as possible, but no later than
8. Hydraulic Control Failure	
a. Plan and schedule to correct lossof hydraulic control	a. 60 days from Regional Board finding that hydraulic control is not beign maintained
b. Achievement and maintenance of hydraulic control	b. In accordance with plan and schedule approved by Regional Board. The schedule shall assure that hydraulic control is achieved as sson as possible
c. Mitigation plan for temporary failure to achieve/maintain hydraulic control	c. By January 23, 2005. Implement plan upon Regional Board determination that hydraulic control is not being maintained (see text)
9. Ambient groundwater quality determination	July 1, 2005 and every 3 years thereafter

A. Description of Chino Basin Watermaster and Inland Empire Utilities Agency Commitments

1. Surface Water Monitoring Program (Table 5-8a #1)

In conjunction with the Groundwater Monitoring Program (see #2, below), the purpose of the surface water monitoring program is to collect the data necessary to demonstrate whether hydraulic control of the Chino Basin (see #8, below) is being achieved and maintained. A surface water monitoring program was developed, approved and implemented in response to the maximum benefit commitments initially incorporated in the Basin Plan in 2004 (Resolution No. R8-2004-0001). The Regional Board approved the Surface Water Monitoring Program in 2005 (R8-2005-0064). Subsequently, the need to revise the monitoring program, and other elements of the maximum benefit commitments (see below), was recognized and appropriate amendments were adopted in 2012 (Resolution No. R8-2012-0002). These include the requirement that by December 21, 2012, the Watermaster shall submit a revised surface water monitoring program to the Regional Board for approval. The monitoring program must be implemented upon Regional Board approval.

It is expected that the monitoring program will be reviewed as it is implemented over time, and that further updates may be necessary. Accordingly, the Basin Plan requires that draft revised monitoring programs be submitted upon notification by the Regional

Board's Executive Officer of the need to do so. The schedule for the submittal will be prescribed by the Executive Officer. Any such revision to the monitoring program is subject to Regional Board approval at a duly noticed public hearing and is to be implemented upon Regional Board approval.

An annual report summarizing all data collected for the year and evaluating compliance with relevant surface water objectives shall be submitted by April 15th of each year.

2. Groundwater Monitoring Program (Table 5-8a, #2)

The purpose of the Groundwater Monitoring Program is to (1) identify potential impacts from implementation of the Chino Basin "maximum benefit" water quality objectives on water levels and water quality within the Chino Basin and in downgradient basins and (2) in conjunction with the surface water monitoring program, determine whether hydraulic control (see # 8, below) is being achieved and maintained. In response to requirements established in 2004 (Resolution No. R80 2004-0001), a proposed groundwater monitoring program was submitted. In 2005, the Regional Board approved a groundwater monitoring program to determine hydraulic control and ambient water quality in the Chino North and Cucamonga Management Zones (Resolution No. R8-2005-0064). The groundwater monitoring program has been ongoing since 2005.

As noted above, the maximum benefit requirements were revised in 2012. Pursuant to these revisions, no later than December 31, 2013, the Watermaster and IEUA shall prepare an updated proposed groundwater monitoring program that includes a proposed plan and schedule for demonstration of hydraulic control. This plan shall be implemented upon Regional Board approval.

It is expected that the monitoring program will be reviewed as it is implemented over time, and that further updates may be necessary. Accordingly, the Basin Plan requires that draft revised monitoring programs be submitted upon notification by the Regional Board's Executive Officer of the need to do so. The schedule for the submittal will be prescribed by the Executive Officer. Any such revision to the monitoring program is subject to Regional Board approval at a duly noticed public hearing and is to be implemented upon Regional Board approval.

An annual report, including all raw data and summarizing the results of the approved groundwater monitoring program, shall be submitted to the Regional Board by April 15th of each year.

3. Chino 1 and Chino 2 Desalters (Table 5-8a, # 3)

Prior to the recharge of recycled water in the Chino Basin, the Chino 1 desalter must be expanded and in operation at a capacity of 10 million gallons per day (MGD). Also, contracts for the construction of the Chino 2 desalter treatment plant must be awarded

and a notice to proceed with the construction must be given prior to recharge of recycled water.

4. Future Desalter Development (Table 5-8a, # 4)

No later than October 1, 2005, the schedule for implementation of the next 20 MGD of desalter capacity, pursuant to the Peace Agreement that implements the Chino Basin OBMP, and as required by the San Bernardino Superior Court, must be submitted to the Regional Board by the Chino Basin Watermaster. IEUA and/or the Chino Basin Watermaster and/or other responsible parties deemed acceptable by the Executive Officer, will initiate building of the next desalter when the 12-month running average effluent concentration (measured as an average for all IEUA wastewater treatment facilities) reaches 545 mg/L TDS for three consecutive months.

5. Recharge Facilities (Table 5-8a, # 5)

By June 30, 2005, or no later than one year from the start of discharge of recycled water, the 17 recharge facilities identified in the August 2001 Watermaster Recharge Master Plan and as updated by the Watermaster and IEUA, must be completed and operated to maximize the capture of storm water in the Chino Basin. The Watermaster has also committed to optimize the recharge of imported water in the Chino Basin based on the goal of maximizing recharge of State Project water when the TDS of that water is lowest.

The Watermaster proposal recognizes the importance and necessity of recharge of both storm water and imported water to meet the water supply demands on the Chino Basin. Recharge of high quality supplies to the Chino Basin is necessary to offset the quality effects of recycled water and to achieve an ambient water quality equal to or better than the “maximum benefit” TDS and nitrate-nitrogen water quality objectives.

6. IEUA Wastewater Effluent Quality (Table 5-8a, # 6)

Within 60 days after the IEUA 12-month running average effluent concentration (measured as an average for all IEUA wastewater treatment facilities) for TDS exceeds 545 mg/L for 3 consecutive months, or the 12-month running average total inorganic nitrogen (TIN) concentration (measured as an average for all IEUA wastewater treatment facilities) exceeds 8 mg/L in any month, the IEUA shall submit to the Regional Board a plan and time schedule for implementation of measures to insure that the 12-month running average agency wastewater effluent quality does not exceed 550 mg/L and 8 mg/L for TDS and TIN, respectively. The Plan and schedule are to be implemented upon Regional Board approval.

7. Recycled Water Use (Table 5-8a, # 7)

The use and recharge of recycled water within the Chino Basin is a critical component of the Watermaster OBMP and is necessary to maximize the use of the water resources of the Chino Basin. The demonstration of maximum benefit, and the

continued application of the “maximum benefit” TDS and nitrate-nitrogen water quality objectives, depends on the recharge to the Chino North Management Zone of 5-year annual average (running average) TDS and nitrogen concentrations of no more than 420 mg/L and 5 mg/L, respectively. If and when recycled water recharge in the Cucamonga Management Zone is pursued, the application of the “maximum benefit” objectives will depend on the recharge to that zone of 5-year running average TDS and nitrogen concentrations no greater than 380 mg/L and 5 mg/L, respectively. IEUA has committed to meeting these levels and recognizes that the maximum benefit objectives depend on achieving these 5-year running average concentrations.

Accordingly, the use of recycled water for groundwater recharge shall be limited to the amount that can be blended on a volume-weighted basis with other sources of recharge to the management zone to achieve a 5-year running average concentration equal to or less than the “maximum benefit” TDS and nitrogen water quality objectives of the affected Management Zone (Chino North or Cucamonga). The 25% nitrogen loss coefficient will be applied to calculate recycled water nitrogen quality when determining the amount of recharge of other water sources that must be achieved to meet the 5-year running averages.

8. Hydraulic Control (Table 5-8a, # 8)

“Hydraulic Control” is defined as eliminating groundwater discharge from the Chino Basin to the Santa Ana River, or controlling the discharge to *de minimis* levels. The surface water and groundwater monitoring programs described above are intended to demonstrate whether hydraulic control is achieved and maintained. In the event that the Regional Board finds that hydraulic control is not being accomplished, the Watermaster is required to submit to the Regional Board within 60 days of that finding a plan and time schedule to correct the failure to achieve and maintain hydraulic control. This plan must be implemented as soon as possible.

In response to a 2010 finding that hydraulic control was not being achieved, Watermaster and IEUA implemented an approved corrective action and mitigation plan and schedule. Additional plans and schedules to address hydraulic control deficiencies will be required if and as there are future Regional Board findings that hydraulic control is not being achieved or maintained.
By January 23, 2005, the Watermaster and IEUA shall prepare a proposed plan and schedule to mitigate temporary losses of hydraulic control. These agencies must implement this plan upon a determination by the Regional Board that hydraulic control is not being achieved or maintained.

9. Ambient Groundwater Quality Determination (Table 5-8a, # 9)

By July 1, 2005, and every three years thereafter, Watermaster shall submit a determination of ambient TDS and nitrate-nitrogen quality in the Chino North and Cucamonga Management Zones. This determination shall be accomplished using methodology consistent with the determinations (20-year running averages) used by

the TDS/Nitrogen Task Force to develop the “antidegradation” TDS and nitrate-nitrogen water quality objectives for groundwaters subbasins within the Region. [Ref.1].

B. Implementation by Regional Board

1. Revision of the Inland Empire Utilities Agency NPDES Permits

To implement the “maximum benefit” objectives, the Regional Board will revise the NPDES permits for IEUA wastewater discharges to reflect the commitments described above, as appropriate. This includes the following. TDS and TIN (includes nitrate-nitrogen) limits of 550 mg/L and 8 mg/L, respectively, will be specified as an agency-wide, volume weighted-average. The limits will be expressed as 12-month running averages. These limits implement the wasteload allocations for IEUA surface water discharges (see Table 5-5), and are not contingent on the “maximum benefit” objectives or demonstration[5]. IEUA will be required to implement measures to improve effluent quality when the 12 month running average effluent concentration (measured as an average for all IEUA treatment facilities) exceeds 545 mg/L for 3 consecutive months, or when the 12-month running average total inorganic nitrogen concentration (also measured as an average for all IEUA treatment facilities) exceeds 8 mg/L in any month. The permits will require that recycled water used for recharge shall be limited to the amount that can be blended in the management zone with other water sources, such as stormwater or imported water, to achieve 5-year running average concentrations equal to or less than the “maximum benefit” TDS and nitrate-nitrogen objectives for the affected management zone (Chino North or Cucamonga). Recycled water recharge is not currently contemplated in other parts of the Chino Basin. Alternative TDS and nitrate-nitrogen limitations based on the “antidegradation” objectives will also be specified for recycled water recharge in the Chino 1, 2 and 3 and Cucamonga Management Zones. These limits will apply should the Regional Board find that maximum benefit is not demonstrated. If recharge projects are implemented elsewhere in the Chino Basin, TDS and TIN limits will be based on the TDS and nitrate-nitrogen objectives of the affected management zones.

The effluent limits for IEUA, which establish an upper limit on TDS and TIN concentrations of recycled water discharged in the basin, are a cornerstone of the maximum benefit demonstration. The cap on effluent TDS and TIN concentrations provides a controlling point for management of TDS and nitrogen water quality in the Chino Basin. The TDS in IEUA’s effluent is expected to reach 550 mg/L before the groundwater in the Chino North Management Zone or the Cucamonga Management Zone reaches the “maximum benefit” objectives of 420 mg/L and 380 mg/L, respectively. The IEUA/Chino Basin Watermaster maximum benefit proposal commits to the initiation of construction of another Chino Basin desalter when the TDS in IEUA’s effluent reaches 545 mg/L for three consecutive months. This desalter may be

[5] Surface water discharges by IEUA do not affect the groundwater management zones for which “maximum benefit” objectives are specified. Thus, the wasteload allocations do not vary depending on whether or not the “maximum benefit” objectives apply.

constructed by IEUA and/or Chino Basin Watermaster and/or other responsible parties deemed acceptable by the Executive Officer. Further, IEUA will immediately implement a salt management program to reduce the salts, including nitrogen, entering IEUA's wastewater treatment plants. This salt management program will include: 1) connection of new industries that have wastewater discharges with TDS greater than 550 mg/L to the brine line; 2) regulation of the use of new and existing water softeners to the extent allowed by law, with incentives provided for the removal of on-site regenerative water softeners and the use of exchange canisters or other off-site regenerative systems; 3) connection of existing domestic system industries with high TDS waste discharges to the brine lines; 4) percolation of State Water Project water into the Chino Basin when that water is low in TDS; and 5) development of a plan for sewering areas presently served by septic tanks to reduce the nitrogen loading into the Chino and Cucamonga Management Zones. IEUA's permits will reflect these commitments.

Implementing these measures will assure that the groundwater quality remains at or below the Chino North Management Zone objective of 420 mg/L and the Cucamonga Management Zone objective of 380 mg/L. Maintenance of this ambient groundwater quality is necessary, in turn; to assure that IEUA's wastewater treatment facilities are able to meet the effluent TDS limits. Chino Basin groundwater is a significant component of the water supplied in IEUA's service area and its quality thus has an important effect on effluent quality. Poor ambient water quality will preclude IEUA from meeting effluent limits, without desalting. IEUA can revise treatment plant operations to assure that the TIN limit is achieved. These TDS and TIN limitations assure beneficial use protection for Chino Basin and downstream Orange County groundwater, as well as surface waters (including Chino Creek and the Santa Ana River) affected by IEUA discharges.

IEUA's revised permits will also reflect the surface and groundwater monitoring program requirements described above.

2. Issuance of permits to Chino Basin Watermaster

The Regional Board will issue appropriate permits to the Watermaster, individually or jointly with IEUA, for the recharge of recycled water in the Basin. These permits will implement the commitments described above for recharge of other water sources to offset the quality of the recycled water. The parties will be required to document the amount, quality and location of recharge of these other sources, and to demonstrate that stormwater recharge used for blending purposes occurred as the result of the parties' efforts to enhance such recharge. Other "maximum benefit" commitments will be reflected in these permits, or in other orders of the Regional Board, as appropriate.

3. Review of Project Status

No later than 2005, and every three years thereafter (to coincide with the Regional Board's triennial review process), the Regional Board intends to review the status of the activities planned and executed by the Watermaster and IEUA to demonstrate

maximum benefit and to justify continued implementation of the “maximum benefit” water quality objectives. This review is intended to determine whether the commitments specified above and summarized in Table 5-8a are met. If, as a result of this review and after consideration at a duly noticed Public Hearing, the Regional Board finds that the Watermaster and IEUA commitments are not met, the Regional Board will make a finding that the lowering of water quality associated with TDS and nitrate-nitrogen water quality objectives that are higher than historical water quality (the “antidegradation” objectives”) is not of maximum benefit to the people of the state. By default, the scientifically derived, “antidegradation objectives” for the Chino 1, 2 and 3 and Cucamonga Management Zones would become effective (280 mg/L, 250 mg/L, 260 mg/L and 210 mg/L TDS respectively; 5.0 mg/L, 2.9 mg/L, 3.5 mg/L and 2.4 mg/L for nitrate-nitrogen – see Chapter 4).

The Watermaster and IEUA have made clear commitments to the implementation of projects and management strategies to achieve the “maximum benefit” objectives. A finding of “maximum benefit to the people of the state” is also a very strong commitment of support by the Regional Board for the goals, vision and future plans of the Watermaster and IEUA. Watermaster and IEUA have indicated that the supervision of the Watermaster program by the San Bernardino County Superior Court will ensure that the Watermaster and IEUA commitments are met. However, people change, commitments may be changed, and public agency decisions may certainly change. If the commitments are not met and “maximum benefit” is not demonstrated, then the Regional Board will require that Watermaster and IEUA mitigate the effects of discharges of recycled and imported water that took place under the maximum benefit objectives. Under this circumstance, mitigation will be required such that, after mitigation, the salt and nitrogen loads to the basin from imported water, newly captured stormwater inputs under the Watermaster enhanced stormwater interception program, and recycled water are made to be equivalent to the salt loads that would have been allowed to the Chino Basin under the antidegradation objectives. Discharges in excess of the antidegradation objectives that must be considered for mitigation include both recycled water and imported water at TDS concentrations in excess of the antidegradation objectives. Mitigation by groundwater extraction and desalting must be adjusted to address concentrations of salt and nitrogen in the basin, not simply salt load. (Desalting will be an effective mitigation strategy, but desalting removes water, as well as salt, and the resulting salt concentrations in the groundwater will not completely mitigate the effects of the maximum benefit discharges, if mitigation is considered simply on a salt load, rather than concentration, basis.) This remediation will be required of the agencies that were responsible for the discharge of recycled and imported water (waste discharge permit holders) under the maximum benefit objectives. The remediation must be completed within a 10-year period following the finding by the Regional Board that the antidegradation objectives apply. The Regional Board will also require mitigation of any adverse effects on water quality downstream of the Chino Basin that result from failure to implement the “maximum benefit” commitments.

B. Salt Management - San Timoteo Watershed (The following was updated under Resolution No. R8-2014-0005)

The 2004 amendments to the Basin Plan established both “antidegradation” and “maximum benefit” nitrogen and TDS objectives for the Yucaipa, San Timoteo and Beaumont Groundwater Management Zones (see Chapter 4). These Groundwater Management Zones are within the San Timoteo Watershed. The agencies that proposed the “maximum benefit” objectives committed to implement specific programs of projects and actions that were also identified in the 2004 Salt Management Plan incorporated in the Basin Plan. These programs were intended to assure that water quality consistent with the maximum benefit to the people of the state would be maintained with the application of the “maximum benefit” objectives. These commitments included the implementation of surface and groundwater monitoring programs, use of recycled water supplies for non-potable uses and construction and operation of desalting facilities to manage recycled water quality.

In 2014 amendments to the Salt Management Plan, changes to these “maximum benefit” commitments and the parties responsible for them were made based on a regional strategy for the San Timoteo Watershed [Ref 10D] developed and proposed by the Yucaipa Valley Water District, the City of Beaumont, the City of Banning, Beaumont-Cherry Valley Water District and the San Gorgonio Pass Agency. The Regional Strategy initially addressed the Maximum Benefit program in the Beaumont Groundwater Management Zone; however, in order to have a consistent approach throughout the San Timoteo Watershed, the Regional Strategy approach was expanded to the San Timoteo and Yucaipa Groundwater Management Zones. The goal of this strategy is to assure reliable water supplies to meet present and anticipated demands. The “maximum benefit” commitments of each responsible agency are described below and shown in Tables 5-9a (Yucaipa Groundwater Management Zone), 5-9b (San Timoteo Groundwater Management Zone) and 5-9c (Beaumont Groundwater Management Zone). These commitments must be implemented by the responsible agencies in accordance with the prescribed schedule in order to assure that water quality consistent with maximum benefit to the people of the state will be maintained.

The Regional Board will revise waste discharge requirements as appropriate to require implementation of these commitments. For each groundwater management zone, it is assumed that maximum benefit is demonstrated, and that the “maximum benefit” water quality TDS and nitrate-nitrogen objectives apply as long as the commitments and schedule applicable to that groundwater management zone are satisfied. If the Regional Board determines that any or all of the maximum benefit programs are not being implemented effectively in accordance with the schedule(s) shown in Tables 5-9a through 5-9c, then maximum benefit is not demonstrated and the “antidegradation” TDS and nitrate-nitrogen objectives apply. In this situation, the Regional Board will require mitigation for TDS and nitrate-nitrogen discharges to the affected groundwater management zone that took place in excess of limits based on the “antidegradation” objectives for that Groundwater Management Zone. As specified for Chino Basin Watermaster and Inland Empire Utilities Agency (see Section VI.A, above), discharges in

excess of the antidegradation objectives that must be considered for mitigation include both recycled water and imported water at TDS concentrations in excess of the antidegradation objectives. Mitigation by groundwater extraction and desalting must be adjusted to address concentrations of salt and nitrogen in the basin, not simply salt load.

1. Yucaipa Groundwater Management Zone - Yucaipa Valley Water District

The application of the “maximum benefit” objectives established for the Yucaipa Groundwater Management Zone relies on the implementation by the Yucaipa Valley Water District (YVWD) of the specific program of projects and requirements shown in Table 5-9a. These “maximum benefit” commitments were updated and revised in 2014 based on YVWD’s ongoing activities to implement the 2004 program and the regional strategy YVWD helped to develop. The projected water demands for the Yucaipa area for the year 2030 require approximately an additional 10,000 AF/Y of supplemental water, which may include State Water Project water, water imported from local sources, recharged storm water and recycled water. The goal is to meet these demands through implementation of the “maximum benefit” commitments, which include enhanced recharge of storm water and recycled water, optimizing direct use of recycled and imported water, desalting of wastewater and/or groundwater and conjunctive use.

In addition to its water supply responsibilities, YVWD provides sewage collection and treatment services within its service area. YVWD operates a wastewater treatment facility that currently discharges tertiary treated wastewater to San Timoteo Creek, Reach 3. This unlined reach of the Creek overlies and recharges the San Timoteo Groundwater Management Zone (see 2. San Timoteo Groundwater Management Zone – Yucaipa Valley Water District and the City of Beaumont). In response to commitments in the 2004 Salt Management Plan, YVWD has taken steps to improve recycled water quality, including the installation of new denitrification facilities and the design and construction of the Yucaipa Valley Regional Brineline and reverse osmosis treatment systems at the Wochholz Regional Water Recycling Facility. The desalting facilities are expected to be complete by June 30, 2015.

Dilution of recycled water with water to meet the 370 mg/L TDS concentration and the 5 mg/L nitrate-N concentration recycled water recharge and direct use requirements will be limited to new water recharge such as reverse osmosis permeate (diluent), imported water or new storm water. New storm water recharge is defined as storm water recharged in quantities greater than historical amounts (net increase) over the groundwater management zone since January 1, 2004. January 2004 corresponds to the month and year when the Regional Board authorized the original maximum benefit objectives and compliance commitments by adopting Resolution No. R8-2004-0001.

Table 5-9a

Yucaipa Groundwater Management Zone
Maximum Benefit Commitments

Responsible Agency – Yucaipa Valley Water District

Description of Commitment	Compliance Date – as soon as possible, but no later than
1. Surface Water Monitoring Program a. Submit Draft Revised Monitoring Program to Regional Borad b. Implement Revised Monitoring Program c. Submit Draft Revised Monitoring Program(s) (subsequent to that required in "a", above) to Regional Board d. Implement Revised Monitoring Program(s) e. Annual data report submittal	a. May 30, 2014 b. Upon Executive Officer approval c. Every three years, in coordination with ambient water quality determination (#6, below) or more frequently upon notification of the need to do so from the Executive Officer and in accordance with the schedule prescribed by the Executive Officer d. Upon Executive Officer approval e. April 15th
2. Groundwater Monitoring Program a. Submit Draft Revised Monitoring Program(s) b. Implement revised monitoring plan(s) c. Annual data report submittal	a. Every three years, in coordination with ambient water quality determination (#6, below) or more frequently upon notification of the need to do so from the Executive Officer and in accordance with the schedule prescribed by the Executive Officer b. Upon Executive Officer approval c. April 15th
3. YVWD Wastewater and/or Groundwater Desalter(s) and Brine Disposal Facilities Complete construction of Desalter and Brine Disposal Facilities	June 30, 2015 (or as provided by the Executive Officer - see text below)
4. Non-potable water supply Implement non-potable water supply system to serve water for irrigation purposes and/or direct non-potable reuse. The non-potable supply used in the Yucaipa Groundwater Management Zone shall comply with a 10-year running average TDS concentration of 370 mg/L or less, and in addition, for any non-irrigation reuse that has the potential to affect groundwater quality, the nitrate-nitrogen shall be less than or equal to the 5 mg/L nitrate-nitrogen "maximum benefit" objective (taking the nitrogen loss coefficient into consideration).	June 30, 2015

Table 5-9a

Yucaipa Groundwater Management Zone
Maximum Benefit Commitments

Responsible Agency – Yucaipa Valley Water District

Description of Commitment	**Compliance Date – as soon as possible, but no later than**
5. Recycled water recharge The recharge of recycled water in the Yucaipa Groundwater Management Zone shall be limited to the amount that can be blended with other recharge sources or reverse osmosis diluent to achieve a 10-year running average equal to or less than the 370 mg/L "maximum benefit" TDS objective and less than or equal to the 5 mg/L nitrate-nitrogen "maximum benefit" objective (taking the nitrogen loss coefficient into consideration).	Compliance must be achieved by end of 10th year after initiation of recycled water use/recharge operations.
a. Submit for Executive Officer approval, a proposed methodology for computing baseline and "new" storm water recharge. The methodology will be posted for public comment for 30 days. If there are significant comments received, the Executive Officer will present the report to the Regional Board for its consideration at a regularly scheduled meeting.	a. 6 months prior to initiation of construction of any basin/other facility to support enhanced storm water/imported water recharge.
b. Submit baseline report of amount, locations, and TDS and nitrogen quality of water/imported water recharge per the approved methodology (# 5a)	b. 1 year from Executive Officer approval of methodology.
c. Submit documentation of amount, TDS and nitrogen quality of all sources of recharge and recharge locations. For storm water recharge used for blending, submit documentation that the recharge is the result of YVWD enhanced recharge facilities/programs	c. Annually, by April 15th, after construction of facilities/implementation of programs to support enhanced recharge
6. Antidegradation Objectives Salt Mitigation Plan	
a. Submi**t a** a proposed Salt Mitigation Plan and Implementation Schedule	a. October 29, 2015
b. Submit b. Implement Salt Mitigation Plan	b. Within 30 days of Regional Board finding that maximum benefit no longer being achieved
7. Ambient groundwater quality determination	July 1, 2014 and every 3 years thereafter

A. Description of Yucaipa Valley Water District Commitments for the Yucaipa Management Zone

1. Surface Water Monitoring Program (Table 5-9a, # 1)

A surface water monitoring program was developed, approved and implemented in response to the maximum benefit commitments initially incorporated in the Basin Plan in 2004 (Resolution No. R8-2004-0001). The Regional Board approved the Surface Water Monitoring Program in 2005 (Resolution No. R8-2005-0065). Subsequently, the need to revise the monitoring program was recognized and appropriate amendments were adopted in 2014 (Resolution No. R8-2014-0005). These include the requirement that by May 30, 2014 YVWD shall submit a revised surface water monitoring program to the Regional Board for approval. The monitoring program must be implemented upon Executive Officer approval.

It is expected that the monitoring program will be reviewed as it is implemented over time, and that further updates may be necessary. YVWD committed to review the surface water monitoring program (and the groundwater monitoring program, see #2, below) as part of the determination of ambient groundwater quality, which occurs every three years pursuant to Basin Plan requirements (see #6, below). Though considered unlikely, it is possible that more frequent review and revision of these monitoring programs may be necessary. Accordingly, the Basin Plan requires review of the surface water monitoring program in coordination with the ambient quality determination and, further, that draft revised monitoring programs be submitted upon notification by the Regional Board's Executive Officer of the need to do so. The schedule for the submittal will be prescribed by the Executive Officer. Any such revision to the monitoring is to be implemented upon Executive Officer approval.

An annual report summarizing all data collected for the year and evaluating compliance with relevant surface water objectives shall be submitted by April 15th of each year.

2. Groundwater Monitoring Program (Table 5-9a, # 2)

In response to the maximum benefit program requirements established in 2004 (Resolution No. R8- 2004-0001), in 2005, YVWD submitted a proposed groundwater monitoring program. The Regional Board approved a groundwater monitoring program to determine ambient water quality in the Yucaipa Groundwater Management Zone (Resolution No. R8-2005-0065). The purpose of the ggroundwater monitoring program is to identify the effects of the implementation of the Yucaipa Groundwater Management Zone maximum benefit water quality objectives on water levels and water quality within the Yucaipa Groundwater Management Zone. The groundwater monitoring program has been implemented since 2005 and must continue to be implemented.

The existing groundwater monitoring implemented by YVWD to comply with the Maximum Benefit program authorized by the 2004 amendments to the salt

management plan shall be continued into the future until a new monitoring plan is approved by the Executive Officer. Any new monitoring plan developed by YVWD shall preserve the geospatial distribution of groundwater wells and the sampling of those wells utilized in the existing Regional Board-approved maximum benefit monitoring program.

As noted above, the groundwater monitoring program will be reviewed as part of regular ambient groundwater quality determinations and may be revised. Once again, more frequent review and revision may be necessary as the monitoring program is implemented over time. Accordingly, the Basin Plan requires that draft revised monitoring programs be submitted upon notification by the Regional Board's Executive Officer of the need to do so. The schedule for the submittal will be prescribed by the Executive Officer. Any such revision to the monitoring program is to be implemented upon Executive Officer approval.

An annual report, including all raw data and summarizing the results of the approved groundwater monitoring program, shall be submitted to the Regional Board by April 15th of each year.

3. YVWD Wastewater and/or Groundwater Desalter(s) and Brine Disposal (Table 5-9a, # 3)

YVWD anticipated that demineralization of groundwater or recycled water would be necessary in the future to protect the Yucaipa Groundwater Management Zone and has constructed desalting and associated brine disposal facilities. YVWD shall ensure that the planned demineralization system is operational by June 30, 2015. The Executive Officer may extend this compliance date upon submittal of compelling evidence that the extension is warranted and would not compromise timely implementation of the other maximum benefit program commitments identified in Table 5-9a.

4. Non-potable Water Supply Distribution System (Table 5-9a, # 4)

A key element of YVWD's water resources management plan is the construction of a non-potable supply system to serve a mix of recycled water, diluent from the Wochholz Regional Water Recycling Facility and un-treated imported water, treated backwash water from the Yucaipa Valley Regional Water Filtration Facility and/or storm water for irrigation uses and other direct non-potable reuse. The intent is to minimize the use of potable water for non-potable uses. For use in the Yucaipa Groundwater Management Zone, YVWD will produce a non-potable supply with a running 10-year average TDS concentration equal to or less than 370 mg/L and, in addition, for any non-irrigation reuse that has the potential to affect groundwater quality, the 10-year running average nitrate-nitrogen concentration shall comply with 6.7 mg/L (taking the 25% nitrogen loss coefficient into account to assure that the "maximum benefit" objective of 5 mg/L will be met). To meet this "maximum benefit" objective, YVWD will blend the recycled water with other water sources or desalt the recycled water.

Compliance with the non-potable water supply TDS and/or nitrate-nitrogen objective shall be measured in the non-potable water system as a weighted 10-year average of all water sources added to that system and used within the Yucaipa Groundwater Management Zone.

As part of the Maximum Benefit Annual Report, YVWD shall report on the TDS and nitrogen quality and quantity of all sources of non-potable water and summarize the annual and 10-year annual weighted TDS and nitrogen average concentrations utilized in the Yucaipa Groundwater Management Zone.

5. Recycled Water Recharge (Table 5-9a, # 5)

The use and recharge of recycled water within the Yucaipa Groundwater Management Zone are necessary to maximize the use of the water resources in the Yucaipa area. The demonstration of “maximum benefit” and the continued application of the “maximum benefit” objectives are contingent on the recharge of recycled water to the Yucaipa Groundwater Management Zone of a 10-year annual average (running average) TDS concentration of 370 mg/L and nitrate-nitrogen concentration of 6.7 mg/L (taking the 25% nitrogen loss coefficient into account to assure that the “maximum benefit” objective of 5 mg/L will be met). These concentrations may be achieved by desalting or other treatment of the recycled water, and/or by blending the recycled water with other sources, such as imported water, storm water and reverse osmosis permeate diluent.

Compliance with these concentrations shall be measured at the point of discharge(s) to the recharge facility as a weighted average concentration of the recycled water and other sources, if any, used for blending.

As part of the Maximum Benefit Annual Report, YVWD shall report on the TDS and nitrogen quality and quantity of all sources of recharged water and summarize the annual and 10-year running annual weighted TDS and nitrogen average concentrations recharged to the Yucaipa Groundwater Management Zone.

6. Antidegradation Salt Mitigation Plan (Table 5-9a, # 6)

By October 29, 2014, YVWD shall submit a Salt Mitigation Plan to mitigate excess salt loading above the antidegradation water quality objectives. The Salt Mitigation Plan shall provide a conceptual framework for mitigation projects should the Regional Board make a finding that the lowering of water quality associated with the “maximum benefit” TDS and nitrate-nitrogen water quality objectives that are higher than historical water quality (the “antidegradation” objectives) is not of maximum benefit to the people of the state. The Salt Mitigation Plan must be implemented within 30 days of a Regional Board finding that maximum benefit is no longer being achieved.

7. Ambient Groundwater Quality Determination (Table 5-9a, # 7)

By July 1, 2014, and every three years thereafter, YVWD shall submit a determination of ambient TDS and nitrate-nitrogen quality in the Yucaipa Groundwater Management Zone. This determination shall be accomplished using methodology consistent with the calculation (20-year running averages) used by the Nitrogen/TDS Task Force to develop the TDS and nitrate-nitrogen "antidegradation" water quality objectives for groundwater Management Zones within the region. [Ref. 1].

B. Implementation by Regional Board

1. Revision to Yucaipa Valley Water District NPDES Permit

To implement the "maximum benefit" objectives, the Regional Board will revise the waste discharge and producer/user reclamation requirements permit for YVWD wastewater discharges to reflect the commitments described above, as appropriate. This includes the following:

For surface water discharges that affect the Yucaipa Groundwater Management Zone discharge limits for TDS and TIN will be specified as an annual volume-weighted average not to exceed 370 mg/L TDS and 6.7 mg/L TIN. These limits are based on the "maximum benefit" objectives of the Yucaipa Groundwater Management Zone shown in Table 4-1 and take the nitrogen loss coefficient into account. Alternative TDS and nitrate-nitrogen limitations based on the "antidegradation" objectives will also be specified and will apply should the Regional Board find that maximum benefit is not demonstrated. These alternative objectives are also specified in Table 4-1. Compliance schedules for these alternative limits will be specified in YVWD's waste discharge requirements, as necessary and appropriate.

YVWD's waste discharge and producer/user reclamation requirements will require that the recharge of recycled water shall be limited to the amount that can be blended with other water sources, such as storm water, imported water or reverse osmosis diluent, to achieve 10-year running average concentrations equal to or less than the "maximum benefit" TDS and nitrate-nitrogen objectives for the Yucaipa Groundwater Management Zone. The use of recycled water for irrigation and other direct re-use purposes in the Yucaipa Groundwater Management Zone shall be limited to the amount that can be blended with other water sources, such as storm water, imported water or reverse osmosis diluent, to achieve 10-year running average concentrations equal to or less than the "maximum benefit" TDS and nitrate-nitrogen objectives for the Yucaipa Groundwater Management Zone. Alternative TDS and nitrate-nitrogen limitations based on the "antidegradation" objectives will also be specified for recycled water recharge and re-use in the Yucaipa Groundwater Management Zone and will apply if the Regional Board finds that the maximum benefit commitments are not met.

2. Review of Project Status

The Regional Board intends to review periodically YVWD's implementation of the maximum benefit program commitments described above and summarized in Table 5-

9a. This review is intended to determine whether the commitments are met, and whether the application of the “maximum benefit” objectives continues to be justified. As indicated above, if, as a result of this review, the Regional Board finds that the YVWD commitments are not met, then the Regional Board may make the finding that the “maximum benefit” objectives are not consistent with the maintenance of water quality that is of maximum benefit to the people of the state, and that the more stringent “antidegradation” objectives for the Yucaipa Management Zone (320 mg/L for TDS and 4.2 mg/L for nitrate-nitrogen; see Chapter 4) must apply instead for regulatory purposes. In the event that the Regional Board makes these determinations, the Regional Board will require that the YVWD implement the Salt Mitigation Plan (see commitment # 6) and mitigate the adverse water quality effects, both on the immediate and downstream waters, which resulted from recycled water discharges based on the “maximum benefit” objectives.

2. San Timoteo Groundwater Management Zone – Yucaipa Valley Water District and the City of Beaumont

The application of the “maximum benefit” objectives established for the San Timoteo Groundwater Management Zone relies on the implementation by both the Yucaipa Valley Water District (YVWD) and the City of Beaumont of the specific program of projects and requirements shown in Table 5-9b [Ref. 10D]. Since the Salt Management Plan was amended in 2004 to incorporate “maximum benefit” commitments applicable to the San Timoteo Management Zone, both YVWD and the City of Beaumont have been engaged in implementing those commitments.

As discussed above, YVWD operates a wastewater treatment facility that discharges a portion of its treated effluent to San Timoteo Creek, Reach 3, which overlies and recharges the San Timoteo Groundwater Management Zone. Similarly, the City of Beaumont provides sewage collection and treatment services within its service area, and a portion of the treated wastewater discharged to Reach 3 of San Timoteo Creek, also recharges the San Timoteo Groundwater Management Zone. Surface water discharges by both YVWD and the City affect groundwater quality in the San Timoteo Groundwater Management Zone. Consistent with the 2004 “maximum benefit” commitments, both the District and the City must identify and implement an acceptable plan to address the adverse water quality impacts of their wastewater discharges.

Dilution of recycled water with water to meet the 400 mg/L TDS concentration and the 5 mg/L nitrate-N concentration recycled water recharge and direct use requirements will be limited to new recharge such as reverse osmosis permeate (diluent), imported water or new storm water. New storm water recharge is defined as storm water recharged in quantities greater than historical amounts (net increase) over the groundwater management zone since January 1, 2004. January 2004 corresponds to the month and year when the Regional Board authorized the original maximum benefit objectives and compliance commitments by adopting Resolution No. R8-2004-0001.

Table 5-9b

San Timoteo Groundwater Management Zone
Maximum Benefit Commitments

Responsible Agencies – Yucaipa Valley Water District and the City of Beaumont

Description of Commitment	**Compliance Date – as soon as possible, but no later than**
1. Surface Water Monitoring Program a. Submit Draft Revised Monitoring Program to Regional Board b. Implement Revised Monitoring Program c. Submit Draft Revised Monitoring Program(s) (subsequent to that required in "a", above) to Regional Board d. Implement Revised Monitoring Program(s) e. Annual data report submittal	a. May 30, 2014 b. Upon Executive Officer approval c. Every three years, in coordination with ambient water quality determination (#6, below) or more frequently upon notification of the need to do so from the Regional Board Executive Officer and in accordance with the schedule prescribed by the Executive Officer d. Upon Executive Officer approval e. April 15th
2. Groundwater Monitoring Program **a.** Submit Draft Revised Monitoring Program(s) b. Implement revised monitoring plan(s) c. Annual data report submittal	a. Every three years, in coordination with ambient water quality determination (#6, below) or more frequently upon notification of the need to do so from the Regional Board Executive Officer and in accordance with the schedule prescribed by the Executive Officer b. Upon Executive Officer approval c. April 15th
3. YVWD Wastewater and/or Groundwater Desalter(s) and Brine Disposal Facilities Complete construction of Desalter and Brine Disposal Facilities	June 30, 2015 (or as provided by the Executive Officer - see text below)

Table 5-9b

San Timoteo Groundwater Management Zone
Maximum Benefit Commitments

Responsible Agencies – Yucaipa Valley Water District and the City of Beaumont

Description of Commitment	Compliance Date – as soon as possible, but no later than
4. City of Beaumont, Wastewater and/or Groundwater Desalter(s) and Brine Disposal Facilities a. Submit detailed plan and schedule for construction of desalter(s) and brine disposal facilities. Facilities are to operational as soon as possible but no later than 5 years from date of Executive Officer approval of plan/schedule or as provided by the Executive Officer (see text below). b. Implement the plan and schedule	a. January 30, 2015 b. Upon Executive Officer approval
5. YVWD, City of Beaumont Non-potable water supply Implement non-potable water supply system to serve water for irrigation purposes and direct non-potable reuse. The non-potable supply used in the San Timoteo Groundwater Management Zone shall comply with a 10-year running average TDS concentration of 400 mg/L or less, and in addition, for any non-irrigation reuse that has the potential to affect groundwater quality, the nitrate-nitrogen shall be less than or equal to the 5 mg/L nitrate-nitrogen "maximum benefit" objective (taking the nitrogen loss coefficient into consideration).	December 31, 2015

Table 5-9b

San Timoteo Groundwater Management Zone
Maximum Benefit Commitments

Responsible Agencies – Yucaipa Valley Water District and the City of Beaumont

Description of Commitment	**Compliance Date – as soon as possible, but no later than**
6. Recycled water recharge/habitat maintenance discharge The recharge of recycled water in the San Timoteo Groundwater Management Zone or discharge to San Timoteo Creek to maintain the riparian habitat shall be limited to the amount that can be blended with other recharge sources or reverse osmosis diluent to achieve a 10-year running average equal to or less than the 400 mg/L "maximum benefit" TDS objective and less than or equal to the 5 mg/L nitrate-nitrogen "maximum benefit" objective (taking the nitrogen loss coefficient into consideration).	Compliance must be achieved by end of 10th year after initiation of recycled water use/recharge operations.
a. Submit for Executive Officer approval, a proposed methodology for computing baseline and new storm water recharge. The methodology will be posted for public comment for 30 days. If there are significant comments received, the Executive Officer will present the report to the Regional Board for its consideration at a regularly scheduled meeting.	a. 6 months prior to initiation of construction of anybasin/other facility to support enhanced storm water/imported water recharge.
b. Submit baseline report of amount, locations, and TDS and nitrogen quality of "new" storm water/imported water recharge per the approved methodology (#6a).	b. 1 year from Executive Officer approval of methodology.
c. Submit documentation of amount, TDS and nitrogen quality of all sources of recharge and recharge locations. For storm water recharge used for blending, submit documentation that the recharge is the result of YVWD and/or City of Beaumont enhanced recharge facilities/programs.	c. Annually, by April 15th, after construction of facilities/ implementation of programs to support enhanced recharge.

Table 5-9b

San Timoteo Groundwater Management Zone
Maximum Benefit Commitments

Responsible Agencies – Yucaipa Valley Water District and the City of Beaumont

Description of Commitment	Compliance Date – as soon as possible, but no later than
7. Improve quality of surface water discharges to the San Timoteo Groundwater Management Zone a. Submit plan and schedule to comply with underlying San Timoteo Groundwater Management Zone Maximum Benefit TDS and nitrate-nitrogen water quality objectives. b. Implement upon approval	a. May 30, 2015 b. Upon Executive Officer approval
8. Antidegradation Objectives Salt Mitigation Plan a. Submit a proposed Salt Mitigation Plan and Implementation Schedule. b. Implement Salt Mitigation Plan	a. October 29, 2015 b. Within 30 days of Regional Board finding that maximum benefit no longer being achieved
9. Ambient groundwater quality determination	July 1, 2014 and every 3 years thereafter

A. Description of Yucaipa Valley Water District (YVWD), City of Beaumont Commitments for the San Timoteo Management Zone

1. Surface Water Monitoring Program (Table 5-9b, # 1)

A surface water monitoring program was developed, approved and implemented in response to the maximum benefit commitments initially incorporated in the Basin Plan in 2004 (Resolution No. R8-2004-0001). The Regional Board approved the Surface Water Monitoring Program in 2005 (Resolutions No. R8-2005-0065 and R8-2005-0066). Subsequently, the need to revise the monitoring program was recognized and appropriate amendments were adopted in 2014 (Resolution No. R8-2014-0005). These include the requirement that by May 30, 2014, YVWD and the City of Beaumont shall submit a revised surface water monitoring program to the Regional Board for approval. The monitoring program must be implemented upon Executive Officer approval.

It is expected that the monitoring program will be reviewed as it is implemented over time, and that further updates may be necessary. YVWD and the City of Beaumont

committed to review the surface water monitoring program (and the groundwater monitoring program, see #2, below) as part of the determination of ambient groundwater quality, which occurs every three years pursuant to Basin Plan requirements (see #6, below). Though considered unlikely, it is possible that more frequent review and revision of these monitoring programs may be necessary. Accordingly, the Basin Plan requires review of the surface water monitoring program in coordination with the ambient quality determination and, further, that draft revised monitoring programs be submitted upon notification by the Regional Board's Executive Officer of the need to do so. The schedule for the submittal will be prescribed by the Executive Officer. Any such revision to the monitoring is to be implemented upon Executive Officer approval.

An annual report summarizing all data collected for the year and evaluating compliance with relevant surface water objectives shall be submitted by April 15th of each year.

2. Groundwater Monitoring Program (Table 5-9a, # 2)

In response to the maximum benefit program requirements established in 2004 (Resolution No. R8- 2004-0001), in 2005, YVWD and the City of Beaumont submitted a proposed groundwater monitoring program. The Regional Board approved a groundwater monitoring program to determine ambient water quality in the Yucaipa and San Timoteo Groundwater Management Zones (Resolutions No. R8-2005-0065 and R8-2005-0066). The purpose of the ggroundwater monitoring program is to identify the effects of the implementation of the San Timoteo Groundwater Management Zone "maximum benefit" water quality objectives on water levels and water quality within the San Timoteo Groundwater Management Zone. The groundwater monitoring program has been implemented since 2005. YVWD and the City of Beaumont have since installed additional wells as part of revised groundwater monitoring workplans to ensure adequate data are collected for ambient quality determination. The workplans were approved in 2009 (Resolution No. R8-2009-0034 for YVWD and No. R8-2009-0035 for the City of Beaumont).

The existing groundwater monitoring implemented by the City of Beaumont and YVWD to comply with the Maximum Benefit program authorized by the 2004 amendments to the salt management plan shall be continued into the future on a cooperative basis until a new monitoring plan is approved by the Executive Officer. Any new monitoring plan developed by the City of Beaumont and/or YVWD shall preserve the geospatial distribution of groundwater wells and the sampling of those wells utilized in the existing Regional Board-approved maximum benefit monitoring program.

As noted above, the groundwater monitoring program will be reviewed as part of regular ambient groundwater quality determinations and may be revised. Once again, more frequent review and revision may be necessary as the monitoring program is implemented over time. Accordingly, the Basin Plan requires that draft revised monitoring programs be submitted upon notification by the Regional Board's Executive Officer of the need to do so. The schedule for the submittal will be prescribed by the

Executive Officer. Any such revision to the monitoring program is to be implemented upon Executive Officer approval.

An annual report, including all raw data and summarizing the results of the approved groundwater monitoring program, shall be submitted to the Regional Board by April 15th of each year.

3. YVWD Wastewater and/or Groundwater Desalter(s) and Brine Disposal (Table 5-9b, #3)

YVWD anticipated that demineralization of groundwater or recycled water would be necessary in the future to protect the San Timoteo Groundwater Management Zone and has planned and designed desalting and associated brine disposal facilities. YVWD shall ensure that the planned desalter system is operational by June 30, 2015. The Executive Officer may extend this compliance date upon submittal of compelling evidence that the extension is warranted and would not compromise timely implementation of the other maximum benefit program commitments identified in Table 5-9b.

4. City of Beaumont Wastewater and/or Groundwater Desalter(s) and Brine Disposal (Table 5-9b, # 4)

The City of Beaumont shall construct and operate desalting facilities and brine disposal facilities to improve recycled water quality and/or other sources of non-potable supply. A detailed desalter/brine line plan and schedule shall be submitted by January 30, 2015. The schedule shall assure that these facilities are in place within 5 years of Executive Officer approval. The Executive Officer may extend this compliance date upon submittal of compelling evidence that the extension is warranted and would not compromise timely implementation of the other maximum benefit program commitments identified in Table 5-9b.

5. YVWD/City of Beaumont Non-potable Water Supply Distribution System (Table 5-9b, # 5)

Both YVWD and the City of Beaumont are planning for the construction of a non-potable supply system to serve a mix of recycled water, un-treated imported water, reverse osmosis permeate (diluent) and/or storm water for irrigation uses and direct non-potable reuse. The intent is to minimize the use of potable water for non-potable uses. Both YVWD and/or the City of Beaumont will produce a non-potable supply for use within the San Timoteo Groundwater Management Zone with a running ten-year average TDS concentration of 400 mg/L. and, in addition, for any non-irrigation reuse that has the potential to affect groundwater quality, the 10-year running average nitrate-nitrogen concentration shall comply with 6.7 mg/L (taking the 25% nitrogen loss coefficient into account to assure that the “maximum benefit” objective of 5 mg/L will be met). To meet this “maximum benefit” objective, YVWD/City of Beaumont will blend the recycled water with other water sources or desalt the recycled water.

Compliance with the non-potable water supply TDS and/or nitrate-nitrogen objective shall be measured in the non-potable water system as a weighted 10-year average of all water sources added to that system and used within the San Timoteo Groundwater Management Zone.

As part of the Maximum Benefit Annual Report, YVWD and the City of Beaumont shall report on the TDS and nitrogen quality and quantity of all sources of non-potable water and summarize the annual and 10-year annual weighted TDS and nitrogen average concentrations utilized in the San Timoteo Groundwater Management Zone.

6. Recycled Water Recharge/ Riparian Habitat Maintenance Discharge (Table 5-9b, # 6)

The use and recharge of recycled water within the San Timoteo Groundwater Management Zone or the discharge of recycled water to San Timoteo Creek to maintain the riparian habitat and the demonstration of “maximum benefit” are contingent on the recharge/discharge of recycled water as a 10-year annual average (running average) TDS concentration of 400 mg/L and nitrate-nitrogen concentration of 6.7 mg/L (taking the 25% nitrogen loss coefficient into account to assure that the “maximum benefit” objective of 5 mg/L will be met). These concentrations may be achieved by desalting or other treatment of the recycled water, and/or by blending the recycled water with other sources, such as imported water, reverse osmosis permeate (diluent) and/or storm water.

Compliance with these concentrations shall be measured at the point of discharge(s) to the recharge facility or at the end of pipe for a recycled water discharge as a weighted average concentration of the recycled water and other sources, if any, used for blending.

As part of the Maximum Benefit Annual Report, YVWD and/or the City of Beaumont shall report on the TDS and nitrogen quality and quantity of all sources of recharged water and summarize the annual and 10-year annual weighted TDS and nitrogen average concentrations recharged to the San Timoteo Groundwater Management Zone.

7. Improve Surface Water Discharge Quality to the San Timoteo Groundwater Management Zone (Table 5-9b, # 7)
YVWD and the City of Beaumont wastewater discharges to the unlined reach of San Timoteo Creek impact the quality of the San Timoteo Groundwater Management Zone. In order to protect underlying groundwater Management Zone quality, by May 30, 2014, the City of Beaumont and YVWD shall submit a proposed plan and schedule to improve the quality of wastewater discharged to the portion of San Timoteo Creek overlying the San Timoteo Groundwater Management Zone in order to assure compliance with the Groundwater Management Zone “maximum benefit” objectives. A contingency plan and schedule to meet the “antidegradation” objectives for the

Groundwater Management Zone shall also be identified and implemented upon a finding by the Regional Board that “maximum benefit” is not demonstrated and that the “antidegradation” objectives apply. The plan must be implemented upon Executive Officer approval.

8. Antidegradation Objectives Salt Mitigation Plan (Table 5-9b, # 8)

By October 29, 2015, YVWD and the City of Beaumont shall submit a Salt Mitigation Plan to mitigate excess salt loading above the antidegradation water quality objectives. The Salt Mitigation Plan shall provide a conceptual framework for mitigation projects should the Regional Board make a finding that the lowering of water quality associated with the “maximum benefit” TDS and nitrate-nitrogen water quality objectives that are higher than historical water quality (the “antidegradation” objectives) is not of maximum benefit to the people of the state. The Salt Mitigation Plan must be implemented within 30 days of a Regional Board finding that maximum benefit is no longer being achieved.

9. Ambient Groundwater Quality Determination (Table 5-9b, # 9)

By July 1, 2014, and every three years thereafter, YVWD and the City of Beaumont shall submit a determination of ambient TDS and nitrate-nitrogen quality in the San Timoteo Groundwater Management Zone. This determination shall be accomplished using methodology consistent with the calculation (20-year running averages) used by the Nitrogen/TDS Task Force to develop the TDS and nitrate-nitrogen “antidegradation” water quality objectives for groundwater Management Zones within the region. [Ref. 1].

B. Implementation by Regional Board

1. Revision to Yucaipa Valley Water District NPDES Permit

To implement the “maximum benefit” objectives, the Regional Board will revise the waste discharge requirements and producer/user reclamation requirements for the YVWD wastewater discharges to reflect the commitments described above, as appropriate. This includes the following:

For surface water discharges that affect the San Timoteo Groundwater Management Zone, discharge limits for TDS and TIN will be specified as an annual volume-weighted average at the end of pipe not to exceed 400 mg/L TDS and 6.7 mg/L TIN. These limits are based on the “maximum benefit” objectives of the San Timoteo Groundwater Management Zone shown in Table 4-1 and take the nitrogen loss coefficient into account. Alternative TDS and nitrate-nitrogen limitations based on the “antidegradation” objectives will also be specified and will apply should the Regional Board find that maximum benefit is not demonstrated. These alternative objectives are also specified in Table 4-1. Compliance schedules for these alternative limits will be specified in the YVWD’s waste discharge requirements, as necessary and appropriate.

YVWD’s waste discharge requirements will require that any planned recharge of

recycled water shall be limited to the amount that can be blended with other water sources, such as storm water, reverse osmosis permeate (diluent) or imported water, to achieve 10-year running average concentrations equal to or less than the “maximum benefit” TDS and nitrate-nitrogen objectives for the San Timoteo Groundwater Management Zone. The use of recycled water for irrigation and other direct re-use shall be limited to the amount that can be blended with other water sources, such as storm water, reverse osmosis permeate (diluent), or imported water, to achieve 10-year running average concentrations equal to or less than the “maximum benefit” TDS and nitrate-nitrogen objectives for the San Timoteo Groundwater Management Zone.

Alternative TDS and nitrate-nitrogen limitations based on the “antidegradation” objectives will also be specified for recycled water recharge and re-use in the San Timoteo Groundwater Management Zone and will apply if the Regional Board finds that the maximum benefit commitments are not met.

2. Revision to the City of Beaumont NPDES Permit

To implement the “maximum benefit” objectives, the Regional Board will revise the waste discharge requirements for the City of Beaumont’s wastewater discharges to reflect the commitments described above, as appropriate. This includes the following:

For discharges to the San Timoteo Groundwater Management Zone, discharge limits for TDS and TIN will be specified as an annual volume-weighted average not to exceed 400 mg/L TDS and 6.7 mg/L TIN to be determined at the end of pipe. These limits are based on the “maximum benefit” objectives of the San Timoteo Groundwater Management Zone shown in Table 4-1 and take the nitrogen loss coefficient into account. Alternative TDS and nitrate-nitrogen limitations based on the “antidegradation” objectives will also be specified and will apply should the Regional Board find that maximum benefit is not demonstrated. These alternative limits are also specified in Table 4-1. Compliance schedules for these alternative limits will be specified in the City’s waste discharge requirements, as necessary and appropriate.

The City of Beaumont’s waste discharge requirements will require that any planned recharge of recycled water shall be limited to the amount that can be blended with other water sources, such as storm water or imported water, to achieve 10-year running average concentrations equal to or less than the “maximum benefit” TDS and nitrate-nitrogen objectives for the San Timoteo Groundwater Management Zone. The use of recycled water for irrigation and other direct reuse shall be limited to the amount that can be blended with other water sources, such as storm water or imported water, to achieve 10-year running average concentrations equal to or less than the “maximum benefit” TDS and nitrate-nitrogen objectives for the San Timoteo Groundwater Management Zone.

Alternative TDS and nitrate-nitrogen limitations based on the “antidegradation” objectives will also be specified for recycled water recharge and re-use in the San Timoteo Groundwater Management Zone and will apply if the Regional Board finds that

the maximum benefit commitments are not met.

3. Review of Project Status

The Regional Board intends to review periodically YVWD's and the City of Beaumont's implementation of the maximum benefit program commitments described above and summarized in Table 5-9b. This review is intended to determine whether the commitments are met, and whether the application of the "maximum benefit" objectives continues to be justified. As indicated above, if, as a result of this review, the Regional Board finds that the YVWD and/or the City of Beaumont commitments are not met, then the Regional Board may make the finding that the "maximum benefit" objectives are not consistent with the maintenance of water quality that is of maximum benefit to the people of the state, and that the more stringent "antidegradation" objectives for the San Timoteo Groundwater Management Zone (300 mg/L for TDS and 2.7 mg/L for nitrate-nitrogen; see Chapter 4) must apply instead for regulatory purposes. In the event that the Regional Board makes these determinations, the Regional Board will require that YVWD and/or the City of Beaumont, either individually or collectively, implement the Salt Mitigation Plan (see commitment # 8) and mitigate the adverse water quality effects, both on the immediate and downstream waters, which resulted from recycled water discharges based on the "maximum benefit" objectives.

3. Beaumont Groundwater Management Zone – Yucaipa Valley Water District, the City of Beaumont, the City of Banning, Beaumont Cherry Valley Water District, San Gorgornio Pass Agency

The application of the "maximum benefit" objectives established for the Beaumont Groundwater Management Zone is contingent on the implementation of commitments by the YVWD, the City of Beaumont, the City of Banning, Beaumont Cherry Valley Water District (BCVWD), and the San Gorgonio Pass Water Agency (Pass Agency) to implement a specific water and wastewater resources management program identified in the Regional Strategy [Ref. 10D]. This program is part of a coordinated effort by these agencies to develop and implement projects that will assure reliable water supplies to meet rapidly increasing demands in this area. The Regional Strategy entails enhanced recharge of native and recycled water, maximizing the direct use of recycled water, optimizing the direct use of imported water, recharge and conjunctive use. The maximum benefit commitments identified in the Regional Strategy for the Beaumont Groundwater Management Zone will be implemented by the City of Beaumont, BCVWD, YVWD, the Pass Agency and the City of Banning. The Regional Strategy forms the basis for the Beaumont Groundwater Management Zone maximum benefit program discussed below.

Wastewater collection and treatment services are provided by the City of Beaumont, the City of Banning, as well as YVWD. The City of Beaumont discharges tertiary treated wastewater to Cooper's Creek, a tributary of San Timoteo Creek, Reach 3. This unlined reach of the Creek overlies and recharges both the Beaumont and San Timoteo Groundwater Management Zones. The City of Banning does not currently utilize recycled

water in the Beaumont Management Zone. The City of Banning has selected to participate in the Maximum Benefit program and commitments if it becomes necessary to use recycled water.

Table 5-9c identifies the projects and requirements that must be implemented by the cities of Beaumont and Banning, YVWD, BCVWD, and the Pass Agency to demonstrate that water quality consistent with maximum benefit to the people of the state will be maintained with the applications of the “maximum benefit” objectives. Table 5-9c also specifies an implementation schedule. The Regional Board will revise waste discharge requirements for the City of Beaumont and YVWD, and will work with the Colorado River Water Board to ensure discharges from the City of Banning comply with the maximum benefit requirements. The Regional Board will also consider issuance of waste discharge requirements for BCVWD and take other actions as necessary to require that these commitments be met by the responsible parties.

Dilution of recycled water with water to meet the 330 mg/L TDS concentration and the 5 mg/L nitrate-N concentration recycled water recharge and direct use requirements will be limited to new water recharge such as reverse osmosis permeate (diluent), imported water or new storm water. New storm water recharge is defined as storm water recharged in quantities greater than historical amounts (net increase) over the groundwater management zone since January 1, 2004. January 2004 corresponds to the month and year when the Regional Board authorized the original maximum benefit objectives and compliance commitments by adopting Resolution No. R8-2004-0001.

Table 5-9c
Beaumont Groundwater Management Zone
Maximum Benefit Commitments

Responsible Agencies – Yucaipa Valley Water District, City of Beaumont, City of Banning, San Gorgonio Pass Water Agency, Beaumont Cherry Valley Water District

Description of Commitment	**Compliance Date – as soon as possible, but no later than**
1. Surface Water Monitoring Program a. Submit Draft Revised Monitoring Program to Regional Board b. Implement Revised Monitoring Program c. Submit Draft Revised Monitoring Program(s) (subsequent to that required in "a", above) to Regional Board d. Implement Revised Monitoring Program(s) e. Annual data report submittal	a. May 30, 2014 b. Upon Executive Officer approval c. Every three years, in coordination with ambient water qualti determination (#6, below) or more frequently upon notification of the need to do so from the Regioanl Board Executive and in accordance with the schedule prescrived by the Executive Officer d. Upon Executive Officer approval e. April 15th
2. Groundwater Monitoring Program a. Submit Draft Revised Monitoring Program(s) b. Implement revised monitoring plan(s) c. Annual data report submittal	a. Every three years, in coordination with ambient water quality determination (#6, below) or more frequently upon notification of the need to do so from the Regional Board Executive Officer and in accordance with the schedule prescribed by the Executive Officer b. Upon Executive Officer approval c. April 15th
3. YVWD Wastewater and/or Groundwater Desalter(s) and Brine Disposal Facilities Complete construction of Desalter and Brine Disposal Facilities	June 30, 2015 (or as provided by the Executive Officer – see text below)

Table 5-9c
Beaumont Groundwater Management Zone
Maximum Benefit Commitments

Responsible Agencies – Yucaipa Valley Water District, City of Beaumont, City of Banning, San Gorgonio Pass Water Agency, Beaumont Cherry Valley Water District

Description of Commitment	**Compliance Date – as soon as possible, but no later than**
4. City of Beaumont, Wastewater and/or Groundwater Desalter(s) and Brine Disposal Facilities a. Submit detailed plan and schedule for construction of desalter(s) and brine disposal facilities. Facilities are to operational as soon as possible but no later than 5 years from date of Executive Officer approval of plan/schedule or as provided by the Executive Officer (see text below). b. Implement the plan and schedule	a. January 30, 2015 b. Upon Executive Officer approval
5.City of Banning, Wastewater and/or Groundwater Salt Mitigation Plan a. Submit detailed plan and schedule for achieving compliance with the maximum benefit objectives. b. Implement the plan and schedule	a. 6 months prior to initiation of the use recycled water application or recharge b. Upon Executive Officer approval
6. Non-potable recycled water supply YVWD, the City of Beaumont, the City of Banning (at the onset of recycled water use in the Beaumont Basin), BCVWD and the Pass Agency shall implement non-potable water supply systems (utilizing recycled water) to serve water for irrigation purposes and direct non-potable reuse. The non-potable supplies used in the Beaumont Groundwater Management Zone shall comply with a 10-year running average TDS concentration of 330 mg/L or less and, in addition, for any non-irrigation reuse that has the potential to affect groundwater quality, the nitrate-nitrogen shall be less than or equal to the 5 mg/L nitrate-nitrogen "maximum benefit" objective (taking the nitrogen loss coefficient into consideration).	December 31, 2015

Table 5-9c
Beaumont Groundwater Management Zone
Maximum Benefit Commitments

Responsible Agencies – Yucaipa Valley Water District, City of Beaumont, City of Banning, San Gorgonio Pass Water Agency, Beaumont Cherry Valley Water District

Description of Commitment	Compliance Date – as soon as possible, but no later than
7. Recycled water recharge	
The recharge of recycled water in the Beaumont Groundwater Management Zone shall be limited to the amount that can be blended with other recharge sources or reverse osmosis diluent to achieve a 10-year running average equal to or less than the 330 mg/L "maximum benefit" TDS objective and less than or equal to the 5 mg/L nitrate-nitrogen "maximum benefit" objective (taking the nitrogen loss coefficient into consideration).	Compliance must be achieved by end of 10th year after initiation of recycled water use/recharge operations.
Submit documentation of amount, TDS and nitrogen quality of all sources of recharge and recharge locations.	Annually, by April 15th, after initiation construction of facilities/implementation of programs to support enhanced recharge.
For any discharger proposing to utilize "new" storm water as a blending source, the following steps must be followed:	
a. Submit for Executive Officer approval, a report that identifies the methodology used in calculating baseline (2004) and "new" storm water (post 2004) recharge. The report shall identify the amount, locations, TDS and nitrogen quality of storm water recharge and any imported water recharge. Further, the report shall identify the manner in which the enhanced storm water/imported water recharge facility will assure, individually or with other facilities, compliance with the 330 mg/L TDS and 5 mg/L nitrate-nitrogen 10-year running average "maximum benefit" objective. The report will be posted for public comment for 30 days. If there are significant adverse comments received on this report, the Executive Officer will present the report to the Regional Board for its consideration at a regularly scheduled meeting.	a. 6 months prior to initiation of construction of any basins/other facilities to support enhanced storm water/imported water recharge
b. Submit 5-year plan for implementation of additional storm water recharge facilities to ensure compliance with the 330 mg/L TDS and the 5 mg/L 10-year running average "maximum benefit" objective.	b. Submit as part of each Report of Waste Discharge (ROWD)
8. Antidegradation Salt Mitigation Plan	
a. Submit a proposed Salt Mitigation Plan and Implementation Schedule	a. October 29, 2015
b. Implement Salt Mitigation Plan	b. Within 30 days of Regional Board finding that maximum benefit no longer being achieved
9. Ambient groundwater quality determination	July 1, 2014 and every 3 years thereafter

A. Description of Yucaipa Valley Water District (YVWD), City of Beaumont,
B. Beaumont Cherry Valley Water District (BCVWD), City of Banning, San Gorgonio Pass Water Agency (Pass Agency) Commitments for the Beaumont Management Zone

1. Surface Water Monitoring Program (Table 5-9c, # 1)

A surface water monitoring program was developed, approved and implemented in response to the maximum benefit commitments initially incorporated in the Basin Plan in 2004 (Resolution No. R8-2004-0001). The Regional Board approved the Surface Water Monitoring Program in 2005 (Resolution No. R8-2005-0066). Subsequently, the need to revise the monitoring program was recognized and appropriate amendments were adopted in 2014 (Resolution No. R8-2014-0005). These include the requirement that by May 30, 2014, YVWD BCVWD, the Pass Agency, the City of Beaumont and the City of Banning shall submit a revised surface water monitoring program to the Regional Board for approval. The monitoring program must be implemented upon Executive Officer approval.
It is expected that the monitoring program will be reviewed as it is implemented over time, and that further updates may be necessary. YVWD, the City of Beaumont, the City of Banning, the Pass Agency and BCVWD committed to review the surface water monitoring program (and the groundwater monitoring program, see #2, below) as part of the determination of ambient groundwater quality, which occurs every three years pursuant to Basin Plan requirements (see #6, below). Though considered unlikely, it is possible that more frequent review and revision of these monitoring programs may be necessary. Accordingly, the Basin Plan requires review of the surface water monitoring program in coordination with the ambient quality determination and, further, that draft revised monitoring programs be submitted upon notification by the Regional Board's Executive Officer of the need to do so. The schedule for the submittal will be prescribed by the Executive Officer. Any such revision to the monitoring program is to be implemented upon Executive Officer approval.

An annual report summarizing all data collected for the year and evaluating compliance with relevant surface water objectives shall be submitted by April 15th of each year.

2. Groundwater Monitoring Program (Table 5-9c, # 2)

In response to the maximum benefit program requirements established in 2004 (Resolution No. R8- 2004-0001), a proposed groundwater monitoring program was submitted in 2005. The Regional Board approved a groundwater monitoring program to determine ambient water quality in the Beaumont Groundwater Management Zone (Resolution No. R8-2005-0066). The purpose of the Groundwater Monitoring Program is to identify the effects of the implementation of the Beaumont Groundwater Management Zone maximum benefit water quality objectives on water levels and water quality within the Beaumont Groundwater Management Zone. The groundwater monitoring program has been implemented since 2005 and YVWD, the City of Beaumont, the City of Banning, the Pass Agency and BCVWD must continue to

implement that program.

The existing groundwater monitoring implemented by the City of Beaumont and YVWD to comply with the Maximum Benefit program authorized by the 2004 amendments to the salt management plan shall be continued into the future on a cooperative basis by all of the maximum benefit partners until a new monitoring plan is approved by the Executive Officer. Any new monitoring plan developed shall preserve the geospatial distribution of groundwater wells and the sampling of those wells utilized in the existing Regional Board-approved maximum benefit monitoring program.

As noted above, the groundwater monitoring program will be reviewed as part of regular ambient groundwater quality determinations and may be revised. Once again, more frequent review and revision may be necessary as the monitoring program is implemented over time. Accordingly, the Basin Plan requires that draft revised monitoring programs be submitted upon notification by the Regional Board's Executive Officer of the need to do so. The schedule for the submittal will be prescribed by the Executive Officer. Any such revision to the monitoring program is to be implemented upon Executive Officer approval.

An annual report, including all raw data and summarizing the results of the approved groundwater monitoring program, shall be submitted to the Regional Board by April 15th of each year.

3. YVWD Wastewater and/or Groundwater Desalter(s) and Brine Disposal
(Table 5-9c, # 3)

YVWD anticipated that demineralization of groundwater or recycled water would be necessary in the future to protect the Beaumont Groundwater Management Zone and has constructed desalting and associated brine disposal facilities. YVWD shall ensure that the planned desalter system is operational by June 30, 2015. The Regional Board may extend this compliance date upon submittal of compelling evidence that the extension is warranted and would not compromise timely implementation of the other maximum benefit program commitments identified in Table 5-9a.

4. City of Beaumont Wastewater and/or Groundwater Desalter(s) and Brine Disposal
(Table 5-9c, #4)

The City of Beaumont shall construct and operate desalting facilities and brine disposal facilities to improve recycled water quality and/or other sources of non-potable supply. A detailed desalter/brine line plan and schedule shall be submitted by January 30, 2015. The schedule shall assure that these facilities are in place within 5 years of Executive Officer approval. The Executive Officer may extend the compliance date upon submittal of compelling evidence that the extension is warranted and would not compromise timely implementation of the other maximum benefit program commitments identified in Table 5-9c.

5. City of Banning Salt Mitigation Plan (Table 5-9c, #5)

The City of Banning shall submit a plan and schedule to improve recycled water quality and/or other sources of non-potable supply. The plan and schedule shall be submitted 6 months prior to the initiation of recycled water application or recharge and must be implemented upon Executive Officer approval.

6. Non-potable Recycled Water Supply Distribution System (Table 5-9c, # 6)

A key element of resources management plan in areas overlying the Beaumont Groundwater Management Zone is the construction of a non-potable supply system to serve a mix of recycled water and un-treated imported water and/or storm water for irrigation uses and direct non-potable reuse. The intent is to minimize the use of potable water for non-potable uses. YVWD, the City of Beaumont and the City of Banning will produce a non-potable supply with a running ten-year average TDS concentration for the Beaumont Groundwater Management Zone of 330 mg/L and, in addition, for any non-irrigation reuse that has the potential to affect groundwater quality, the 10-year running average nitrate-nitrogen concentration shall comply with 6.7 mg/L (taking the 25% nitrogen loss coefficient into account to assure that the “maximum benefit” objective of 5 mg/L will be met). To meet this “maximum benefit” objective, YVWD, the City of Beaumont and the City of Banning, BCVWD and San Gorgonio Pass Agency will blend the recycled water with other water sources or desalt the recycled water as needed.

Compliance with the non-potable water supply TDS and nitrate-nitrogen objective shall be measured in the non-potable water system as a weighted 10-year running average of all water sources added to that system and used within the Beaumont Groundwater Management Zone.

As part of the Maximum Benefit Annual Report, YVWD, BCVWD, the Pass Agency, the City of Beaumont and the City of Banning shall report on the TDS and nitrogen quality and quantity of all sources of non-potable water and summarize the annual and 10-year annual weighted TDS and nitrogen average concentrations utilized in the Beaumont Groundwater Management Zone.

7. Recycled Water Recharge (Table 5-9c, # 7)

The use and recharge of recycled water within the Beaumont Groundwater Management Zone are necessary to maximize the use of the water resources of the Beaumont area. The demonstration of “maximum benefit” and the continued application of the “maximum benefit” objectives are contingent on the recharge of recycled water to the Beaumont Groundwater Management Zone of a 10-year annual average (running average) TDS concentration of 330 mg/L and nitrate-nitrogen concentration of 6.7 mg/L (taking the 25% nitrogen loss coefficient into account to assure that the “maximum benefit” objective of 5 mg/L will be met). These concentrations may be achieved by desalting or other treatment of the recycled water, and/or by blending the recycled

water with other sources, such as imported water and/or storm water.

Compliance with these concentrations shall be measured at the point of discharge(s) to the recharge facility as a weighted average concentration of the recycled water and other sources, if any, used for blending.

As part of the Maximum Benefit Annual Report, YVWD, BCVWD, the Pass Agency, the City of Beaumont and the City of Banning shall report on the TDS and nitrogen quality and quantity of all sources of recharged water and summarize the annual and 10-year annual weighted TDS and nitrogen average concentrations recharged to the Beaumont Groundwater Management Zone.

8. Antidegradation Objectives Salt Mitigation Plan (Table 5-9c, #8)

By October 29, 2015, YVWD, BCVWD, the Pass Agency, the City of Beaumont and the City of Banning shall submit a Salt Mitigation Plan to mitigate excess salt loading above the antidegradation water quality objectives. The Salt Mitigation Plan shall provide a conceptual framework for mitigation projects should the Regional Board make a finding that the lowering of water quality associated with the “maximum benefit” TDS and nitrate-nitrogen water quality objectives that are higher than historical water quality (the “antidegradation” objectives) is not of maximum benefit to the people of the state. The Salt Mitigation Plan must be implemented within 30 days of a Regional Board finding that maximum benefit is no longer being achieved.

9. Ambient Groundwater Quality Determination (Table 5-9c, # 9)

By July 1, 2014, and every three years thereafter, YVWD, BCVWD, the Pass Agency, the City of Beaumont and the City of Banning shall submit a determination of ambient TDS and nitrate-nitrogen quality in the Beaumont Groundwater Management Zone. This determination shall be accomplished using methodology consistent with the calculation (20-year running averages) used by the Nitrogen/TDS Task Force to develop the TDS and nitrate-nitrogen “antidegradation” water quality objectives for groundwater Management Zones within the region. [Ref. 1].

B. Implementation by Regional Board

1. Revision to Yucaipa Valley Water District NPDES Permit

To implement the “maximum benefit” objectives, the Regional Board will revise the waste discharge requirements and producer/user reclamation requirements for the YVWD wastewater discharges to reflect the commitments described above, as appropriate. This includes the following:

For any surface water discharges that affect the Beaumont Groundwater Management Zone, discharge limits for TDS and TIN will be specified as an annual volume-weighted average at the end of pipe not to exceed 330 mg/L TDS and 6.7 mg/L TIN. These limits are based on the “maximum benefit” objectives of the Beaumont Groundwater Management Zone shown in Table 4-1 and take the nitrogen loss coefficient into

account. Alternative TDS and nitrate-nitrogen limitations based on the “antidegradation” objectives will also be specified and will apply should the Regional Board find that maximum benefit is not demonstrated. These alternative objectives are also specified in Table 4-1. Compliance schedules for these alternative limits will be specified in the YVWD’s waste discharge requirements, as necessary and appropriate.

YVWD’s waste discharge requirements will require that any planned recharge of recycled water shall be limited to the amount that can be blended with other water sources, such as new storm water or imported water, to achieve 10-year running average concentrations equal to or less than the “maximum benefit” TDS and nitrate-nitrogen objectives for the Beaumont Groundwater Management Zone. The use of recycled water for irrigation and other direct re-use shall be limited to the amount that can be blended with other water sources, such as storm water or imported water, to achieve 10-year running average concentrations equal to or less than the “maximum benefit” TDS and nitrate-nitrogen objectives for the Beaumont Groundwater Management Zone.

Alternative TDS and nitrate-nitrogen limitations based on the “antidegradation” objectives will also be specified for recycled water recharge and re-use in the Beaumont Groundwater Management Zone and will apply if the Regional Board finds that the maximum benefit commitments are not met.

2. Revision to the City of Beaumont NPDES Permit

To implement the “maximum benefit” objectives, the Regional Board will revise the waste discharge requirements and producer/user reclamation requirements for the City of Beaumont wastewater discharges to reflect the commitments described above, as appropriate. This includes the following:

For surface water discharges that affect the Beaumont Groundwater Management Zone, discharge limits for TDS and TIN will be specified as an annual volume-weighted average at the end of pipe not to exceed 330 mg/L TDS and 6.7 mg/L TIN. These limits are based on the “maximum benefit” objectives of the Beaumont Groundwater Management Zone shown in Table 4-1 and take the nitrogen loss coefficient into account. Alternative TDS and nitrate-nitrogen limitations based on the “antidegradation” objectives will also be specified and will apply should the Regional Board find that maximum benefit is not demonstrated. These alternative objectives are also specified in Table 4-1. Compliance schedules for these alternative limits will be specified in the City of Beaumont’s waste discharge requirements, as necessary and appropriate.

The City of Beaumont’s waste discharge requirements will require that any planned recharge of recycled water shall be limited to the amount that can be blended with other water sources, such as storm water or imported water, to achieve 10-year running average concentrations equal to or less than the “maximum benefit” TDS and nitrate-nitrogen objectives for the Beaumont Groundwater Management Zone. The use of recycled water for irrigation and other direct re-use shall be limited to the amount that

can be blended with other water sources, such as storm water or imported water, to achieve 10-year running average concentrations equal to or less than the “maximum benefit” TDS and nitrate-nitrogen objectives for the Beaumont Groundwater Management Zone.

Alternative TDS and nitrate-nitrogen limitations based on the “antidegradation” objectives will also be specified for recycled water recharge and re-use in the Beaumont Groundwater Management Zone and will apply if the Regional Board finds that the maximum benefit commitments are not met.

3. Revision of City of Banning NPDES Permit

Discharges from the City of Banning are currently regulated by the Colorado River Water Board. To implement the “maximum benefit” objectives, the Santa Ana Water Board will work with the Colorado River Water Board to revise the NPDES permit for the City of Banning’s wastewater discharge to reflect the commitments described below, as appropriate.

For any surface water discharges that affect the Beaumont Groundwater Management Zone, discharge limits for TDS and TIN will be specified as an annual volume-weighted average at the end of pipe not to exceed 330 mg/L TDS and 6.7 mg/L TIN. These limits are based on the “maximum benefit” objectives of the Beaumont Groundwater Management Zone shown in Table 4-1 and take the nitrogen loss coefficient into account. Alternative TDS and nitrate-nitrogen limitations based on the “antidegradation” objectives will also be specified and will apply should the Regional Board find that maximum benefit is not demonstrated. These alternative objectives are also specified in Table 4-1. Compliance schedules for these alternative limits will be specified in the City of Banning’s waste discharge requirements, as necessary and appropriate.

The City of Banning waste discharge requirements will require that any planned recharge of recycled water shall be limited to the amount that can be blended with other water sources, such as storm water or imported water, to achieve 10-year running average concentrations equal to or less than the “maximum benefit” TDS and nitrate-nitrogen objectives for the Beaumont Groundwater Management Zone. The use of recycled water for irrigation and other direct re-use shall be limited to the amount that can be blended with other water sources, such as storm water or imported water, to achieve 10-year running average concentrations equal to or less than the “maximum benefit” TDS and nitrate-nitrogen objectives for the Beaumont Groundwater Management Zone.

Alternative TDS and nitrate-nitrogen limitations based on the “antidegradation” objectives will also be specified for recycled water recharge and re-use in the Beaumont Groundwater Management Zone and will apply if the Regional Board finds that the maximum benefit commitments are not met.

4. Review of Project Status

The Regional Board intends to review periodically YVWD, the City of Beaumont, the City of Banning, BCVWD and the Pass Agency's implementation of the maximum benefit program commitments described above and summarized in Table 5-9c. This review is intended to determine whether the commitments are met, and whether the application of the "maximum benefit" objectives continues to be justified. As indicated above, if, as a result of this review, the Regional Board finds that the commitments are not met, then the Regional Board may make the finding that the "maximum benefit" objectives are not consistent with the maintenance of water quality that is of maximum benefit to the people of the state, and that the more stringent "antidegradation" objectives for the Beaumont Groundwater Management Zone (230 mg/L for TDS and 1.5 mg/L for nitrate-nitrogen; see Chapter 4) must apply instead for regulatory purposes. In the event that the Regional Board makes these determinations, the Regional Board will require that YVWD, the City of Beaumont, the City of Banning, BCVWD and the Pass Agency, either individually or collectively, implement the Salt Mitigation Plan (see commitment # 6) and mitigate the adverse water quality effects, both on the immediate and downstream waters, which resulted from recycled water discharges based on the "maximum benefit" objectives.

C. Salt Management - San Jacinto Upper Pressure Management Zone (The following was updated under Resolution No. R8-2010-0039)

As shown in Chapter 4, both "antidegradation" and "maximum benefit" objectives for TDS and nitrate-nitrogen are specified for the San Jacinto Upper Pressure Management Zone. The application of the "maximum benefit" objectives for these Management Zones is contingent on the implementation of a specific water and wastewater resources management program by Eastern Municipal Water District (EMWD) [Ref. 33]. This program is an integral part of the Hemet/San Jacinto Water Management Plan (Management Plan). The "maximum benefit" objectives would allow the Management Plan to be implemented. The Management Plan guides and supports responsible water management into the future. It includes recharge of high quality imported water, use of recycled water for agricultural purposes, and import of high quality water into EMWD's water filtration plant to provide water for potable use in the San Jacinto Upper Pressure Management Zone. Recycled water from the San Jacinto Valley Regional Water Reclamation Facility will be provided for agricultural irrigation in lieu of pumping native groundwater for agricultural operations that overlie the San Jacinto Upper Pressure Management Zone. The Management Plan was developed through a coordinated effort among EMWD, Lake Hemet Municipal Water District, the cities of Hemet and San Jacinto, and two of the areas largest farming operations. The primary benefits of the Management Plan are to reduce local overdraft and increase the sustainability and reliability of the local groundwater resources, to maximize use of recycled water produced from local water reclamation plants, and to maximize the reasonable and beneficial use of all waters available in the area. All of these activities will be managed by a local Watermaster.

In addition to its water supply responsibilities, EMWD also provides sewage collection and treatment services within its service area. EMWD operates four (4) wastewater treatment

facilities. For the most part, EMWD provides the recycled water to local agencies and farmers for irrigation purposes. During winter months, when the demand for recycled water is reduced, EMWD discharges excess recycled water to the Santa Ana River via Temescal Creek.

Table 5-11 identifies the actions and requirements that must be implemented to demonstrate that water quality consistent with maximum benefit to the people of the state will be maintained. An implementation schedule is also specified. It is assumed that the maximum benefit demonstration is made, and that the “maximum benefit” TDS and nitrate-nitrogen objectives apply to the San Jacinto Upper Pressure Management Zone, as long as the schedule and commitments are being met. If the Regional Board determines that the maximum benefit program is not being implemented effectively in accordance with the schedule shown in Table 5-11, then the maximum benefit demonstration is not made, and the “antidegradation” TDS and nitrate-nitrogen objectives would apply for the San Jacinto Upper Pressure Management Zone. In this situation, the Regional Board will require mitigation for TDS and nitrate-nitrogen discharges to these management zones that took place in excess of limits based on the “antidegradation” objectives.

Table 5-11

Eastern Municipal Water District Maximum Benefit Commitments and Schedule for the San Jacinto Upper Pressure Management Zone

Description of Commitment	Compliance Date – as soon as possible, but no later than
1. Groundwater Monitoring Program a. Submit Draft Monitoring Program to Regional Board b. Implement Monitoring Program c. Annual data report submittal	 a. May 23, 2012 b. Within 30 days from Regional Board approval of monitoring plan c. August 15th
2. Ambient Groundwater Quality Determination For all the groundwater management zones within EMWD's service area in the San Jacinto watershed, EMWD shall develop: a. Estimates of ambient TDS and nitrate b. Ambient TDS projection	 a. July 1, 2012 and every 3 years thereafter b. July 18, 2014 and every 6 years thereafter
3. TDS and Nitrogen Wasteload Allocation (WLA) Submit necessary studies and/or modeling to support update of the TDS and Nitrogen WLA for the Upper Santa Ana River watershed.	Within 1 year after notification from Regional Board that WLA needs to be reviewed/revised
4. Salinity Management Plan a. Submit Draft Salinity Management Plan for control of TDS in source water and in recycled water. b. Implement the Plan and schedule c. Triennial Report submittal	 a. April 23, 2013 b. Within 30 days of Regional Board approval c. August 15, 2012 and every 3 years thereafter

Table 5-11 cont.

Eastern Municipal Water District Maximum Benefit Commitments and Schedule for the San Jacinto Upper Pressure Management Zone

Description of Commitment	Compliance Date – as soon as possible, but no later than
5. Desalter(s) and Brine Disposal Facilities (or Equivalent Technologies) a. Submit plan and schedule for construction of desalter(s) and brine disposal facilities. b. Implement the plan and schedule c. Desalter(s)/Brine Disposal Facilities operational	a. Within 6 months of either of the following: i. When the 5-year running average TDS of the San Jacinto Valley Regional Water Reclamation Facility effluent exceeds 640 mg/L; and/or ii. When the volume weighted, ambient, average concentration in the San Jacinto Upper Pressure MZ of TDS exceeds 490 mg/L b. Within 30 days from Regional Board approval of plan/schedule c. Within 7 years from date of Regional Board approval of plan/schedule.
6. Recycled water reuse The use of recycled water in the San Jacinto Upper Pressure Management Zone shall be limited to agricultural and landscape irrigation uses only. Recycled water shall not be used for direct, intentional recharge of the San Jacinto Upper Pressure Management Zone, unless authorization has been provided by the Regional Board and Department of Public Health. Submit documentation of amount, TDS and nitrogen quality of recycled water provided to agricultural operations and/or landscape irrigation, the amount of groundwater pumped for agricultural and all other uses and amount of State Project Water recharged in the San Jacinto Upper Pressure Management Zone.	Annually, by April 15th, after initiation of construction of facilities/implementation of programs to support recycled water reuse program.
7. EMWD recycled water quality improvement plan and schedule a. Submit plan and schedule b. Implement plan and schedule	a. 60 days after the TDS 5-year running average effluent quality at the San Jacinto Valley Regional Water Reclamation Facility equals or exceeds 640 mg/L b. Upon approval by Regional Board

A. Description of Eastern Municipal Water District's (EMWD's) Commitments

1. Groundwater Monitoring Program (Table 5-11, # 1)

For the Canyon Management Zone, the Hemet South Management Zone, the San Jacinto Upper Pressure Management Zone and Lakeview-Hemet North Management Zone, EMWD shall conduct and/or fund monitoring activities to determine ambient TDS and nitrate concentrations. EMWD already implements comprehensive monitoring and reporting programs associated with the use of the groundwater for potable water supply and the use of recycled water for agricultural and landscape irrigation purposes. EMWD periodically reports the data to several regulatory agencies for the State and US EPA and will provide these data as needed to the Regional Board. These monitoring and reporting programs will continue and the data will be analyzed and used to evaluate water quality in the area. For purposes of this maximum benefit program, the groundwater monitoring program data will be used to assess the water quality of the San Jacinto Upper Pressure Management Zone and the management zones addressed in the Management Plan.

By May 23, 2012 and prior to the discharge of recycled water to the San Jacinto Upper Pressure Management Zone, EMWD shall submit to the Regional Board for approval a proposed groundwater monitoring program to determine ambient water quality and to evaluate the water quality effects of implementation of the maximum benefit program, including the "maximum benefit" nitrate-nitrogen and TDS objectives. The proposed monitoring program shall include an appropriate quality control/quality assurance component. Within 30 days of Regional Board approval of the monitoring plan, the groundwater monitoring program must be implemented.

An annual report, including all raw data, quality assurance/quality control data and a summary of the results of the approved groundwater monitoring program, shall be submitted to the Regional Board by August 15th of each year.

2. Ambient Groundwater Quality Determinations (Table 5-11, # 2)

a. Develop estimates of ambient TDS and nitrate

By July 1, 2012 and every three years thereafter, EMWD shall submit a determination of ambient TDS and nitrate-nitrogen quality in all of the San Jacinto Basin management zones within the EMWD service area. This determination shall be accomplished using methodology consistent with the calculation of ambient quality as conducted by the Basin Monitoring Program Task Force.[6] To conduct the ambient quality determinations, EMWD can either

[6] The Basin Monitoring Program Task Force, was formed after the N/TDS Task Force completed its work and the 2004 N/TDS Basin Plan amendments were adopted. The Basin Monitoring Program Task Force has assumed the responsibility to conduct analyses needed to implement certain Basin Plan requirements, including the triennial determiniation of ambient groundwater quality and revisions to the TDS and TIN waseload allocations.

contribute financially to efforts by the Basin Monitoring Program Task Force to estimate the ambient TDS and nitrate concentrations for the management zones in EMWD's service area or assume sole responsibility for the preparation of these estimates.

b. Develop ambient TDS projection

By July 18, 2014 and every six years thereafter, EMWD shall submit a projection of TDS quality in all of the San Jacinto Basin management zones. This projection shall be developed using methodology developed by the Imported Water Recharge Workgroup [7] and approved by the Regional Board. The projections will be compared to prior projections and to estimates of the historical ambient TDS concentrations. This analysis must be submitted in a report to the Regional Board. The methodology employed to date provides a 20-year TDS projection. Changes to this time period may be made if justified to the satisfaction of the Executive Officer.

3. TDS and Nitrogen Wasteload Allocations (WLAs) (Table 5-11, # 3)

Within 1 year after notification from the Regional Board of the need to review/revise the TDS and nitrogen WLAs, EMWD shall submit documents including, but not limited to, modeling analysis, data compilation or data analysis in support of a revised TDS and nitrogen WLA for the Santa Ana River and its tributaries. EMWD may contribute financially in regional efforts, such as those of the Basin Monitoring Program Task Force, to review and recommend updates to the wasteload allocations, or EMWD may conduct the analyses individually.

4. Salinity Management Plan (Table 5-11, # 4)

By April 23, 2013, EMWD shall submit a proposed Salinity Management Plan to minimize the TDS concentration in water supplied in the EMWD service area and in recycled water. The Plan shall include efforts to supply water with the lowest reasonable TDS concentration for municipal uses. The Plan shall also include efforts to reduce the TDS waste increment through use (defined herein as the average TDS increase that occurs through indoor uses, which is numerically equal to the average TDS concentration in recycled water minus the average TDS concentration in the source water supply) and salt added through treatment at recycled water facilities. The waste increment includes salt added by water conditioning and self regenerative water softeners, industrial sources, and other sources. EMWD will use its best efforts to enact ordinances, incentive programs, and development requirements that minimize the TDS waste increment.

[7] The Imported Water Recharge Workgroup was established by agencies that recharge water to assure that water quality (TDS and Nitrogen) in groundwater as a result of recharge operations is protected. The Workgroup developed a cooperative agreement to prepare a report at six-year intervals that provides a 20-year projection of ambient water quality in each groundwater management zone.

Within 30 days of Regional Board approval, the Salinity Management Plan must be implemented.

Beginning August 15, 2012 and every three years thereafter, EMWD shall submit a Salinity Management Report that describes past, current and planned salinity management actions and evaluates the efficacy of these actions.

5. Desalters and Brine Disposal (Table 5-11, # 5)

EMWD shall submit a plan and schedule for the construction and operation of desalting facilities and brine disposal facilities (or equivalent technologies) when:

a. The 5-year running average TDS concentration in recycled water produced at the San Jacinto Valley Regional Reclamation Facility exceeds 640 mg/L, or

b. The volume-weighted ambient average TDS concentration in the San Jacinto Upper Pressure Management Zone equals or exceeds 490 mg/L.

Within 30 days of Regional Board approval, the Plan/schedule must be implemented.

The construction of these facilities will be in accordance with a plan and schedule submitted by EMWD and approved by the Regional Board. The schedule shall assure that these facilities are in place within 7 years of Regional Board approval. These facilities shall be designed to stabilize or reverse the degradation trend evidenced by effluent and/or management zone quality.

6. Recycled Water Use (Table 5-11,# 6)

The use of recycled water for agricultural and landscape irrigation in-lieu of potable water within the San Jacinto Upper Pressure Management Zone is a critical component of the implementation of the Hemet/San Jacinto Water Management Plan and is necessary to maximize the use of the water resources of the area. Recycled water use in the San Jacinto Upper Pressure Management Zone is contingent upon EMWD providing recycled water quality of 5-year annual average (running average) concentrations of 640 mg/L or less TDS, and 13 mg/L or less nitrate-nitrogen. The use of recycled water in the San Jacinto Upper Pressure Management Zone shall be limited to agricultural and landscape uses. Recycled water shall not be directly recharged in the San Jacinto Upper Pressure Management Zone, unless prior authorization has been provided by the Regional Board and California Department of Public Health.

An annual report shall be submitted to the Regional Board by April 15th of each year that documents (1) the TDS and nitrogen quality and amount of recycled water provided to agricultural operations, including the in-lieu program, and/or used for

landscape irrigation and (2) the amount of groundwater pumped for agricultural and all other uses.

7. Recycled Water Quality Improvement (Table 5-11, # 7)

Within 60 days after the TDS 5 year running average effluent quality at the San Jacinto Valley Regional Water Reclamation Facility equals or exceeds 640 mg/L, EMWD shall submit a plan and schedule for the improvement of recycled water quality

Upon Regional Board approval, the recycled water quality plan and schedule must be implemented.

B. Implementation by Regional Board

No later than January 2014, and every three years thereafter, the Regional Board intends to review the status of the activities planned and executed by the EMWD to demonstrate maximum benefit and justify continued implementation of the "maximum benefit" water quality objectives. This review is intended to determine whether the commitments described above and summarized in Table 5-11 are being or have been met. As indicated above, if, as a result of this review, the Regional Board finds that the EMWD commitments are not being met, then the lowering of water quality that would be allowed by the "maximum benefit" objectives is not of maximum benefit to the people of the state. Under these circumstances, the "antidegradation" objectives for the San Jacinto Upper Pressure Management Zone (320 mg/L TDS and 1.4 mg/L nitrate-nitrogen; see Chapter 4) would apply for regulatory purposes. Further, the Regional Board will require that the EMWD mitigate TDS and nitrogen discharges that occurred in excess of those allowed pursuant to the "antidegradation" objectives. Consistent with the requirements for the other agencies implementing maximum benefit programs, discharges in excess of the "antidegradation" objectives that must be considered for mitigation include both recycled water and imported water at TDS and/or nitrogen concentrations in excess of the antidegradation objectives. Mitigation by groundwater extraction and desalting must be adjusted to address concentrations of salt and nitrogen in the basin, not simply salt load.

(End of revisions adopted under Resolution No. R8-2004-0001, No. R8-2010-0039, No. R8-2012-0002 and No. R8-2014-0005)

Recreation Water Quality Standards (The following was added under Resolution No. R8-2012-0001)

Since the early 1970's, this Basin Plan has specified recreation water quality standards for surface waters in the Region, including REC1 and/or REC2 beneficial use designations and water quality objectives intended to protect those uses. Because of analytical constraints that make routine direct measurement of pathogens impractical, these objectives have been and continue to be based on levels of surrogate bacteria

indicators. As noted in Chapter 4, the USEPA's recommendations for surrogate indicators to protect primary contact recreation have changed from total and fecal coliform to *E. coli* or enterococcus for freshwaters, and to enterococcus for marine waters (USEPA 1986). Epidemiological and laboratory investigations are ongoing and may lead to revised recommendations regarding the appropriate water quality criteria to protect recreation uses.

In 2012, the Regional Board adopted changes to the recreation standards, based on the work and recommendations of the Stormwater Quality Standards Task Force (Resolution No. R8-2012-0001). These changes included revised bacteria quality objectives applicable to freshwaters (see Chapter 4), and changes to the recreation use designations for specific fresh waters. Specific implementation strategies pertaining to the revised standards for freshwaters were also approved. This section describes those implementation strategies, which include the following:

- Intended application of Single Sample Maximum values in REC1 freshwaters
- Antidegradation targets for REC2 only freshwaters
- Controllable and uncontrollable sources of bacteria
- High flow suspension of recreation standards
- Monitoring plan for pathogen indicator bacteria in freshwaters
- POTW discharge requirements and implementation of recreational standards

Application of Single Sample Maximum values in REC1 freshwaters[+]

[+ NOTE: In their April 8, 2015 decision letter on the recreation standards amendments approved by the Regional Board (Res. No. R8-2012-0001) and State Board (Res. No. 2014-0005), USEPA Region IX stated that USEPA no longer condones the tiering of recreation uses for the protection of human health, consistent with their December 12, 2012 recommended criteria for recreational waters. Tiering of recreation waters based on the intensity of REC1 use was specified in USEPA's 1986 recommended recreational water criteria and was to be used to identify appropriate single sample maximum values for *E. coli* and other recommended bacterial indicators.

Further, in their April 8, 2015 decision letter, USEPA disapproved Regional and State Board-approved single sample maximum values for *E. coli* greater than 410 cfu/100mL, again consistent with the 2012 criteria. USEPA approved Regional and State Board-approved single sample maximum values for *E. coli* less than 410 cfu/100mL.

The following approach to the application of single sample maximum values is based on USEPA's 1986 recommended criteria for recreational waters and includes tiering of inland surface waters based on the known or anticipated intensity of REC1 use. See Table 5- REC1 –Tiers. Table 5-REC1-ssv identifies a range of single sample maximum values for *E. coli*, based, in part, on the defined

tiers. This approach to the use of single sample maximum *E. coli* values, Table 5-REC1-Tiers and Table 5-REC1-ssv are expected to be revised in response to the State Board's adoption of a statewide bacteria objectives policy implementing the 2012 recreational water criteria.]

It is recognized that a variety of factors affect the suitability of a water body for primary contact recreation, including the morphology of stream channels, the depth, velocity and aesthetic quality of the flows, access to the site by the public, and the extent to which recreational activity is actively encouraged by local authorities by providing parking, access, restrooms and other amenities. Federal guidance and regulation [United States Environmental Protection Agency, "Ambient Water Quality Criteria for Bacteria", January 1986, and "Water Quality Standards for Coastal and Great Lakes Recreation Waters; Final Rule" (the so-called "BEACH Act Rule"), Federal Register, Vol. 69, No. 200, November 16, 2004, pp.67217 *et seq.*] directs states to differentiate primary contact waters on the basis of the intensity of use, and other conditions as states deem appropriate, for the purposes of assigning Single Sample Maximum pathogen indicator values. These Single Sample Maximum values are statistical constructs, designed to be used as an indicator of whether established pathogen objectives (typically expressed as geometric means, as in this Plan (see Chapter 4)) are being met when insufficient data are available to calculate a geomean. The Single Sample values are derived from the formula included in the USEPA criteria document and shown in Table 5-REC1-ssv, note 2 (also see note 5). The Single Sample Maximum values are intended to provide a timely measure of the apparent quality of the water for primary contact recreation for public notification (posting) and, where necessary, closure purposes. States have discretion to employ the Single Sample Maximum values in the context of Clean Water Act programs, apart from their use for beach notification and closure purposes.

This Plan includes Single Sample Maximum provisions that apply to the REC1 freshwaters in the Region and that are consistent with federal guidance and regulation. These provisions are described below.

First, based on the analyses and recommendations of the Stormwater Quality Standards Task Force, REC1 freshwater lakes and streams within the Region are identified as "Tier A", "B", "C" or "D", based on the known or estimated actual or potential intensity of primary contact recreational use by the public, and other factors. These Tiers are defined as follows:

Tier A REC1 Waters: includes freshwater lakes and streams that are or may be heavily-used by the public for primary contact recreational activities, relative to other freshwater bodies in the Santa Ana Region. Typical examples of Tier A waters include, but are not limited to: Big Bear Lake, Canyon Lake, Lake Elsinore, Lake Perris, Reach 3 of the Santa Ana River, Reach 2 of Mill Creek (near Redlands) and Lytle Creek (Middle and North Forks). Single Sample Maximum (SSM) values for Tier A waters are calculated using a 75% statistical confidence factor. (See Table 5-REC1-ssv, below).

Tier B REC1 Waters: includes freshwater lakes and streams that are or may be moderately-used by the public for primary contact recreational activities. Moderate use occurs where the number of people accessing the waterbody is approximately half that which generally occurs in Tier A waters. Typical examples of Tier B waters include, but are not limited to: Jenks Lake, Santiago Reservoir, Cucamonga Creek Reach 2, and Reaches 4 and 6 of the Santa Ana River. Single Sample Maximum values for Tier B waters are calculated using an 82% statistical confidence factor. (See Table 5-REC1-ssv, below)

Tier C REC1 Waters: includes freshwater lakes and streams that are or may be lightly-used by the public for primary contact recreational activities. Light use occurs where the number of people accessing the waterbody is less than half that which generally occurs in Tier A waters. Typical examples of Tier C waters include, but are not limited to: Reach 2 of the Santa Ana River, Bear Creek, Chino Creek Reach 1B, Anza Park Drain, and Sunnyslope Channel. Single Sample Maximum values for Tier C waters are calculated using a 90% statistical confidence factor. (See Table 5-REC1-ssv, below)

Tier D REC1 Waters: includes freshwater lakes and streams that are infrequently used by the public for primary contact recreational activities. Infrequent use occurs where people only access the waterbody rarely or occasionally. Typical examples of Tier D waters include but are not limited to: most concrete-lined storm water channels in the urbanized areas of the watershed and many of the ephemeral streams located in the undeveloped areas of the watershed. Single Sample Maximum values for Tier D waters are calculated using a 95% statistical confidence factor. (See Note next page and Table 5-REC1-ssv, below).

Tier A, B, C and D waters are listed in Table 5-REC1-Tiers. Table 5-REC1-Tiers includes a “Comments” column that provides information regarding factors considered in making Tier assignments. An additional, qualifying notation, “N”, is also included in this table for certain waters assigned to Tier A, B, C, and D based on the known or anticipated frequency of use. It is recognized that there are waters within the Region that are in undeveloped areas and are expected to have low natural bacteria levels. While use of these waters for primary contact recreation may or may not occur or may be limited due to difficulties in access, channel characteristics, flow conditions and the like, as reflected in the Tier assignments, it is also necessary and appropriate to assure the protection of the high quality of these waters. Accordingly, these “N” listed waters are assigned Single Sample Maximum values using the 75% confidence factor in the calculation, which is the same approach utilized with Tier A, heavily-used waters. “N” listed waters are defined as follows:

Natural Conditions (N): includes freshwater lakes and streams located in largely undeveloped areas where ambient water quality is expected to be better than necessary to protect primary contact recreational activities regardless of whether such activities actually occur in these waterbodies. Single Sample Maximum values for “N” waters are calculated using a 75% statistical confidence factor. (See Table 5-REC1-ssv, below).

Use of the different statistical confidence factors (75%, 82%, 90% and 95%) to calculate SSM values results in a range in conservatism regarding the likelihood that the geometric mean is being met. A more conservative SSM value, based on the 75% confidence factor, is appropriate for waters that are heavily-used for primary contact recreation (Tier A). More people are likely to become ill if the bacteria quality of heavily-used waters is poor, so a higher degree of caution in evaluating quality conditions is appropriate. The more conservative SSM value is also appropriate where it is necessary to assure that existing high quality waters are protected (“N” waters). Progressively less conservative SSM values, calculated using the 82, 90 and 95% confidence factors, are appropriate where there is declining frequency of existing or potential primary contact recreation (Tier B, C and D.)

Table 5- REC 1-Tiers[x]

INLAND SURFACE STREAMS	TIER A, B, C, OR D[1]	Rationale for Tier Assignment
LOWER SANTA ANA RIVER		
Santa Ana River		
Reach 1	D	Intermittent, low flow[1] limited access[2]
Reach 2	C	Low flows, limited access
Aliso Creek	D (N)	Natural condition, limited access
Carbon Canyon Creek	D	Low, intermittent flow, limited access
Santiago Creek Drainage		
Santiago Creek		
Reach 1	D	Intermittent flow
Reach 2 – Irvine Lake (see Lakes)		
Reach 3 -	D (N)	Low flow
Reach 4 -	D (N)	Low flow
Silverado Creek	D (N)	Low flow
Black Star Creek	D (N)	Low flow
Ladd Creek	D (N)	Low flow, limited access
San Diego Creek Drainage		
San Diego Creek		
Reach 1	C	Low flow, no observed REC1 use[3]; however fishing and children observed near water
Reach 2	D	Low flow, limited access
Tributaries: Bonita Creek, Serrano Creek, Peters Canyon Wash, Hicks Canyon Wash, Bee Canyon Wash, Borrego Canyon Wash, Agua Chinon Wash, Laguna Canyon Wash, Rattlesnake Canyon, Sand Canyon Wash and other tributaries to these creeks.	D	Low flow, limited access
San Gabriel River Drainage		
Coyote Creek	D	Low flow/access prohibited

[X] Tiers based on USEPA's "Ambient Water Quality Criteria for Bacteria – 1986" and "Water Quality Standards for Coastal and Great Lakes Recreation Waters, Final Rule" (40 CFR 131.41), November 2004. Natural (N) refers to waters, typically in largely natural condition, that are expected to have good ambient bacterial quality. N waters will be assigned SSMs based on the 75% confidence level, like Tier A waters, even if designated Tier B, C, or D based on the intensity of REC1 use.

[1] Low, intermittent or ephemeral flows limit opportunity for REC1 use.

[2] Access limited or precluded by prohibitions by agency/party with jurisdiction and/or physical constraints (fencing and signage, riprap/concrete/natural steep slopes, impenetrable vegetation in/adjacent to the fresh water body, remote location, and the like)

[3] Photographic survey showed no REC1 use. (See CDM Recreation Use Survey Reports)

Table 5- REC 1-Tiers[x] (Continued)

INLAND SURFACE STREAMS	Tier A, B, C, OR D	Rationale for Tier Assignment
Upper Santa Ana River		
Reach 3	A	High use, wading and soaking, **Reference condition for Tier A waters**
Reach 4	B	Access restricted, some water contact REC use observed
Reach 5	D	Low/intermittent flow
Reach 6	B (N)	Natural condition, fishing stream
San Bernardino Mountain Streams		
Mill Creek Drainage		
Mill Creek Reach 1	A	High use, wading and soaking
Mill Creek Reach 2	A (N)	Natural condition, wading and soaking
Mountain Home Creek	D (N)	Natural condition, infrequent water contact REC use
Mountain Home Creek, East Fork	D (N)	Natural condition, remote
Monkeyface Creek	D (N)	Natural condition, remote/low flow, light to infrequent water contact REC use
Alger Creek	D (N)	
Falls Creek	D (N)	
Vivan Creek	D (N)	
High Creek	D (N)	
Other Tributaries: Lost, Oak, Cove, Green, Skinner, Hatchery, Rattlesnake, Slide, Snow, Bridal Veil, and Oak Creeks and tributaries to these Creeks	D (N)	
Bear Creek Drainage	C (N)	Natural condition, remote, light to infrequent water contact REC use. Fishing streams
Bear Creek		
Siberia Creek		
Slide Creek		
Johnson Creek		
All other tributaries to these Creeks		
Big Bear Lake Tributaries		
North Creek	D (N)	Natural condition/low flows, infrequent water contact REC activities
Metcalf Creek		
Grout Creek		
Rathbone Creek		
Meadow Creek		
Summit Creek		

[x] Tiers based on USEPA's "Ambient Water Quality Criteria for Bacteria – 1986" and "Water Quality Standards for Coastal and Great Lakes Recreation Waters, Final Rule" (40 CFR 131.41), November 2004. Natural (N) refers to waters, typically in largely natural condition, that are expected to have good ambient bacterial quality. N waters will be assigned SSMs based on the 75% confidence level, like Tier A waters, even if designated Tier B, C, or D based on the intensity of REC1 use.

Table 5- REC 1-Tiers[x] (Continued)

INLAND SURFACE STREAMS	Tier A, B, C, OR D	Rationale for Tier Assignment
Knickerbocker Creek /Reach 1	D	Access prohibited, low flow, no REC 1 use observed[4]
Reach 2	D (N)	Natural condition, low flow
Other tributaries: Minnelusa Canyon, Poligue, Red Ant Creeks and Tributaries to these Creeks	D (N)	Natural condition, low flow
Other Tributaries to Baldwin Lake: Sawmill, Green, and Caribou Canyon Creeks and other Tributaries to these Creeks	D (N)	Natural condition, low flow, remote
Other Streams Draining to Santa Ana River (Mountain Reaches)		
Cajon Canyon Creek	C (N)	Natural condition, low flow
City Creek	D (N)	Natural condition, low flow, limited access, remote
Devil Canyon Creek	D (N)	Natural condition, low flow, limited access, remote
East Twin and Strawberry Creeks	D (N)	Natural condition, low flow, limited access, remote
Waterman Canyon Creek	D (N)	Natural condition, low flow, limited access, remote
Fish Creek	D (N)	Natural condition, low flow, limited access, remote
Forsee Creek	D (N)	Natural condition, low flow, limited access, remote
Plunge Creek	D (N)	Natural condition, low flow, limited access, remote
Barton Creek	D (N)	Natural condition, low flow, limited access, remote
Bailey Creek	D (N)	Natural condition, low flow, limited access, remote
Kimbark Canyon, East Fork Kimbark Canyon, Ames Canyon and West Fork Cable Canyon Creeks	D (N)	Natural condition, low flow, limited access, remote
Valley Reaches of Above Streams	D (N)	Natural condition, low, flow, limited access

[x] Tiers based on USEPA's "Ambient Water Quality Criteria for Bacteria – 1986" and "Water Quality Standards for Coastal and Great Lakes Recreation Waters, Final Rule" (40 CFR 131.41), November 2004. Natural (N) refers to waters, typically in largely natural condition, that are expected to have good ambient bacterial quality. N waters will be assigned SSMs based on the 75% confidence level, like Tier A waters, even if designated Tier B, C, or D based on the intensity of REC1 use.

[4] Photographic survey for one year period showed no REC1 use.

Table 5- REC 1-Tiers[x] (Continued)

INLAND SURFACE STREAMS	Tier A, B, C, OR D	Rationale for Tier Assignment
Other Tributaries (Mountain Reaches): Alder, Badger Canyon, Bledsoe Gulch, Borea Canyon, Breakneck, Cable Canyon, Cienaga Seca, Cold, Converse, Coon, Crystal, Deer, Elder, Fredalba, Frog, Government, Hamilton, Heart Bar, Hemlock, Keller, Kilpecker, Little Mill, Little Sand Canyon, Lost, Meyer Canyon, Mile, Monroe Canyon, Oak, Rattlesnake, Round Cienaga, Sand, Schneider, Staircase, Warm Springs Canyon and Wild Horse Creeks, and other tributaries to those Creeks.	D (N)	Natural condition, low flow, limited access, remote
San Gabriel Mountain Streams		
San Antonio Creek	A (N)	Natural condition, wading and soaking in summer months
Lytle Creek (Middle and North Forks)	A (N)	Natural condition, wading and soaking in summer months, fishing streams
Tributaries to Lytle Creek (South Fork and Coldwater Canyon Creek)	D (N)	Natural condition, low flow
Day Canyon Creek	D (N)	Natural condition, low flow, remote, limited access
East Etiwanda Creek	D (N)	Natural condition, low flow, limited access, remote
Valley Reaches of Above Streams	D (N)	Natural condition, low flow, limited access
Cucamonga Creek / Reach 2 (Mountain Reach) – 23rd St. in Upland to headwaters	B (N)	Natural condition, limited access
Mill Creek (Prado Area)	C	limited access, low flow
Other Tributaries (Mountain Reaches) San Sevaine, Deer Canyon, Duncan Canyon, Henderson Canyon, Bull, Fan, Demens, Thorpe, Angalls, Telegraph Canyon, Stoddard Canyon, Icehouse Canyon, Cascade Canyon, Cedar, Falling Rock, Kerkhoff, and Cherry Creeks and other Tributaries to these Creeks	C (N)	Natural condition, low flow, limited access, most creeks in remote areas
Valley Reaches of Above Streams	D	Low flow, limited access
San Timoteo Creek Reach 1A – Santa Ana River Confluence to Barton Road	D	Low flow, limited access

[x] Tiers based on USEPA's "Ambient Water Quality Criteria for Bacteria – 1986" and "Water Quality Standards for Coastal and Great Lakes Recreation Waters, Final Rule" (40 CFR 131.41), November 2004. Natural (N) refers to waters, typically in largely natural condition, that are expected to have good ambient bacterial quality. N waters will be assigned SSMs based on the 75% confidence level, like Tier A waters, even if designated Tier B, C, or D based on the intensity of REC1 use.

Table 5- REC 1-Tiers[x] (Continued)

INLAND SURFACE STREAMS	Tier A, B, C, OR D	Rationale for Tier Assignment
Reach 1B – Barton Road to Gage at San Timoteo Canyon Rd.	D	Low flow, limited access
Reach 2 – gage at San Timoteo to confluence with Yucaipa Creek	C	Low flow, limited access
Reach 3 – Confluence with Yucaipa Creek to confluence with little San Gorgonio and Noble Creeks	C	Low flow, limited access
Oak Glen, Potato Canyon, and Birch Creeks	D (N)	Natural condition, low flow, limited access
Little San Gorgonio Creeks	C (N)	Natural condition, low flow, limited access, remote
Yucaipa Creek	D	Low flow, limited access
Other Tributaries to these Creeks-Valley Reaches	D	Low flow, limited access
Other Tributaries to these Creeks (Mountain Reaches)	C (N)	Natural condition
Anza Park Drain	C	Low flow
Sunnyslope Channel	C	Low flow, limited access, Santa Ana sucker habitat
Tequesquite Arroyo (Sycamore Creek)	C	Low flow, limited access
Prado Area Streams		
Chino Creek		
Reach 1A – Santa Ana River confluence to downstream of confluence with Mill Creek (Prado Area)	D	Low flow, limited access
Reach 1B – Confluence with Mill Creek (Prado Area) to beginning of concrete lined channel south of Los Serranos Rd.	C	Low flow, limited access
Reach 2 – Beginning of concrete-lined channel south of Los Serranos Rd. to confluence with San Antonio Creek	D	Low flow, limited access
Temescal Creek[5]		
Reach 2 – 1400 ft. upstream of Magnolia Ave. to Lee Lake	D	Low flow, limited access
Reach 3 – Lee Lakes (see Lakes)		
Reach 4 – Lee Lake to Mid-section Line of Section 17	D	Low flow, limited access
Reach 5 – Mid-section line of Section 17 to Elsinore Groundwater Management Zone Boundary	D	Low flow, limited access

[x] Tiers based on USEPA's "Ambient Water Quality Criteria for Bacteria – 1986" and "Water Quality Standards for Coastal and Great Lakes Recreation Waters, Final Rule" (40 CFR 131.41), November 2004. Natural (N) refers to waters, typically in largely natural condition, that are expected to have good ambient bacterial quality. N waters will be assigned SSMs based on the 75% confidence level, like Tier A waters, even if designated Tier B, C, or D based on the intensity of REC1 use.

[5] Reach 1a and 1b not designated REC1 as determined through the UAA process.

Table 5- REC 1-Tiers[x] (Continued)

INLAND SURFACE STREAMS	Tier A, B, C, OR D	Rationale for Tier Assignment
Reach 6 – Elsinore Groundwater Management Zone Boundary to Lake Elsinore Outlet	D	Low flow
Coldwater Canyon Creek	C (N)	Natural condition, limited access, remote
Bedford Canyon Creek	C (N)	Natural condition, limited access, remote
Dawson Canyon Creek	C (N)	Natural condition, limited access, remote
Other Tributaries to these Creeks	C (N)	Natural condition, limited access
San Jacinto River		
Reach 1 – Lake Elsinore to Canyon Lake	C	Low flow
Reach 2 – Canyon Lake (see Lakes)		
Reach 3 – Canyon Lake to Nuevo Road	D	Low / ephemeral flow, limited access
Reach 4 – Nuevo Road to North-South Mid-Section Line, T4S/R1W-S8	D	Low / ephemeral flow, limited access
Reach 5 – North-South Mid-Section Line, T4S/R1W-S8, to Confluence with Poppet Creek	D	Low / ephemeral flow, limited access
Reach 6 – Poppet Creek to Cranston Bridge	C	Low flow
Reach 7 – Cranston Bridge to Lake Hemet	C (N)	Natural condition, limited access, remote
Bautista Creek - Headwaters to Debris Dam	D (N)	Low flow, agricultural lands in lower section
Strawberry Creek and San Jacinto River, North Fork	C (N)	Low flow, limited access, some areas remote
Fuller Mill Creek	C (N)	Low flow, limited access, remote
Stone Creek	C (N)	Low flow, limited access, remote
Other Tributaries: Logan, Black Mountain, Juaro Canyon, Indian, Herkey, Poppet, and Potrero Creeks and other Tribuarties to these Creeks	D (N)	Low flow, limited access, remote
Salt Creek	D	Low / ephemeral flow
Goodhart Canyon Creek, St. John's Canyon, and Cactus Valley Creeks	D	Low /ephemeral flow, remote
Lakes and Reservoirs		
Baldwin Lake	D (N)	Ephemeral / intermittent
Big Bear Lake	A	Designated swimming areas
Erwin Lake	D	Ephemeral / intermittent

[x] Tiers based on USEPA's "Ambient Water Quality Criteria for Bacteria – 1986" and "Water Quality Standards for Coastal and Great Lakes Recreation Waters, Final Rule" (40 CFR 131.41), November 2004. Natural (N) refers to waters, typically in largely natural condition, that are expected to have good ambient bacterial quality. N waters will be assigned SSMs based on the 75% confidence level, like Tier A waters, even if designated Tier B, C, or D based on the intensity of REC1 use.

Table 5- REC 1-Tiers[x] (Continued)

LAKES AND RESERVOIRS	Tier A, B, C, OR D	Rationale for Tier Assignment
Evans Lake	D	Swimming prohibited by City Park officials
Jenks Lake	B (N)	Mt. fishing lake, REC body contact activities discouraged
Lee Lake	C	Swimming prohibited, float tube fishing allowed
Lake Mathews	D	Drinking water reservoir, access prohibited
Mockingbird Reservoir	D	Limited access/ fenced and locked
Lake Norconian	D	Access prohibited by U.S. Navy, no water contact REC activities allowed
Anaheim Lake	C	Fishing, GW recharge basin, water contact REC activities prohibited
Irvine Lake	B	Fishing Lake, water contact REC activities prohibited. Float tube fishing allowed.
Peters Canyon, Rattlesnake, Sand Canyon and Siphon Reservoirs	D	Water contact REC activities and/or access prohibited
Canyon Lake	A	Water contact activities allowed
Lake Elsinore	A	Water contact activities allowed
Lake Fulmor	C	Fishing allowed
Lake Hemet	C	Fishing Lake, float tube fishing and water contact REC activities prohibited.
Mystic Lake	C	Ephemeral lake, water fowl hunting allowed
Lake Perris	A	Water contact activities allowed, designated swimming areas
WETLANDS (INLAND)		
San Joaquin Freshwater Marsh	D	Access prohibited
Shay Meadows	D (N)	Natural conditions, low flows
Stanfield Marsh	D	Access prohibited
Prado Basin Management Zone	C	Access prohibited, thick vegetation limits accessibility
San Jacinto Wildlife Preserve	C	Hunting ponds filled with treated effluent
Glen Helen	C	Low flow, County Park

[x] Tiers based on USEPA's "Ambient Water Quality Criteria for Bacteria – 1986" and "Water Quality Standards for Coastal and Great Lakes Recreation Waters, Final Rule" (40 CFR 131.41), November 2004. Natural (N) refers to waters, typically in largely natural condition, that are expected to have good ambient bacterial quality. N waters will be assigned SSMs based on the 75% confidence level, like Tier A waters, even if designated Tier B, C, or D based on the intensity of REC1 use.

It is important to note that the freshwaters listed in Table 5-REC1-Tiers were not assessed comprehensively in detail to determine whether primary contact recreation actually takes place or has taken place in the past, and at what intensity. The assignments to different Tiers are based on Board staff and stakeholder knowledge of the characteristics of these waters, evidence regarding existing or probable future primary contact recreational activity, and anecdotal information, all compiled by the Stormwater Quality Standards Task Force and during public review of the recreation standards amendments in 2012. Therefore, if and as knowledge of each of these waters is obtained in the future, the Tier assignments are subject to change. Further, Use Attainability Analyses may be conducted in the future for one or more of these waters, which may lead to changes in REC1 designations (see Chapter 3, Recreation Beneficial Uses). Inclusion of a waterbody in Table 5- REC1-Tiers does not denote a determination that REC1 is, in fact, an existing use for that waterbody.

In accordance with federal regulation (the “BEACH Act Rule”), an heavily used primary contact freshwater (Reach 3 of the Santa Ana River) was used as the baseline for identifying other Tier A waters within the Region. Then, Reach 3 and other Tier A waters were used to categorize other freshwaters in the Region based on their relative known or estimated intensity of primary contact use.

Table 5-REC1-ssv shows maximum expected Single Sample values for *E. coli* for Tier A, B, C and D freshwaters. The values shown are based on a default log standard deviation, derived from the epidemiological studies USEPA used to formulate the 1986 national criteria, and on alternative log standard deviations. The equation used to calculate these Single Sample Maximum values is included in the Table and may be used to derive site-specific SSMs, under certain conditions (see table notes 2 and 5). As stated above, these Single Sample Maximum values were derived from USEPA’s recommended bacteria criteria (USEPA 1986). Again as stated previously, the Single Sample values for waters denoted as “N” in Table 5-REC1-Tiers are calculated using the 75% confidence factor, like Tier A waters.

As specified in Table 4-pio (note 3) and Table 5-REC1-ssv (note 1), where there are sufficient data to calculate a representative geometric mean for *E. coli*, the Single Sample Maximum values specified in Table 5-REC1-ssv shall not be used to assess compliance with the geometric mean *E. coli* objective specified in Table 4-pio. Geometric mean objectives are the more reliable measure of long-term water body conditions and are thus strongly preferred for use in water body assessment decisions, including the development of the Clean Water Act section 303(d) list of impaired waters. The use of only Single Sample Maximum bacterial data is generally inappropriate for such assessments unless there is a limited data set, the water is subject to short-term spikes in bacteria concentrations, or there are other circumstances that justify the use of only single sample maximum data. The expected principal use of Single Sample Maximum values for the freshwaters of this Region is to implement public notification programs and/or to trigger additional monitoring and investigation to determine whether there are controllable sources of pathogen input that pose a public health concern. Where it is necessary to make public notification and/or beach closure decisions in the

absence of sufficient data to calculate a representative geometric mean for *E. coli*, no single sample shall exceed the default value shown in Table 5-REC1-ssv or an alternative value calculated by using the formula shown in table note 2 (see also table note 5). For all other purposes related to implementing the Clean Water Act, if there are insufficient data to calculate a representative geometric mean for *E. coli*, "X%" of the representative sample data collected over a 30 day period (running) shall be less than the default value specified in this Table or the alternative calculated value, where X% is the statistical confidence level assigned to a particular waterbody.

A monitoring program designed to assure that sufficient data are collected to determine geometric means and/or to provide sufficient data necessary to assess trends in bacteria water quality will be implemented. The expected elements of that program, which is subject to approval by the Regional Board through the normal public participation process, are described below (*Monitoring plan for pathogen indicator bacteria in freshwaters*).

[NOTE re Table 5-REC1-ssv: Alternative Method for Assessing Probable Compliance with the *E. coli* Objective in Freshwaters Designated REC1 when Insufficient Data are Available to Calculate a Geometric Mean (next page): As noted at the outset of this section, USEPA disapproved single sample maximum *E. coli* values greater than 410 cfu/100mL.[8] Accordingly values greater than 410 cfu/100mL in Table 5-REC1-ssv are struck out. This Table and the Regional and State Board-approved approach to the calculation and application of single sample maximum *E. coli* values will be revised based on the pending adoption of statewide bacteria quality objectives by the State Board**]**

(The following footnote was added under Resolution No. R8-2017-0019)

[8] Objectives, targets, and TMDL and/or Waste Load Allocations listed in the Basin Plan that are associated with bacteria are expressed with different units (i.e., organisms, colony forming units [cfu], or most probably number [MPN] /100 mL). "CFU" and "MPN" represent units specific to analytical techniques used to quantify bacteria concentration, whereas "organisms" is a generic term used to express bacteria concentration. All unit expressions are considered equivalent measures of bacteria concentration (see Protocol for Developing Pathogen TMDLs, USEPA 2001, Office of Water, EPA 841-R-00-002 p 2-1).

Table 5-REC1-ssv: Alternative Method for Assessing Probable Compliance with the *E. coli* Objective in Freshwaters Designated REC1 when Insufficient Data are Available to Calculate a Geometric Mean[1]

	Maximum Expected Single Value for *E. coli*[2] (assuming true geometric mean is =126 organism/mL			
Standard Deviation of Log-transformed *E. coli* data	**Tier A[3]: 75% C.L[4].**	**Tier B[3]: 82% C.L.**	**Tier C[3]: 90% C.L.**	**Tier D[3]: 95% C.L.**
0.10	147	156	169	184
0.20	172	194	227	269
0.30	201	240	305	394
0.40(default)[5]	235	298	409	~~575~~
0.50	274	370	~~550~~	~~842~~
0.60	320	~~459~~	~~739~~	~~1,231~~
0.70	374	~~569~~	~~992~~	~~1,801~~
0.80	~~437~~	~~705~~	~~1,332~~	~~2,633~~
0.90	~~510~~	~~875~~	~~1,788~~	~~3,849~~
1.00	~~596~~	~~1,085~~	~~2,401~~	~~5,629~~
1.10	~~696~~	~~1,346~~	~~3,224~~	~~8,230~~
1.20	~~814~~	~~1,669~~	~~4,329~~	~~12,034~~

[1] This table shows single sample values calculated using the formula identified in table note 2. Default values for each Tier are calculated using 0.4 as the log standard deviation (LSD). Alternative values calculated using different LSD values are also shown. See table note 5 for discussion of these alternative LSD values. Where it is necessary to make public notification and/or beach closure decisions in the absence of sufficient data to calculate a representative geometric mean for *E. coli*, no single sample shall exceed the default value shown in this table or an alternative value calculated by using the formula shown in table note 2 (see also table note 5). For all other purposes related to implementing the Clean Water Act, if there are insufficient data to calculate a representative geometric mean for *E. coli*, "X%" of the representative sample data collected over a 30 day peri0d (running) shall be less than the default value specified in this Table or the alternative calculated value, where X% is the statistical confidence level assigned to a particular waterbody. Where there are sufficient data to calculate a representative geometric mean for *E. coli*, the default or calculated single sample maximum value shall not be used to assess compliance with the *E. coli* objective in Table 4-pio. The intent of single sample maximum values is to inform public notification decisions and to trigger additional follow-up monitoring.

[2] EPA's recommended formula for calculating the maximum expected single sample value is:

$$\mathbf{SSM = ECO * 10^{(SCF * LSD)}}, \text{ where…}$$

ECO = *E. coli* Objective expressed as geometric mean of a minimum number of samples; Assumed ECO=126 based on a minimum of 5 samples over a 30-day period (rolling average) (see Table 4-pio).
SCF = the appropriate Statistical Confidence Level Factor for the given waterbody; SCF=0.675 corresponds with the 75% confidence level; SCF=0.935 corresponds with the 82% confidence level; SCF=1.28 corresponds with the 90% confidence level; SCF=1.65 corresponds with the 95% confidence level.
LSD = the Log Standard Deviation of measured *E. coli* densities.

[3] Single Sample Maximum values for Tier A, B, C or D waters that are also denoted with an "N" in Table 5-REC1-Tiers shall be calculated as for Tier A waters.

[4] **C.L.** = Confidence Level

[5] Variability is calculated as the standard deviation of the log-transformed *E. coli* data. In the absence of adequate representative data to estimate *E. coli* variability, the maximum expected single sample value will be calculated based on the assumption that the LSD = 0.4, as recommended by EPA [40 CFR 131.41 (69 Fed. Reg. 220, 67242; Nov. 16, 2004 ("BEACH Act Rule"))]. Application of an alternative LSD value(s) must be approved by the Regional Board through the normal public notice and comment process. Per USEPA requirements identified in the BEACH Act Rule (69 Fed. Reg. 220, 67227), at least 30 samples must be collected in a single recreation season to calculate a statistically valid site-specific log standard deviation that can be used to calculate a corresponding single sample maximum. Data acceptability shall generally be determined using the guidelines described in the Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List [Sept.2004].

Antidegradation targets for REC2 only freshwaters

As discussed in Chapter 4 (Pathogen Indicator Bacteria, *REC2 Only Freshwaters*), this Plan does not specify bacteria quality objectives for freshwaters designated REC2 only. However, it is appropriate to take steps to assure that bacteria quality conditions in these waters do not degrade as the result of controllable water quality factors, consistent with antidegradation policy requirements.

For waters designated REC2 only pursuant to approved Use Attainability Analyses (UAAs; see discussion in Chapter 3 and Table 3-1), bacteria quality targets will be calculated and used to provide a baseline for expected water quality conditions in these waters. If future monitoring provides credible evidence that these targets are being exceeded and that quality conditions may have declined, then additional monitoring and investigation will be initiated, and corrective action taken if and as appropriate. Requirements pertaining to monitoring and follow-up investigation and action are identified below (*Monitoring Plan for Pathogen Indicator Bacteria in Freshwaters*).

The baseline condition (antidegradation target) for each REC2 only water will be established through a comprehensive statistical analysis of ambient bacteria quality data that is conducted as part of the UAA used to justify the REC2 only designation. The statistical analysis must be designed to characterize the entire distribution of the dataset. This includes determination of the geometric mean, median, standard deviation, coefficient-of-variation, maximum value, 75th percentile value and sample size for the dataset. The 75th percentile density will serve as the antidegradation target, that is, the trigger threshold for further investigation and possible corrective action. As new data become available pursuant to requisite monitoring, they will be compared to this antidegradation target to determine whether further investigation or action is needed. The additional monitoring results must be sufficiently robust to assess whether a lowering of water quality has occurred.

In general, the following method will be used to estimate the 75th percentile densities:

Step 1) Log-transform the existing data
Step 2) Calculate the mean of the log-transformed data
Step 3) Calculate the standard deviation of the log-transformed data
Step 4) Multiply the standard deviation of log-transformed data by 0.675
Step 5) Add result from Step 4 to the mean value calculated in Step 2
Step 6) Calculate the anti-log for the value derived in Step 5; this is the 75% percentile of the fitted log-normal distribution.

Using the 75th percentile to assess water quality trends and as a trigger for further monitoring is conceptually similar to U.S. EPA's recommended approach for using Single Sample Maximums (see *Application of Single Sample Maximum values in REC1 freshwaters,* above), and to the approach used to characterize ambient TDS and nitrogen quality in the groundwater management zones throughout the Santa Ana

Region (see Chapter 4, Management Zone TDS and Nitrate-nitrogen Water Quality Objectives).

Where 75% of the new data is less than or equal to the antidegradation target, no degradation will be inferred. However, if more than 25% of the samples exceed the target, additional samples must be collected and analyzed to determine whether the elevated values are anomalous (verified by formal outlier analysis) or if there is a true trend toward water quality degradation.

Use Attainability Analyses have been completed to justify the designation as REC2-only the specific freshwater stream segments listed in Table 5-REC2 Only Targets-FW. For each of these waters, this Table shows the antidegradation indicator bacteria targets, based on the 75% percentile of data obtained as part of the UAAs:

Table 5-REC2 Only Targets-FW[1]

REC2 Only Waterbody	*E. coli* Densities (cfu/100 mL)				
	Geometric Mean	Std. Dev.	N	Max. Observed	75**%**[3]
Temescal Creek, Reach 1a and 1b	353	1.1	36	9,200[2]	725
Santa Ana Delhi Channel, Reach 1 and Reach 2	399	1.5	55	12,590	1,067
Cucamonga Creek Reach 1	509	1.5	197	23,000	1,385

75% percentile is the antidegradation target

[1] CDM, Inc. Technical Memorandum. Calculation of Antidegradation Targets for REC2 Only Freshwaters. April 24, 2012.

[2] A value of 1,800,000 cfu/100 mL, from the sample collected on 9/8/2007, was excluded as an outlier.

[3] Targets calculated for dry weather baseflow conditions only; do not apply to samples collected during wet weather conditions.

Use Attainability Analyses have also been completed for two tidal prisms (Santa Ana Delhi and Greenville-Banning channels). Antidegradation targets for these waters, though not freshwater bodies, are shown in Table 5-REC2 Only Targets-Other Waters, below.

Table 5-REC2 Only Targets- Other Waters[1]

REC2 Only Waterbody	Enterococcus Densities (cfu/100 mL)				
	Geometric Mean	Std. Dev.	N	Max. Observed	**75%[2]**
Greenville-Banning Channel, Tidal Prism	24	144	61	740	64
Santa Ana-Delhi Channel, Tidal Prism	240	474	43	2,200	464

75% percentile is the antidegradation target

1 California Regional Water Quality Control Board, Santa Ana Region. Memorandum prepared by David Woelfel. Calculation of Antidegradation Targets for REC2 Only Waters-Tidal Prisms. April 24, 2012

2 Targets calculated for dry weather baseflow conditions only; do not apply to samples collected during wet weather conditions.

Controllable and Uncontrollable Sources of Bacteria

As described in Chapter 4, certain water quality objectives established in this Basin Plan refer to “controllable sources” or “controllable water quality factors”. Whether or not sources are “controllable” affects the ability of the Regional Board and dischargers to assure that waste discharges are regulated and controlled so as to assure the reasonable protection of beneficial uses.

Uncontrollable bacteria sources refer to contributions of bacteria within the watershed from nonpoint sources that are not readily managed through technological or natural mechanisms or through source control and that may result in exceedances of water quality objectives for indicator bacteria. Specific uncontrollable indicator bacteria sources within the Santa Ana Region may include:

- Wildlife activity and waste
- Bacterial regrowth within sediment or biofilm
- Resuspension from disturbed sediment
- Marine vegetation (wrack) along high tide line
- Concentrations (flocks) of semi-wild waterfowl
- Shedding during swimming

Controllable bacteria sources refer to any bacteria indicator source that can be controlled by treatment or management methods. Requirements for the application of Best Available Treatment technology (BAT) and Best Conventional Treatment technology (BCT) apply to some of these sources (e.g., POTWs) ; in other cases, such as discharges regulated under the areawide municipal separate storm system permits (“MS4” permits), reasonable actions to reduce or eliminate the contribution of these sources to the maximum extent practicable are required. These include the implementation of best management practices or other mechanisms. Controllable

sources are predominantly anthropogenic in nature and can be reduced in varying degrees.

Specific anthropogenic controllable indicator bacteria sources within the Santa Ana Region may include:

- Improper use of fertilizers on residential and commercial properties and agricultural lands
- Improper handling of pet waste
- Cross-connections between the sanitary and storm sewer systems
- Leaky sanitary sewer conveyances
- Discharges from POTWs
- Improper handling and disposal of food waste
- Improper management of CAFO waste and washwater
- Runoff from yards containing fertilizers, pet waste, and lawn trimmings
- Homeless encampments

Certain techniques are available to identify human sources; when practical, those techniques should be used in areas where persistent exceedances of bacteria objectives occur.

These source definitions and categories may be further refined as more science becomes available.

High flow suspension of recreation standards

In semi-arid areas like much of the Santa Ana Region, intermittent but sometimes intense rains pose a serious risk of flash flooding. Stormwater runoff significantly increases the volume and velocity of local stream flows. Dam releases and other irregular sources, such as imported water transfers, can also result in dramatic, though transitory, increases in stream flow and velocity. Such flows create a severe hazard to public safety and temporarily preclude attainment of recreational uses in or near the water.

These hazards are exacerbated in urban streams that have been engineered or heavily modified to provide essential flood protection during and immediately following storm events. Channel straightening, bank stabilization, substantial vegetation removal and flow diversions are all intended to convey stormwater runoff to a suitable discharge location as rapidly as possible while minimizing the risk of flooding and erosion. However, these common flood control construction practices and maintenance procedures significantly increase the volume and velocity of flow in urban channels during wet weather conditions. The danger inherent in recreating under such conditions is well-recognized by other Regional Boards and reflected in the suspension of recreational beneficial uses and applicable bacteria quality objectives during specific high flow conditions in other urban areas (see, for example, Resolution No. 2003-010 of

the Los Angeles Regional Board, subsequently affirmed by State Board Resolution No. 2003-0071).

This Plan recognizes these circumstances and specifies that the recreational use designations (REC1 and REC2), the narrative pathogen objective and the numeric pathogen indicator objectives shown in Table 4-pio are temporarily suspended when high flows preclude safe recreation in or near freshwater stream channels that have been engineered, heavily modified or maintained to serve as temporary flood control facilities. Temporary suspensions of recreation standards do not apply to freshwater lakes, ocean beaches or enclosed bays or estuaries.

Definition of Unsafe Flows. Flow conditions in freshwater streams in the Santa Ana watershed are presumptively unsafe if either of the following conditions occurs: (1) stream velocity is greater than 8 feet-per-second (fps); or, (2) the product of stream depth (feet) and stream velocity (fps) (the depth-velocity product) is greater than 10 ft^2/s^+. Where representative stream gauge data are not available, unsafe flows are presumed to exist in stream channels that have been engineered or heavily modified for flood control purposes when rainfall in the area tributary to the stream is greater than or equal to 0.5 inches in 24 hours. Rainfall measurements may be estimated using gauges, Doppler radar data, or other scientifically defensible methods.

It is recognized that, because of channel morphology, substrate type or other conditions, it may be unsafe to engage in recreational activities under lower flow conditions in stream channels. The fact that recreational standards may be suspended under some but not all flow conditions does not imply that it is safe to recreate in or near a waterbody when the high flow suspension is not in force.

+ The depth-velocity product criterion is not intended to apply to normal dry weather flows contained within low-flow pilot channels within engineered or heavily modified channels.

Termination of Temporary Suspension. Stream flows will be presumed to return to safe conditions and the temporary suspension of recreation standards will cease 24-hours after the end of the storm event, unless actual flow data demonstrate that the suspension should terminate sooner or later than the default period. In such cases, the suspension terminates once stream flows (measured as cubic-feet/second or (cfs) have returned to the range of normal pre-storm conditions (cfs<98th percentile as calculated from a calibrated hydrograph for the stream).

Site-Specific Flow Triggers. The hydrology of individual freshwater streams varies greatly. Therefore, the thresholds and presumptions related to rainfall and stream flow identified above may be adjusted based on site-specific data analysis and/or runoff models, subject to approval by the Regional Board through the normal public participation process.

Definition of Engineered or Heavily Modified Channels. The temporary suspension of recreational uses and related water quality objectives during unsafe flow conditions

applies only to streams that have been engineered or heavily modified to enhance flood control protection. Engineered streams include all man-made flood control facilities with a box-shaped, V-shaped or trapezoidal configuration that have been lined on the side(s) and/or bottom with concrete or similar channel-hardening materials. Heavily modified channels include once natural streams that have been substantially re-engineered, using levees, bank stabilization (rip-rap), channel straightening, vegetation removal and other similar practices, to facilitate rapid evacuation of increased urban runoff during storm events.

Delineation of Engineered or Modified Channels. The very large number of engineered and modified flood control facilities in the Santa Ana Region makes it difficult to identify all such channels individually by name. Therefore, Appendix VIII provides maps of the waterbody segments that have been engineered or modified in the manner described above and that, therefore, qualify for the temporary suspension of recreational standards under specific high flow conditions. Appendix IX contains ArcGIS files that identify each of these same waterbodies in a more precise, high-resolution format. The engineered flood control channels identified in these Appendices will be updated annually via the annual report submitted by the MS4 permittees for each county in the Region. Additions or deletions to the list of waters identified in these Appendices will also be considered during the triennial review process or on a case-by-case basis upon request by an interested party to do so. Any such request must be supported by substantial evidence. Appendix VIII and Appendix IX can be viewed at the Regional Board's website:

http://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/docs/rec_standards/BPA_REC_Standards_Staff_Rpt_AttA_AppVIII.pdf, and http://www.waterboards.ca.gov/santaana/water_issues/programs/basin_plan/docs/rec_standards/BPA_REC_Standards_Staff_Rpt_AttA_AppIX.zip.

It is important to recognize that while these channels have been engineered or modified for flood control purposes, these changes do not necessarily preclude the support of habitat in and adjacent to the channels, or the use of that habitat by aquatic, avian and terrestrial wildlife. There may be opportunities for habitat and/or species restoration projects in or adjacent to these channels. The temporary suspension of recreation standards in these channels would have no effect on the ability to implement such projects.

Site-Specific Eligibility for Temporary Suspension. The Regional Board may determine that it is appropriate to apply the temporary suspension to additional waters that may not be engineered or modified. Such waters may be added provided that it is demonstrated that high hazardous flow conditions preclude attainment of the use and that such recreational uses are not "existing" uses during high flow conditions. Such a demonstration will require that a Use Attainability Analysis (UAA) be performed in accordance with federal regulations. The Regional Board may also determine that recreation standards should *not* be suspended in some specific streams if it is

demonstrated that stream channel conditions or flow controls effectively eliminate any safety hazard to the public.

Special Case: Santa Ana River- Reach 2. Reach 2 of the Santa Ana River extends from Prado Dam near Corona downstream to 17th Street in Santa Ana. Much of this segment of the River has been heavily modified and re-engineered to provide greater flood control protection to the residents of Orange County. Although flow control at Prado Dam minimizes the risk of flash flooding in Reach 2, the volume of water passing through the deep and narrow channel near Featherly Park, just downstream of the Dam, often exceeds the default threshold that triggers application of the high flow suspension.[9] The temporary high flow suspension is intended to apply on a limited basis to transient conditions. It is not intended to de-designate recreational uses where elevated flows represent the normal baseline condition even during dry weather conditions. Consequently, the flow-based threshold will not be used to trigger application of the high flow suspension in Reach 2 of the Santa Ana River. Instead, the temporary high flow suspension will only be applied using the rainfall criteria described above or when the Army Corps of Engineers is releasing excess flows stored behind Prado Dam in response to previous rain events as described in their Standard Operating Procedures.[10]

Santa Ana River- Reach 3. It is appropriate to take notice also of Reach 3 of the Santa Ana River, which extends from Prado Dam upstream to Mission Avenue in Riverside. Although much of Reach 3 may appear relatively natural to the casual observer, it has in fact been heavily modified and re-engineered to enhance flood protection. The upper half of the reach has been channelized with reinforced levees armored by rip-rap. Below Van Buren Boulevard, Reach 3 remains largely natural. However, numerous flood control facilities have been constructed/modified in the multiple streams tributary to this area. These changes have modified the natural stream hydrology of the Reach by re-directing and accelerating stormwater runoff from the upper Santa Ana watershed that can create exceptionally hazardous flow conditions in the Reach. The temporary suspension of recreational standards applies to this Reach.

Limitations of the Temporary High Flow Suspension. It is important to emphasize that temporary suspensions of recreation standards in specific waters do not nullify the obligation to meet downstream standards, unless the recreation standards have also been suspended for those waters at the same time. Further, temporary suspensions of recreation standards do not relieve Publicly Owned Treatment Works (POTWs) of the obligation to continue to comply with effluent limitations established to assure the protection of recreation beneficial uses in the receiving waters. These effluent limitations take into account the dilution that may be made available by stormwater flows. (See

[9] Wildermuth Environmental Inc., 2008 Santa Ana River Wasteload Allocation Model Report. Prepared for the Santa Ana Watershed Project Authority's (SAWPA) Basin Monitoring Program Task Force. May, 2009 (Historical flows below Prado Dam are charted in Fig. 2-16 of the Report).

[10] United States Army Corps of Engineers. Water Control Manual: Prado Dam and Reservoir, Santa Ana River, California. 1994.

also *POTW Discharge Requirements and Implementation of Recreational Standards*, below).

Monitoring Plan for Pathogen Indicator Bacteria in Freshwaters

Monitoring of pathogen indicator bacteria in fresh surface waters in the Region is conducted by a variety of agencies in response to statutory and regulatory requirements. This includes monitoring of stormwater at selected locations within Orange, Riverside and San Bernardino counties, as required by the areawide urban stormwater permits. Monitoring is also conducted to address pathogen indicator TMDL requirements (e.g, the Middle Santa Ana River TMDL) and to support the assessment of surface waters, which may lead to the listing or delisting of these waters on the Clean Water Section 303(d) list of impaired waters. These monitoring efforts have been conducted independently to a large degree to respond to individual agency needs.

Some of these monitoring programs have evolved from focus on fecal and total coliform bacteria, on which bacteria quality objectives have been based historically, to include other pathogen indicators, such as E. coli and enterococcus. Measurement of these other indicators was prompted by changes in USEPA's recommended bacteria quality criteria for recreation waters, published in 1986. These criteria changes also led to the modification of the Basin Plan in 2012 to incorporate revised pathogen indicator objectives and implementation triggers (single sample maximum values), all based on E. coli, to protect recreation uses in inland surface waters (see Chapter 4 WATER QUALITY OBJECTIVES; CHAPTER 5 IMPLEMENTATION, Application of Single Sample Maximum Values in REC1 freshwaters).

The *E. coli* objectives and single sample maximum values that are specified in this Basin Plan implement the public health risk management approach employed in USEPA's 1986 national criteria. Pathogen indicator monitoring should also reflect this risk-based approach. Because monitoring resources are limited, the highest priority should be given to REC1 waters where primary contact recreation is most likely to occur, i.e. Tier A REC1 waters. Lower priority should be assigned to waters where primary contact recreation occurs infrequently or not at all.

As part of the Stormwater Quality Standards Task Force efforts that led to the adoption of the E. coli objectives for inland fresh surface waters, the three principal funding members, i.e., the Orange, Riverside and San Bernardino county stormwater agencies, committed to participate in the development and implementation of a comprehensive, watershed-wide bacteria quality monitoring program. Other dischargers who contribute or may contribute to pathogen indicator bacteria inputs to surface waters will be required to conduct bacteria quality monitoring, individually or in concert with this comprehensive program. It is expected that participation in the comprehensive effort would result in cost savings to individual dischargers and would be the most effective way to collect data necessary to assess the receiving water quality effects of discharges.

A proposed comprehensive monitoring program is to be submitted by the Orange, Riverside and San Bernardino county stormwater agencies no later than June 15, 2013, except that the Quality Assurance Project Plan (QAPP) shall be submitted no later than July 8, 2015. The proposed program shall meet the following: (1) all water quality monitoring for pathogen indicator bacteria must be conducted in accordance with a QAPP that has been approved by the Regional Board's Quality Assurance Officer; (2) bacteria monitoring data must be compatible with the state's Surface Water Ambient Monitoring Program (SWAMP); (3) waterbodies proposed as a high priority for monitoring shall be identified and the rationale for their selection documented; (4) each identified high priority waterbody must be sampled for pathogen indicator bacteria sufficient to provide a minimum of 5 samples per 30 day period, year-round, unless documented waterbody conditions (e.g,. water temperature, ice on the surface of lakes, high risk of flash flooding, etc.) exist that justify a reduced frequency; (5) the designated sampling locations must be selected so as to characterize bacteria concentrations immediately upstream of areas where the greatest level of recreational activity normally occurs; (6) the monitoring plan must identify the latitude and longitude of routine sampling location(s), the rationale for selecting each location, other locations considered but rejected, and the agency responsible for collecting and analyzing the sample from each high priority location; (7) the monitoring plan must describe the sampling locations and frequency for collecting pathogen indicator bacteria data in lakes and streams designated REC-1 but where recreational activities are far less likely to occur (i.e., Tier B, C or D waterbodies); (8) the monitoring plan must include a proposal for periodic bacteria monitoring of waters designated REC2 in order to confirm that there is no significant degradation of the quality of these waters; (9) results from the comprehensive bacteria monitoring program must be submitted annually. The agencies implementing the program may submit the report collectively or on an individual basis; and, (10) the data must be put into the CEDEN (SWAMP) database and/or the database maintained by the Santa Ana Watershed Project Authority.

The comprehensive program is to be implemented upon the approval of the Regional Board. The program will be reviewed and may be revised at least once every three years. This includes consideration of the waterbodies deemed high and low priority for monitoring purposes. Monitoring programs specified as part of NPDES permits, Waste Discharge Requirements and other orders of the Regional Board will be considered in light of the comprehensive program being implemented. As appropriate, dischargers in addition to the stormwater agencies will be required to conduct bacteria quality monitoring of the receiving waters. Such monitoring may be conducted independently by these other dischargers, but participation in and coordination with the comprehensive program will be strongly encouraged. The goal is to integrate all monitoring efforts to the extent feasible and reasonable to reduce or eliminate redundancy and maximize the efficacy of the monitoring effort. Requirements pertaining to data quality assurance, SWAMP compatibility, reporting and database entry will also be specified in individual requirements issued by the Regional Board.

Where water quality monitoring data indicate significant non-compliance with the applicable pathogen indicator objective, dischargers discharging to that waterbody must

submit a plan to the Regional Board to identify the pollutant source(s) unless monitoring data show that their particular discharge is not causing or contributing to the exceedance. The source evaluation plan must be implemented upon approval by the Executive Officer.

Where water quality monitoring data, collected through the approved comprehensive monitoring program or by interested agencies, organizations or individuals, indicate that a single sample maximum value assigned to a Tier B, C or D REC1 water, or the bacteria target assigned to a REC2 only water, is being exceeded, then the Regional Board will require agencies discharging to that waterbody to submit a plan for investigation into the bacteria quality of that waterbody, including monitoring. Where the investigation shows that the bacteria quality of the waterbody is adversely affected by a controllable source, then a corrective action plan and schedule will be required. Both the investigation plan and, as necessary, corrective action plan, must be implemented upon approval by the Regional Board's Executive Officer. Such follow-up investigation and corrective action will be triggered only upon the demonstration of credible evidence documenting a potential bacterial quality problem. Credible evidence shall consist of at least two consecutive samples that exceed the SSM/REC2 target. It is expected that the proposed schedule for any needed corrective action will be as soon as practicable but no longer than two years from the date that the controllable source(s) is identified.

The Regional Board acknowledges that the obligation to gather, analyze and report water quality data does not, by itself, establish any specific liability for pollutant remediation. That responsibility depends on identifying the source(s) of bacterial contamination. The Regional Board strongly supports proactive voluntary efforts organized through local Task Forces to accomplish these objectives. However, where necessary, the Regional Board will continue to impose monitoring and remediation requirements through the permitting, enforcement and TMDL processes in order to protect water quality for recreational uses.

To begin the development of a comprehensive bacteria quality monitoring program, the Stormwater Quality Standards Task Force considered the waterbodies that should be considered high priority for monitoring and identified a tentative list, shown in Table 5- REC-Potential High Priority Waters, below. The waterbodies identified in Table 5- REC-Potential High Priority Waters should be considered in the development of the proposed comprehensive monitoring program.

Table 5-REC-Potential High Priority Waters for Monitoring of Pathogen Indicator Bacteria in Freshwaters

LAKES	STREAMS
Big Bear Lake	Lytle Creek – Middle and North Forks
Lake Perris	Mill Creek – Reach 2
Lake Elsinore	Santa Ana River – Reach 3
Canyon Lake	San Antonio Creek

POTW discharge requirements and implementation of recreation standards

As discussed in Chapter 4 – WATER QUALITY OBJECTIVES, this Basin Plan establishes water quality objectives that are intended to protect beneficial uses. These include the narrative pathogen objective and numeric pathogen indicator objectives for freshwaters (Table 4-pio) that are specified for the protection of primary contact recreation in surface waters. However, in issuing waste discharge requirements that assure beneficial use protection, the Regional Board must consider not only the established objectives but also whether case-specific circumstances warrant the application of limitations more stringent than those necessary to implement the objectives. Such special consideration applies to discharges of treated sewage to surface waters by Publicly Owned Treatment Works (POTWs) or other entities and the protection of public health and primary contact recreation in those receiving waters.

The California Department of Public Health (CDPH) has found that in most instances, in order to protect the health of members of the public who engage in primary contact recreation in surface waters that receive treated sewage discharges, treatment of the discharges must be provided so as to achieve an approximate 5 log reduction in the virus content of the wastewater. The efficacy of the treatment process in achieving this reduction is reflected, in part, by measurements of total coliform bacteria.

Based on these recommendations and relevant regulations established by CDPH in the California Code of Regulations (Title 22, Division 4, Chapter 3, Section 60301 *et seq.*), waste discharge requirements issued by the Regional Board to POTWs and other entities for discharges of treated sewage to surface waters include stringent total coliform limitations. The Fact Sheets accompanying these waste discharge requirements provide detailed explanation of the rationale for these effluent limitations and related discharge specifications. The salient point here is that these waste discharge requirements do not include effluent limitations based on the numeric objectives for *E. coli* that are specified in Table 4-pio. The Regional Board has found that the total coliform limitations are necessary to assure adequate treatment of sewage before discharge to surface waters and thereby, to assure protection of public health and primary contact recreation uses.

The temporary suspension of recreation standards in certain surface waters (*see High flow suspension of recreation standards, above*) under high flow conditions does not obviate the need for POTWs and other entities discharging treated sewage (recycled water) to surface waters to continue to meet the coliform limitations specified in their waste discharge requirements. To implement the narrative pathogen objective (see Chapter 4, WATER QUALITY OBJECTIVES, INLAND SURFACE WATERS, Pathogen Indicator Bacteria), the Regional Board may also require recycled water discharged to freshwaters designated REC1 or REC2 to comply with other limitations, including those recommended by CDPH.

(End of section adopted under Resolution No. R8-2012-0001)

NONPOINT SOURCE (NPS) PROGRAM

Considerable improvements in water quality have been achieved in the nation through the control of point source discharges such as those from sewage treatment plants or industrial facilities. It is now recognized that in many areas, nonpoint source inputs, such as urban nuisance flows and stormwater runoff, are the principal sources of contaminant inputs to surface and groundwaters.

In contrast to point sources, which discharge wastewater of predictable quantity and quality at a discrete point (usually at the end of a pipe), nonpoint source inputs are diffuse in origin and variable in quality. Management of nonpoint source inputs is in many ways more difficult to achieve, since it requires an array of control techniques customized to local watershed conditions.

Nonpoint Source (NPS) Management Plan

Section 319 of the 1987 amendments to the Clean Water Act (33 USC 466 *et seq.*), established the framework for nonpoint source activities. 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 (see Chapter 7 for a discussion of the Water Quality Assessment). The NPSMP establishes a statewide policy for managing nonpoint source inputs to California's waters and is part of this Basin Plan.

The State Board defined six objectives of the Nonpoint Source Management Plan, four of which apply to activities in the Santa Ana Region:

1. Initiate and institutionalize activities for control of nonpoint source pollution (drainage from urban activities, agriculture, silviculture, abandoned mines construction, grazing, hydrologic modification, and individual disposal systems). These activities include outreach, education, public participation, technical

assistance, financial assistance, interagency coordination, and demonstration projects.

A major part of the Regional Board staff's nonpoint source activities is participation in outreach activities. Board staffs attend committee meetings to exchange information and to coordinate planning efforts among the various agencies in the region. Staff also coordinates with other public agencies and citizens' groups engaged in protecting water quality form nonpoint source impacts, generally by participating in technical advisory committees. Regional outreach activities are also beginning to include identification of best management practices such as education, information dissemination, and structural and nonstructural water quality controls.

2. Fund contracts for nonpoint source projects selected for nonpoint source grant funding in State Fiscal Year 1992-93. Regional water Board staff will also participate in these projects and provide technical assistance.

Regional Board staff has managed or acted in an advisory capacity for a number of nonpoint source grant funded contracts. These projects have included Newport Bay studies to develop a hydrodynamic model of the Bay as well as a study to monitor sources of toxics into the Bay.

3. Initiate nonpoint source watershed pilot programs on nine watersheds in the state.

San Diego Creek was designated as the region's pilot watershed project. The Creek's water quality has been impaired by excessive sedimentation, nitrates, pesticides, and metals originating from point and nonpoint sources (see the following discussion on the Newport Bay Watershed). In addition, the Upper Newport Bay Dredging Project was identified as the Region's focused nonpoint source watershed project. The U.S. Army Corps of Engineers, under Congressional authorization, is investigating dredging Upper Newport Bay to deepen the channel. The Army Corps of Engineers' activities could modify the Upper Bay's water quality and currents. Regional Board staff are aiding the Army Corps of Engineers in their development of preliminary ideas so as to prevent potential water quality degradation.

4. Implement the requirements of the 1990 Reauthorization of the Coastal Zone Management Act (CZMA) which requires the State Water 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 US EPA 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; gazing; 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 US EPA and NOAA in July 1995.

Revision of the NPSMP has been initiated. The revised NPSMP will go beyond the requirements of the Coastal Zone Management Act by specifying management measures that are applicable throughout the state. 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 Committee 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.

Some major nonpoint source problems which have been addressed in the Santa Ana Region include:

- Urban runoff: addressed through the stormwater permitting program;
- Animal confinement facilities: addressed through the Dairy Regulatory Strategy;
- On-site disposal systems: addressed through prohibitions and the Minimum Lot-Size Criteria; and
- Erosion/sedimentation in the Newport Bay watershed: addressed through the implementation of the Areawide 208 Plan.

Stormwater Program

The 1987 Clean Water Act amendments required the U.S. Environmental Protection Agency (US EPA) to establish regulations to control stormwater discharges associated with industrial activity, and discharges from large and medium municipal separate storm sewer systems. Large municipal separate storm sewer systems serve a population of 250,000 or more and medium municipal separate storm sewer systems serve a population of more than 100,000 but less than 250,000. On November 16, 1990, EPA published the final regulations that established the National Pollutant Discharge Elimination System (NPDES) permit requirements for discharges of stormwater from large and medium municipal separate storm sewer systems and stormwater discharges associated with industrial activities, including construction activities.

The stormwater NPDES permitting program is administered by the State Board and the Regional Boards.

A. Municipal Stormwater Discharge Permits

Prior to the promulgation of EPA's final regulations, the Santa Ana Regional Water Quality Control Board adopted areawide urban NPDES stormwater permits for each of the three counties in the Region. As shown in Table 5-9, as part of the areawide urban permits, the counties are named as the principal permittee and the incorporated cities are named as co-permittees. These permits require the development and implementation of programs to identify and eliminate illegal/illicit discharges to municipal stormwater conveyance systems, the development and implementation of best management practices (BMPs) to reduce pollutants in stormwater and urban runoff, and the development and implementation of monitoring programs.

Table 5-9
Municipal Stormwater Permits
Santa Ana Region

Municipality	Order Number	Date Issued
Orange County Environmental Management Agency, the County of Orange, and 23 incorporated cities	90-071 NPDES - CA8000180	7/12/90
Riverside County Flood Control and Water Conservation District, the County of Riverside, and 13 incorporated cities	90-104 NPDES - CA8000192	7/13/90
San Bernardino County Transportation and Flood Control Department, the County of San Bernardino, and 16 incorporated cities	90-136 NPDES - CA8000200	10/19/90

B. Industrial and Construction Stormwater Discharge Permits

The federal regulations identify eleven industrial categories which are subject to stormwater discharge permitting:

1. Facilities subject to stormwater effluent guidelines (40 CFR Subchapter N);
2. Manufacturing facilities;
3. Mining and Oil and Gas facilities;
4. Hazardous waste treatment, storage or disposal facilities;
5. Landfills, land application sites, and open dumps that receive industrial waste;
6. Recycling facilities such as metal scrap yards, battery reclaimers, salvage yards, and automobile yards;
7. Steam electric generating facilities;
8. Transportation facilities;
9. Sewage treatment plants;
10. Construction activities; and
11. Certain facilities if materials are exposed to stormwater.

As shown these categories include construction activities (#10), which are covered by a separate permit in the State of California (see below).

To satisfy the federal requirements, the State Board issued two general permits: the General Industrial Activities Stormwater Permit (State Board Order No. 91-13-DWQ as amended by State Board Order No. 92-12-DWQ); and the General Construction Activity Stormwater Permit (State Board Order No. 92-08-DWQ). Industrial facilities and proponents of construction projects must file a Notice of Intent (NOI) with the State Board to be covered under the applicable general permit.

The General Industrial Activities Stormwater Permit requires dischargers to comply with federal regulations to reduce or eliminate industrial stormwater pollution, to develop and implement a stormwater pollution prevention plan, and to perform monitoring of stormwater discharges. This permit covers stormwater discharges from all the listed categories of industrial activity, except construction activities.

The General Construction Activity Stormwater Permit addresses stormwater discharges associated with a construction activity where grading, clearing, and excavation results in a land disturbance of five acres of more. A stormwater discharge from a construction resulting in a land disturbance of less than five acres also requires a permit if the construction is a part of a larger common plan of development or sale.

The use of general permits to regulate these various types of stormwater discharges streamlines the permitting process, which greatly benefits the Regional Board. It is also the least costly way for a discharger to obtain a permit and comply with federal and state regulations.

For industrial and construction activities in the Region, it is the Regional Board's responsibility to enforce the General Industrial Activities and General Construction Activity stormwater permits. In addition to these general permits, the Regional Board has issued and will continue to issue individual permits for stormwater dischargers if warranted by the character of the discharges and/or sensitivity of the receiving waters.

Animal Confinement Facilities (Dairies)

As described earlier in this chapter, one of the most significant water quality problems confronting the region is increasing concentrations of TDS and nitrates in the groundwater. This problem is particularly acute in those groundwater subbasins without assimilative capacity, including the Chino II and III Groundwater Subbasins (Subbasins changed by December 22, 2004 amendment).

In 1989-90, the Regional Board conducted a special investigation of the salt balance problem in the Chino Basin, described in "Dairies and Their Relationship to Water Quality Problems in the Chino Basin" or Dairy Report [Ref. 11]. The findings of this study showed that while irrigated agriculture and municipal wastewater disposal are contributors to the degradation, wastes form dairies and other animal confinement facilities play an overwhelmingly significant role.

Dairy operations began in the Chino Basin about 40 years ago and continue intensively today. In fact, the Chino Basin contains the highest concentration of dairy animals found anywhere in the world. Within an area of about 15,000 acres, there are approximately 300 dairies, housing about 300,000 animals. These animals produce approximately 0.5 million tons (dry weight) per year of manure. Significant quantities of water are used to wash the cows prior to milking. Both this wastewater and the manure contain significant quantities of salts (TDS and nitrogen). The Regional Board's studies showed that close to 30,000 tons of salts reach Chino Basin groundwater every year as a result of the disposal of these dairy wastes.

Dairy operations and waste disposal practices can also affect the quality of surface waters. Discharges of washwater and/or runoff of stormwater which has come into contact with manure contribute salts and other pollutants to receiving streams, which ultimately flow into the Santa Ana River. While the Regional Board prohibits these discharges (with the exception of stormwater under certain conditions), these discharges do occur as a result of inadequate construction and maintenance of containment facilities. Drainage from upstream urban areas exacerbates this problem.

The quality of the Santa Ana River is affected indirectly as well: significant quantities of the poor quality groundwater in the Chino Basin rise to the surface and enter the River just upstream of Prado Dam. The TDS and nitrogen problems in the Santa Ana River, which are addressed by the implementation of wasteload allocations, have been described previously. The failure to address and correct the water quality problems in the Chino Basin could compromise the effectiveness of the water quality improvements implemented by the sewage treatment plants in response to those allocations.
The Regional Board initiated a regulatory program to address the water quality impacts of the salt loads from dairy operations in 1972. Waste discharge requirements are issued to all dairies and other significant animal confinement facilities. (See the Dairy Report for a detailed description of the Regional Board's waste discharge requirements). However, the Regional Board's studies demonstrated that changes in this regulatory program were necessary.

The Regional Board developed a revised regulatory strategy, working closely with dairy industry representatives. As described in the Dairy Report, it consists of a comprehensive, three part program. Part I is designed to address the present and future impacts from ongoing dairy activities. Part II addresses the impacts from past dairy activities, and Part III addresses the need for improved drainage facilities upstream of and within the dairy area. Although termed a "dairy" regulatory strategy, the strategy is intended to apply to <u>all</u> animal confinement facilities within the Chino Basin. The term "dairy" is used here for simplicity.

Part I. Dairy Waste Discharge Requirements: Impacts of Ongoing Operations

The first part of the strategy addresses dairy waste discharge requirements and the impacts of ongoing operations. Four specific changes to the dairy regulatory program are included: an improved manure tracking system; inclusion of groundwater monitoring

requirements for dairy operators; submittal of engineered waste management plans; and revision of waste discharge requirements to prohibit dairy waste disposal unless suitable offset programs are implemented.

1. Implementation of Manure Tracking and Reporting System

The Regional Board determined that the manure tracking system in use was not adequate to determine the full effects of dairy waste management practices on groundwater quality nor was it adequate to determine compliance with waste discharge requirements related to manure disposal.

In response, a new manure tracking manifest form was developed and is now being used. Dairy operators are required to complete the form and submit it annually in a report to the Regional Board.

2. Implementations of Groundwater Monitoring Requirements

Comprehensive groundwater quality data is necessary for planning mitigation activities in the Chino Basin. Groundwater monitoring requirements will be included in the waste discharge requirements for all dairy operators in the Chino Basin. The WDRs will provide the operators with the option of participating in an established, comprehensive groundwater monitoring program in lieu of their individual monitoring efforts. Such a monitoring program is now being conducted by the Chino Basin Watermaster.

3. Preparation of an Engineered Waste Management Plan as part of the Report of Waste Discharge

Historically, the Regional Board has required that dairy operators provide a general description of their proposed containment controls as part of the Report of Waste Discharge (ROWD). Experience has shown, however, that this is not adequate and that illegal discharges of manured water occur due to improper design, construction, and maintenance of containment controls.

To address this problem, the Regional Board now requires that a waste management plan be prepared by a registered engineer, member of the Soil Conservation Service or others who are suitably qualified. This plan must address containment of all washwater and stormwater runoff, as well as protection of the facility from inundation, as required by the waste discharge requirements. For any given property, the engineering plan must address necessary containment controls for the property as a whole, even in situations where some portion of that property is leased, subleased or operated by another party (for example, cultivation of agricultural crops by a farmer on a portion of dairy property).

Engineered waste management plans are required to be submitted as part of the ROWD for new or substantially modified dairy operations. These plans are also required when the containment controls at facilities are known or suspected to be inadequate.

4. Revision of the Manure and Washwater Disposal Requirements

As noted earlier, the Chino II and III Groundwater Subbasins lack assimilative capacity for additional salt inputs. In basins without assimilative capacity, mineral increments are not permitted when regulating waste discharges (see preceding section on salt balance and assimilative capacity, State Board Order No. 73-4, the Rancho Caballero decision [Ref. 7]). To meet the Chino Basin groundwater objectives, the discharge of manure and dairy washwater and their application as fertilizer and irrigation water cannot be legally permitted.

The implications of prohibiting manure and washwater disposal are significant. Recognizing this, the strategy allows for the implementation of programs to offset the salt loads contributed by ongoing manure/washwater disposal. An offset program would work as follows: for every ton of salt that will reach groundwater as a result of continued disposal/application of manure or washwater within the Chino Basin, the dairy operator must remove an equivalent amount of salt from the Basin through participation in a desalter or other appropriate means. The offsets required of the dairy industry would depend on the industry's success in identifying acceptable methods of manure and wastewater disposal; the more manure and washwater that is removed form the basin, the less need there is for offset.

The strategy calls for the waste discharge requirements for dairy operators in the Chino Basin to "prohibit the disposal of manure and washwater, and their application as fertilizer or irrigation water in the Chino Basin unless the dairy operator participates in an offset program. The offset program must ensure that water quality impacts of continued manure and/or washwater disposal/application practices are mitigated."

Implementation of this element of the dairy regulatory strategy has been withheld since acceptable mitigation projects are now being developed. As described in the preceding section the selected TDS and nitrogen management plan (Alternative 5C) includes two desalters in the Chino Basin, which are being built by the Santa Ana Watershed Project Authority and other participating agencies. These desalters, though not designed or implemented specifically to address ongoing dairy salt loading, will provide sufficient groundwater treatment and salt loads identified in Alternative 5C. This includes the salt loads from present and future dairy operations and other agriculture, unsewered areas, and other sources.

Part II. Impacts of Past Dairy Operations

This part of the dairy regulatory strategy addresses the mitigation of water quality impacts caused by past discharges of dairy waste in the Chino Basin.

While the two desalters mentioned above should be adequate to offset present and future salt wasteloads, they will not provide sufficient groundwater treatment to address the historic contributions of salts from long-term dairy or other agricultural activities, municipal wastewater disposal, etc. These historic salt inputs must be addressed to protect the beneficial uses of the Basin's groundwaters and to prevent long-term adverse impacts to the Santa Ana River.

Additional desalters or other treatment facilities and strategies will be necessary. The implementation of these measures may have significant costs. To be equitable, each of the sources of TDS and nitrogen input to the Basin, including dairies, other types of agriculture, and municipalities, should assume its fair share of the Chino Basin cleanup costs. The dairy regulatory strategy incorporates the concept of shared responsibility and directs the use of this concept to develop an equitable approach to water quality correction in the Chino Basin.

A comprehensive study of water resources management in the Chino Basin is now being conducted. The study, the Chino Basin Water Resources Management Study, is funded by a task force which includes representatives of the Chino Basin Watermaster (composed of water users in the Chino Basin including the agricultural industry), Chino Basin Municipal Water District, Western Municipal Water District, the Santa Ana Watershed Project Authority, Metropolitan Water District, and the Regional Board. The goal of this study is to identify a water resources management plan which will provide for water quality protection, water demands are met, and the quality of the Santa Ana River is not adversely affected by outflow from the Basin.

Part III. Surface Water Quality Impacts: Control of Drainage in the Chino Agricultural Preserve

The third part of the dairy strategy addresses surface water drainage problems in the Chino Agricultural Preserve, where most of the dairies are located. These problems are caused both by inadequate and poorly maintained drainage facilities within the Preserve, and by inadequate controls on drainage from upstream urban areas.

Runoff from the rapidly developing areas upstream of the dairy area creates additional difficulties for many dairy operators in complying with the manured water containment requirements specified in their waste discharge requirements. A number of studies have been conducted to determine the best method of preventing urban stormwater runoff impacts in the dairy area. The most recent study, "Chino Agricultural Preserve Drainage and Land Use Study"[Ref. 12], was conducted with federal 205(j) planning funds and was completed in 1987. The recommended solution to these urban drainage problems was the construction of a trapezoidal earth swale at the northern boundary of the dairy

area (roughly, at Riverside Avenue, between Campus Avenue and the Cucamonga Creek flood control channel, just west of Archibald Avenue). This swale would intercept flows from upstream urban areas (cities of Ontario and Chino) and convey these flows to the Lower Cucamonga Spreading Grounds, adjacent to the Cucamonga Creek Channel.

To alleviate drainage problems in the dairy area and reduce surface water quality problems which result from dairy waste inputs, the following measures need to be implemented:

1. Riverside Avenue interceptor swale – San Bernardino County and/or the cities of Ontario and Chino should pursue the funding and implementation of the interceptor swale project at Riverside Avenue.

2. Other drainage controls – Both San Bernardino and Riverside counties and the cities tributary to the dairy area should identify and implement a coordinated program of drainage controls necessary to supplement the interceptor swale and prevent drainage problems within the dairy area.

These recommendations are directed to the counties and cities, rather than to the dairy industry. The counties are required to implement such best management practices (BMPs) as part of their NPDES stormwater permits.

Dairy Operations Outside the Chino Basin

Since the greatest concentration of dairies occurs in the Chino Basin, the dairy strategy has appropriately focused on mitigating the problems in this area. However, in recent years, many new dairies have been established elsewhere in the Region, specifically in the San Jacinto Basin, and this trend appears to be continuing. To prevent the recurrence of the groundwater quality problem now confronting the Region in the Chino Basin, an appropriate dairy waste management strategy for the San Jacinto Basin must be developed and implemented. The pattern of dairy land use, the quality of underlying groundwater, and the availability of assimilative capacity in the San Jacinto Groundwater Subbasins should be considered in more detail before recommending a complete dairy strategy. However, it is anticipated that the wastewater management plan, the manure tracking system, and the groundwater monitoring elements of the strategy recommended for the Chino Basin will also apply in the San Jacinto Basin.

The following has been added under Resolution No. R8-2014-0005

[These Requirements shall sunset no later than May 13, 2018. If a Local Agency Management Plan (LAMP) developed pursuant to the State Water Resources Control Board's Onsite Wastewater Treatment System Policy is approved prior to that date, the LAMP shall supersede these requirements as of the date of approval.]

Minimum Lot Size Requirements and Exemption Criteria for New Developments Using On-Site Septic Tank-Subsurface Leaching/Percolation Systems

The Santa Ana Region is characterized by dramatic population growth. Most of this population is concentrated in urban areas, where high density development on small lots is typical. Sanitary sewers are not available in many areas where rapid growth is occurring, so many of these high density developments use on-site septic tank-subsurface disposal systems for sewage disposal. In 1989, the Regional Board investigated the relationship between these high density developments and the nitrate problems found in the groundwater of the Region [Ref. 13]. The findings showed that the use of high density subsurface disposal systems would cause or add to nitrate quality problems. To control these impacts, the Board found that it was necessary to limit the density of new subsurface systems.

On October 13, 1989, the Regional Board adopted Resolution No. 89-157, amending the Water Quality Control Plan to add a one-half acre minimum lot size requirement for new developments using on-site septic tank-subsurface leaching/percolation systems region-wide. Certain exemptions from the minimum lot size requirement were specified in Resolution No. 89-157. On December 7, 1990, the Regional Board adopted Resolution No. 90-158, which revised the exemption criteria. However, on June 7, 1991, the Regional Board adopted Resolution No. 91-51, rescinding Resolution No. 90-158 and revising the exemption criteria in Resolution No. 89-157. On July 16, 1993, the Regional Board adopted Resolution No. 93-40, revising the requirements and exemption criteria in Resolution No. 89-157, as amended by Resolution No. 91-51. Resolution No. 89-157, as amended by Resolution No. 93-40, stipulates the following:

1. A minimum lot size of one-half acre (average gross) per dwelling unit is required for <u>new</u> developments in the Region using on-site septic tank-subsurface leaching/percolation systems.

    A. The term “one-half acre” specified as the minimum lot size requirement means an average gross area of land of one-half acre per dwelling unit. Easements (including streets, curbs, commons, and greenbelts), or those portions thereof which are part of the property proposed for development shall be included in the calculation of the average gross area of land.

    B. A “new” development is defined as a proposed tract, parcel, industrial or commercial development for which:

        1. One or more of the following has not been granted on or prior to September 7, 1989:

            a. Conditional approval or approval of a tentative parcel or tract map by the local agency such as the county/city Planning Commission, City Council or the Board of Supervisors.

b. A conditional use permit.

c. Conditional approval or approval by the San Bernardino County Department of Environmental Health Services, Riverside County Department of Health Care Agency or other local agency; or

2. One or more of the conditional approvals or approvals listed under B.1., above, were granted on or prior to September 7, 1989 but had expired prior to September 7, 1989.

C. The minimum lot size requirement does not apply to existing developments where septic tank-subsurface disposal systems have been installed on or prior to September 7, 1989. Replacement of the existing septic tank-subsurface disposal systems shall be exempt from the minimum lot size requirements under the following conditions:

1. <u>For Residential, Commercial and Industrial Developments</u>

Replacement of the existing septic tank-subsurface disposal systems is necessary to bring the system up to code as required by the local health care agencies and/or the building and safety departments.

2. <u>For Single-Family Residential Only</u>

Replacement of the existing septic tank-subsurface disposal systems is proposed to allow additional flows resulting from additions to the existing dwelling unit. (This does not include any free-standing additional structures.)

(Note: Board staff does not consider the number of bedrooms and/or bathrooms for existing or proposed single-family dwelling units in determining compliance with the exemption criteria.)

a. An existing development on land zoned single-family residential will be considered as a new development if the addition of any free-standing structures which result in additional wastewater flows to the septic system is proposed. Commercial and/or industrial developments will be considered as new development if any additions to the existing structures are proposed which will result in additional wastewater flows to the septic system.

b. For single-family residential developments, if the existing septic system could accommodate additional wastewater flows, then additional installations (rooms/bathroom) to these developments shall be exempt from the minimum lot size requirements.

D. Those tracts, parcels, industrial or commercial developments which have received one or more of the approvals listed in B.1., above, on or prior to September 7, 1989 are exempt from minimum lot size requirements for use of septic tank-subsurface disposal systems. However, those tracts, parcels, industrial or commercial developments which had received one or more of the approvals listed in B.1., above, but for which the approval had expired prior to September 7, 1989 are considered as new development and are subject to the minimum lot size requirements.

E. Industrial/commercial developments are developments other than single-family residential developments. For new industrial commercial developments utilizing septic tank-subsurface disposal systems, the wastewater flow for each one-half acre gross area of land may not exceed that from a three-bedroom, two bathroom single-family dwelling unit. For determining compliance with this criterion, a flow rate of 300 gallons per day shall be considered as the flow equivalent to that from a 3-bedroom, 2-bathroom single-family dwelling. For industrial/commercial developments with lots smaller than one-half acre, this flow rate requirement shall be prorated. (For example, an industrial/commercial development on a one-quarter (1/4) acre parcel will be in compliance with this requirement if the wastewater flow does not exceed 150 gallons per day.)

F. This minimum lot size requirement does not affect the lot size criterion for continuing exemptions in prohibition areas (1 acre minimum).

G. This minimum lot size requirement does not preclude the prescription of more stringent lot size requirements in specific areas if it is determined necessary to protect water quality.

H. No exemptions shall be granted for new developments on lots less than one-half acre which are 200 feel or less from a sewer which could serve that tract/parcel, barring legal impediments to such use. All other developments shall be considered on sliding scale, *e.g.,* for each additional unit (any development which is more than a single-family dwelling), this requirement should be increased by 100 feet per dwelling unit. For example, a 10-lot subdivision shall be required to connect to a sewer if the sewer is within 1,100 feet (200 + 9 x 100 feet = 1,100 feet) of the proposed development barring legal impediments to connection to the sewer. For this subsection, a commercial/industrial development which produces a wastewater flow of up to 300 gallons per day would be considered equivalent to a single-family dwelling unit.

I. New lots of less than one-half acre may be formed by combining two or more lots which have received one of the approvals specified in Section B.1., above on or prior to September 7, 1989. Individually, these existing

lots would be eligible for an exemption from the minimum lot size requirement. Developments on the combined lots may also be granted an exemption provided that the total number of units proposed for the new parcel is equal to or less than the total number of units proposed for the existing parcel. For the purposes of this subsection, a combined lot of less than one-half acre formed from two or more existing lots shall not be considered a new development.

J. Exemptions from the minimum lot size requirements for the use of septic tank-subsurface disposal systems on lots smaller than one-half acre may be granted if the following conditions are met:

   1. The project proponent implements an acceptable offset program. Under an offset program, the project proponent can proceed with development using septic systems on lots smaller than one-half acre if the proponent connects an equivalent number of septic systems to the sewer. The unsewered developments must be those which would not otherwise be required to connect to the sewer.

   2. If the septic systems (developments) proposed are not identical to the ones connected to the sewer (the offset), an engineering report shall be submitted certifying that the nitrogen loading rate from the proposed development(s) is(are) equivalent to or less than the nitrogen loading rate from the septic systems in the offset program.

   3. The proposed use of septic tank-subsurface disposal systems complies with the Regional Board's "Guidelines for Sewage Disposal from Land Developments,"

K. The project proponent may propose an alternative treatment system for sewage disposal as the basis for an exemption from the minimum lot size requirement. Each request for use of an alternative treatment system shall be reviewed on a case-by-case basis and submitted to the Regional Board for consideration.

BAY PROTECTION AND TOXIC CLEANUP PROGRAM

Legislation enacted in 1989 added Chapter 5.6, Bay Protection and Toxic Cleanup, to Division 7 of the California Water Code (Sections 13390-13396). These new sections require the State Board and Regional Boards to establish programs for the maximum protection of beneficial uses of bays and estuaries, focusing on water quality problems due to toxic substances. In part, the State Board was directed to formulate and adopt a water quality control plan for Enclosed Bays and Estuaries and a workplan for the development of sediment quality objectives. When setting waste discharge requirements, the Regional Boards must implement the water quality control plan and any sediment quality objectives which may be adopted by the State Board.

The Bay Protection and Toxic Cleanup Program (BPTCP) must also include plans to identify and remediate "toxic hot spots." These are areas in the enclosed bays, estuaries or adjacent waters where the contamination affects the interests of the state and "…where hazardous substances have accumulated in the water or sediment to levels which (1) may pose a substantial present or potential hazard to aquatic life, wildlife, fisheries or human health, or (2) may adversely affect the beneficial uses of bay, estuary or ocean waters as defined in water quality control plans, or (3) exceeds adopted water quality or sediment quality objectives." Criteria for the assessment and priority ranking of toxic hot spots are to be developed by the State Board in coordination with the California Department of Fish and Game and the California Office of Environmental Health Hazard Assessment (OEHHA). The ranking criteria will be used by the Regional Board to prioritize toxic hot spots based on the severity of the problem.

The BPTCP consists of both short- and long-term activities. The short-term activities include:

- 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;
- Develop and implement regional monitoring and assessment programs;
- Develop numeric sediment quality objectives;
- Develop and implement Toxic Hot Spot Cleanup Plans;
- Revise waste discharge requirements, if necessary, to conform to the Basin Plan; and
- Develop a comprehensive database containing information pertinent to describing and managing toxic hot spots.

Long-term activities of the BPTCP include:

- (Continue to) develop numeric sediment quality objectives;
- Develop and implement strategies to prevent the formation of new Toxic Hot Spots and to reduce the severity of effects from existing Toxic Hot Spots;
- Periodic review and update of a Water Quality Control Plan for enclosed bays and estuaries; and
- Maintain the comprehensive database.

The BPTCP is a comprehensive effort to regulate toxic pollutants in enclosed bays and estuaries and is not intended to be a monitoring program resembling the State Mussel

Watch Program or the Toxic Substances Monitoring Program (see Chapter 7 for descriptions of these programs). The BPTCP program does, however, use the data from the State Mussel Watch Program and the Toxic Substances Monitoring Program to identify Toxic Hot Spots.

The Santa Ana Region, State Mussel Watch data and data provided by the Orange County Environmental Management Agency have been used to identify toxic hot spots in Newport Bay and Anaheim Bay / Huntington Harbour. Tables 5-10 and 5-11 lists the known toxic hot spots and potential toxic hot spots, respectively. The Regional Board, in coordination with the State Board and the California Department of Fish and Game are currently in the process of confirming these toxic hot spots and potential toxic hot spots using a battery of toxicity tests on both the water column and sediment. Once confirmed, the list of toxic hot spots and potential toxic hot spots will be ranked according to the ranking criteria. The priority ranking will be included in the regional Toxic Hot Spot Cleanup Plan(s) which will include identification of likely contaminant sources and appropriate remedial actions.

GROUNDWATER CONTAMINATION FROM VOLATILE ORGANIC COMPOUNDS

In 1984, the legislation passed Assembly Bill 1803 which instructed the California Department of Health Services, Office of Drinking Water, to develop and implement a program to require the sampling of public drinking water supply wells for volatile organic compounds. The Department was instructed to provide the results to the appropriate Regional Board. The initial data indicated extensive organic contamination of groundwater supplies throughout the state. As a result, in 1985, the State Board and the Regional Water Quality Control Boards initiated the Well Investigation Program. The intent of the Well Investigation Program was to identify the parties responsible for the organic contamination of municipal drinking water supply wells so that those parties could be made accountable for cleanup.

In order to identify the responsible parties, the Regional Board followed an intensive investigation program for each contaminated public drinking water supply well on a priority basis. This program included:

- Field reconnaissance for potential sources
- Record searches
- Hydrogeological assessments
- Questionnaires, meetings, and inspections
- Requests for preliminary soil investigations and follow-up soil and groundwater investigations of potential sources
- Requests for cleanup
- Enforcement actions, where appropriate

In the late1980’s the Well Investigation Program was expanded to include private drinking water supply wells and agricultural and industrial supply wells that were located

in areas where organic contamination posed a threat to public drinking water supply wells. In the late 1980's the Well Investigation Program represented the largest single funded program in the Region. However, due to severe budget cuts statewide, the Well Investigation Program was scaled down and eventually discontinued in 1992. Investigation and cleanup of sites identified by the Well Investigation Program are currently being overseen by the Regional Board's Spills, Leaks, Investigations, and Cleanup (SLIC) program.
Currently (1993), there are more than 300 water supply wells identified in the Region which contain organic compound contaminants. The loss of many drinking water supply wells and the threat of loss of additional existing drinking water supply wells due to organic compound contamination is a serious problem in several areas of the Region, most notably the Bunker Hill, Chino, and Santa Ana Forebay Groundwater Basins.

Perchloroethylene (PCE) and trichloroethylene (TCE) are the major contaminants in the Bunker Hill I Subbasin, which underlies northern San Bernardino. The City of San Bernardino lost 25% of its water supply in the early 1980s when 14 wells operated by the City were found to contain concentrations of perchloroethylene above the state and federal drinking water Maximum Contaminant Level (MCL). The Newmark Wellfield was placed on the federal Superfund list in 1988, and EPA assumed lead responsibility for investigating the extent of the contamination and identifying long-term cleanup measures. The Regional Board has identified no specific source of the contamination; potential sources include dry cleaners, airports, and a World War II munitions facility. Interim groundwater extraction and treatment at existing municipal supply wells using air stripping and granulated activated carbon (GAC) facilities funded by the California Department of Toxic Substances Control. These facilities have the capacity to treat 37.6 million gallons per day (MGD). The treated water is used as a potable water supply to replace the water lost as a result of the solvent contamination.

Table 5-10

Known Toxic Hot Spots
Santa Ana Region

Waterbody Name	Pollutants Involved
Lower Newport Bay	Cd, Pb, As, Se, Zn, Cu
Upper Newport Bay Ecological Reserve	Pb, Cu, Cd
Anaheim Bay	Cd, Cu, Pb, Cr
Huntington Harbour	Cd, Pb, Se, Cr, Cu
Bolsa Bay	Cr, Cu, Pb

Table 5-11

Potential Toxic Hot Spots
Santa Ana Region

Waterbody Name	Pollutants Involved
Lower Newport Bay	Chlorpyrifos, Dacthal, PCB, Chlorbenside, DDT, Lindane, Ronnel, Hexachlorbenzene, Chlordane, Endosulfan, Toxaphene, Aldrin, Heptachlorepoxide, Heptachlor
Upper Newport Bay Ecological Reserve	Dacthal,DDT,PCB,Endosulfan,Chlordane, Chlorpyrifos, Diazinon, Lindane, Heptachlorepoxide, Hexchlorbenzene
Anaheim Bay	Aldrin, Chlordane, Lindane, Chlorbenside, PCB, DDT, Chlorpyrifos, Endosulfan, Heptachlorepoxide, Hexachlorbenzene
Huntington Harbour	Aldrin, Chlorbenzide, DDT, Lindane, Endosulfan, Chlordane, Chlorpyrifos, Dieldrin, Endrin, Toxaphene, Heptachlorepoxide

The Bunker Hill II Subbasin underlying Redlands has been contaminated with TCE and dibromochloropropane (DBCP). It is estimated that the TCE plume covers an area of approximately twenty square miles. Twenty-six water supply wells are impacted by TCE or DBCP, including five municipal water supply wells where the concentration of TCE or DBCP exceeds the MCL. No responsible parties have been identified yet, however, potential sources for the TCE plume include an airport, commercial and industrial facilities, and a former rocket motor testing facility. DBCP, a soil fumigant, was used extensively by the citrus industry prior to the 1960's and the DBCP contamination in the Bunker Hill II Subbasin is believed to be the result of this past legal agricultural use. A 3.0 MGD GAC facility at the Rees Well, which began operation in 1989, treats the contaminated water and provides potable water for the City of Redlands. In addition, an 8.6 MGD wellhead treatment facility at the Texas Street Well Field began operation in 1993. The facility, which was funded by the State Board and the State Department of Toxics, removes TCE and DBCP and also provides potable water back to the City of Redlands.

Forty-four water supply wells in the Chino Basin, primarily the Chino II Subbasin, contain TCE and PCE. To date, only one facility, the former GE Flatiron Plant in Ontario, has been confirmed as a source of organic compound contamination that has impacted a water supply well. In 1993, prior to exploring final cleanup options, GE will be implementing plume containment and interim cleanup activities on the almost two mile long, one-half mile wide TCE plume. Other potential sources in the Chino Basin include the California Institute for Men, the Chino Airport, and the Ontario Airport.

Potential responsible parties are in the process of conducting investigative studies. Organic contamination from TCE, PCE, dichloroethylene (DCE), and dichloroethane (DCA) has been found in water supply wells in Orange County in the Santa Ana Forebay and Irvine Forebay Groundwater Basins. A wellhead treatment unit (air stripping) was installed at the City of Orange Well No. 13 and began operation in 1993. The Regional Board staff oversees investigations at numerous sites in the Forebay area where past discharges of industrial solvents have occurred. Twenty-one of these sites have been identified to date as sources of volatile organic compounds in groundwater. Site investigations are being conducted to identify the extent of contamination and to clean up the effects of the discharges.

The Regional Board has been successful in identifying many sites throughout the region where volatile organic compounds have impacted groundwater. However, with the exception of the former GE Flatiron facility in the Chino Basin, there has been no other direct cause-and-effect relationship drawn between a contaminated drinking water supply well and a specific source. In most cases, records of compounds used at facilities have not been maintained and information regarding past disposal practices is not available, making it difficult to pinpoint specific sources. In addition, considering that most sources of the volatile organic compounds found in water supply wells are probably industrial discharges that may have occurred as long as 30 years ago, and considering the complex factors affecting the fate of volatile organic compounds in soil and groundwater and the changes in groundwater flow patterns from pumping, etc., it is difficult to backtrack contamination from water supply wells to specific sites which may be sources of local groundwater contamination.

DEPARTMENT OF DEFENSE FACILITIES

There are six major Departments of Defense (DoD) facilities in the Santa Ana Region, two of which are currently scheduled for closure. Table 5-12 identifies these facilities and the water quality problems of each.

Significant groundwater contamination has been detected at a number of these facilities. Contamination is severe enough at three of these facilities to have them placed on EPA's National Priorities List (NPL) for remediation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, commonly referred to as Superfund).

For these three National Priorities List facilities (Norton and March Air Force Bases and Marine Corps Air Station – El Toro), the EPA is the lead environmental regulatory agency for oversight of investigation and cleanup. CERCLA requires EPA to consider applicable or relevant and appropriate state laws and regulations when establishing cleanup. CERCLA requires EPA 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 US EPA, DoD, and the state agencies have signed Federal Facility Agreements (FFA) for each of the National Priorities List facilities. 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 it performed; and (6) compromise is reached.

The US EPA is not involved in the investigation and cleanup of DoD facilities that are not on the National Priorities List (Marine Corps Air Station-Tustin, Naval Weapons Station-Seal Beach, and Armed Forces Reserve Center-Los Alamitos). However, many of these facilities have significant contamination. In these cases, the two state agencies enter info Federal Facility Site Remediation Agreements (FFSRAs) with DoD.

Table 5-12
Summary of Water Quality Problems from Department of Defense (DoD) Facilities
Santa Ana Region

DoD Facility	Receiving Water Affected	Water Quality Problem Identified to Date
Norton Air Force Base [1]	Bunker Hill I Subbasin	trichloroethylene (TCE) plume; landfills; Superfund listing
March Air Force Base	Perris North Subbasin	trichloroethylene (TCE) plume; fuel plume; landfills; Superfund listing
Marine Corps Air Station - El Toro	Irvine Forebay Subbasin	trichloroethylene (TCE) plume; fuel plume; benzene plume; landfills; proposed Superfund Listing
Marine Corps Air Station - Tustin [1]	Irvine Pressure Subbasin	volatile organic compound (VOC) plume; fuel plume
Naval Weapons Station - Seal Beach	Santa Ana Pressure Subbasin	fuel plume; landfills
Armed Forces Reserve Center - Los Alamitos	Santa Ana Pressure Subbasin	fuel plume; landfills

1 Facilities which are scheduled to be closed. These bases are given high cleanup priority.

FFSRAs are very similar to the above-mentioned Federal Facility Agreements, with the exception that US EPA is not a party. The Regional Board and Department of Toxic Substances Control have already entered into an agreement with DoD for the Naval Weapons Station – Seal Beach and are near the end of negotiations on Federal Facility Site Remediation Agreements for Marine Corps Air Station – Tustin.

The Department of Toxic Substances Control has been identified as the “lead” state agency and the Regional Board as “support” agency for all of the above facilities. A Memorandum of Understanding has been signed by the State Board and Department of Toxic Substances Control 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 Department of Defense for cleanup and oversight reimbursement. All work performed by the State agencies with regard tot he investigation and cleanup of environmental problems at these facilities is fully reimbursed by DoD.

LEAKING UNDERGROUND STORAGE TANKS

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 California Code of Regulations, Title 23, Division 3, Chapter 16. In 1988, the State Board and the Department of Health Services (now Department of Toxic Substances Control) issued the Leaking Underground Fuel Tank (LUFT) field manual which prescribes specific methods for evaluating the effects of underground storage tank leaks.

There are approximately 2,000 known cases of leaking underground storage tanks (USTs) in the Region. Approximately 35% of the cases involve instances where only soil contamination is present, 35% 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, with tanks from industrial facilities contributing a smaller, but significant, minority. To date, these groundwater impacts have not grown to the point where drinking water supply wells have been affected. The Regional Board maintains and regularly updates the Leaking Underground Storage Tank Information Systems (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 storage tanks

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 the County of San Bernardino Department of Environmental Health Services handle approximately 80% of the active cases in the Region, with several cities managing their own programs. The local agencies' caseload consists of soil cases, while the Regional Board maintains responsibility for the highly complex cases where groundwater has been affected.

As specified in State Board Resolution No. 92-49, "Policies and Procedures for Investigation and Cleanup and Abatement of Discharges," the investigation and cleanup of releases from underground storage tanks involves several steps including: (1) preliminary site assessment and workplan submittal; (2) pollution characterization; (3) remediation; and (4) post-remedial action monitoring. Soil contamination cleanup levels are determined on a case-by-case basis and are established to prevent continued leaching from the affected soils at levels which may cause the underlying groundwater to exceed applicable water quality objectives. Cleanup goals for groundwater contamination cases are generally established at drinking water standards (Maximum Contaminant Levels or Action Levels).

In most areas of the Santa Ana Region, the uppermost portions of the aquifers are considered to be in hydrologic contact with deeper portions which are currently utilized for drinking water supplies. In the pressure zone of Orange County, the uppermost sediments are fine-grained materials which are unable to sustain sufficient pumping rates. However, due to the large volume of water held within these sediments, the close vertical proximity of these areas to underlying pumping locations, and the existence of pathways for movement into the deeper aquifers, the shallow waters in this area are considered as contributing to the sources of drinking water in Orange County. Leaking underground storage tank cleanups must be conducted accordingly.

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 UST. The Fund can also pay for direct cleanup (by local agency or Regional Board) of UST 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 cents per gallon fee for gasoline. The Fund has been established to provide reimbursement to tank owners or operators for the costs of cleanup of the effects of unauthorized releases of petroleum. Up to one million dollars ($1,000,000) 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.

The Regional Boards provide technical support to both the applicants who file claims against the UST Cleanup Fund and the State Board staff who verify the corrective action work covered by the claim. For claims that involve future work, the Regional Boards will oversee site investigation and cleanup on cases for which they are the lead agency.

ABOVEGROUND STORAGE TANKS

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).

The purpose of the regulation is to protect the public and the environment from the serious threat of millions of gallons of petroleum-derived chemicals stored in thousands of aboveground storage tanks. The Regional Board inspects aboveground petroleum storage tanks, which were used to store crude oil and its fractions after January 1991, to assure compliance with a federally required site-specific Spill Prevention, Control, and Countermeasure Plan. In the event that a release occurs which threatens surface or groundwater, the Act allows the state to recover reasonable costs incurred in the oversight and regulation of cleanup.

Storage statements are required from facilities with aboveground storage tanks, describing the nature and size of their tanks. Filing fees are required which are intended to fund inspections, training, and research. Approximately 280 aboveground storage tanks are under regulation in the Santa Ana Region as of May 1, 1993. Their number is continually expanding as aboveground storage tanks are increasingly used to replace underground storage tanks. A list of aboveground storage tanks is available from the Regional Board.

DISPOSAL OF HAZARDOUS AND NONHAZARDOUS WASTE TO LAND

Hazardous and nonhazardous waste disposal can, if not properly managed and regulated, diminish the beneficial uses of the waters of the Region. These are typically losses to groundwater beneficial uses, but in some cases, surface waters can also be affected by disposal operations or contaminated soil in the vadose zone.

The Regional Board regulates landfills receiving municipal solid wastes and surface impoundments receiving hazardous or designated liquid wastes. Although these sites are closely regulated and monitored, some water quality problems have been detected and are being addressed. There are no hazardous solid waste disposal facilities currently operating in the Region.

The laws and regulations governing the disposal of both hazardous and nonhazardous solid wastes have been revised and strengthened in the last few years. The US EPA, DTSC, the State Board, and Regional Water Quality Control Boards are implementing the federal RCRA regulations. Described below is Regional Board implementation of

RCRA and the following state programs: Title 23, Division 3, Chapter 15; Toxic Pits Cleanup Act; and Solid Waste Assessment Tests.

Resource Conservation and Recovery Act

The state implements the Resource Conservation and Recovery Act (RCRA) in California through the Department of Toxic Substances Control (DTSC) and the Regional Boards. Chapter 15 monitoring requirements have been implemented through the adoption of waste discharge requirements for both hazardous and nonhazardous waste disposal sites covered by RCRA. The discharge requirements for both hazardous waste sites are part of a state RCRA permit issued by the DTSC. The Regional Board and the Integrated Waste Management Board issues state permits for nonhazardous waste disposal sites.

The Resource Conservation and Recovery Act of 1976 provided for the development of federal and state programs for the regulation of land disposal of waste materials and the recovery of materials and energy resources from the waste stream. The Act regulates not only the generation, transportation, treatment, storage, and disposal of hazardous wastes, but also nonhazardous solid waste disposal facilities. In addition, the 1976 Act called for phasing out the use of open dumps for disposal of solid wastes in favor of sanitary landfills.

The most recent and significant amendments to RCRA (1984) impose a variety of new, more stringent requirements both on hazardous and nonhazardous waste generators, transporters, and the owners/operators of treatment, storage, and disposal facilities within the existing regulated community. Significant provisions include bans on land disposal of certain wastes, restrictions and placement of liquids in landfills, and establishment of minimum technological requirements for landfills and surface impoundments.

Subtitle C of RCRA contains requirements related to the identification and listing of hazardous wastes and standards applicable to generators, transporters, owners, and owner/operators of treatment, storage, and disposal facilities. Primary responsibility for the implementation of Subtitle C rests with the DTSC, with Regional Board participation as necessary.

Subtitle D of RCRA establishes a framework for federal, state, and local government cooperation in controlling the management of nonhazardous solid waste. The federal role in this arrangement is to establish the overall regulatory direction by providing minimum nationwide standards for protecting human health and the environment and to provide technical assistance to states for planning and developing their own environmentally sound waste management practices. The actual planning and direct implementation of solid waste programs under subtitle D. however, remain largely state and local functions, and the act authorizes states to devise programs to deal with state-specific conditions and needs. US EPA approved the state's proposed solid waste management program, and delegated authority to the state to implement the program in

October 1993. In September 1993, the Santa Ana Region adopted a blanket Waste Discharge Requirement (WDR) amendment for all affected landfills in the Region which implements both Subtitle D and Chapter 15.

Subtitle D includes the Criteria for Classification of Solid Waste Disposal Facilities and Practices (40 CFR Part 257). The criteria establish minimum national performance standards necessary to ensure that “no reasonable probability of adverse effects on health or the environment” will result from solid waste disposal facilities or practices.

Part 258 of subtitle D establishes minimum national criteria for municipal solid waste landfills including those used for sludge disposal and disposal of nonhazardous waste combustion and ash. Part 258 also sets forth minimum federal criteria for municipal solid waste landfills, including location restrictions, facility design and operating criteria, groundwater monitoring requirements, financial assurance requirements, and closure and post-closure care requirements. The rule establishes differing requirements for existing and new units, (*e.g.,* existing units are not required to remove wastes in order to install liners).

Subtitle D provides that states with approved water management programs that wish to run the program will have flexibility in implementing these criteria. A municipal solid waste landfill unit that does not meet the Part 258 Criteria will be considered to be engaged in the practice of “open dumping” in violation of Section 4005 of RCRA. Municipal solid waste landfill units that receive sewage sludge and fail to satisfy those criteria will be deemed to be in violation of Sections 309 and 405(e) of the Clean Water Act.

Title 23, Division 3, Chapter 15

The most important regulation used by the Regional Board in regulating hazardous and nonhazardous waste disposal is California Code of Regulations (CCR) Title 23, Division 3, Chapter 15 (formerly Subchapter 15). These regulations include very specific siting, construction, monitoring, and closure requirements for all existing and new waste disposal facilities. Chapter 15 also contains a provision requiring landfill operators to provide assurances of financial responsibility for initiating and completing closure, and for corrective action to address all known or reasonably foreseeable releases from their waste management units. Detailed technical criteria are provided for establishing water quality protection standards, monitoring programs, and corrective action programs for releases from waste management units. Chapter 15 defines waste types to include hazardous wastes (Class I), designated wastes (Class II), and nonhazardous solid wastes (Class III). Hazardous wastes are defined by DTSC in Title 22 of the California Code of Regulations.

Designated wastes are defined as:

1. Those non hazardous wastes consisting of or containing contaminants which under ambient landfill conditions could be released at concentrations that could cause water quality degradation, or

2. Those wastes which are hazardous according to Title 22, but are not considered hazardous by the federal RCRA definition and have been granted a variance from hazardous waste management requirements by DTSC.

Nonhazardous solid wastes are those normally associated with domestic and commercial activities. The California Integrated Waste Management Board (CIWMB) is the lead agency responsible for non-water quality-related issues relating to nonhazardous waste management in California (Division 7 of Title 14 of the CCR). CIWMB has the overall responsibility for landfill operations and ensuring that nonhazardous wastes are collected and disposed of in a manner which protects public health and safety as well as the environment. Inert wastes can be regulated by the Regional Board if necessary to protect water quality.

The Regional Board has regulated nonhazardous municipal solid waste facilities (Class III) since the mid-1970s. Many of the smaller, older facilities have closed, and waste is now typically disposed of at larger regional nonhazardous solid waste facilities. The Regional Board is responsible for the review and revision of waste discharge requirements for both active and inactive permitted sites to assure consistency with the current regulations. These responsibilities include the upgrading of groundwater monitoring systems to identify violations of water quality protection standards, and the establishment of corrective action programs where standards are violated.

A significant task faced by the Regional Board in implementing Chapter 15 at nonhazardous solid waste facilities is defining what constitutes designated wastes. Many wastes which are not hazardous still contain constituents of water quality concern that can become mobile in a nonhazardous solid waste facility, and can produce leachates that could pose a threat to beneficial uses of the water of the state. The criteria for determining whether a nonhazardous waste is a designated waste are based on water quality objectives for waters located in the vicinity of the sites, the containment features of the solid waste facility, and the solubility/mobility of the waste constituents. To assist in the identification of designated waste criteria, the Regional Board will rely on a methodology acceptable to the Executive Officer and other relevant technical data.

Landfill Expansion

A steady increase in the rate of solid waste generation in the region is causing landfills to reach capacity sooner than expected. This situation has man it necessary not only to plan for the closure of some existing landfills, but also to anticipate the need for expansions of existing facilities and the construction of new ones. To minimize the problems associated with the rapid filling and subsequent closure of solid waste disposal facilities, the Regional Board supports efforts to reduce the volume of wastes disposed of at landfills. To reduce the potential for household hazardous wastes entering municipal landfills, the Regional Board also supports public education and household hazardous waste disposal and recycling programs.

The Regional Board conducts many other activities related to the disposal of wastes. Examples of these activities are review and approval of site design plans and construction oversight for new or expanding facilities, implementation of strict drainage and erosion control measures at landfills, soil and groundwater cleanup activities at contaminated disposal sites, and closure/post-closure plan review, approval, and closure construction oversight.

Toxics Pits Cleanup Act

The Toxics Pits Cleanup Act of 1984 (TPCA) required that all impoundments containing liquid hazardous wastes or free liquids containing hazardous waste must be either reconstructed with a liner/leachate collection system or be dried out by July 1, 1988. These facilities must also be closed by removing all contaminants or by capping to contain any residual soil contamination. In 1985, there were 11 sites in the Santa Ana Region with ponds subject to TPCA. As of 1993, 2 facilities are continuing to operate following upgrades to meet TPCA requirements, eight facilities have closed, and discharges at the remaining facility have ceased. Lead responsibility for closure of the remaining site has been assumed by the DTSC, with participation continued by the Regional Board.

Solid Waste Assessment Tests

Section 13273 was added to the Water Code in 1985, requiring all operations of both active and inactive nonhazardous landfills to complete a Solid Waste Assessment Test (SWAT). The purpose of the SWAT is to determine whether hazardous or toxic substances above regulatory thresholds, or any other constituents which may threaten water quality, are migrating from the facility. Funding for the SWAT program is provided by the California Integrated Waste Management Board.

There were 159 sites identified in the region subject to this program. Pursuant to a list adopted by the State Board, 150 sites statewide were to be evaluated each year through the year 2001 (approximately 10 sites per year in the Santa Ana Region). These sites were according to their perceived threat to water quality. Active sites, those overlying high quality aquifers, and those already known to have adversely impacted groundwater were replaced in the highest ranks (Rank 1 through 4).

Program funding was eliminated in 1991, but was restored in 1992 for a period of three years to allow for review of reports for sites in Ranks 1 through 5 only. These reviews must be completed by 1995. Although landfill site evaluations, which seek to identify adverse impacts to both surface and groundwater quality, can be required pursuant to Chapter 15 whenever necessary, it appears that the SWAT program will be fully funded after 1995. A revised SWAT ranking list will be created prior to implementation of the program for Rank 6 and beyond.

REFERENCES:

1. Wildermuth Environmental, Inc., TIN/TDS – Phase 2A of the Santa Ana Watershed, Development of Groundwater Management Zones, Estimation of Historic and Current TDS and Nitrogen Concentrations in Groundwater, Final Technical Memorandum," July 2000.

2. Wildermuth Environmental, Inc., "Santa Ana Watershed Data Collection and Management Program, Final Technical Memorandum," October 2001.

3. Wildermuth Environmental, Inc., "TIN/TDS Study - Phase 2B of the Santa Ana Watershed, Wasteload Allocation Investigation Memorandum," October 2002.

4. Wildermuth Environmental, Inc., Memo to TIN/TDS Task Force, "Transmittal of Final Tables, Figures and CD in Support of Basin Plan Amendments – TIN/TDS Study," October 2002.

5. Wildermuth Environmental, Inc., "June 2003 Addendum TIN/TDS Study – Phase 2B of the Santa Ana Watershed Wasteload Allocation Investigation," July 2003

6. California Regional Water Quality Control Board – Santa Ana Region, "Guidelines for Sewage Disposal from Land Developments," January 1979.

7. State Water Resources Control Board, "Order No. 73-4, Rancho Caballero Decision," April 1972.

8. Department of Water Resources, "Mineral Increases from Municipal Use of Water in the Santa Ana River Basin," Memorandum Report, June 1982.

9. City of Riverside, Memo from Rod Cruze to TIN/TDS Task Force," Nitrogen Loss Assumptions for Reach 3 of the Santa Ana River," April 2002.

10A. No entry (intentionally left blank)

10B. Chino Basin Watermaster, Letter to Gerard Thibeault, "Chino Basin Watermaster Proposal for New Total Dissolved Solids (TDS) and Nitrogen Water Quality Objectives for the Chino and Cucamonga Basins Based on Maximum Beneficial Use," December 2002.

10C. Chino Basin Watermaster, "Chino Basin Optimum Basin Management Plan," 1999.

10D. City of Banning, Beaumont Cherry Valley Water District, San Gorgonio Pass Water Agency, Yucaipa Valley Water District, Proposed Regional Implementation of Maximum Benefit Commitments for the Beaumont Management Zone. Preliminary Draft, September 2011

10E. San Timoteo Watershed Management Agency, Letter to Gerard Thibeault, “Revised San Timoteo Watershed Management Agency Proposal for New Total Dissolved Solids (TDS) and Total Inorganic Nitrogen Water Quality Objectives for the Beaumont, San Timoteo and Yucaipa Management Zones Based on Maximum Beneficial Use,” December 2002 (Revised November 11, 2003).

10F. Daniel B. Stephens & Associates. (2007), Quantification of Nitrogen Removal Under Recycled Water Ponds, Prepared for Eastern Municipal Water District.

11. California Regional Water Quality Control Board – Santa Ana Region, “Dairies and Their Relationship to Water Quality Problems in the Chino Basin, “ July 1990.

12. USDA Soil Conservation Service, U.S. Forest Service, and the West End Conservation District, “Chino Agriculture Land Use Study,” September 1988.

13. California Regional Water Quality Control Board – Santa Ana Region, “A Review of Nitrate Problems in the Ground Waters of the Santa Ana Region and Their Relationship to High Density Developments on Septic Tank-Subsurface Disposal Systems,” September 1989.

14. California Regional Water Quality Control Board – Santa Ana Region, “Guidelines for Sewage Disposal from Land Developments,” January 1979.

15. Department of Water Resources, “Mineral Increases from Municipal Use of Water in the Santa Ana River Basin,” Memorandum Report, June 1982.

16. California Regional Water Quality Control Board – Santa Ana Region, “A Report to the California Legislature, Newport Bay: Water Quality Issues and Recommendations,” November 1985.

17. California Regional Water Quality Control Board – Santa Ana Region, “Newport Bay Clean Water Strategy--A Report and Recommendations for Future Actions,” September 1989.

18. California Regional Water Quality Control Board – Santa Ana Region, “Evaluation of Boatyard Waste Treatment Technologies within the Santa Ana Region,” October 1990.

19. University of California, Irvine, “Newport Bay Basin Plan Update/Nonpoint Source Study,” July 1993.

20. University of California, Davis, “Newport Bay Watershed Toxicity Study,” June 1993.

21. California Regional Water Quality Control Board – Santa Ana Region, “Total Maximum Daily Load for Fecal Coliform Bacteria in Newport Bay, California,” November 1998.

22. California Regional Water Quality Control Board – Santa Ana Region, “Total Maximum Daily Load for Fecal Coliform in Newport Bay, California: Continuation of Public Hearing,” April 9, 1999.

23. University of California, Irvine, “Anaheim Bay Basin Plan Update Study,” August 1993.

24. University of California, Davis, “Anaheim Bay Watershed Toxicity Study,” June 1993.

25. California Regional Water Quality Control Board – Santa Ana Region, “An Assessment of the Water Quality Conditions in Big Bear Lake,” pending.

26. California Regional Water Quality Control Board, Santa Ana Region. “Staff Report on the Nutrient Total Maximum Daily Loads for Big Bear Lake,” June 2005.

27. California Regional Water Quality Control Board, “Lake Elsinore Nutrient TMDL Problem Statement,” October, 2000.

28. California Regional Water Quality Control Board, “Canyon Lake Nutrient TMDL Problem Statement,” October 2001.

29. California Regional Water Quality Control Board, “Total Maximum Daily Load for Nutrients in Lake Elsinore and Canyon Lake,” May 2004.

30. US Environmental Protection Agency, “Update of Ambient Water Quality Criteria for Ammonia.” EPA-822-R-99-014.

31. California Regional Water Quality Control Board, “Total Maximum Daily Load for Bacterial Indicators in the Middle Santa Ana River Watershed,” February 3, 2005.

32. US Environmental Protection Agency (USEPA), “Ambient Water Quality Criteria for Bacteria,” 1986.

33. Eastern Municipal Water District, Letter to Gerard Thibeault, “Eastern Municipal Water District Proposal for New Total Dissolved Solids (TDS) and Total Inorganic Nitrogen (TIN) Water Quality Objectives for the San Jacinto Upper Pressure Management Zone Based on Maximum Beneficial Use,” July 3, 2007.

34. United States Environmental Protection Agency, “Water Quality Standards for Coastal and Great Lakes Recreation Waters; Final Rule”, 40 CFR 131.41. Federal Register, Vol. 69, No. 200, November 16, 2004, pp.67217 *et seq*

35. CDM. Technical Memorandum. Calculation of Antidegradation Targets for REC2 Only Freshwaters. December 30, 2011.

36. California Regional Water Quality Control Board, Santa Ana Region. Memorandum prepared by David Woelfel. Calculation of Antidegradation Targets for REC2 Only Waters-Tidal Prisms. December 30, 2011

37. U.S. EPA. Water Quality Standards Handbook. Sept. 15, 1993.

38. United States Army Corps of Engineers. Water Control Manual: Prado Dam and Reservoir, Santa Ana River, California. 1994.

39. Wildermuth Environmental Inc., 2008 Santa Ana River Wasteload Allocation Model Report. Prepared for the Santa Ana Watershed Project Authority's (SAWPA) Basin Monitoring Program Task Force. May, 2009

40. State Water Resources Control Board. “Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List”. September 2004.