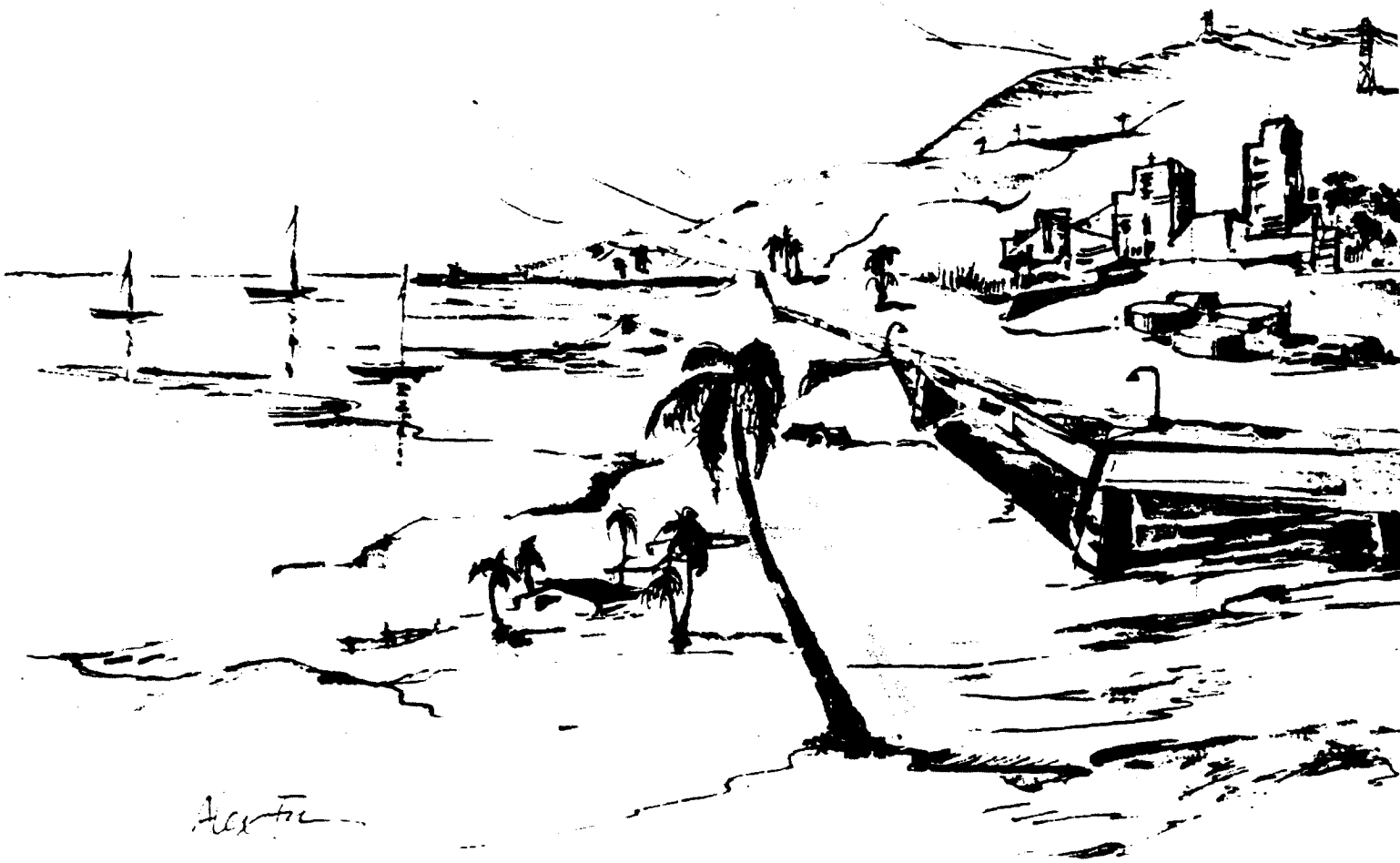
WATER QUALITY CONTROL PLAN
Los Angeles Region

Basin Plan
for the
Coastal Watersheds of
Los Angeles and Ventura Counties



California Regional Water Quality Control Board

Los Angeles Region (4)

WATER QUALITY CONTROL PLAN

Los Angeles Region

Adopted by

California Regional Water Quality Control Board, Los Angeles Region on June 13, 1994.

Approved by

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State Office of Administrative Law on February 23, 1995.

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TABLE OF CONTENTS

Chapter 1. Introduction

The State and Regional Boards 1-1
Function of the Basin Plan 1-1
Legal Basis and Authority 1-3
History of Basin Planning in the Los Angeles Region 1-3
Continuing Planning Process 1-4
- Triennial Review Process 1-4
- Basin Plan Amendments 1-4

The Region 1-5
- Regional Setting 1-5
- Geology 1-11
- Climate 1-11
- Land Use/Population 1-13
- Natural Resources 1-13
  - Locally Unique Habitats 1-13
- Water Resources/Water Quality Issues 1-18
  - Surface Waters 1-18
  - Ground Waters 1-19
  - Coastal Waters 1-21
  - Imported Waters 1-22
  - Water Supply and Drought Issues 1-23
  - Reclaimed Wastewaters 1-23

The Basin Plan 1-23

Chapter 2. Beneficial Uses

Introduction 2-1
Beneficial Use Definitions 2-1
Beneficial Uses for Specific Waterbodies 2-3
- Inland Surface Waters 2-4
- Ground Waters 2-4
- Coastal Waters 2-4
- Wetlands 2-4

Chapter 3. Water Quality Objectives

Introduction 3-1
Statement of Policy with Respect to Maintaining High Quality of Waters in California 3-1
Regional Objectives for Inland Surface Waters 3-3
- Ammonia 3-3
- Bacteria, Coliform 3-3
- Bioaccumulation 3-8
- Biochemical Oxygen Demand (BOD_5) 3-8
- Biostimulatory Substances 3-8
- Chemical Constituents 3-8
- Chlorine, Total Residual 3-9
- Color 3-9

Exotic Vegetation . . . 3-9
Floating Material . . . 3-9
Methylene Blue Activated Substances (MBAS) . . . 3-11
Mineral Quality . . . 3-11
Nitrogen (Nitrate, Nitrite) . . . 3-11
Oil and Grease . . . 3-11
Oxygen, Dissolved (DO) . . . 3-11
Pesticides . . . 3-15
pH . . . 3-15
Polychlorinated Biphenyls (PCBs) . . . 3-15
Radioactive Substances . . . 3-15
Solid, Suspended, or Settleable Materials . . . 3-16
Taste and Odor . . . 3-16
Temperature . . . 3-16
Toxicity . . . 3-16
Turbidity . . . 3-17
Regional Narrative Objectives for Wetlands . . . 3-17
Hydrology . . . 3-17
Habitat . . . 3-17
Regional Objectives for Ground Waters . . . 3-17
Bacteria . . . 3-18
Chemical Constituents and Radioactivity . . . 3-18
Mineral Quality . . . 3-18
Nitrogen (Nitrate, Nitrite) . . . 3-18
Taste and Odor . . . 3-18
Statewide Objectives for Ocean Waters . . . 3-22
Site Specific Objectives . . . 3-22

Chapter 4. Strategic Planning and Implementation

Introduction . . . 4-1
Control of Point Source Pollutants . . . 4-3
Introduction – General Information about Regional Board Permitting Programs . . . 4-3
Waste Discharge Requirements (WDRs) . . . 4-4
Land Disposal . . . 4-5
Landfills . . . 4-10
Sludge Use and Disposal . . . 4-16
Soil and Hazardous Waste Disposal . . . 4-17
Dredging Requirements . . . 4-17
Septic Systems . . . 4-17
Waivers from WDRs . . . 4-17
Water Reclamation Requirements (WRRs) . . . 4-18
National Pollutant Discharge Elimination System Program (NPDES) . . . 4-18
Pretreatment . . . 4-21
Storm Water Permits . . . 4-21
Criteria for WDRs, WRRs, and NPDES Permit Limit and Provisions . . . 4-25
Municipal Effluent Limits (NPDES) . . . 4-25
Specific Criteria for Site-specific Determination of Effluent Limits . . . 4-25
Standard Provisions in WDRs and NPDES Permits . . . 4-31
Self Monitoring, Compliance Monitoring and Inspections . . . 4-32
Enforcement . . . 4-32
Control of Nonpoint Source Pollutants . . . 4-33
Introduction . . . 4-33

Early Nonpoint Source Pollution Planning Efforts 4-34
Development of the State Nonpoint Source Program 4-34
Nonpoint Source Funding 4-36
Nonpoint Source Categories 4-37
Agriculture 4-37
Confined Animal Operations 4-39
Urban Runoff 4-39
Comprehensive Control Program 4-41
Highway Runoff Control Program 4-42
Industrial Activity Control Program 4-43
Construction Activity Control Program 4-43
Hydrologic Modification 4-43
401 Certification Program 4-44
Streambed Alteration Agreements 4-46
Recreational Impacts 4-46
Septic Systems 4-46
Seawater Intrusion 4-47
Resource Extraction 4-48
Mines 4-48
Oil and Gas Extraction 4-49
Silviculture 4-52
Coastal Nonpoint Source Pollution Program 4-54
Future Direction: Watershed-Based Water Quality Control 4-54
Remediation of Pollution 4-57
Underground Storage Tanks 4-57
Well Investigations 4-59
Spills, Leaks, Investigation and Cleanup (SLIC) 4-60
Department of Defense and Department of Energy 4-60
Aboveground Petroleum Storage Tanks 4-63
Resource Conservation and Recovery Act 4-63
Toxic Pits Cleanup Act 4-63
Bay Protection and Toxic Cleanup Program 4-63
The Santa Monica Bay Restoration Project 4-64
Introduction 4-64
Assessment of Problems in Santa Monica Bay 4-64
Environmental Issues 4-64
Management Issues 4-65
Recommended Actions 4-65

Chapter 5. Plans and Policies

Introduction 5-1
State Board Plans 5-1
Ocean Plan 5-1
Thermal Plan 5-4
Nonpoint Source Management Plan 5-4
State Board Policies 5-5
The State Policy for Water Quality Control 5-5
Statement of Policy with Respect to Maintaining High Quality Water in California (Antidegradation Policy) 5-5
Water Quality Control Policy for the Enclosed Bays and Estuaries of California 5-6
Water Quality Control Policy on the Use and Disposal of Inland Water Used for Powerplant Cooling 5-6

Policy with Respect to Water Reclamation in California 5-6
Policy on the Disposal of Shredder Waste 5-7
Sources of Drinking Water 5-7
Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304 5-7
Regional Water Quality Advisory Task Force 5-7
Regional Board Resolutions 5-8

Chapter 6. Monitoring and Assessment

Introduction 6-1
The State's Monitoring Programs 6-1
Primary Monitoring Network 6-1
Discharger Self-Monitoring 6-2
Compliance Monitoring 6-2
Complaint Investigations 6-2
Lake Surveillance 6-2
Bay Protection and Toxic Cleanup Program 6-3
Quality Assurance 6-3
Data Storage and Retrieval 6-3
Biennial Water Quality Inventory/Water Quality Assessment Report 6-3
Toxic Substances Monitoring and State Mussel Watch Programs 6-5
Regional Board Monitoring Programs 6-9
Regional Board Surface Water Monitoring Network 6-9
Intensive Surveys 6-10
Coordination With Other Agencies 6-10
Biological Criteria 6-10

References

Appendix One

Inventory of Major Surface Waters and Waters to which they are Tributary

Appendix Two

Overlays
1 Hydrologic Units
2 Major Freeways, Highways
3 USGS 7.5 Minute Quad Boundaries

LIST OF FIGURES, TABLES AND INSERTS

Chapter 1. Introduction

Figures

1-1 Regional map 1-2
1-2 Hydrologic units 1-7
1-3 Major rivers and streams 1-8
1-4 Major reservoirs and lakes 1-9
1-5 Watershed management areas 1-10
1-6 Physiographic features of the Los Angeles Region 1-12
1-7 Regional land use 1-14
1-8 Population projections in Los Angeles and Ventura Counties 1-15
1-9 Regional groundwater basins 1-20
1-10 Sources of imported water in the Los Angeles Region 1-22

Tables

1-1 Significant Ecological Areas (SEAs) in Los Angeles County 1-17

Chapter 2. Beneficial Uses

Figures

2-1 Miscellaneous streams and coastal features, Ventura County 2-22
2-2 Major surface waters of the Ventura River watershed 2-23
2-3 Major surface waters of the Santa Clara River watershed 2-24
2-4 Major surface waters of the Calleguas-Conejo Creek watershed 2-25
2-5 Major surface waters of the Malibu Creek watershed 2-26
2-6 Major surface waters of the Ballona Creek watershed 2-27
2-7 Major surface waters of the Dominguez Channel watershed 2-28
2-8 Major surface waters of the Los Angeles River watershed 2-29
2-9 Major surface waters of the San Gabriel River watershed 2-30
2-10 Miscellaneous streams and coastal features, Los Angeles County 2-31
2-11 Ojai Valley and Ventura River Valley groundwater basins 2-32
2-12 Ventura Central groundwater basins 2-33
2-13 Upper Santa Clara groundwater basins 2-34
2-14 Eastern Santa Clara groundwater basins 2-35
2-15 Los Angeles Coastal groundwater basins 2-36
2-16 San Fernando Valley groundwater basins 2-37
2-17 San Gabriel Valley and Upper Santa Ana Valley groundwater basins 2-38
2-18 Lockwood Valley, Hungry Valley, Peace Valley groundwater basins 2-39
2-19 Ventura Harbor, Marina, and Keys 2-40
2-20 Marina Del Rey 2-41
2-21 Los Angeles Harbor and Long Beach Harbor 2-42
2-22 Alamitos Bay 2-43

Tables

2-1 Beneficial uses of inland surface waters 2-6
2-2 Beneficial uses of ground waters 2-16
2-3 Beneficial uses of coastal features 2-18
2-4 Beneficial uses of significant costal wetlands 2-21

Chapter 3. Water Quality Objectives

Tables

3-1 One-hour average concentration for ammonia for waters designated as COLD 3-4
3-2 One-hour average concentration for ammonia for waters designated as WARM 3-5
3-3 Four-day average concentration for ammonia for waters designated as COLD 3-6
3-4 Four-day average concentration for ammonia for waters designated as WARM 3-7
3-5 The maximum contaminant levels: inorganic chemicals (for MUN beneficial use) specified in Table 64431-A of Section 64431 of Title 22 of the California Code of Regulations as of 9-8-94 3-8
3-6 The limiting and optimum concentrations for fluoride (for MUN beneficial use) specified in Table 64431-B of Section 64431 of Title 22 of the California Code of Regulations as of 9-8-94 3-9
3-7 The maximum contaminant levels: organic chemicals (for MUN beneficial use) specified in Table 64444-A of Section 64444 of Title 22 of the California Code of Regulations as of 9-8-94 3-10
3-8 Water quality objectives for selected constituents in inland surface waters 3-12
3-9 The maximum contaminant levels: radioactivity (for MUN beneficial use) specified in Table 4 of Section 64443 of Title 22 of the California Code of Regulations as of 12-22-88 3-16
3-10 Water quality objectives for selected constituents in regional ground waters 3-19

Inserts

State Water Resources Control Board Resolution No. 68-16
Statement of Policy with Respect to Maintaining High Quality of Waters in California 3-2

Chapter 4. Strategic Planning and Implementation

Figures

4-1 Publicly owned treatment works (POTW's) 4-9
4-2 Major landfills 4-14
4-3 Drainage basins and phases of the Los Angeles County municipal storm water NPDES permit . 4-23
4-4 Los Angeles County Ventura County 1990 land use: agriculture 4-38
4-5 Septic system 4-47
4-6 Artificial recharge through spreading grounds and injection wells 4-48
4-7 Regional mines and sand and gravel operations 4-50
4-8 Oil field boundaries 4-51
4-9 Leaking underground storage tank 4-58
4-10 San Gabriel Valley groundwater basin contamination plumes 4-61
4-11 San Fernando Valley groundwater basin contamination plumes 4-62

Tables

4-1 "Threat to water quality" and "complexity" definitions 4-2
4-2 Summary of general WDRs and NPDES permits issued by the State Board and the Regional Board 4-4
4-3 Examples of industrial and municipal point source discharges to surface waters 4-5
4-4 Sewage treatment facilities with design flow greater than 100,000 gallons per day 4-6
4-5 Major or significant NPDES and WDR discharge categories, number of permits and total design flow 4-10
4-6 Cooperating agencies for the Land Disposal Programs 4-11
4-7 Landfill classifications 4-11
4-8 Status of landfills (active and inactive) in Region that have ongoing groundwater monitoring programs 4-12
4-9 Active regional Class III landfills 4-15
4-10 Procedures for siting inert landfills 4-16
4-11 Waiver conditions from WDRs 4-18
4-12 Reclaimed water: Uses and California Title 22 Health Requirements 4-19
4-13 Storm water general NPDES categories 4-21
4-14 Drainage areas and associated co-permittees of Los Angeles County municipal storm water NPDES permit 4-22
4-15 Drainage areas and co-permittee cities and agencies of the Ventura County municipal storm water NPDES permit 4-24
4-16 Four-tier priority strategy for permitting industrial storm water dischargers 4-25
4-17 Selected point source categories subject to storm water effluent limitation guidelines 4-26
4-18 Nonpoint source-related Memorandums of Understanding (MOUs) and Management Agency Agreements (MAAs) between the State Water Resources Control Board and other agencies . . . 4-36
4-19 Los Angeles County municipal storm water permit: minimum required best management practices (BMPs) to be implemented county-wide 4-42
4-20 Selected reservoirs in the region: ownership, capacity and function 4-45
4-21 Best management practices in forest management - Angeles and Los Padres National Forests . 4-53
4-22 Management measures in the guidance specifying management measures for sources of nonpoint pollution in coastal waters ["*(g) Guidance*"] 4-55

Inserts

Malibu Creek Watershed Nonpoint Source Pilot Project 4-56

Chapter 5. Plans and Policies

Figures

5-1 General location of Areas of Special Biological Significance in Los Angeles Region 5-2
5-2 Detailed locations of Areas of Special Biological Significance in Los Angeles Region 5-3

Inserts

State Water Resources Control Board Resolution No. 77-11
Policy with Respecto to Water Reclamation in California 5-11
State Water Resources Control Board Resolution No. 88-63
Adoption of Policy Entitled "Sources of Drinking Water" 5-13

Chapter 6. Surveillance and Monitoring

Tables

6-1 Objectives of an adequate State surveillance and monitoring program 6-1
6-2 Constituents analyzed under the State Mussel Watch and Toxic Substances Monitoring Programs 6-4
6-3 Toxic Substances Monitoring stations and type of samples collected (LA Region) 6-6
6-4 State Mussel Watch sampling stations and type of samples collected (LA Region) 6-7

Appendix One

Inventory of major surface waters and waters to which they are tributary A-1

1

1. INTRODUCTION

Table of Contents

The State and Regional Boards 1-1

Function of the Basin Plan 1-1

Legal Basis and Authority 1-3

History of Basin Planning in the Los Angeles Region 1-3

Continuing Planning Process 1-4
- Triennial Review Process 1-4
- Basin Plan Amendments 1-4

The Region 1-5
- Regional Setting 1-5
- Geology 1-11
- Climate 1-11
- Land Use/Population 1-13
- Natural Resources 1-13
  - Locally Unique Habitats 1-13
- Water Resources/Water Quality Issues 1-18
  - Surface Waters 1-18
  - Ground Waters 1-19
  - Coastal Waters 1-21
  - Imported Waters 1-22
  - Water Supply and Drought Issues 1-23
  - Reclaimed Wastewaters 1-23

The Basin Plan 1-23

The State and Regional Boards

Responsibility for the protection of water quality in California rests with the State Water Resources Control Board (hereinafter referred to as the State Board) and nine Regional Water Quality Control Boards. The State Board sets statewide policies and develops regulations for the implementation of water quality control programs mandated by state and federal water quality statutes and regulations. Regional Water Quality Control Boards develop and implement Water Quality Control Plans (Basin Plans) that consider regional beneficial uses, water quality characteristics, and water quality problems.

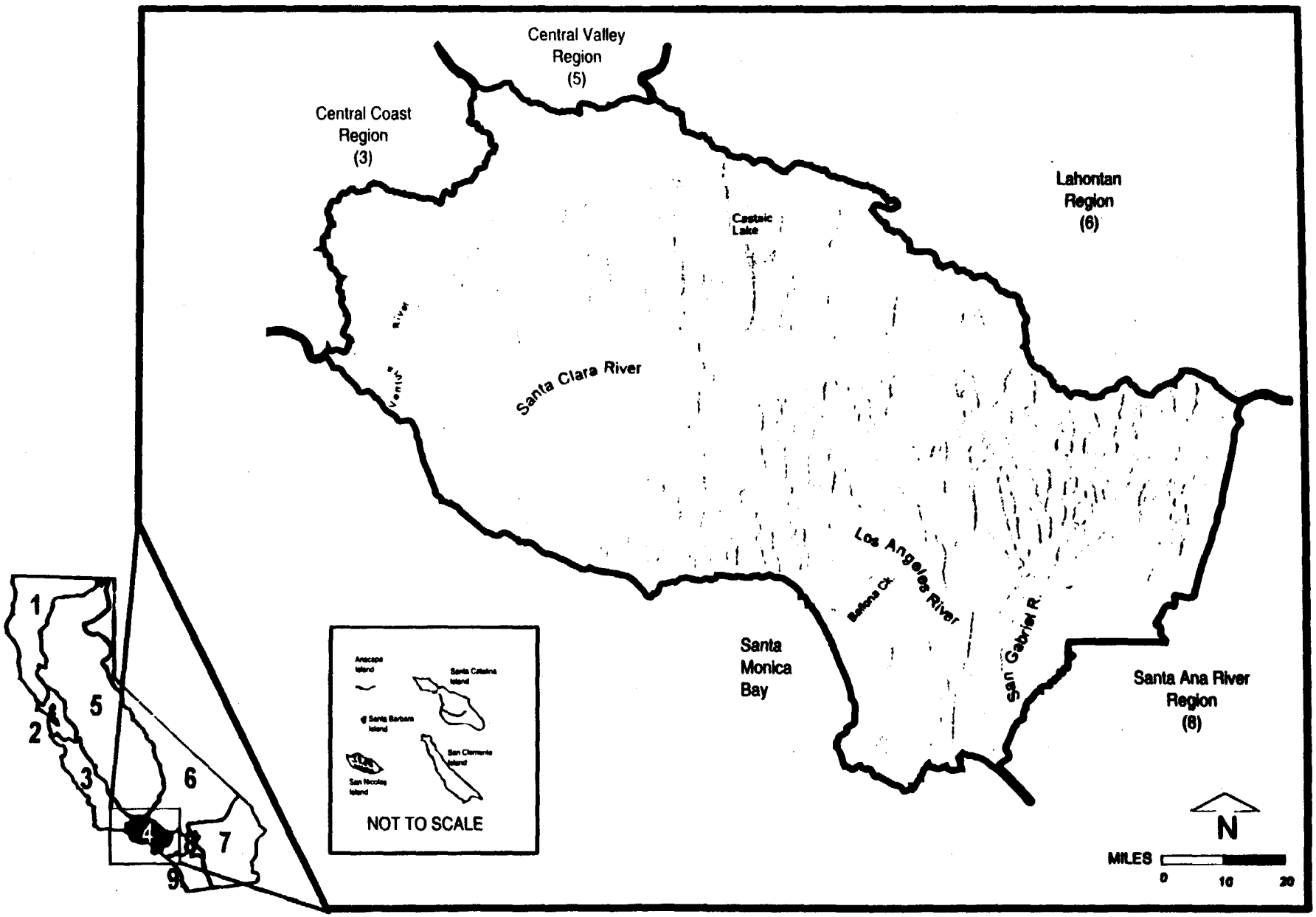
The California Regional Water Quality Control Board, Los Angeles Region (hereinafter referred to as the Los Angeles Regional Board or Regional Board) has jurisdiction over the coastal drainages between Rincon Point (on the coast of western Ventura County) and the eastern Los Angeles County line (Figure 1-1). The Regional Board is governed by nine members, all of whom are appointed by the Governor and confirmed by the State Senate. Regional Board members represent certain categories related to the control of water quality and must reside in, or have a principal place of business within, the Region. Members of the Regional Board hold regular meetings at different sites throughout the Region. The staff at the Regional Board implement Regional Board policies under the direction of the Executive Officer who is appointed by the Regional Board. The public may address the Regional Board regarding any matter within the Regional Board's jurisdiction during the public forum period at any regular Regional Board meeting. Copies of the Regional Board meeting agendas are available for examination at the office of the Regional Board during regular working hours.

Function of the Basin Plan

The Los Angeles Regional Board's Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan (i) designates beneficial uses for surface and ground waters, (ii) sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's antidegradation policy, and (iii) describes implementation programs to protect all waters in the Region. In addition, the Basin Plan incorporates (by reference) all applicable State and Regional Board plans and policies and other pertinent water quality policies and regulations. Major State and Regional Board plans and policies are summarized in Chapter 5. Those of other agencies are referenced in appropriate sections throughout the Basin Plan.

The Basin Plan is a resource for the Regional Board and others who use water and/or discharge wastewater in the Los Angeles Region. Other agencies and organizations involved in environmental permitting and resource management activities also use the Basin Plan. Finally, the Basin Plan provides valuable information to the public about local water quality issues.

The Basin Plan is reviewed and updated as necessary. Following adoption by the Regional Board, the Basin Plan and subsequent amendments are subject to approval by the State Board, the



F 1-1. Regional Map: Regional Water Quality Control F , Los Angeles Region.

State Office of Administrative Law (OAL), and the United States Environmental Protection Agency (USEPA).

Legal Basis and Authority

The Basin Plan implements a number of state and federal laws, the most important of which are the California Porter-Cologne Water Quality Control Act (California Water Code, Division 1, Chapter 2, Article 3, et seq., plus others) and the Clean Water Act (PL 92-500, as amended). Other pertinent state laws include: the Hazardous Substances Cleanup Bond Act of 1984 (Health & Safety Code, §25385 et seq.), the Toxic Pits Cleanup Act (Health & Safety Code, §25208 et seq.), and the Toxic Injection Well Control Act (Health & Safety Code, §25159.10 et seq.). Pertinent federal laws include: the Safe Drinking Water Act (42 U.S.C.A., §300F et seq.), the Toxic Substances Control Act (15 U.S.C.A., §2601 et seq.), the Resource Conservation and Recovery Act (RCRA, 42 U.S.C.A., §6 901 et seq.), and the Endangered Species Act (16 U.S.C.A., §1531 et seq.).

The Porter-Cologne Water Quality Control Act (herein after referred to as California Water Code), enacted by the State of California in 1969 and effective January 1, 1970, is considered landmark water quality legislation and has served as a model for subsequent legislation by the federal government and other state governments. This legislation authorizes the State Board to adopt, review, and revise policies for all waters of the state (including both surface and ground waters) and directs the Regional Boards to develop regional Basin Plans. The California Water Code (§13170) also authorizes the State Board to adopt water quality control plans on its own initiative. In the event of inconsistencies among various State and Regional Board plans, the more stringent provisions apply.

The Clean Water Act (CWA), enacted by the federal government in 1972, was designed to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. One of the national goals states that wherever attainable water quality should provide for the protection and propagation of fish, shellfish, and wildlife, and provide for recreation in and on the water (i.e., fishable, swimmable). The CWA (§303[c]) directs states to establish water quality standards for all "waters of the United States" and to review and update such standards on a triennial basis. Other provisions of the CWA related to basin planning include Section 208, which authorizes the preparation of waste treatment management plans, and Section 319 (added by 1987 amendments) which mandates specific actions for the control of pollution from nonpoint sources. The 1987 amendments to the CWA (§307[a]) also mandate that states adopt numerical standards for all priority pollutants.

The USEPA has delegated responsibility for implementation of portions of the CWA to the State and Regional Boards, including water quality planning and control programs such as the National Pollutant Discharge Elimination System (NPDES). The Code of Federal Regulations (Title 40, CFR) and USEPA guidance documents provide direction for implementation of the CWA.

Besides state and federal laws, several court decisions provide guidance for basin planning. For example, the 1983 Mono Lake Decision (National Audubon Society v. Superior Court [1993]) reaffirmed the public trust doctrine, holding that the public trust is "an affirmation of the duty of the state to protect the people's common heritage in streams, lakes, marshlands, and tidelands, surrendering that right of protection only in rare cases when the abandonment of that right is consistent with the purposes of the trust." Public trust encompasses uses of water for commerce, navigation, fisheries, and recreation. In California Trout, Inc. v. State Water Resources Control Board (1989), the courts found that the public trust doctrine also applies to activities that could harm the fisheries in a non-navigable water.

History of Basin Planning in the Los Angeles Region

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

With the enactment of the Porter-Cologne Water Quality Act in 1969, the names of the Regional Water Pollution Control Boards were changed to Regional Water Quality Control Boards, and their authorities were broadened. At this time, the Regional Water Quality Control Boards initiated development of comprehensive regional Basin Plans.

In 1971, the Los Angeles Regional Board adopted an *Interim Water Quality Control Plan* that compiled all of the existing objectives and policies into one document and rescinded all individually-adopted objectives and policies. A more comprehensive planning effort was undertaken when the State Board engaged Daniel, Mann, Johnson, and Mendenhall, Inc., and Koebig and Koebig, Inc. to develop Basin Plans for the Santa Clara River Basin and the Los Angeles River Basin, respectively. This major planning effort culminated in 1975 with the *Water Quality Control Plan for the Santa Clara River Basin (4A)* and the *Water Quality Control Plan for the Los Angeles River Basin (4B)*. These two documents, which together comprised the Basin Plans for the Los Angeles Region, were amended in 1978, 1990, and 1991. These two Basin Plans and amendments are superseded by this single Basin Plan which, for planning purposes, divides the Region into major surface watersheds and groundwater basins.

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

Continuing Planning Process

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

Triennial Review Process

The California Water Code, (§13240), directs the State and Regional Boards to periodically review and update Basin Plans. Furthermore, the CWA (§303 [c]) directs states to review water quality standards every three years (triennial review) and, as appropriate, modify and adopt new standards.

In the Triennial Review Process, basin planning issues are formally identified and ranked during the public hearing process. These and other modifications to the Basin Plan are implemented through Basin Plan amendments as described below. In addition, the Regional Board can amend the Basin Plan as needed. Such amendments need not coincide with the Triennial Review Process.

Basin Plan Amendments

Amending the Basin Plan involves the preparation o. an amendment, an environmental checklist, and a staff report. Public workshops can be held to inform the public about planning issues before formal action is scheduled on the amendments. Following a public review period of at least 30 days, the Regional Board responds to public comments. Subsequently, the Regional Board can take action on the draft amendments at a public hearing.

The California Environmental Quality Act (as codified in the California Public Resources Code, §21080.5[d][2][i]) provides that the Secretary of Resources can exempt regulatory programs of state agencies from the requirements of preparing environmental impact reports, negative declarations, and initial studies should such programs be certified as "functionally equivalent." The Basin Planning process has been so certified. Accordingly, this amendment for the Basin Plan update (and accompanying documentation) is functionally equivalent to an environmental impact report or negative declaration.

Following adoption by the Regional Board, Basin Plan amendments and supporting documents are submitted to the State Board for review and approval. All Basin Plan amendments approved by the State Board after June 1, 1992 must also be reviewed and approved by the State Office of Administrative Law (OAL). All amendments take effect upon approval by the OAL. In addition, the USEPA must review and approve those Basin Plan amendments that involve changes in state standards to ensure such changes do not conflict with federal regulations.

The Region

Regional Setting

The Los Angeles Region (Figure 1-1) encompasses all coastal drainages flowing to the Pacific Ocean between Rincon Point (on the coast of western Ventura County) and the eastern Los Angeles County line, as well as the drainages of five coastal islands (Anacapa, San Nicolas, Santa Barbara, Santa Catalina, and San Clemente). In addition, the Region includes all coastal waters within three miles of the continental and island coastlines.

For planning purposes, the Regional Board uses the classification system developed by the California Department of Water Resources, which divides surface waters into hydrologic units, areas, and subareas (Figure 1-2) and ground waters into major groundwater basins (see ground water section). Figures 1-3 and 1-4 illustrate the major streams and lakes within the Region. As the eastern boundary, formed by the Los Angeles County line, departs somewhat from the hydrologic divide, the Los Angeles and Santa Ana Regions share jurisdiction over watersheds along their common border. The Regional Board is moving towards the use of Watershed Management Areas. Surface water watershed boundaries are illustrated on Figure 1-5.

Descriptions of the major hydrologic units follow:

- Pitas Point Hydrologic Unit, located in western Ventura County, extends from Rincon Point to the Ventura River. Numerous small canyons drain the southern slopes of the coastal hills in this area, which totals about 22 square miles. Limited supplies of ground water are present in alluvium along the bottoms of the canyons.

- Ventura River Hydrologic Unit includes parts of western Ventura County and a small part of eastern Santa Barbara County. The Ventura River drains the northern slopes of Sulphur Mountain and portions of the southern slopes of the Santa Ynez Mountains. The drainage area totals about 300 square miles and, except in coastal areas, land use is predominantly rural and open space. Small alluvial basins along the surface drainage system contain supplies of ground water.

- Santa Clara-Calleguas Hydrologic Unit covers most of Ventura County, part of northern Los Angeles County, and small parts of Santa Barbara and Kern Counties. With a drainage area of 1,760 square miles, it is the largest hydrologic unit in the Region. Most of the upland area is within the Angeles and Los Padres National Forests. While land use in the lower portion of the drainage area – in particular the Oxnard Plain – is predominantly agricultural, urban (primarily residential) land uses are encroaching upon and rapidly replacing these agricultural lands. The Santa Clara River and Calleguas Creek are the major streams in this area, draining the San Gabriel Mountains, Santa Susana Mountains, Oak Ridge, South Mountain, Simi Hills, Sawmill, Liebre and Frazier Mountains. Large reserves of ground water exist in alluvial aquifers underlying the Oxnard Plain and along the valleys of the Santa Clara River and its tributaries.

- Malibu Hydrologic Unit drains the southern slopes of the Santa Monica Mountains in western Los Angeles County and a small area of southeastern Ventura County. The drainage area totals 242 square miles and, except for the coastal area where land use is residential and commercial, most of the area is open space. No one stream dominates this drainage area rather, it is comprised of several small streams, including Topanga Canyon Creek, Malibu Creek, Dume Creek (Zuma Canyon Creek) and Big Sycamore Canyon Creek, which flow southward into the Pacific Ocean. Ground water is present in limited amounts in alluvium along the bottom of canyons and valleys and in fractured volcanic rocks.

- Los Angeles-San Gabriel Hydrologic Unit covers most of Los Angeles County and small areas of southeastern Ventura County. This drainage area totals 1,608 square miles. With most of

Regional Hydrologic Units, Areas and Subareas

401.00	PITAS POINT HYDROLOGIC UNIT
402.00	VENTURA RIVER HYDROLOGIC UNIT
402.10	Lower Ventura River HA
402.20	Upper Ventura River HA
402.30	Ojai HA
2.31	Upper Ojai HSA
2.32	Ojai Valley HSA
403.00	SANTA CLARA-CALLEGUAS HYDROLOGIC UNIT
403.10	Oxnard Plain HA
3.11	Oxnard HSA
3.12	Pleasant Valley HSA
403.20	Santa Paula HA
3.21	Sulfur Springs HSA
3.22	Sisar HSA
403.30	Soapa HA
3.31	Fillmore HSA
3.32	Topa Topa HSA
403.40	Piru HA
3.41	Santa Felicia HSA
3.42	Upper Piru HSA
3.43	Hungry Valley HSA
3.44	Stauffer HSA
403.50	Upper Santa Clara River HA
3.51	Eastern HSA
3.52	Bouquet HSA
3.53	Mint Canyon HSA
3.54	Sierra Pelona HSA
3.55	Acton HSA
403.60	Calleguas-Conejo HA

	SANTA CLARA-CALLEGUAS HU (Continued)
3.61	West Las Posas HSA
3.62	East Las Posas HSA
3.63	Arroyo Santa Rosa HSA
3.64	Conejo Valley HSA
3.65	Tierra Rejada Valley HSA
3.66	Gillibrand HSA
3.67	Simi Valley HSA
3.68	Thousand Oaks HSA
404.00	MALIBU HYDROLOGIC UNIT
404.10	Topanga HA
4.11	Topanga Canyon HSA
4.12	Tuna Canyon HSA
4.13	Pena Canyon HSA
4.14	Piedra Gorda Canyon HSA
4.15	Las Flores Canyon HSA
4.16	Carbon Canyon HSA
404.20	Malibu Creek HA
4.21	Monte Nido HSA
4.22	Las Virgenes Canyon HSA
4.23	Lindero Canyon HSA
4.24	Triunfo Canyon HSA
4.25	Russell Valley HSA
4.26	Sherwood HSA
404.30	Point Dume HA
4.31	Corral Canyon HSA
4.32	Solstice Canyon HSA
4.33	Latigo Canyon HSA
4.34	Escondido Canyon HSA
4.35	Ramirez Canyon HSA

	MALIBU HU (Continued)
4.36	Zuma Canyon HSA
4.37	Trancas Canyon HSA
404.40	Camarillo HA
4.41	Encinal Canyon HSA
4.42	Los Alisos Canyon HSA
4.43	Nicolas Canyon HSA
4.44	Arroyo Sequit HSA
4.45	Little Sycamore HSA
4.46	Deer Canyon HSA
4.47	Big Sycamore Canyon HSA
4.48	La Jolla Valley HSA
405.00	LOS ANGELES-SAN GABRIEL HYDROLOGIC UNIT
405.10	Coastal Plain HA
5.11	Palos Verdes HSA
5.12	West Coast HSA
5.13	Santa Monica HSA
5.14	Hollywood HSA
405.15	Central HSA Split
845.15	Central HSA Split
405.20	San Fernando HA
5.21	Bull Canyon HSA
5.22	Sylmar HSA
5.23	Tujunga HSA
5.24	Verdugo HSA
5.25	Eagle Rock HSA
405.30	Raymond HA
5.31	Pasadena HSA
5.32	Monk Hill HSA

	LOS ANGELES-SAN GABRIEL HU (Continued)
5.33	Santa Anita HSA
405.40	San Gabriel Valley HA
5.41	Main San Gabriel HSA
5.42	Lower Canyon HSA
5.43	Upper Canyon HSA
5.44	Foothill HSA
405.50	Spadra HA
5.51	San Jose HSA
5.52	Pomona HSA
5.53	Live Oak HSA
405.60	Anaheim HA
845.61	Buena Park HSA
405.62	La Habra HSA Split
845.62	La Habra HSA Split
405.63	Yorba Linda HSA Split
845.63	Yorba Linda HSA Split
405.80	SAN PEDRO CHANNEL ISLANDS HYDROLOGIC UNIT
405.10	Anacapa Island HA
405.20	San Nicolas Island HA
405.30	Santa Barbara Island HA
405.40	Santa Catalina Island HA
405.50	San Clemente Island HA
801.00	SANTA ANA RIVER HYDROLOGIC UNIT
801.20	Middle Santa Ana River HA Split
401.20	Chino HSA Split
401.22	Harrison HSA
401.23	Claremont Heights HSA Split

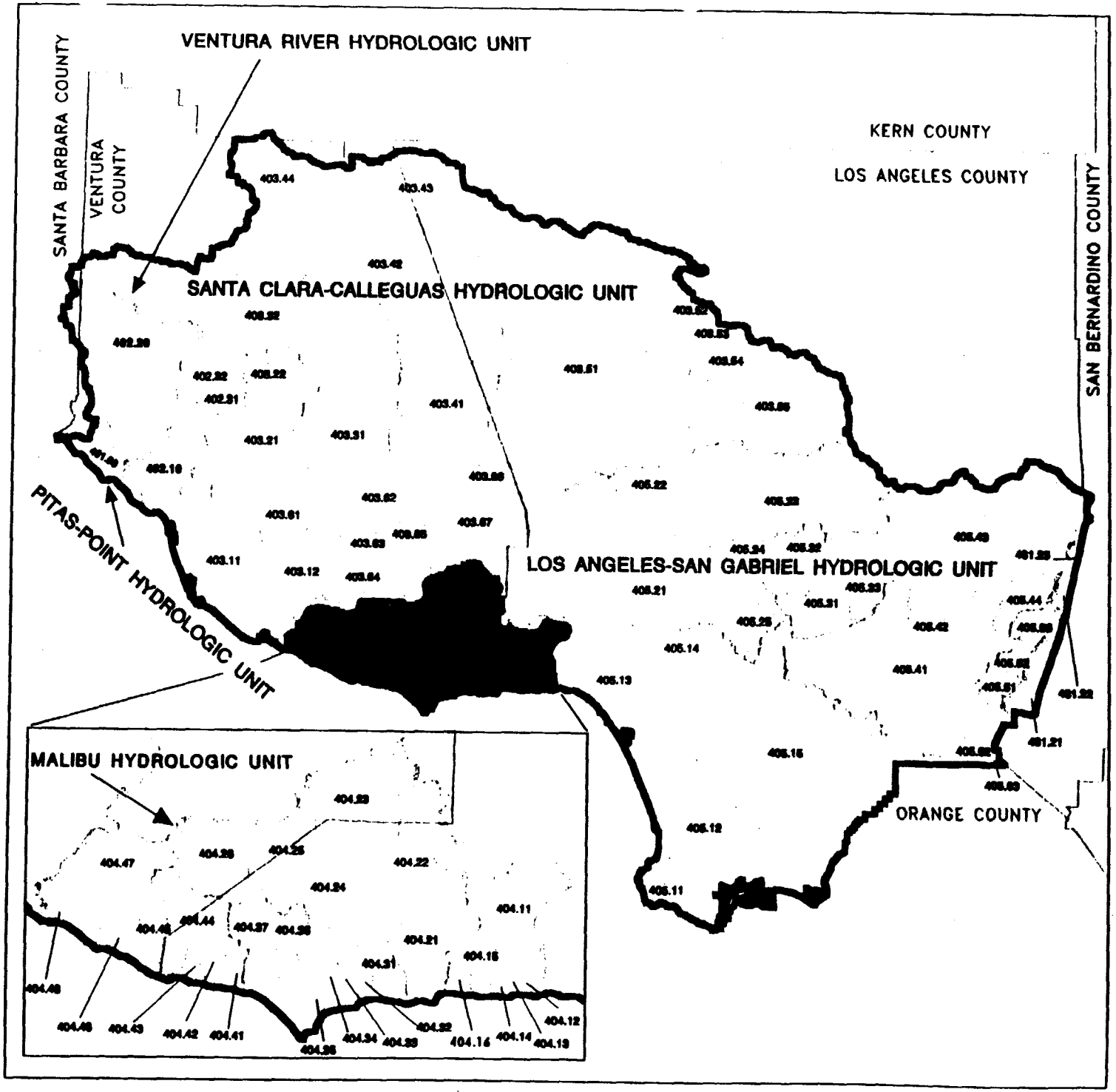


FIGURE 1-2

HYDROLOGIC UNITS

WITH AREAS AND SUBAREAS

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

RWQCB BOUNDARY

HYDROLOGIC UNITS

HYDROLOGIC AREAS

HYDROLOGIC SUBAREAS

COUNTY LINE

N

Miles

0 10 20

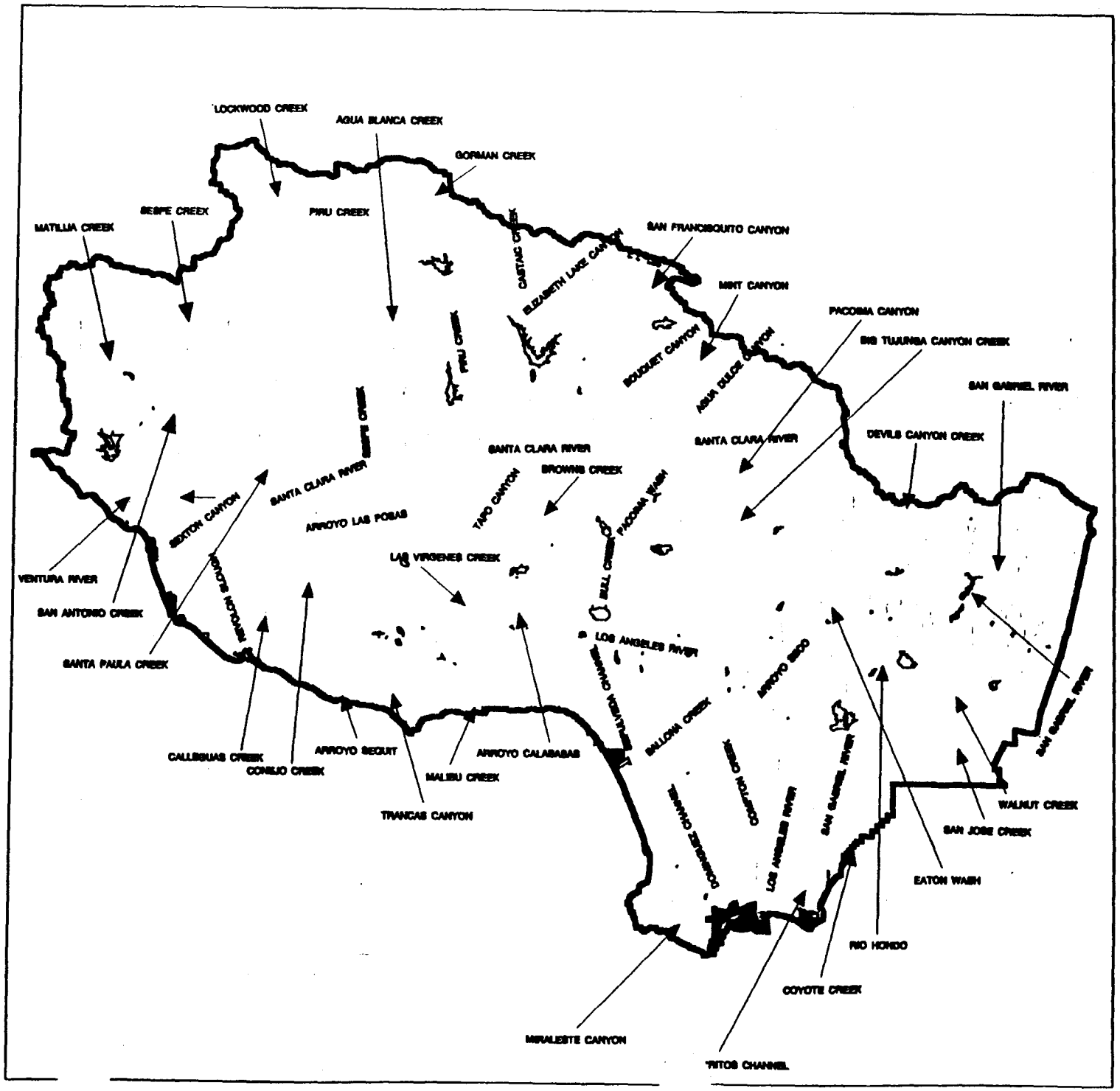


FIGURE 1-3

MAJOR RIVERS AND STREAMS

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

REGIONAL BOUNDARY

STREAMS

LAKES

N

Miles

0 10 20

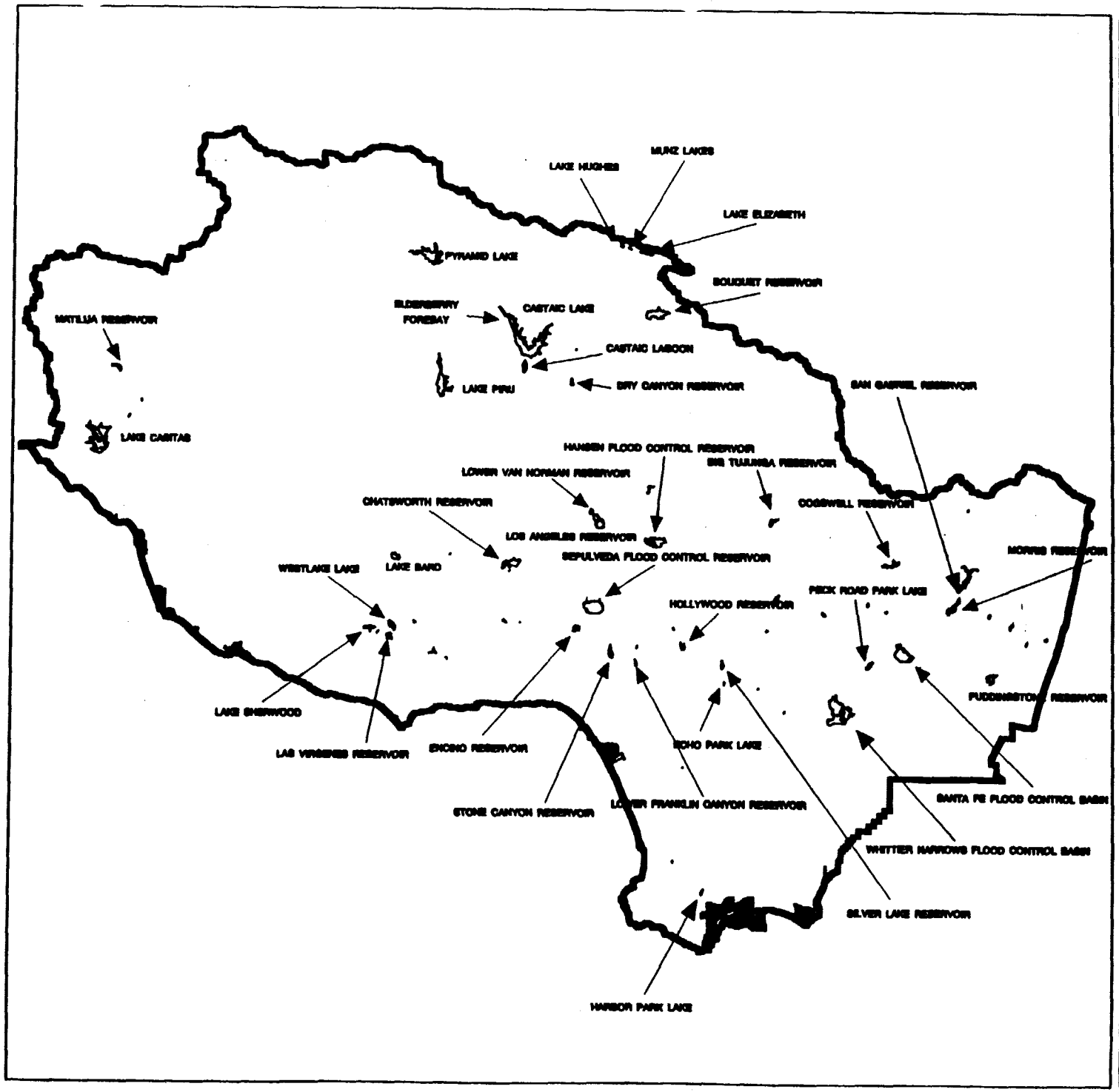


FIGURE 1-4

MAJOR RESERVOIRS AND LAKES

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

RWQCB BOUNDARY

RESERVOIRS AND LAKES

STREAMS

N

Miles

0 10 20

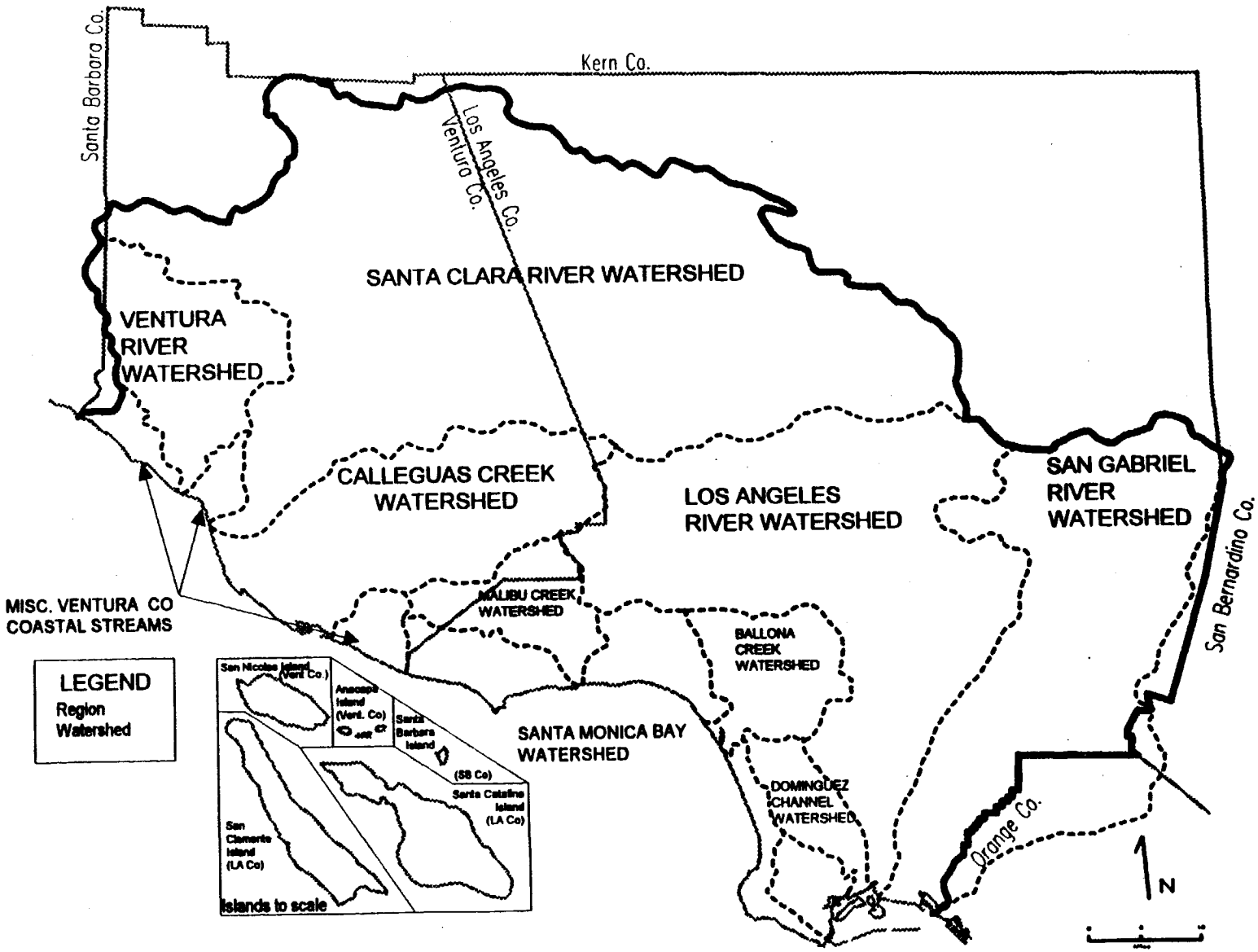


Figure 1-5. Watershed Managment Areas.

the population in the Region located in this hydrologic unit, land use is predominantly residential, commercial, and industrial; much of the area is covered with semi-permeable or non-permeable material (i.e., paved). The Los Angeles River, San Gabriel River, and Ballona Creek, which are the major drainage systems in this area, drain the coastal watersheds of the Transverse Ranges. These surface waters also recharge large reserves of ground water that exist in alluvial aquifers underlying the San Fernando and San Gabriel Valleys and the Los Angeles Coastal Plain.

- San Pedro Channel Islands Hydrologic Unit includes Santa Barbara, Santa Catalina, San Clemente, San Nicolas, and Anacapa Islands and Begg Rock. Except for limited development on Santa Catalina Island, land use of the Channel Islands is predominantly open space. Surface runoff on Santa Barbara Island does not flow in well-defined drainages; rather, surface runoff flows in sheets to the surrounding coastlines. Surface runoff on the other islands drains into intermittently-flowing creeks in small valleys and canyons. Reserves of ground water are limited on all of the islands.

Geology

Most of the Los Angeles Region lies within the western portion of the Transverse Ranges Geomorphic Province. The San Andreas transform fault system, forming the boundary between the North American and Pacific tectonic plates, cuts these western Transverse Ranges. This fault system, which extends northwesterly for over 700 miles from the Salton Sea in southern California to Cape Mendocino in northern California, bends in an east-west direction through the Transverse Ranges. Known as the "Big Bend," this portion of the San Andreas fault system formed from complex movements of the Pacific Plate against the North American Plate. Compression generated by such forces resulted in uplift of the Transverse Ranges, which have a conspicuous east-west trend (unlike other major ranges in the continental United States, which typically have a roughly north-south trend).

Major mountain ranges within the Los Angeles Region include: San Gabriel Mountains, Santa Monica Mountains, Santa Susana Mountains, Simi Hills, and Santa Ynez Mountains (Figure 1-6). The San Gabriel Mountains are the most prominent range in this group. The rock types exposed in the San Gabriel Mountains consist predominantly of Mesozoic granitic rocks (66 to 245 million years old), with minor exposures of Precambrian igneous and metamorphic rocks (prior to 570 million years old), and small stocks of Tertiary plutonic rocks (1.6 to 66 million years old). Cenozoic sedimentary beds (younger than 66 million years) are exposed only at the margins of the San Gabriel Mountains. Reflecting the recent and continuing uplift from plate tectonic activity, the San Gabriels are rugged mountains with deeply dissected canyons. Eroded sediments from these mountains have formed and are continuing to form prominent alluvial fans in the valleys along the flanks of the range.

During the Miocene Epoch (5 million to 23.5 million years ago), the sea advanced to the base of the San Gabriel Mountains, depositing fine-grained marine sediments. As the sea retreated, coarser-grained sediments, eroded from the Transverse Ranges, were deposited as alluvial fans in low-lying areas such as the San Fernando Valley, San Gabriel Valley, Oxnard Plain, and the Los Angeles Coastal Plain (Norris and Webb, 1991). These low-lying areas or basins are filled with layers of sediment. Many of these layers of sediment form aquifers that are important sources of ground water in the Region.

Climate

With prevailing winds from the west and northwest, moist air from the Pacific Ocean is carried inland in the Los Angeles Region until it is forced upward by the mountains. The resulting storms, common from November through March, are followed by dry periods during summer months. Differences in topography are responsible for large variations in temperature, humidity, precipitation, and cloud cover throughout the Region. The coastal plains and islands, with mild rainy winters and warm dry summers, are noted for their subtropical "mediterranean" climate. The inland slopes and basins of the Transverse Ranges, on the other hand, are characterized by more extreme temperatures and little precipitation.

Precipitation in the Region generally occurs as rainfall, although snowfall can occur at high elevations. Most precipitation occurs during just a few major storms. Annual rainfall in Ventura County averages 15.2 inches, although highs of almost 40 inches occur around Cobblestone Mountain and Pine Mountain, and lows of around 14 inches occur on the Oxnard Plain (Ventura County, 1993a).

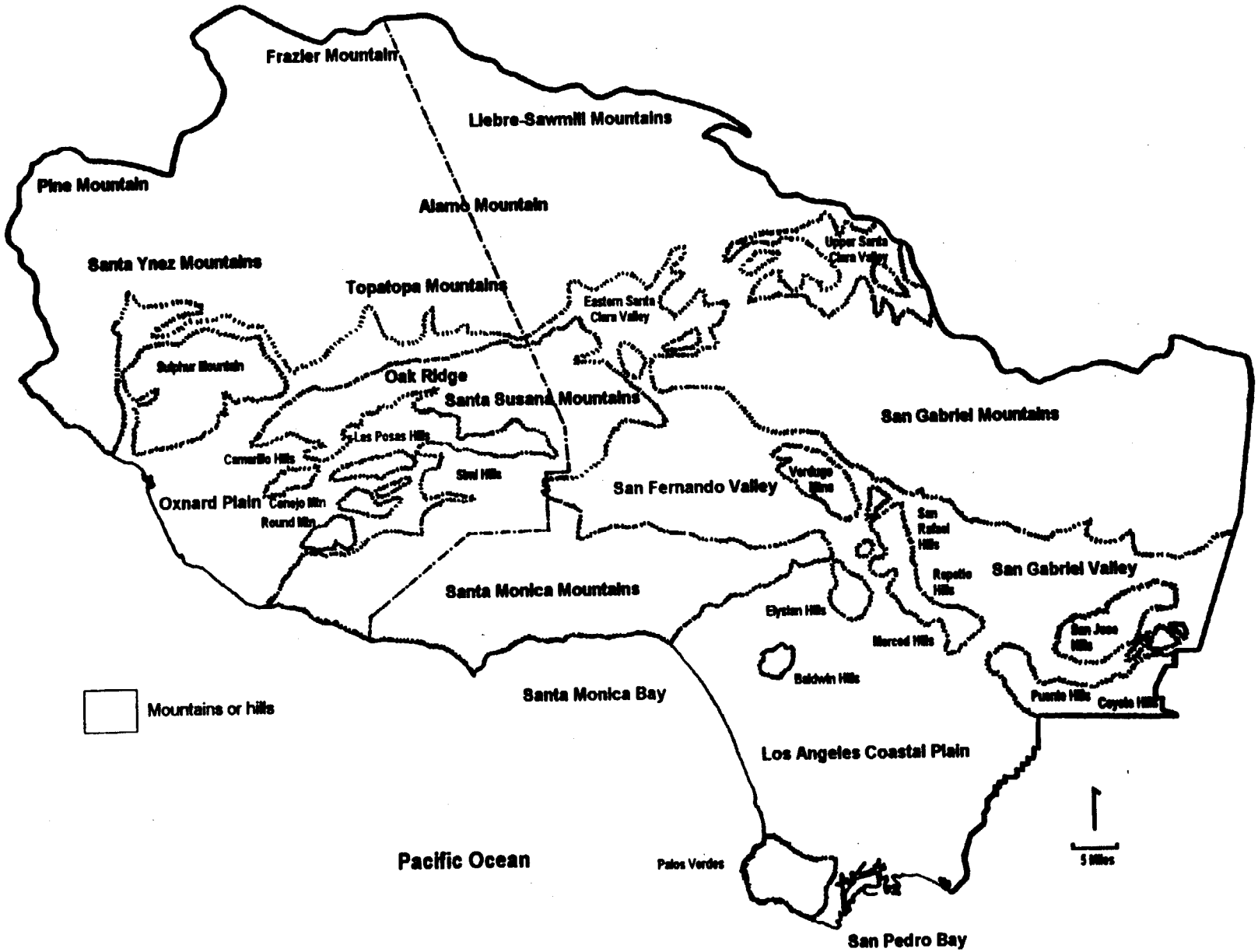


Figure 1-6. Physiographic features of the Los Angeles Region.

Large variations also exist within Los Angeles County, as indicated by annual highs of around 42 inches at Mount Islip (along the crest of the Angeles National Forest) and annual lows of around 10 inches in the eastern Santa Clara River Valley. While an overall average is not available for Los Angeles County, annual rainfall at the Ducommun Street rain gauge in the City of Los Angeles averages 15.5 inches since measurements began in 1872 (Los Angeles County, 1993).

Land Use/Population

Land use within the Region varies considerably (Figure 1-7). In Ventura County, land uses are changing from agriculture and open space to urban residential and commercial. In southern Los Angeles County, the predominant land uses include urban residential, commercial and industrial. In northern Los Angeles County, open space is rapidly being transformed into residential communities.

The economy in Los Angeles County is primarily industrial, commercial, and service; while in Ventura County the economy is primarily agricultural, service, and commercial.

About 10 million people currently live in the Region. From 1950 to 1990 the population in the Region more than doubled. Figure 1-8 shows the increases in population in the Region since 1950, as well as projected population growth until the year 2015.

Natural Resources

Diversity in topography, soils, and microclimates of the Region supports a corresponding variety of plant and animal communities. Native vegetation in the Region can be categorized into several general plant communities: grasslands, sage-scrub, chaparral, oak woodland, riparian, pinyon-juniper, and timber-conifer. Within these general groups, many mixed subgroups and locally distinct vegetation types can be distinguished: mixed chaparral, semi-desert, and chamise chaparral, are a few examples.

Chaparral is the most common type of native vegetation in the Region. Large expanses of chaparral are found in the Santa Monica Mountains. Inland, coastal sagebrush occurs in the Simi Hills, Santa Susana Knolls, Verdugo Hills, and San Gabriel Mountains. Oak woodland, with the easily identifiable "Valley Oaks", sometimes reaching a height of 20 to 60 feet, is dominant in Thousand Oaks, Lake Casitas, Hidden Valley, Santa Clarita Valley, and elsewhere in the Transverse Mountain Ranges. Grasslands occur in Point Mugu State Park and on hillsides and valleys of northern Los Angeles County.

Riparian vegetation, found along most of the rivers and creeks, consists of sycamores, willows, cottonwoods, and alders. Extensive riparian corridors occur along Piru, Sespe, Santa Paula, Malibu, and Las Virgenes Creeks, Santa Clara, Ventura Rivers, and San Gabriel Rivers, as well as other rivers and creeks of the Los Padres and Angeles National Forests. The riparian vegetation provides essential habitat and transportation corridors for wildlife, supporting a great abundance and diversity of species.

The existence of "ecological islands" as a result of topography and climatic changes has led to the evolution of species, subspecies, and genetic strains of plants and animals in the Region. However, increasing urbanization and development have resulted in the loss of habitat and a decline in biological diversity. As a result, several native flora and fauna species have been listed as rare, endangered or threatened. Representative examples of endangered species include: California condor, American peregrine falcon, California least tern, tidewater goby, unarmored threespine stickleback, Mohave ground squirrel, conejo buckwheat, many-stemmed *Dudleya*, least Bell's vireo, and slender-horned spire flower.

Locally Unique Habitats

Habitats that support rare, threatened, endangered, or other sensitive plant or animal species are unique, not simply because they support these species, but because they are unique habitats in terms of their physical, geographical, and biological characteristics. Both Ventura and Los Angeles Counties have officially designated these unique areas as Significant Biological Resources or Significant Ecological Areas, respectively. These areas are described in detail in the counties' respective General Plans. The following two sections describe some of the more significant ecological areas recognized by Ventura and Los Angeles Counties as unique habitats.

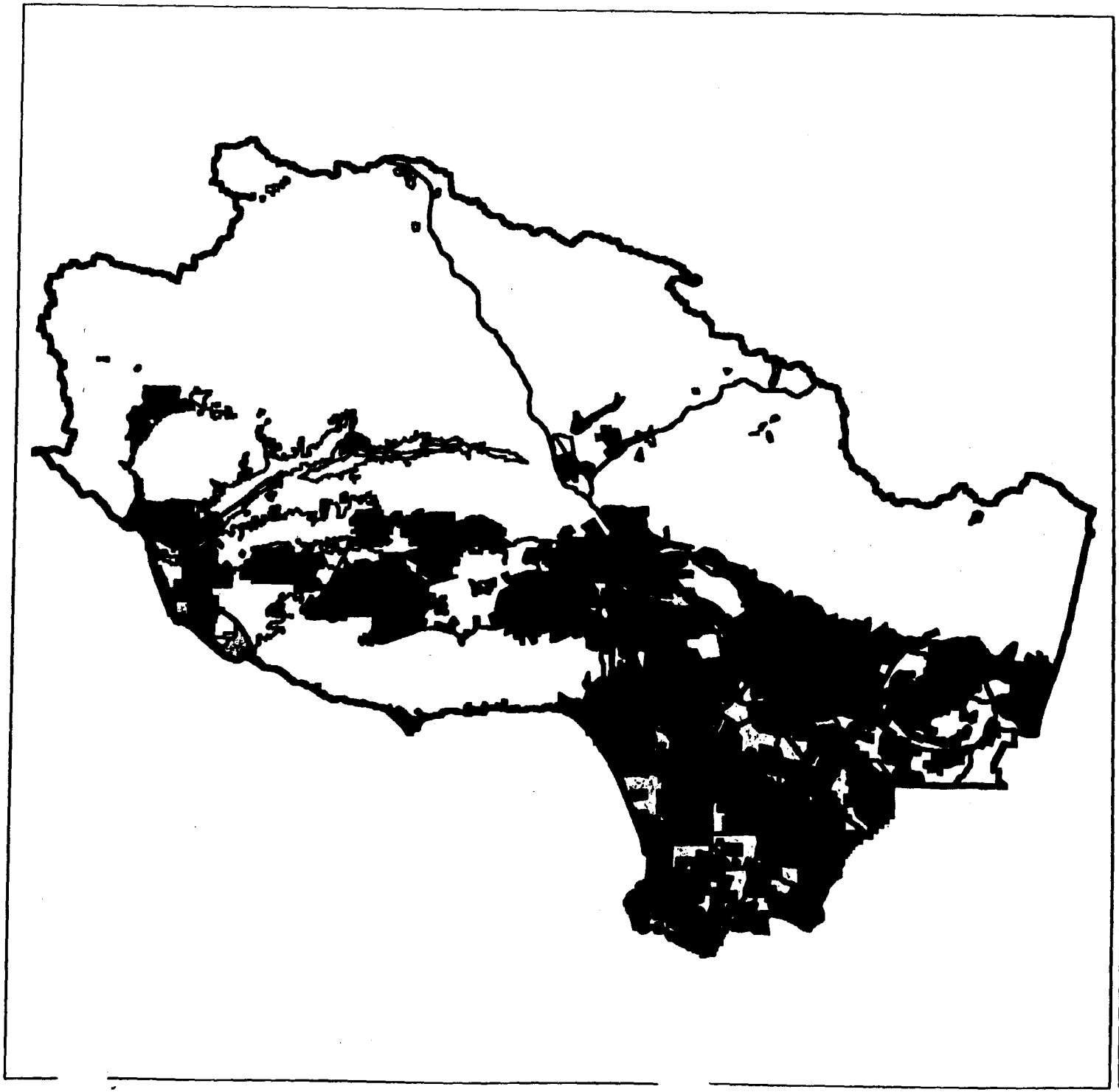


FIGURE 1-7

REGIONAL LAND USE

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

REGIONAL BOUNDARY

TRANSPORTATION
(MAJOR FREEWAYS)

URBAN

INDUSTRIAL/MILITARY

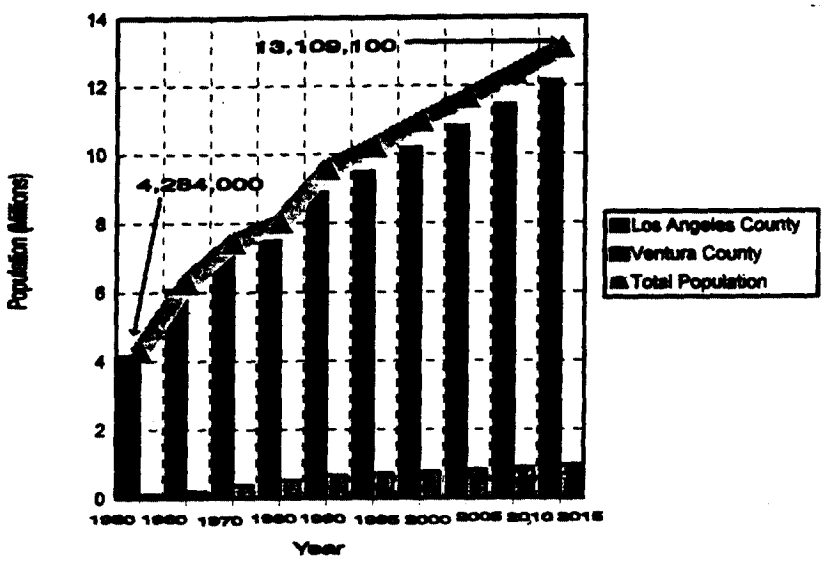
AGRICULTURE

OPEN SPACE

N

Miles

0 10 20



Year	Los Angeles County	Ventura County	Total
1950	4,168,400	115,600	4,284,000
1960	6,071,900	203,100	6,275,000
1970	7,055,800	381,400	7,437,200
1980	7,500,300	532,200	8,032,500
1990	8,897,500	671,000	9,569,100
1995	9,489,600p	725,700p	10,215,300p
2000	10,180,900p	782,700p	10,963,600p
2005	10,812,900p	834,500p	11,647,400p
2010	11,441,900p	905,600p	12,347,500p
2015	12,137,600p	971,500p	13,109,100p

p = Projected Population

Source: California Department of Finance, June 1994

Figure 1-8. Population Projections in Los Angeles and Ventura Counties.

Ventura County

Many unique habitats, including coastal wetlands and lagoons, are found along the southern coast of Ventura County. These areas provide habitats for many fish, birds, invertebrates, sea lions, and for other marine and estuarine species. Mugu Lagoon is the most extensive wetland in the Region and supports a rich diversity of fish and wildlife (that once inhabited much of southern California's coastal areas). Other wetlands include McGrath Lake, Ormond Beach, and the estuaries at the mouths of the Ventura and Santa Clara Rivers. The "Pothole" in the Devil's Potrero (on Agua Blanca Creek) is an inland freshwater marsh that supports several species of plants unique to freshwater marshes.

One of the largest of Santa Clara River's tributaries, Sespe Creek, contains most of the Santa Clara River's remnant, but restorable, run of the steelhead trout. Sespe Creek is designated as a "Wild Trout Stream" by the State of California and supports significant steelhead spawning and rearing habitat. The steelhead trout is an "anadromous" fish (migrating from the ocean into fresh water for spawning). The federal Los Padres Wilderness Act (1992) permanently set aside portions of Sespe Creek for steelhead trout protection and designated Sespe Creek as a "Wild and Scenic River." Piru and Santa Paula Creeks, two other tributaries of the Santa Clara River, also support good habitats for steelhead. The Pacific lamprey, another anadromous fish, also uses Sespe Creek and the Santa Clara River for spawning. The Santa Clara River also has populations of unarmored three-spine stickleback. In addition, the Santa Clara River serves as an important wildlife corridor.

The Sespe Condor Sanctuary was dedicated in 1947 and consists of 53,000 acres in northern Ventura County. Due to problems with the condor recovery efforts, condors are now being released in Santa Barbara County.

Local populations of steelhead and rainbow trout have nearly been eliminated along the Ventura River. A limited resident population of rainbow trout occurs above Robles Diversion Dam, in San Antonio Creek, and in the lower Ventura River. Migratory steelhead ascend upstream in the Ventura River as far as Robles Diversion Dam and into San Antonio Creek. The California Department of Fish and Game and others, however, have recognized the potential for the restoration of the estuary and enhancement of steelhead populations in the Ventura River (Ventura County, 1991).

Los Angeles County

The County of Los Angeles has designated sixty Significant Ecological Areas (SEAs; Table 1-1) within the County in their general plan (Los Angeles County, 1976). Selected SEAs are described below.

Malibu Lagoon supports two important plant communities, the coastal salt marsh and coastal strand, and is an important refuge for migrating birds (over 200 species of birds have been observed). As Malibu Canyon dissects the Santa Monica Mountains, species normally restricted to the drier interior valleys have extended their range down the canyon. Perennial streams in Malibu Canyon support outstanding oak and riparian woodlands. Malibu Creek is also the southernmost watercourse in California where steelhead trout continue to spawn (for more information about the Malibu Creek watershed see Chapter 4, page 4-54.

The Tujunga Canyon/Hansen Dam area possesses several important features. The floodplain behind the dam supports some of the last examples of the open coastal sage-scrub vegetation in the Los Angeles area. A spreading ground (basin used for groundwater recharge) southwest of the dam has created several freshwater marsh areas that are used by migratory waterfowl and shore birds. The area is also valuable as a wildlife corridor.

The San Gabriel River watershed, totalling more than 136,000 acres, has extensive areas of undisturbed riparian and woodland habitats. The United States Congress has set aside approximately 36,215 acres of the West Fork San Gabriel River watershed as the "San Gabriel Wilderness Area." In addition, about 31,680 acres of the East Fork San Gabriel River watershed have been set aside as the "Sheep Mountain Wilderness Area." This watershed is also valuable to sportsmen, hikers, and picnickers.

San Francisquito Canyon, a tributary of the Santa Clara River, supports populations of Unarmored Three-spine Stickleback, an endangered fish species.

Table 1- 1. Significant Ecological Areas (SEAs) in Los Angeles County.[1]

No.	Significant Ecological Area (SEA)	No.	Significant Ecological Area (SEA)
1	Malibu Coastline	33	Terminal Island
2	Point Dume	34	Palos Verdes Peninsula Coastline
3	Zuma Canyon	35	Harbor Lake Regional Park
4	Upper Sierra Canyon	36	Madrona Marsh
5	Malibu Canyon and Lagoon	37	Griffith Park
6	Las Virgenes	38	Baldwin Hills[2]
7	Hepatic Gulch	39	Encino Reservoir
8	Malibu Creek State Park Buffer Area	40	Verdugo Mountains
9	Cold Creek	41	Rio Hondo Spreading Grounds[2]
10	Tuna Canyon	42	Whittier Narrows Dam County Recreation Area
11	Temescal–Rustic–Sullivan Canyons	43	Rio Hondo College Wildlife Sanctuary
12	Palo Comado Canyon	44	Sycamore and Tumbull Canyons
13	Chatsworth Reservoir	45	*Dudleya densiflora* Population
14	Simi Hills	46	Tujunga Spreading Grounds[2]
15	Tonner Canyon/Chino Hills	47*	Edwards Air Force Base
16	Buzzard Peak/San Jose Hills	48*	Big Rock Wash
17	Powder Canyon/Puente Hills	49*	Little Rock Wash
18	Way Hill	50*	Rosamond Lake
19	San Francisquito Canyon	51*	Saddleback Butte State Park
20	Santa Susana Mountains	52*	Alpine Butte
21	Santa Susana Pass	53*	Lovejoy Butte
22	Santa Fe Dam Floodplain	54*	Piute Butte
23	Santa Clara River	55*	Desert-Montane Transect
24	Tujunga Valley/Hansen Dam	56*	Ritter Ridge
25	San Dimas Canyon	57*	Fairmont and Antelope Buttes
26	San Antonio Canyon Mouth	58*	Portal Ridge/Liebre Mountain
27	Portuguese Bend Landslide	59*	Tehachapi Foothills
28	El Segundo Dunes	60*	Joshua Tree Woodland Habitat
29	Ballona Creek	61*	Kentucky Springs[2]
30	Alamitos Bay	62*	Galium grande Population
31	Rolling Hills Canyons	63	Lyon Canyon
32	Agua Amarga Canyon	64	Oak Savannah

1 Descriptions of these areas can be found in the Los Angeles County General Plan (1976)
2 These are also designated as open spaces.
* Outside of the Los Angeles Region

Water Resources/Water Quality Issues

Surface and ground waters within the Los Angeles Region have proven insufficient to support the rapidly growing population in the Los Angeles Region. Water imported from other areas now meets about 50% of fresh water demands in the Region. Restrictions on imported water as well as drought conditions have necessitated water conservation measures which, at present, are voluntary. These conservation measures have slightly lessened the use of potable water in many areas of the Region. In addition, the demand for water is being partially fulfilled by the increasing use of reclaimed water for non-potable purposes such as greenbelt irrigation and industrial processing and servicing.

Surface Waters

Major surface waters of the Los Angeles Region flow from head waters in pristine mountain areas (largely in two National Forests and the Santa Monica Mountains), through urbanized foothill and valley areas, high density residential and industrial coastal areas, and terminate at highly utilized recreational beaches and harbors. Uncontrolled pollutants from nonpoint sources are believed to be the greatest threats to rivers and streams within the Region.

- *Ventura River Watershed:* The Ventura River is the northern-most river system in southern California (south of Point Conception) that supports a large number of sensitive aquatic species, several of which are currently, or proposed to be, endangered or threatened. Water quality in the upper reaches is good but quality in the lower reaches is impacted by a combination of municipal water discharges and agricultural, urban and oil industry nonpoint sources.

- *Santa Clara River Watershed:* The Santa Clara River is the largest river system in southern California that remains in a relatively natural state. Extensive patches of high quality riparian habitat are present along the length of the river and its tributaries. Stream flows are diverted, usually during high flow, for "out-of-stream" beneficial uses. Threats to water quality include increasing development in floodplain areas, necessitating flood control measures such as channelization that results in increased flows, erosion, and loss of habitat.

- *Calleguas Creek Watershed:* Calleguas Creek drains a predominantly agricultural area on the Oxnard Plain and empties into Mugu Lagoon, one of southern California's few remaining large wetlands. While natural flows in the past were intermittent, discharges of municipal, agricultural, and urban wastewaters have increased surface flow in the watershed resulting in increased sedimentation in the lagoon. The general instability of the streambanks, continual destruction of riparian vegetation, and other land use practices have accelerated erosion in this watershed. Erosion problems are intensified in areas where residential development is occurring on steeply sloping upland areas. Should sedimentation continue at the present rate, the lagoon is projected to fill with sediment in about 50 years. Additional problems are produced by irrigation return-flows which add nutrients, pesticides, and other dissolved constituents to the creek and its tributaries.

- *Malibu Creek Watershed:* This watershed has changed rapidly in the last 20 years from a predominantly rural area to a steadily developing area that has doubled in population to nearly 80,000 residents. Increased flows (from imported waters needed to support the growing population base) and channelization of several tributaries to Malibu Creek have caused an imbalance in the natural flow regime in the watershed. Pollutants of concern, many of which are discharged from nonpoint sources, include excess nutrients, sediment, and bacteria.

- *Ballona Creek Watershed:* Pollutants from industrial and municipal effluent as well as urban runoff degrade the quality of Ballona Creek. Specific pollutants include high levels of dissolved solids (chlorides, sulfates, heavy metals) and bacteria. Untreated sewage overflows discharged into Ballona Creek during the rainy season cause beach closures along Santa Monica Bay. In addition, high concentrations of DDT in sediments at the mouth of the creek and in Marina Del Rey provide evidence of past discharges that have resulted in long-term water quality problems.

- *Los Angeles River Watershed:* The Los Angeles River is highly modified, having been lined with concrete along most of its length by the U.S. Army Corps of Engineers from the

1930s to the 1960s. One seven-mile reach in the narrows area (in the middle portion of the river system), where ground water rises into the streambed, is mostly unlined along the stream bottom and provides natural habitat for fish and other wildlife in an otherwise concrete conveyance. The upper reaches of the river carry urban runoff and flood flows from the San Fernando Valley. Below the Sepulveda Basin, flows are dominated by tertiary-treated effluent from several municipal wastewater treatment plants. Because the watershed is highly urbanized, urban runoff and illegal dumping are major contributors to impaired water quality in the Los Angeles River and tributaries.

- *San Gabriel River Watershed:* While the upper San Gabriel River and its tributaries remain in a relatively pristine state, intensive recreational use of this area for picnicking, off road vehicle use, fishing, and hiking threaten water quality and aquatic and riparian habitats. Further problems in the upper San Gabriel River occur as vast amounts of naturally eroding sediment from the rugged San Gabriel Mountains settle into reservoirs behind flood control dams. Improper sediment sluicing operations from these reservoirs can impact aquatic habitats and groundwater recharge areas. In the San Gabriel Valley, the middle reaches of the river have been extensively modified in order to control flood and debris flows and to recharge ground water. Extensive sand and gravel operations are found along these stretches of the river. The lower San Gabriel River (i.e., those stretches flowing through the Los Angeles Coastal Plain) also has been extensively modified and is lined with concrete from approximately Firestone Boulevard to the estuary. Flow in these lower reaches is dominated by effluent from several municipal wastewater treatment facilities and urban runoff. Beneficial uses have been impaired in these lower reaches of the San Gabriel River, as evidenced by ambient toxicity and bioaccumulation of metals in fish tissue.

Other more generalized surface water problems in the Region include:

- Poor mineral quality in some areas due to a variety of reasons including geology, agricultural runoff, discharge of highly mineralized ground water, and poor quality of some imported waters
- Bioaccumulation of toxic compounds in fish and other aquatic life
- Impacts from increased development and recreational uses
- In-stream toxicity from point and nonpoint sources
- Diversion of flows necessary for the propagation of fish and wildlife populations
- Channelization, dredging, and other losses of habitat
- Impacts from transient camps located along creeks and lagoons
- Illegal dumping
- Introduction of non-native plants which are of little value to the biota and clog the streams
- Impacts from sand and gravel mining operations
- Natural oil seeps
- Eutrophication and the accumulation of toxic pollutants in lakes

Ground Waters

Ground water accounts for most of the Region's local (i.e., non-imported) supply of fresh water. Major groundwater basins in the Region are shown in Figure 1-9.

The general quality of ground water in the Region has degraded substantially from background levels. Much of the degradation reflects land uses. For example, fertilizers and pesticides, typically used on agricultural lands, can degrade ground water when irrigation-return waters containing such substances seep into the subsurface. In areas that are unsewered, nitrogen and pathogenic bacteria from overloaded or improperly sited septic tanks can seep into ground water and result in health risks to those who rely on ground water for domestic supply. In areas with industrial or commercial activities, aboveground and underground storage tanks contain vast quantities of hazardous substances. Thousands of these tanks in the Region have leaked or are leaking, discharging petroleum fuels, solvents, and other hazardous substances into the subsurface. These leaks as well as otherdischarges

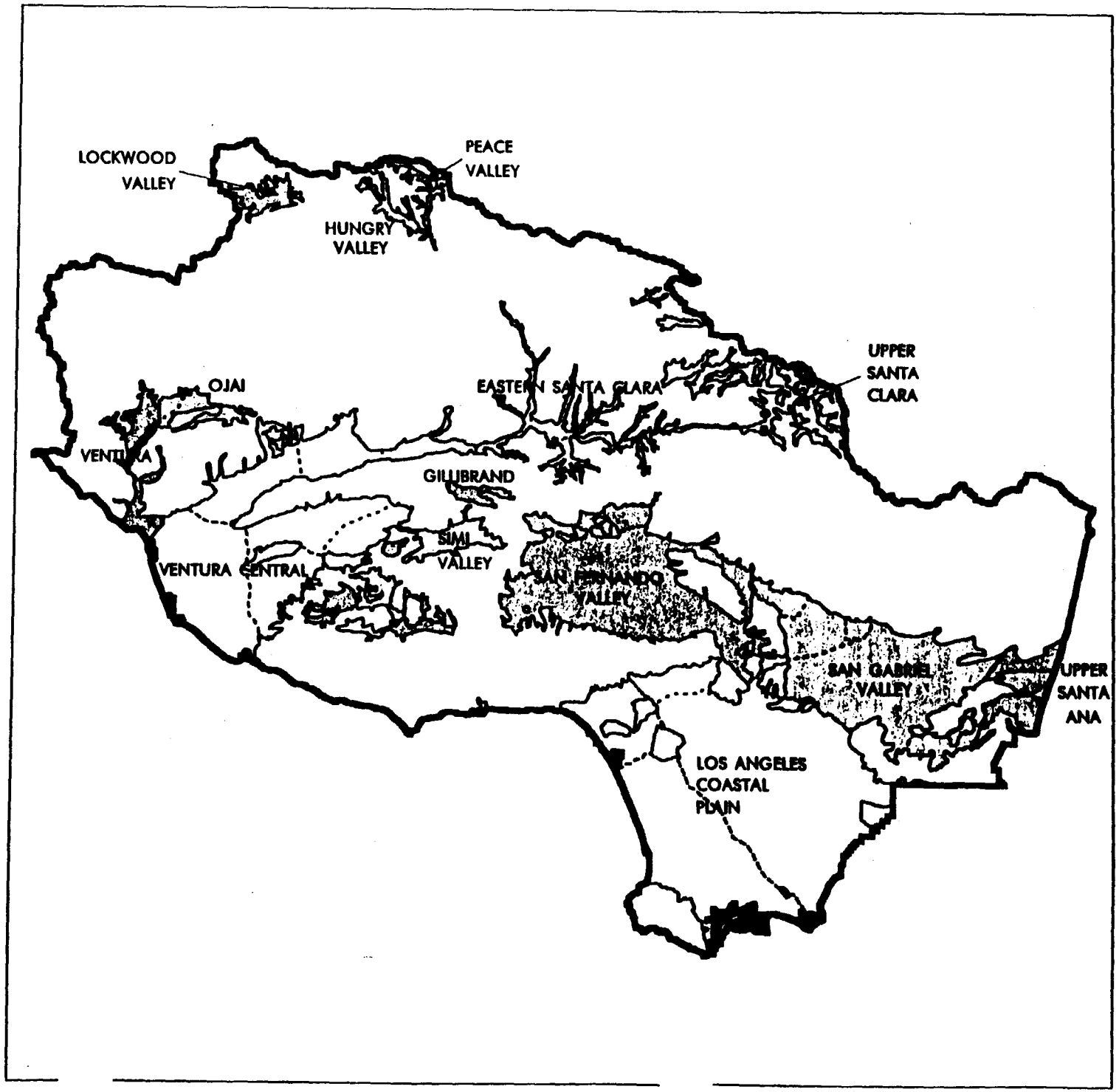


FIGURE 1-9

REGIONAL GROUNDWATER BASINS

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

REGIONAL BOUNDARY

NOTE: THIS FIGURE SHOWS ONLY MAJOR GROUNDWATER BASINS IN THE LOS ANGELES REGION. DESIGNATIONS OF BASINS CONFORM TO CA DEPARTMENT OF WATER RESOURCES DESIGNATIONS (1980)

N

Miles

0 10 20

to the subsurface that result from inadequate handling, storage, and disposal practices can seep into the subsurface and pollute ground water.

Compared to surface water pollution, investigations and remediation of polluted ground waters are often difficult, costly, and extremely slow.

Examples of specific groundwater quality problems include:

- San Gabriel Valley and San Fernando Valley Groundwater Basins: Volatile organic compounds from industry, and nitrates from subsurface sewage disposal and past agricultural activities, are the primary pollutants in much of the ground water throughout these basins. These deep alluvial basins do not have continuous effective confining layers above ground water and as a result pollutants have seeped through the upper sediments into the ground water. Approximately 20% of groundwater production capacity for municipal use in the San Gabriel Valley has been shut down due to this pollution.

  In light of the widespread pollution in both the San Gabriel Valley and San Fernando Valley Groundwater Basins, the California Department of Toxic Substances Control has designated large areas of these basins as high priority Hazardous Substances Cleanup sites. Furthermore, the USEPA has designated these areas as Superfund sites. The Regional Board and USEPA are overseeing investigations to further define the extent of pollution, identify the responsible parties, and begin remediation in these areas.

- Central and West Coast Groundwater Basins (Los Angeles Coastal Plain): Seawater intrusion that has occurred in these basins is now under control in most areas through an artificial recharge system consisting of spreading basins and injection wells that form fresh water barriers along the coast. Ground water in the lower aquifers of these basins is generally of good quality, but large plumes of saline water have been trapped behind the barrier of injection wells in the West Coast Basin, degrading significant volumes of ground water with high concentrations of chloride. Furthermore, the quality of ground water in parts of the upper aquifers of both basins is degraded by both organic and inorganic pollutants from a variety of sources, such as leaking tanks, leaking sewer lines, and illegal discharges. As the aquifers and confining layers in these alluvial basins are typically interfingered, the quality of ground water in the deeper production aquifers is threatened by migration of pollutants from the upper aquifers.

- Ventura Central Groundwater Basins: Despite efforts to artificially recharge ground water and to control levels of pumping, ground water in several of the Ventura Central basins has been, and continues to be, overdrafted (particularly in the Oxnard Plain and Pleasant Valley areas). Some of the aquifers in these basins are in hydraulic continuity with seawater; thus seawater is intruding further inland, degrading large volumes of ground water with high concentrations of chloride. In addition, nutrients and other dissolved constituents in irrigation return-flows are seeping into shallow aquifers and degrading ground water in these basins. Furthermore, degradation and cross-contamination are occurring as degraded or contaminated ground water travels between aquifers through abandoned and improperly sealed wells and corroded active wells.

  Unsewered areas of Ventura County, such as the El Rio area (to the northwest of Oxnard), represent another source of pollution to ground water in the Ventura Central Basins. In many wells in the El Rio area, nitrate is present in levels exceeding maximum contaminant levels (MCLs) established by the state and federal government (Ventura County, 1994).

- Acton Valley Groundwater Basin: Ground water is the source of most potable water in this unsewered area. However, increasing concentrations of nitrate are degrading the quality of this water. Investigations are underway to confirm septic tanks as the source of high levels of nitrate in this area.

Coastal Waters

Coastal waters in the Region include bays, harbors, estuaries, beaches, and open ocean. Santa Monica Bay dominates a large portion of the Region's open coastal waters. Deep-draft commercial harbors include the Los Angeles/Long Beach Harbor complex and Port Hueneme. Shallower, small craft harbors, such as Marina del Rey, King Harbor and Ventura Marina, occur at a number of locations.

Important estuaries are represented by coastal lagoons such as Mugu Lagoon and numerous small coastal wetlands such as Ballona Wetlands and Los Cerritos Wetlands. Recreational beaches occur along large stretches of the coastal waters.

These coastal waters are impacted by a variety of activities which include:

- Municipal and industrial wastewater discharges
- Cooling water discharges
- Nonpoint source runoff (urban and agricultural runoff in particular), including leaking septic systems, construction, and recreational activities
- Oil spills
- Vessel wastes
- Dredging
- Increased development and loss of habitat
- Offshore operations
- Illegal dumping
- Natural oil seeps

Imported Waters

Water from other areas has been imported into the Los Angeles Region since 1913, when the Los Angeles Aqueduct started delivering water from the Owens Valley. Since that time, southern California has developed complex systems of aqueducts to import water to support a rapidly growing population and economy. Water imported to the Region presently meets roughly half of the demand for potable water.

The principal systems (Figure 1-9) for importing water are summarized below:

- *The Los Angeles Aqueducts:* The City of Los Angeles, Department of Water and Power, diverts water from the Mono and Owens River Basins and transports this water via the 338-mile long Los Angeles Aqueducts to the City of Los Angeles. The original aqueduct was completed in 1913. A second aqueduct, which parallels the first, was completed in 1970.

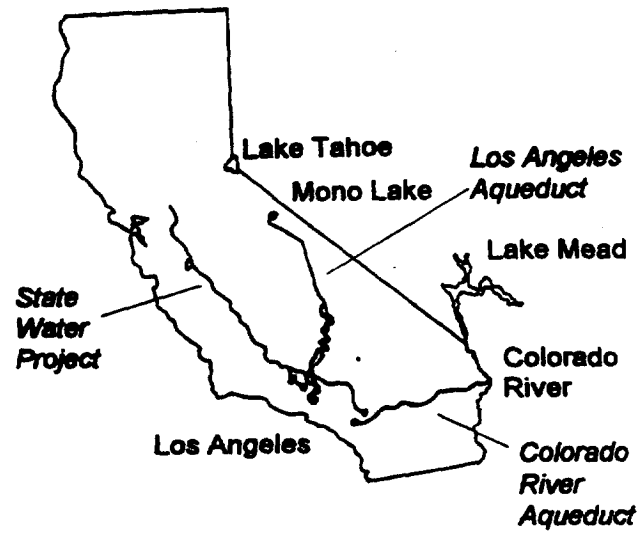


Figure 1-10. Sources of Imported Water in the Los Angeles Region (after Los Angeles Department of Water and Power, 1991).

Releases from the Haiwee Reservoir Complex, at the end of the Owens Valley Basin, supplied over 500,000 acre-feet per year to the City of Los Angeles during the first half of the 1980s. However, releases dropped to 127,012 acre-feet in 1990 as a result of the recent statewide drought, as well as legal restrictions on Mono Basin and Owens Valley water resources. Releases in 1992 totalled 173,945 acre-feet.

- *The California Aqueduct (The State Water Project):* The State of California, Department of Water Resources, transports about 2.4 million acre-feet per year of water, largely from the Feather and the Sacramento Rivers in northern California, to other parts of California via the California Aqueduct. In southern California, the aqueduct splits into east and west branches, terminating at Perris and Castaic Reservoirs, respectively. Approximately 1.4 million acre-feet per year of this water is delivered to four contractors for use within the Los Angeles Region: The Metropolitan Water District of Southern California (MWD), County of Ventura, Castaic Lake Water Agency, and San Gabriel Valley Municipal Water District.

- *The Colorado River Aqueduct:* The MWD imports water from Lake Havasu on the Colorado River through the 242-mile long Colorado River Aqueduct. This water is

transported to Lake Mathews, MWD's terminal reservoir, in Riverside County. While MWD held water rights for over 1.2 million acre-feet per year in the 1930s, MWD's dependable supply of Colorado River water has now been reduced to 450,000 acre-feet per year due to the exercise of water rights by other Colorado River water users. After blending with water delivered through the State Water Project, MWD delivers a portion of this water to its member agencies in the Los Angeles Region; the remaining water is delivered to other areas in southern California.

Water imported from the Owens Valley through the Los Angeles Aqueduct is usually treated for turbidity. Water from the Colorado River typically is harder than local supplies and other imported waters. This hardness is the result of dissolved constituents from soils and rocks in the Colorado River watershed. Water from northern California, while not as hard as Colorado River water, accumulates organic materials as it flows through the fertile Sacramento-San Joaquin Delta. These organic materials when combined with chlorine during typical disinfection treatment processes can result in by-products such as trihalomethanes (THMs). As THMs are linked to cancer, a 100 parts per billion standard has been established that mitigates the occurrence of THMs in drinking water while still allowing for adequate chlorine disinfection.

Water Supply and Drought Issues

During the most recent period of drought, water supplies from northern California often had higher than normal concentrations of chlorides which, in turn, often resulted in waste discharges that exceeded chloride limitations. To provide a measure of relief to dischargers who were unable to meet chloride limitations due to the drought and/or water conservation measures, the Regional Board adopted Resolution No. 90-04, entitled *Effects of Drought Induced Water Supply Changes and Water Conservation Measures on Compliance with Waste Discharge Requirements within the Los Angeles Region*. This policy, which was adopted on March 26, 1990, temporarily raised chloride limitations to match chloride increases in the water supply for a period of three years. Under this policy, chloride limitations were temporarily set at the lesser of (i) 250 mg/L or (ii) the supply concentration plus 85 mg/L.

Although the drought ended in 1993, water supplies in storage still contained higher than normal levels of chlorides. Accordingly, on June 14, 1993 the Regional Board extended these temporary chloride limitations for 18 months.

The Regional Board realizes that there may be a need for a longer term solution to these water supply issues, and will address these issues as part of the next Triennial Review.

Reclaimed Wastewaters

The State and Regional Boards recognize the shortage of fresh water in the Region and the need to conserve water for beneficial uses. Accordingly, reclaimed wastewaters are an increasingly important local resource. The State Board's *Policy with Respect to Water Reclamation in California* (State Board Resolution No. 77-1) is summarized and reprinted in Chapter 5. The importance of water reclamation is also recognized in Porter-Cologne. Sections 13575 to 13577, which were added in 1991 (during the fifth year of the last drought), set reclamation goals of 700,000 acre-feet per year and 1,000,000 acre-feet per year in the years 2000 and 2010, respectively.

The Regional Board supports reclamation projects (i.e., those projects that reuse treated wastewaters, thereby offsetting the use of fresh waters) through the Water Reclamation Requirements program. Under this program, discussed in detail in Chapter 4, treated wastewaters are reused for groundwater recharge, recreational impoundments, industrial processing and supply, and landscape irrigation.

In addition, the State and Regional Boards provide financial assistance to projects that are developing reclamation capabilities.

The Basin Plan

The following chapters designate beneficial uses of the Region's waters, water quality objectives for the protection of these beneficial uses, and a plan of implementation for enhancing or maintaining water quality. This information supersedes that in previously adopted Basin Plans and amendments.

Three overlays are located in appendix two of this Plan (hydrologic units, major freeways and USGS Quad Boundaries). These can be placed over any of the standard regional maps throughout this plan for orientation.

2

2. BENEFICIAL USES

Table of Contents

Introduction 2-1

Beneficial Use Definitions 2-1

Beneficial Uses for Specific Waterbodies 2-3
- Inland Surface Waters 2-4
- Ground Waters 2-4
- Coastal Waters 2-4
- Wetlands 2-4

Introduction

Beneficial uses form the cornerstone of water quality protection under the Basin Plan. Once beneficial uses are designated, appropriate water quality objectives can be established and programs that maintain or enhance water quality can be implemented to ensure the protection of beneficial uses. The designated beneficial uses, together with water quality objectives (referred to as criteria in federal regulations), form water quality standards. Such standards are mandated for all waterbodies within the state under the California Water Code. In addition, the federal Clean Water Act mandates standards for all surface waters, including wetlands.

Twenty-four beneficial uses in the Region are identified in this Chapter. These beneficial uses and their definitions were developed by the State and Regional Boards for use in the Regional Board Basin Plans. Three beneficial uses were added since the original 1975 Basin Plans. These new beneficial uses are Aquaculture, Estuarine Habitat, and Wetlands Habitat.

Beneficial uses can be designated for a waterbody in a number of ways. Those beneficial uses that have been attained for a waterbody on, or after, November 28, 1975, must be designated as "existing" in the Basin Plans. Other uses can be designated, whether or not they have been attained on a waterbody, in order to implement either federal or state mandates and goals (such as fishable and swimmable) for regional waters. Beneficial uses of streams that have intermittent flows, as is typical of many streams in southern California, are designated as intermittent. During dry periods, however, shallow ground water or small pools of water can support some beneficial uses associated with intermittent streams; accordingly, such beneficial uses (e.g., wildlife habitat) must be protected throughout the year and are designated "existing." In addition, beneficial uses can be designated as "potential" for several reasons, including:

- implementation of the State Board's policy entitled "Sources of Drinking Water Policy" (State Board Resolution No. 88-63, described in Chapter 5),
- plans to put the water to such future use,
- potential to put the water to such future use,
- designation of a use by the Regional Board as a regional water quality goal, or
- public desire to put the water to such future use.

Beneficial Use Definitions

Beneficial uses for waterbodies in the Los Angeles Region are listed and defined below. The uses are listed in no preferential order.

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

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

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

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

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

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

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

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

Water Contact Recreation (REC-1)
Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.

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

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

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

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

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

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

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

Wetland Habitat (WET)
Uses of water that support wetland ecosystems, including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife, and other unique wetland functions which enhance water quality, such as providing flood and erosion control, stream bank stabilization, and filtration and purification of naturally occurring contaminants.

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

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

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

The following coastal waters have been designated as ASBS in the Los Angeles Region. For detailed descriptions of their boundaries, see the Ocean Plan discussion in Chapter 5, Plans and Policies:

- San Nicolas Island and Begg Rock
- Santa Barbara Island and Anacapa Island
- San Clemente Island
- Mugu Lagoon to Latigo Point

- Santa Catalina Island, Subarea One, Isthmus Cove to Catalina Head
- Santa Catalina Island, Subarea Two, North End of Little Harbor to Ben Weston Point
- Santa Catalina Island, Subarea Three, Farnsworth Bank Ecological Reserve
- Santa Catalina Island, Subarea Four, Binnacle Rock to Jewfish Point

The following areas are designated Ecological Reserves or Refuges:

- Channel Islands National Marine Sanctuary
- Santa Barbara Island Ecological Reserve
- Anacapa Island Ecological Reserve
- Catalina Marine Science Center Marine Life
- Point Fermin Marine Life Refuge
- Farnsworth Bank Ecological Reserve
- Lowers Cove Reserve
- Abalone Cove Ecological Reserve
- Big Sycamore Canyon Ecological Reserve

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

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

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

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

Beneficial Uses for Specific Waterbodies

Tables 2-1 through 2-4 list the major regional waterbodies and their designated beneficial uses. These tables are organized by waterbody type: (i) inland surface waters (rivers, streams, lakes, and inland wetlands), (ii) ground water, (iii) coastal waters (bays, estuaries, lagoons, harbors, beaches, and ocean waters), and (iv) coastal wetlands. Within Table 2-1 waterbodies are organized by major watersheds. Hydrologic unit, area, and subarea numbers are noted in the surface water tables (2-1, 2-3, and 2-4) as a cross reference to the classification system developed by the California Department of Water Resources. For those surface waterbodies that cross into other hydrologic units, such waterbodies appear more than once in a table. Furthermore, certain coastal waterbodies are duplicated in more than one table for completeness (e.g., many lagoons are listed both in inland surface waters and in coastal features tables). Major groundwater basins are classified in Table 2-2 according to the Department of Water Resources Bulletin No. 118 (1980). A series of maps (Figures 2-1 to 2-22) illustrates regional surface waters, ground waters, and major harbors.

The Regional Board contracted with the California Department of Water Resources for a study of beneficial uses and objectives for the upper Santa Clara River (DWR, 1989) and for another study of the beneficial uses and objectives the Piru, Sespe, and Santa Paula Hydrologic areas of the Santa Clara River (DWR, 1993). In addition, the Regional Board contracted with Dr. Prem Saint of California State University at Fullerton to survey and research beneficial uses of all waterbodies throughout the Region (Saint, et al., 1993a and 1993b). Information from these studies was used to update this Basin Plan.

State Board Resolution No. 88-63 (Sources of Drinking Water) followed by Regional Board Resolution No. 89-03 (Incorporation of Sources of Drinking Water Policy into the Water Quality Control Plans (Basin Plans)) states that " All surface and ground waters of the State are considered to be suitable, or potentially suitable, for municipal or domestic waters supply and should be so designated by the Regional Boards ... [with certain exceptions which must be adopted by the Regional Board]." In adherence with these policies, all inland surface and ground waters have been designated as MUN - presuming at least a potential suitability for such a designation.

These policies allow for Regional Boards to consider the allowance of certain exceptions according to criteria set forth in SB Resolution No. 88-63. While

supporting the protection of all waters that may be used as a municipal water supply in the future, the Regional Board realizes that there may be exceptions to this policy.

In recognition of this fact, the Regional Board will soon implement a detailed review of criteria in the State Sources of Drinking Water policy and identify those waters in the Region that should be excepted from the MUN designation. Such exceptions will be proposed under a special Basin Plan Amendment and will apply exclusively to those waters designated as MUN under SB Res. No. 88-63 and RB Res. No. 89-03.

In the interim, no new effluent limitations will be placed in Waste Discharge Requirements as a results of these designations until the Regional Board adopts this amendment.

The following sections summarize general information regarding beneficial uses designated for the various waterbody types.

Inland Surface Waters

Inland surface waters consist of rivers, streams, lakes, reservoirs, and inland wetlands. Beneficial uses of these inland surface waters and their tributaries (which are graphically represented on Figures 2-1 to 2-10) are designated on Table 2-1.

Beneficial uses of inland surface waters generally include REC-1 (swimmable) and WARM, COLD, SAL, or COMM (fishable), reflecting the goals of the federal Clean Water Act. In addition, inland waters are usually designated as IND, PRO, REC-2, WILD, and are sometimes designated as BIOL and RARE. In a few cases, such as reservoirs used primarily for drinking water, REC-1 uses can be restricted or prohibited by the entities that manage these waters. Many of these reservoirs, however, are designated as potential for REC-1, again reflecting federal goals. Furthermore, many regional streams are primary sources of replenishment for major groundwater basins that supply water for drinking and other uses, and as such must be protected as GWR. Inland surface waters that meet the criteria mandated by the *Sources of Drinking Water Policy* (which became effective when the State Board adopted Resolution No. 88-63 in 1988) are designated MUN. (This policy is reprinted in Chapter 5, Plans and Policies).

Under federal law, all surface waters must have water quality standards designated in the Basin Plans. Most of the inland surface waters in the Region have beneficial uses specifically designated for them. Those waters not specifically listed (generally smaller tributaries) are designated with the same beneficial uses as the streams, lakes, or reservoirs to which they are tributary. This is commonly referred to as the "tributary rule."

Ground Waters

Beneficial uses for regional groundwater basins (Figure 1-9) are designated on Table 2-2. For reference, Figures 2-11 to 2-18 show enlargements of all of the major basins and sub-basins referred to in the ground water beneficial use table (Table 2-2) and the water quality objective table (Table 3-8) in Chapter 3.

Many groundwater basins are designated MUN, reflecting the importance of ground water as a source of drinking water in the Region and as required by the State Board's *Sources of Drinking Water Policy*. Other beneficial uses for ground water are generally IND, PROC, and AGR. Occasionally, ground water is used for other purposes (e.g., ground water pumped for use in aquaculture operations at the Fillmore Fish Hatchery).

Coastal Waters

Coastal waters in the Region include bays, estuaries, lagoons, harbors, beaches, and ocean waters. Beneficial uses for these coastal waters provide habitat for marine life and are used extensively for recreation, boating, shipping, and commercial and sport fishing, and are accordingly designated in Table 2-3. Figures 2-19 to 2-22 show specific sub-areas of some of these coastal waters.

Wetlands

Wetlands include freshwater, estuarine, and saltwater marshes, swamps, mudflats, and riparian areas. As the California Water Code (§13050[e]) defines "waters of the state" to be "any water, surface or underground, including saline waters, within the boundaries of the state," natural wetlands are therefore entitled to the same level of protection as other waters of the state.

Wetlands also are protected under the Clean Water Act, which was enacted to restore and maintain the physical, chemical, and biological integrity of the nation's waters, including wetlands. Regulations developed under the CWA specifically include wetlands "as waters of the United States" (40 CFR 116.3) and defines them as "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Although the definition of wetlands differs widely among federal agencies, both the USEPA and the U.S. Army Corps of Engineers use this definition in administrating the 404 permit program.

Recently, both state and federal wetlands policies have been developed to protect these valuable waters. Executive Order W-59-93 (signed by Governor Pete Wilson on August 23, 1993) established state policy guidelines for wetlands conservation. The primary goal of this policy is to ensure no overall net loss and to achieve a long-term net gain in the quantity, quality, and permanence of wetland acreage in California. The federal wetlands policy, representing a significant advance in wetlands protection, was unveiled by nine federal agencies on August 24, 1993. This policy represents an agreement that is sensitive to the needs of landowners, more efficient, and provides flexibility in the permit process.

The USEPA has requested that states adopt water quality standards (beneficial uses and objectives) for wetlands as part of their overall effort to protect the nation's water resources. The 1975 Basin Plans identified a number of waters which are known to include wetlands; these wetlands, however, were not specifically identified as such. In this Basin Plan, a wetlands beneficial use category has been added to identify inland waters that support wetland habitat as well as a variety of other beneficial uses. The wetlands habitat definition recognizes the uniqueness of these areas and functions they serve in protecting water quality. Table 2-4 identifies and designates beneficial uses for significant coastal wetlands in the Region. These waterbodies are also included on Tables 2-1 and 2-3. Beneficial uses of wetlands include many of the same uses designated for the rivers, lakes, and coastal waters to which they are adjacent, and include REC-1, REC-2, WARM, COLD, EST, MAR, WET, GWR, COMM, SHELL, MIGR, SPWN, WILD and often RARE or BIOL.

As some wetlands can not be easily identified in southern California because of the hydrologic regime, the Regional Board identifies wetlands using indicators such as hydrology, presence of hydrophytic plants (plants adapted for growth in water), and/or hydric soils (soils saturated for a period of time during the growing season). The Regional Board contracted with Dr. Prem Saint, et al. (1993a and 1993b), to inventory and describe major regional wetlands. Information from this study was used to update this Basin Plan.

Table 2-1. Beneficial Uses of Inland Surface Waters.

WATERSHED[a]	Hydro. Unit No.	MUN	IND	PROC	AGR	GWR	FRSH	NAV	POW	REC1	REC2	COMM	AQUA	WARM	COLD	SAL	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL	WET[b]
VENTURA COUNTY COASTAL STREAMS																									
Los Sauces Creek	401.00	P*	I	I	I	I				I	I			I	I				E			I	I		
[illegible]	401.00	P*	I	I	I	I				I	I			I	I				E			I	I		
[illegible]	401.00	P*	I	I	I	I				I	I			I	I				E			I	I		
Javon Canyon	401.00	P*	I	I	I	I				I	I			I	I				E			I	I		E
Padre Juan Canyon	401.00	P*	I	I	I	I				I	I			I	I				E			I	I		
[illegible]	403.11									Ed	Ed														
[illegible]	404.17	P*																							
Little Sycamore Canyon Creek	404.45	P*								I	I			I					E		E		P		
VENTURA RIVER WATERSHED																									
[illegible]	402.10																								
Ventura River	402.10	P*	E		E	E	E			E	E			E	E				E		E	E	E		E
Ventura River	402.20	E	E	E	E	E	E			E	E			E	E				E		Eg	E	E		E
[illegible]	402.20	P*																							
Lake Casitas tributaries	402.20	E*			P	E				E	E			E	E				E		P	E	E		E
Coyote Creek below dam	402.20	P*				E				P				E	E				E			E	E		E
[illegible]	402.26	E	E	E	E	E				E															
[illegible]	402.32	E	E	E	E	E				E															
Lion Creek	402.31	I*	I	I	I					I	I			I	I				E						
Reeves Creek	402.32	I*	I	I	I	I				I	I			I	I				E			I	I		
[illegible]	402.40																								
Matilija Creek	402.20	P*				E				E	E				E				E			E	E		E
Murietta Canyon Creek	402.20	P*				E				E	E				E				E			E	E		E
SANTA CLARA RIVER WATERSHED																									
Santa Clara River	403.21	P*	E	E	E	E	E			Ed	E			E					E		E	E			E
Santa Clara River	403.31	P*	E	E	E	E	E			Ed	E			E					E		E	E			E
Santa Clara River (Soledad Cyn)	403.55	E*	E	E	E	E	E			E	E			E					E		Ei				E
Santa Paula Creek	403.21	P	E	E	E	E	E			E	E			E	E				E		E	E	E		

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
* Asterixed MUN designations are designated under SB 88-63 and RB 89-03. Some designations may be considered for [illegible]ons at a later date. (See pa[illegible] for more details).

Footnotes are consistent on all beneficial use tables.

a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries. Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.

c Coastal waterbodies which are also listed in Coastal Features Table (2-3) or in Wetlands Table (2-4).

d Limited public access precludes full utilization.

e One or more rare species utilize all ocean, bays, estuaries, and coastal [illegible]s for foraging and/or nesting.

f Aquatic organisms utilize all bays, estuaries, lagoons and coastal wetlands, to a certain extent, for spawning and early development. This may include migration into areas which are heavily influenced by freshwater inputs.

g Condor refuge.

h Water contact recreational activities prohibited by Casitas MWD.

i Soledad Canyon is the habitat of the Unarmored Three-Spine Stickleback.

Table 2-1. Beneficial Uses of Inland Surface Waters (Continued).

WATERSHED[a]	Hydro. Unit No.	MUN	IND	PROC	AGR	GWR	FRSH	NAV	POW	REC1	REC2	COMM	AQUA	WARM	COLD	SAL	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL	WET[b]
SANTA CLARA RIVER WATERSHED (CONT)																									
Sisar Creek	403.21	P	E	P	E	E				E	E			E	E				E		Eg		E		E
[redacted]	403.22	[redacted]																							
[redacted]	403.31	[redacted]																							
Sespe Creek	403.32	P	E	P	E	E				E	E			E	E				E	E	Eg	E	E		E
Timber Creek	403.32	P*				E				E	E				E				E	E	E	E	E		E
[redacted]																									
Piedra Blanca Creek	403.32	P*				E				E	E				E				E		E	E	E		E
Lion Canyon	403.32	P*				E				E	E			E	E				E			E	E		E
[redacted]																									
Tule Creek	403.32	P*				E				P	E				P				E	E	E	E	E		E
Potrero John Creek	403.32	P*				E				E	E				P				E		E	E	E		E
[redacted]																									
Piru Creek	403.42	P	E	E	E	E	E			E	E			E	E				E		Eg		E		E
Lake Piru	403.41	P	E	E	E	E	P			E	E			E	E				E		E		E		
[redacted]																									
Cañada de los Alamos	403.43	I*			I	I	I			I	I			I	I				E		E				
Gorman Creek	403.43	I*			I	I				I	I			I	I				E		P				
[redacted]																									
Tapo Canyon	403.41	P*			P					P	E			E					E						
Castaic Creek	403.51	I	I	I	I	I	I			I	E			I					E		E				
[redacted]																									
Elderberry Forebay	403.51	E	E	E	E	E	E		E	Ek	E			E					E		E		E		
Elizabeth Lake Canyon	403.51	I	I	I	I	I	I			I	E			I					E						
[redacted]																									
Drinkwater Reservoir	403.51	P*				E				Pk	E			P					E		E				E
Bouquet Canyon	403.51	E I	EI	PI	P I	E	P			Em	E			E	E				E				P		E
[redacted]																									
Dry Canyon Reservoir j	403.51	E	E	E	E	P	P		P	Pk	E			E					E						
Bouquet Reservoir	403.52	E	E	E	E	E	E		P	Pk	E			E					E						
[redacted]																									

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
* Asterisked MUN designations are designated under SB 88-63 and RB 89-03. Some designations may be considered for exemptions at a later date. (See [illegible])

Footnotes are consistent on all beneficial use tables.

a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries. Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.

g Condor refuge.

j Out of service.

k Public access to reservoir and its surrounding watershed is prohibited by Los Angeles County Department of Public Works.

l The majority of the reach is intermittent; there is a small area of rising ground water creating perennial flow.

m Access prohibited by Los Angeles County Department of Public Works in the concrete-channelized areas.

Table 2-1. Beneficial Uses of Inland Surface Waters (Continued).

WATERSHED[a]	Hydro. Unit No.	MUN	IND	PROC	AGR	GWR	FRSH	NAV	POW	REC1	REC2	COMM	AQUA	WARM	COLD	SAL	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL	WET[b]
SANTA CLARA RIVER WATERSHED (CONT)																									
Mint Canyon Creek	403.51	I	I	I	I	I	I			Im	I			I					E						
[redacted]																									
Agua Dulce Canyon Creek	403.55	I*			I	I	I			I	I			I					E						
Aliso Canyon Creek	403.55	P*			P	E				E	E			E					E						E
[redacted]																									
Lake Elizabeth	403.51	P	P	P	P	P	P			E	E			E					E		E				
[redacted]																									
Mugu Lagoon c	403.11							E		Pn	E	Ed					E	E	Eo	E	Ee,p	Ef	Ef	Ed	E
Calleguas Creek Estuary c	403.11							P		Pn	E	E					E		E		Ee,p	Ef	Ef		Ef
[redacted]																									
Revolon Slough	403.11	P*	P		E	E				Eq	E			E					E						E
Beardsley Wash	403.61	P*					E			E	E			E					E						
[redacted]																									
Arroyo Conejo	403.64	P*				I	I			I	I			I					E		E				
Arroyo Conejo	403.68	P*				I	I			I	I			I					E						
[redacted]																									
North Fork Arroyo Conejo	403.64	P*			E	E				E	E			E					E				E		
Arroyo Las Posas	403.12	P*	P	P	P	E				E	E			E	P				E						
[redacted]																									
Arroyo Simi	403.67	I*	I			I	I			I	I			I					E						
Tapo Canyon Creek	403.66	I*		P	P	I				I	I			I					E						
[redacted]																									
Gillibrand Canyon Creek	403.67	P*				I				I	I			I					E						
Lake Bard (Wood Ranch Reservoir)	403.67	E	E	E	E	P				Pr	Er			E					E						
[redacted]																									
LOS ANGELES COUNTY COASTAL STREAMS																									
Arroyo Sequit	404.44	P*				I				E	E			E	E				E		E	E	E		E
[redacted]																									

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
* Asterixed MUN designations are designated under SB 88-63 and RB 89-03. Some designations may be considered for exemptions at a later date (pages 2-3,4 for more details).

Footnotes are consistent on all beneficial use tables.

a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries. Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.
b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.
c Coastal waterbodies which are also listed in Coastal Features Table (2-3) or in Wetlands Table (2-4).
d Limited public access precludes full utilization.
e One or more rare species utilize all ocean, bays, estuaries, and coastal wet[illegible] foraging and/or nesting.
f Aquatic organisms utilize all bays, estuaries, lagoons and coastal wetlands, to a certain extent, for spawning and early development. This may include migration into areas which are heavily influenced by freshwater inputs
m Access prohibited by Los Angeles County DPW in the concrete-channelized areas.
n Area is currently under control of the Navy: swimming is prohibited.
o Marine habitats of the Channel Islands and Mugu Lagoon serve as pinneped haul-out areas for one or more species (i.e., sea lions).
p Habitat of the Clapper Rail.
q Whenever flow conditions are suitable.
r Public access prohibited by Calleguas MWD.

Table 2-1. Benefical Uses of Inland Surface Waters (Continued).

WATERSHED[a]	Hydro. Unit No.	MUN	IND	PROC	AGR	GWR	FRSH	NAV	POW	REC1	REC2	COMM	AQUA	WARM	COLD	SAL	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL	WET[b]
LA COUNTY COASTAL STREAMS (CONT)																									
Los Alisos Canyon Creek	404.42	P*								I	I			I					E		E				
[redacted]																									
Trancas Canyon Creek	404.37	E*								Em	E			E					E		E				
Dume Lagoon c	404.36							E		E	E	E					E		E		Ee	Pf	Pf		E
[redacted]																									
Escondido Canyon Creek	404.34	I*								I	I			I					E		E				
Latigo Canyon Creek	404.33	I*								I	I			I					E		E				
[redacted]																									
Corral Canyon Creek	404.31	I*								I	I			I					E						I
Carbon Canyon Creek	404.16	P*								I	I			I					E						
[redacted]																									
Pena Canyon Creek	404.13	P*								I	I			I	E				E						
Tuna Canyon Creek	404.12	P*								I	I			I					E						
[redacted]																									
Santa Ynez Canyon	405.13	P*								I	E			I					E		E				
Santa Ynez Lake (Lake Shrine)	405.13	P*								Pk	E			E					E						
[redacted]																									
Sullivan Canyon Creek	405.13	P*								I	I			I					E						
Mandeville Canyon Creek	405.13	P*								I	I			I					E						
[redacted]																									
Streams of Palos Verdes	405.12	P*				I				I	I			I					E		Et				
Bixby Slough and Harbor Lake	405.12	P*								E	E			E					E		E				E
[redacted]																									
Sims Pond	405.15	P*								P	E			P					E						E
Los Cerritos Channel to Estuary	405.15	P*								P	I			I					E						
[redacted]																									
Stone Canyon Reservoir	405.13	E*	E	E		P				Pk	E			E					E						
Hollywood Reservoir	405.14	E*	E	E		P				Pk	E			E					E						
[redacted]																									

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
* Asterbred MUN designations are designated under SB 88-63 and RB 89-03. Some designations may be considered for exemptions at a later date. (See [illegible] for more details)

Footnotes are constatent on all benefical use tables.

a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.

c Coastal waterbodies which are also listed in Coastal Features Table (2-3) or in Wetlands Table (2-4).

e One or more rare species utilize all ocean, bays, esturaries, and coastal wetlands for foraging and/or nesting.

f Aquatic organisms utilize all bays, estuaries, lagoons and coastal wetlands, to a certain extent, for spawning and early development. This may include migration into areas which are heavily influenced by freshwater inputs.

k Public access to reservoir and its surrounding watershed is prohibited by the Los Angeles Department of Water and Power.

m Access prohibited by Los Angeles County DPW in the concrete-channelized areas.

s Access prohibited by Los Angeles County DPW.

t Rare applies only to Agua Magna Canyon & Sepulveda Canyon areas.

u These reservoirs are covered and thus inaccessible.

Table 2-1. Benefical Uses of Inland Surface Waters (Continued).

WATERSHED[a]	Hydro. Unit No.	MUN	IND	PROC	AGR	GWR	FRSH	NAV	POW	REC1	REC2	COMM	AQUA	WARM	COLD	SAL	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL	WET[b]
MALIBU CREEK WATERSHED																									
Malibu Lagoon c	404.21							E		E	E						E	E	E		Ee	Ef	Ef		E
[redacted]																									
Las Virgenes Creek	404.22	P*								Em	E			E	P				E		E	P	P		E
Century Reservoir	404.21	P*								E	E			E					E						E
[redacted]																									
Medea Creek	404.24	I*				I				Em	E			E					E						E
Lindero Creek	404.23	P*								I	I			I					E						
[redacted]																									
Westlake Lake	404.25	P*						E		E	E			E					E						
Potrero Valley Creek	404.25	P*				I				I	I			P					E						I
[redacted]																									
Las Virgenes (Westlake) Reservoir	404.25	E	E	E	E					Pk,v	E			P					E						
Hidden Valley Creek	404.26	I*				I				I	I			I					E						
[redacted]																									
BALLONA CREEK WATERSHED																									
Ballona Creek Estuary c,w	405.13							E		E	E	E					E	E	E		Ee	Ef	Ef	E	
[redacted]																									
Del Rey Lagoon c	405.13							E		E	E	E					E		E		Ee	Ef	Ef		E
Ballona Creek to Estuary	405.13	P*								Ps	E			P					P						
[redacted]																									
DOMINGUEZ CHANNEL WATERSHED																									
Dominguez Channel Estuary c,w	405.12							P		Es	E	E					E	E	E		Ee	Ef	Ef		
[redacted]																									
LOS ANGELES RIVER WATERSHED																									
Los Angeles River Estuary c,w	405.12		E					E		E	E	E					E	E	E		Ee	Ef	Ef	P	E
[redacted]																									
Los Angeles River	405.21	P*	P			E				E	E			E					E						E
Compton Creek	405.15	P*				E				Es	E			E					E						E
[redacted]																									

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
* Asterisked MUN designations are designated under SB 88-63 and RB 89-03. Some designations may be considered for [illegible] at a later date. (See page [illegible] for more details).

Footnotes are consistent on all beneficial use tables.

a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries. Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.

c Coastal waterbodies which are also listed in Coastal Features Table (2-3) or in Wetlands Table (2-4).

e One or more rare species utilize all ocean, bays, estuaries, and coastal wetlands for foraging and/or nesting.

f Aquatic organisms utilize all bays, estuaries, lagoons and coastal wetl[illegible] a certain extent, for spawning and early development. This may include migration into areas which are heavily influenced by [illegible]r inputs.

k Public access to reservoir and its surrounding watershed is prohibited by LADWP.

m Access prohibited by Los Angeles County DPW in the concrete-channelized areas.

v Public water supply reservoir. Owner prohibits public entry.

w These areas are engineered channels. All references to Tidal Prisms in Regional Board documents are fur[illegible] equivalent to estuaries.

s Access prohibited by Los Angeles County D[illegible]

Table 2-1. Benefical Uses of Inland Surface Waters (Continued).

WATERSHED[a]	Hydro. Unit No.	MUN	IND	PROC	AGR	GWR	FRSH	NAV	POW	REC1	REC2	COMM	AQUA	WARM	COLD	SAL	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL	WET[b]
LA RIVER WATERSHED (CONTINUED)																									
Rio Hondo below Spreading Grounds	405.15	P*				I				Pm	E			P					I						
Rio Hondo to Spreading Grounds	405.15	P*				I				Im	I			I					I						
Rio Hondo	405.41	P*				I				Im	I			I					I						
Alhambra Wash	405.41	P*				I				Pm	I			P					P		E				
Rubio Wash	405.41	P*				I				Im	I			I					E		P				
Rubio Canyon	405.31	P				E				I	I			I					I						
Eaton Wash	405.31	P				I				I	I			I					I						
Eaton Wash (below dam)	405.31	P*				I				Im	I			I					E						
Eaton Wash (above dam)	405.31	P*				I				I	I			I					E						
Eaton Dam And Reservoir	405.31	P				I				I	I			I					I						
Eaton Canyon Creek	405.31	P				E				I	I			I					I						
Arcadia Wash (lower)	405.41	P*				I				Pm	I			P					P						I
Arcadia Wash (upper)	405.33	P*				I				Pm	I			P					P						
Santa Anita Wash (lower)	405.41	P				I				I	I			I					I						
Santa Anita Wash (upper)	405.33	P				E				I	I			I					I						
Little Santa Anita Canyon Creek	405.33	P*				I				I	I			I					E						
Big Santa Anita Reservoir	405.33	P*				E				Px	E			E	E				E						
Santa Anita Canyon Creek	405.33	E				E				E	E			E	E				E						
Winter Creek	405.33	P				I				I	I			I	I				I						
East Fork Santa Anita Canyon	405.33	P*				E				E	E			E	E				E				E		E
Sawpit Wash	405.41	I				I				Im	I			I					E						
Sawpit Canyon Creek	405.41	P				I				I	I			I					I						
Sawpit Dam And Reservoir	405.41	P				I				I	I			I					I						
Monrovia Canyon Creek	405.41	I				I				I	I			I					E						E
Arroyo Seco S. Of Devil's Gates. (L)	405.15	P*								I	I			P					P						
Arroyo Seco S. Of Devil's Gates (U)	405.31	P								I	I			I					I						
Devil's Gate Reservoir (lower)	405.31	P								I	I			I					I						
Devil's Gate Reservoir (upper)	405.32	I*				I				I	I			I					E						
Arroyo Seco	405.32	E	E	E		E				Em	E			E	E				E						E
Pasadena Area Streams	405.31	P				I				I	I			I					I						
Little Bear Canyon Creek	405.32	P*				I				I	I			I	I				E						E
Verdugo Wash	405.24	P*				I				Pm	I			P					P						
Verdugo Hills	405.24	P				I				I	I			I					I						
Pickens Canyon	405.24	I*				I				Im	I			I					E						
Shields Canyon	405.24	I	I	I		I				Im	I			I					E						
Verdugo Wash	405.24	P*				I				Pm	I			P					P						

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
* Asterixed MUN designations are designated under SB 88-63 and RB 89-03. Some designations may be considered for exemptions at a later date. (See pages 2-3,4 for more details).

Footnotes are consistent on all beneficial use tables.
a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries
Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.
b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.
m Access prohibited by Los Angeles County DPW in concrete-channelized areas.
x Owner prohibits entry.

Table 2-1. Benefical Uses of Inland Surface Waters (Continued).

WATERSHED[a]	Hydro. Unit No.	MUN	IND	PROC	AGR	GWR	FRSH	NAV	POW	REC1	REC2	COMM	AQUA	WARM	COLD	SAL	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL	WET[b]
LA RIVER WATERSHED (CONT)																									
Dunsmore Canyon Creek	405.24	I	I	I		I				I	I			I					E						
[redacted]																									
Tujunga Wash	405.21	P*				I				Pm	I			P	P				P						
Hansen Flood Control Basin & Lakes	405.23	P*				E				E	E			E	E				E		E				
[redacted]																									
Kagel Canyon Creek	405.23	P*				I				Im	I			I					E						
Big Tujunga Canyon Creek	405.23	P*				E				E	E			E	E				E		E		E		E
[redacted]																									
Vasquez Creek	405.23	P*				E				E	E			P	P				E						E
Clear Creek	405.23	P*				E				E	E			E	E				E						E
[redacted]																									
Pacoima Wash	405.21	P*				E				Pm	E			E					E		E				
Pacoima Reservoir	405.22	P*				E				E	E			E					E						
[redacted]																									
Wilson Canyon Creek	405.22	P*				I				Em	E			I					E						
May Canyon Creek	405.22	P*				I				I	E			I					E						
[redacted]																									
Los Angeles Reservoir	405.21	E	E	E		P				Pk	E			E					E		E				
Lower Van Norman Reservoir	405.21	E*	E	E		E				E	E			E					E		E				
[redacted]																									
Aliso Canyon Wash and Creek	405.21	P*				I				Im	I			I					E						
Limekiln Canyon Wash	405.21	P*				I				Im	I			I					E						
[redacted]																									
McCoy Canyon Creek	405.21	P*				I				I	I			I					E						
Dry Canyon Creek	405.21	P*				I				Im	I			I					E						
[redacted]																									
Dayton Canyon Creek	405.21	P*				I				I	I			I					E						
[redacted]																									

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
* Asterisked MUN designations are designated under SB 88-63 and RB 89-03. Some [illegible]nations may be considered for [illegible]s at a later date. (See pag[illegible] or more details).

Footnotes are consistent on all beneficial use tables.

a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries
Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody.
Any regulatory action would require a detailed analysis of the area.

k Public access to reservoir and its surrounding watershed is prohibited by Los Angeles Department of Water and Power.

m Access prohibited by Los Angeles County DPW in concrete-channelized areas.

u This reservoir is covered and thus inaccessible.

y Currently dry and no plans for restoration.

Table 2-1. Benefical Uses of Inland Surface Waters (Continued).

WATERSHED[a]	Hydro. Unit No.	MUN	IND	PROC	AGR	GWR	FRSH	NAV	POW	REC1	REC2	COMM	AQUA	WARM	COLD	SAL	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL	WET[b]
LOS ANGELES RIVER WATERSHED (CONT)																									
ISOLATED LAKES AND RESERVOIRS:																									
Eagle Rock Reservoir	[illegible]	[illegible]																							
Echo Lake	405.15	[illegible]																							
El Dorado Lakes	405.15	P*								E	E			P					E						E
Elysian Reservoir	405.15	E*	E	E						Pk	E			P					E						
Echo Reservoir	[illegible]	[illegible]																							
Kenneth Reservoir	[illegible]	[illegible]																							
Lincoln Park Lake	405.15	P*								P	E			P					E						
Silver Lake Reservoir	405.15	E*	E	E						Pk	E			P					E						
Tanner Lake	[illegible]	[illegible]																							
SAN GABRIEL RIVER WATERSHED																									
San Gabriel River: Estuary	[illegible]	[illegible]																							
San Gabriel River: Firestone and [illegible]	[illegible]	[illegible]																							
San Gabriel River: Whittier N-Firestone	405.15	P*	P	P		I				Em	E			I					E		E				
San Gabriel River	405.41	P*				I				Im	I			I					E						
San Gabriel River	[illegible]	[illegible]																							
San Gabriel River: Main Stem	[illegible]	[illegible]																							
North Fork San Gabriel River	405.43	For uses please see UPPER SAN GABRIEL TRIBUTARIES below																							
West Fork San Gabriel River	405.43	For uses please see UPPER SAN GABRIEL TRIBUTARIES below																							
East Fork San Gabriel River	[illegible]	For uses please see UPPER SAN GABRIEL TRIBUTARIES below																							
Coyote Creek to Estuary	[illegible]	[illegible]																							
Whittier Narrows Flood Control Basin	405.41	P*				E				E	E			E					E		P				
Legg Lake	405.41	P*				E				E	E			E	E				E						E
[illegible]	[illegible]	[illegible]																							
San Jose Creek	[illegible]	[illegible]																							
Puente Creek	405.41	P*				I				P	I			P					P						
Thompson Wash	405.52	P*				I				Im	I			I					E						
[illegible]	[illegible]	[illegible]																							
Walnut Creek Wash	405.41	P*				I				Im	I			I					E						E
Big Dalton Wash	405.41	P*				I				Pm	I			P					P						
[illegible]	[illegible]	[illegible]																							
Big Dalton Dam & Reservoir	405.41	P*				E				Px	E			E					E						
[illegible]	[illegible]	[illegible]																							

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
* Asterisked MUN designations are designated under SB 88-63 and RB 89-03. Some designations may be considered for exemptions at a later date. (See pages 2-3,4 for more details).

Footnotes are consistent on all beneficial use tables.

a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries. Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.

c Coastal waterbodies which are also listed in Coastal Features Table (2-3) or in Wetlands Table (2-4).

e One or more rare species utilize all ocean, bays, estuaries, and coastal wetlands for foraging and/or nesting.

f Aquatic organisms utilize all bays, estuaries, lagoons and coastal wetlands, to a certain extent, for spawning and early development. This may include migration into areas which are heavily influenced by freshwater inputs.

k Public access to reservoir and its surrounding watershed is prohibited by the Los Angeles Department of Water and Power.

w These areas are engineered channels. All references to Tidal Prisms in Regional Board documents are functionally equivalent to estuaries.

m Access prohibited by Los Angeles County DPW in concrete-channelized areas.

x Owner prohibits entry.

u This reservoir is covered and thus inaccessible.

z Listed twice in this table (see next page).

Table 2-1. Benefical Uses of Inland Surface Waters (Continued).

WATERSHED[a]	Hydro. Unit No.	MUN	IND	PROC	AGR	GWR	FRSH	NAV	POW	REC1	REC2	COMM	AQUA	WARM	COLD	SAL	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL	WET
SAN GABRIEL RIVER WATERSHED (CONT)																									
Bell Canyon Creek	405.41	P*				I				I	I			I					E						
San Dimas Wash (lower)	405.41	P*				I				Im	I			I					E		E				
San Dimas Wash (upper)	405.44	P*				E				Im	I			I					E						
West Fork San Dimas Canyon	405.44	E*				E				E	E			E	P				E						E
Wolfskill Canyon	405.44	E*				E				E	E			E	P				E		E				E
Marshall Creek and Wash	405.41	E*				I				Im	I			I					E						
Marshall Creek and Wash	405.53	E*				I	I			Im	I			I					E		E				E
Live Oak Dam and Reservoir	405.53	E*				E	E			E	E			E					E						
Emerald Creek And Wash	405.53	E*				I	I			Im	I			I					E						
Spinks Canyon Creek	405.41	P*				I				I	I			I					E						
Maddock Canyon Creek	405.43	P*				I				I	I			I					E						
Roberts Canyon Creek	405.43	P*				I				I	I			I					E		E				E
Morris Reservoir	405.43	E	E	E	E	E			E	P	E			E	E				E				E		
San Gabriel River: Main Stem z	405.43	E	E	E	E	E				E	E			E	E				E						E
Cattle Canyon Creek	405.43	P*				E				E	E			E	E				E		E		E		E
East Fork San Gabriel River	405.43	P*				E				E	E			E	E				E		E		E		E
Allison Gulch	405.43	P*				E				E	E			E	E				E				E		E

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
* Asterisked MUN designations are designated under SB 88-63 and RB 89-03. Some designations may be considered for [illegible] at a later date. (See page [illegible] for more details).

Footnotes are consistent on all benefical use tables.
a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries
Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.
b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody.
Any regulatory action would require a detailed analysis of the area.
m Access prohibited by Los Angeles County DPW in concrete channelized areas.
x Owner prohibits entry.
z Also listed on previous page.

Table 2-1. Benefical Uses of Inland Surface Waters (Continued).

WATERSHED[a]	Hydro. Unit No.	MUN	IND	PROC	AGR	GWR	FRSH	NAV	POW	REC1	REC2	COMM	AQUA	WARM	COLD	SAL	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL	WET[b]
SAN GABRIEL RIVER WATERSHED (CONT)																									
North Fork San Gabriel River	405.43	P*				E				E	E			E	E				E		E		E		E
[redacted]																									
Cedar Creek	405.43	P*				E				E	E			E	E				E		E		E		E
Crystal Lake	405.43	P*								E	E			E	E				E				E		
[redacted]																									
Bear Creek	405.43	P*				E				E	E			E	E				E		E		E		E
Cogswell Reservoir	405.43	P*				E				E	E			E	E				E				E		
[redacted]																									
ISLAND WATERCOURSES																									
[redacted]																									
Santa Barbara Island	406.30	P*								E	E			P					E		E				
Santa Catalina Island	406.40	E*				E				E	E			E					E		E				
[redacted]																									
[redacted]																									
San Antonio Canyon Creek	481.23	E		E	E	E			E	E	E			E	E				E				E		
[redacted]																									
[redacted]																									
[redacted]																									
[redacted]																									

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
* Asterixed MUN designations are designated under SB 88-63 and RB 89-03. Some designations may be considered for exemptions at a later date. (See pages 2-3,4 for more details).

Footnotes are consistent on all benefical use tables.
a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries. Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.
b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.
aa Habitat of the Channel Island Fox.
ab This watershed is also in Region 8 (801.23).

Table 2-2. Beneficial Uses of Ground Waters.[ac]

DWR[ad] Basin No.	BASIN	MUN	IND	PROC	AGR	AQUA
	PITAS POINT AREA ae	E	E	P	E	
4-1	[redacted]					
	West of Sulfur Mountain Road	E	E	E	E	
	Central area	E	E	E	E	
	[redacted]					
4-2	Lower Ojai Valley					
	West of San Antonio--Senior Canyon Creeks	E	E	E	E	
	[redacted]					
4-3	VENTURA RIVER VALLEY					
	Upper Ventura	E	E	E	E	
	[redacted]					
	VENTURA CENTRAL[af]					
4-4	[redacted]					
	Lower area east of Piru Creek	E	E	E	E	
	Lower area west of Piru Creek	E	E	E	E	
	[redacted]					
	Topa Topa (upper Sespe) area	P	E	P	E	
	Fillmore area					
	[redacted]					
	Remaining Fillmore area	E	E	E	E	E
	[redacted]					
	West of Peck Road	E	E	E	E	
	[redacted]					
	Confined aquifers	E	E	E	E	
	Unconfined and perched aquifers	E	P		E	
	[redacted]					

DWR[ad] Basin No.	BASIN	MUN	IND	PROC	AGR	AQUA
	VENTURA CENTRAL (CONT.)					
4-6	Pleasant Valley					
	[redacted]					
4-7	Arroyo Santa Rosa	E	E	E	E	
	[redacted]					
4-8	[redacted]					
	South Las Posas area					
	NW of Grimes Cyn Rd. and LA Ave. & Somis Rd.	E	E	E	E	
	[redacted]					
	Grimes Canyon Rd. and Broadway area	E	E	E	E	
	North Las Posas area	E	E	E	E	
4-5	[redacted]					
	Acton Valley	E	E	E	E	
	Sierra Pelona Valley (Agua Dulce)	E	E		E	
	[redacted]					
	Green Valley	E	P	P	E	
	Lake Elizabeth-Lake Hughes area	E	P	P	E	
4-4.07	[redacted]					
	Santa Clara-Mint Canyon	E	E	E	E	
	South Fork	E	E	E	E	
	[redacted]					
	Castaic Valley	E	E	E	E	
	Saugus Aquifer	E				
	[redacted]					
4-9						
	Simi Valley Basin					
	Confined aquifers	E	E	E	E	
	[redacted]					
	Gillibrand Basin	E	E	P	E	
4-10	[redacted]					

E: Existing beneficial use
P: Potential beneficial use
See pages 2-1 to 2-3 for descriptions of beneficial uses.

Footnotes are consistent for all beneficial use tables.

ac Beneficial uses for ground waters outside of the major basins listed on this table and outlined in Fig. 1-9 have not been specifically listed. However, ground waters outside of the major basins are, in many cases, significant sources of water. Furthermore, ground waters outside of the major basins are either potential or existing sources of water for downgradient basins, and as such, beneficial uses in the downgradient basins shall apply to these areas.

ad Basins are numbered according to California Department of Water Resources (DWR) Bulletin No. 118-80 (DWR, 1980).

ae Ground waters in the Pitas Point area (between the lower Ventura River and Rincon Point) are not considered to comprise a major basin and, accordingly, have not been designated a basin number by the DWR or outlined on Fig. 1-9.

af The Santa Clara River Valley (4-4), Pleasant Valley (4-6), Arroyo Sar Valley (4-7), and Las Posas Valley (4-8) Ground Water Basins have been combined and designated as the Ventura Central Basin (DWR, 1980).

Table 2-2. Beneficial Uses of Ground Waters (Continued). ac

DWR Basin No. ad	BASIN	MUN	IND	PROC	AGR	AQUA
4-11	LOS ANGELES COASTAL PLAIN					
	Central Basin	E	E	E	E	
	West Coast Basin	E	E	E	E	
	Hollywood Basin	E	E	E	E	
	Santa Monica Basin	E	E	E	E	
4-12	SAN FERNANDO VALLEY					
	Sylmar Basin	E	E	E	E	
	[illegible]	E	E	E	E	
	San Fernando Basin					
	West of Highway 405	E	E	E	E	
	[illegible]	E	E	E	E	
	Foothill area ag	E	E	E	E	
	Area encompassing RT-Tujunga-Erwin-					
	[illegible]					
	Well Fields	E	E	E	E	
	Narrows area (below confluence of Verdugo					
	[illegible]					
	Eagle Rock Basin	E	E	E	E	
4-13	[illegible]					
	Monk Hill sub-basin	E	E	E	E	
	Santa Anita area	E	E	E	E	
	[illegible]					
	Main San Gabriel Basin					
	Western area al	E	E	E	E	
	[illegible]					
	Puente Basin	E	E	E	E	

DWR Basin No. ad	BASIN	MUN	IND	PROC	AGR	AQUA
4-14	UPPER SANTA ANA VALLEY					
8-2aj	Live Oak Area	E	E	E	E	
	Claremont Heights area	E	E	E	E	
	Pomona area	E	E	E	E	
	Chino area	E	E	E	E	
	Spadra area	E	E	E	E	
4-15	TIERRA REJADA	E	P	P	E	
4-16	HIDDEN VALLEY					
	[illegible]					
4-17	LOCKWOOD VALLEY	E	E		E	
4-18	[illegible]					
4-19	THOUSAND OAKS AREA	E	E	E	E	
4-20	RUSSELL VALLEY					
	[illegible]					
	Triunfo Canyon area	P	P		E	
	Lindero Canyon area	P	P		E	
	[illegible]					
4-21	CONEJO-TIERRA REJADA VOLCANIC AREA ak	E			E	
	[illegible]					
	Point Dume area	E	P		E	
4-22	Malibu Valley	P	P		E	
	[illegible]					
	SAN PEDRO CHANNEL ISLANDS am					
	Anacapa Island	P	P			
	[illegible]					
	San Clemente Island	P	P			
	Santa Barbara Island	P	P			

E: Existing beneficial use
P: Potential beneficial use
See pages 2-1 to 2-3 for descriptions of beneficial uses.

Footnotes are consistent for all beneficial use tables.

ac Beneficial uses for ground waters outside of the major basins listed on this table and outlined in Fig. 1-9 have not been specifically listed. However, ground waters outside of the major basins are, in many cases, significant sources of water. Furthermore, ground waters outside of the major basins are either potential or existing sources of water for downgradient basins, and as such, beneficial uses in the downgradient basins shall apply to these areas.

ad Basins are numbered according to DWR Bulletin No. 118-80 (DWR, 1980).

ag The category for the Foothill Wells area in the old Basin Plan incorrectly grouped ground water in the Foothill area with ground water in the Sunland-Tujunga area. Accordingly, the new categories, Foothill area and Sunland-Tujunga area, replace the Foothill Wells area.

ah Nitrite pollution in the groundwater of the Sunland-Tujunga area currently precludes direct MUN uses. Since the ground water in this area can be treated or blended (or both), it retains the MUN designation.

ai All of the ground water in the Main San Gabriel Basin is covered by the beneficial uses listed under Main San Gabriel Basin-eastern area and western area. Walnut Creek, Big Dalton Wash and Little Dalton Wash separate the eastern area from the western area (see dashed line on Fig. 2-17). Any ground water upgradient of these areas is subject to downgradient beneficial uses and objectives, as explained in Footnote ac.

aj The border between Regions 4 and 8 crosses the Upper Santa Ana Valley Ground Water Basin.

ak Ground water in the Conejo-Tierra Rejada Volcanic Area occurs primarily in fractured vocanic rocks in the western Santa Monica Mountains and Conejo Mountain areas. These areas have not been delineated on Fig. 1-9.

al With the exception of ground water in Malibu Valley (DWR Basin No. 4-22), ground waters along the southern slopes of the Santa Monica Mountains are not considered to comprise a major basin and accordingly have not been designated a basin number by DWR or outlined on Fig. 1-9.

am DWR has not designated basins for ground waters on the San Pedro Channel Islands.

Table 2-3. Benefical Uses of Coastal Features.

COASTAL FEATURE [a]	Hydro. Unit No.	MUN	IND	PROC	NAV	POW	REC1	REC2	COMM	WARM	COLD	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL	WET [b]
VENTURA COUNTY COASTAL																				
[redacted]																				
Rincon Beach	401.00				E		E	E	E				E	E			E		E	
[redacted]	402.10																			
Ventura Marina	403.11		E		E		E	E	E				E	E					E	
Santa Clara River Estuary c	403.11				E		E	E	E			E	E	E		Ee	Ef	Ef		E
[redacted]																				
Edison Canal Estuary	403.11		E				Eao	E					E	E		Ee				
Channel Islands Harbor	403.11		E		E		Eap	E	E				E	E						
[redacted]																				
Ormond Beach	403.11		E		E	E	E	E	E				E	E		Ee		P	E	
Ormond Beach Wetlands c	403.11						E	E				E		E		Ee				E
[redacted]																				
LOS ANGELES COUNTY COASTAL																				
[redacted]																				
Nicholas Canyon Beach	404.43				E		E	E	E				E	E				P	E	
[redacted]																				
Dume State Beach	404.36				E		E	E	E				E	E				P	E	
Dume Lagoon c	404.36				E		E	E	E			E		E		Ee	Pf	Pf		E
[redacted]																				

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
+ Nearshore is defined as the zone bounded by the shoreline and a line 1000 feet from the shoreline or the 30-foot depth contours, whichever is further from the shore line. Longshore extent is from Rincon Creek to the San Gabriel River Estuary.

Footnotes are consistent for all beneficial use tables.

a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries. Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.
b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.
c Coastal waterbodies which are also listed in Inland Surface Waters Table (2-1) or in Wetlands Table (2-4).
d Limited public access precludes full utilization.
e One or more rare species utilize all ocean, bays, estuaries, and coastal wetlands for foraging and/or nesting.
f Aquatic organisms utilize all bays, estuaries, lagoons and coastal wetlands, to a certain extent, for spawning and early development. This may include migration into areas which are heavily influenced by freshwater inputs.
n Area is currently under control of the Navy: swimming is prohibited.
o Marine Habitats of the Channel Islands and Mugu Lagoon serve as pinniped haul-out areas for one or more species (i.e., sea lions).
p Habitat of the Clapper Rail.
an Areas of Special Biological Significance (along coast from Latigo Point to Laguna Point) and Big Sycamore Canyon and Abalone Cove Ecological Reserves and Point Fermin Marine Life Refuge.
ao Water contact recreation activites are prohibited by the Southern California Edison Co.
ap Water contact recreational activities are limited to the beach area at the harbor by Marina Authorities.
aq Water contact recreational activities are limited by Ch[illegible]ard to within the easement area of each home.
ar Areas exhibiting large shellfish populations include M[illegible]nt Dume, Point Fermin, White Point and Zuma Beach.

Table 2-3. Benefical Uses of Coastal Features (Continued).

COASTAL FEATURE [a]	Hydro. Unit No.	MUN	IND	PROC	NAV	POW	REC1	REC2	COMM	WARM	COLD	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL	WET [b]
LOS ANGELES COUNTY COASTAL (CONT)																				
[redacted]	[redacted]																			
[redacted]	[redacted]																			
Malibu Beach	404.21				E		E	E	E				E	E			E	Eas	Ear	
Malibu Lagoon c	404.21				E		E	E				E	E	E		Ee	Ef	Ef		E
[redacted]	[redacted]																			
[redacted]	[redacted]																			
Las Flores Beach	404.15				E		E	E	E				E	E				P	E	
Las Tunas Beach	404.12				E		E	E	E				E	E				P	E	
[redacted]	[redacted]																			
[redacted]	[redacted]																			
Will Rogers State Beach	405.13				E		E	E	E				E	E				P	E	
Santa Monica Beach	405.13				E		E	E	E				E	E			E	Eas	E	
[redacted]	[redacted]																			
Harbor	405.13				E		E	E	E				E	E					E	
Public Beach Areas	405.13				E		E	E	E				E	E		E				
[redacted]	[redacted]																			
Ballona Creek Estuary c,w	405.13				E		E	E	E			E	E	E		Ee	Ef	Ef	E	
Ballona Lagoon/Venice Canals c	405.13				E		E	E	E			E	E	E		Ee	Ef	Ef	E	E
[redacted]	[redacted]																			
Dockweiler Beach	405.12		E		E		E	E	E				E	E				P		
Manhattan Beach	405.12				E		E	E	E				E	E				P	E	
[redacted]	[redacted]																			
Redondo Beach	405.12		E		E		E	E	E				E	E		E	E	Eas	E	
Torrance Beach	405.12				E		E	E	E				E	E			E	Eas	E	
[redacted]	[redacted]																			

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required

Footnotes are consistent for all beneficial use tables.

a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries
Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody.
Any regulatory action would require a detailed analysis of the area.

c Coastal waterbodies which are also listed in Inland Surface Waters Table (2-1) or in Wetlands Table (2-4).

e One or more rare species utilize all ocean, bays, estuaries, and coastal wetlands for foraging and/or nesting.

f Aquatic organisms utilize all bays, estuaries, lagoons and coastal wetlands, to a certain extent, for spawning and early development.
This may include migration into areas which are heavily influenced by freshwater inputs.

ar Areas exhibiting large shellfish populations include Malibu, Point Dume, Point Fermin, White Point and Zuma Beach

as Most frequently used grunion spawning beaches. Other beaches may be used as well.

w These areas are engineered channels. All references to Tidal Prisms in Regional Board documents are functionally equivalent to estuaries.

Table 2-3. Benefical Uses of Coastal Features (Continued).

COASTAL FEATURE [a]	Hydro. Unit No.	MUN	IND	PROC	NAV	POW	REC1	REC2	COMM	WARM	COLD	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL	WET[b]
LOS ANGELES COUNTY COASTAL (CONT)																				
[illegible]	405.[illegible]				E		E													
[illegible]	405.[illegible]				E		E													
Los Angeles-Long Beach Harbor																				
Outer Harbor	405.12				E		E	E	E				E			E			P	
[illegible]	405.[illegible]				E		E													
[illegible]	405.[illegible]				E		E													
All Other Inner Areas	405.12		E		E		P	E	E				E			Ee			P	
Dominguez Channel Estuary c,w	405.12				P		E	E	E			E	E	E		Ee	Ef	Ef		
[illegible]	[illegible]																			
Los Cerritos Wetlands c	405.15				E		E	E	E			E		E		Ee	Pf	Pf	E	E
Los Cerritos Channel Estuary c	405.12		E		E		E	E	E			E	E	E		Ee	Ef	Ef	E	
[illegible]	[illegible]																			
Public Beach Areas	405.12				E		E	E	E				E			E		P		
All other Areas	405.12						P	E	E				E			E			P	
[illegible]	[illegible]																			
ISLANDS: NEARSHORE ZONES+																				
[illegible]	[illegible]																			
Begg Rock Nearshore Zone	406.20						E	E	E				E	Eo	Est	E		P	E	
Santa Barbara Island	406.30				E		E	E	E				E	Eo	Est	E		P	E	
[illegible]	[illegible]																			

E: Existing beneficial use
P: Potential beneficial use
I: Intermittent beneficial use
E, P, and I shall be protected as required
* Asterisked MUN designations are designated under SB 88-63 and RB-03 Some designations may be considered for exemptions at a later date (See pages 2-3 and 2-4 for more details).
\+ Nearshore is defined as the zone bounded by the shoreline and a line 1000 feet from the shoreline or the 30-foot depth contours, whichever is further from the shore line.

Footnotes are consistent for all beneficial use tables.

a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries. Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.
b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.
c Coastal waterbodies which are also listed in Inland Surface Waters Table (2-1) or in Wetlands Table (2-4).
e One or more rare species utilize all ocean, bays, estuaries, and coastal wetlands for foraging and/or nesting.
f Aquatic organisms utilize all bays, estuaries, lagoons and coastal wetlands, to a certain extent, for spawning and early development. This may include migration into areas which are heavily influenced by freshwater inputs.
o Marine Habitats of the Channel Islands and Mugu Lagoon serve as pinniped haul-out areas for one or more species (i.e., sea lions).
w These areas are engineered channels. All references to Tidal Prisms in Regional Board documents are functionally equivalent to estuaries.
es Most frequently used grunion spawning beaches. Other beaches may be used as well.
st Areas of Special Biological Significance or ecological reserves.

Table 2-4. Beneficial Uses of Significant Coastal Wetlands *.

WATERSHED[a]	Hydro. Unit No.	MUN	IND	PROC	AGR	GWR	FRSH	NAV	POW	REC1	REC2	COMM	AQUA	WARM	COLD	SAL	EST	MAR	WILD	BIOL	RARE	MIGR	SPWN	SHELL	WET[b]
Ventura River Estuary c	402.10							E		E	E	E		E			E	E	E		Ee	Ef	Ef	E	E
Santa Clara River Estuary c	403.11							E		E	E	E					E	E	E		Ee	Ef	Ef		E
Mugu Lagoon c	403.11							E		Pn	E	Ed					E	E	Eo	E	Ee,p	Ef	Ef	Ed	E
Dume Lagoon c	403.36							E		E	E	E					E		E		Ee	Pf	Pf		E
Ballona Lagoon/Venice Canals c	405.13							E		E	E	E					E	E	E		Ee	Ef	Ef	E	E
Ballona Wetlands c	405.13									E	E						E		E		Ee	Ef	Ef		E

* This list may not be all inclusive. More areas may be added as information becomes available.

E: Existing beneficial use

P: Potential beneficial use

I: Intermittent beneficial use

E, P, and I shall be protected as required

Footnotes are consistent for all beneficial use tables.

a Waterbodies are listed multiple times if they cross hydrologic area or subarea boundaries. Beneficial use designations apply to all tributaries to the indicated waterbody, if not listed separately.

b Waterbodies designated as WET may have wetlands habitat associated with only a portion of the waterbody. Any regulatory action would require a detailed analysis of the area.

c Coastal waterbodies which are also listed in Inland Surface Waters Table (2-1) or in Coastal Features Table (2-3).

d Limited public access precludes full utilization.

e One or more rare species utilize all ocean, bays, estuaries, and coastal wetlands for foraging and/or nesting.

f Aquatic organisms utilize all bays, estuaries, lagoons and coastal wetlands, to a certain extent, for spawning and early development. This may include migration into areas which are heavily influenced by freshwater inputs.

n Area is currently under control of the Navy: swimming is prohibited.

o Marine Habitats of the Channel Islands and Mugu Lagoon serve as pinniped haul-out areas for one or more species (i.e., sea lions).

p Habitat of the Clapper Rail.

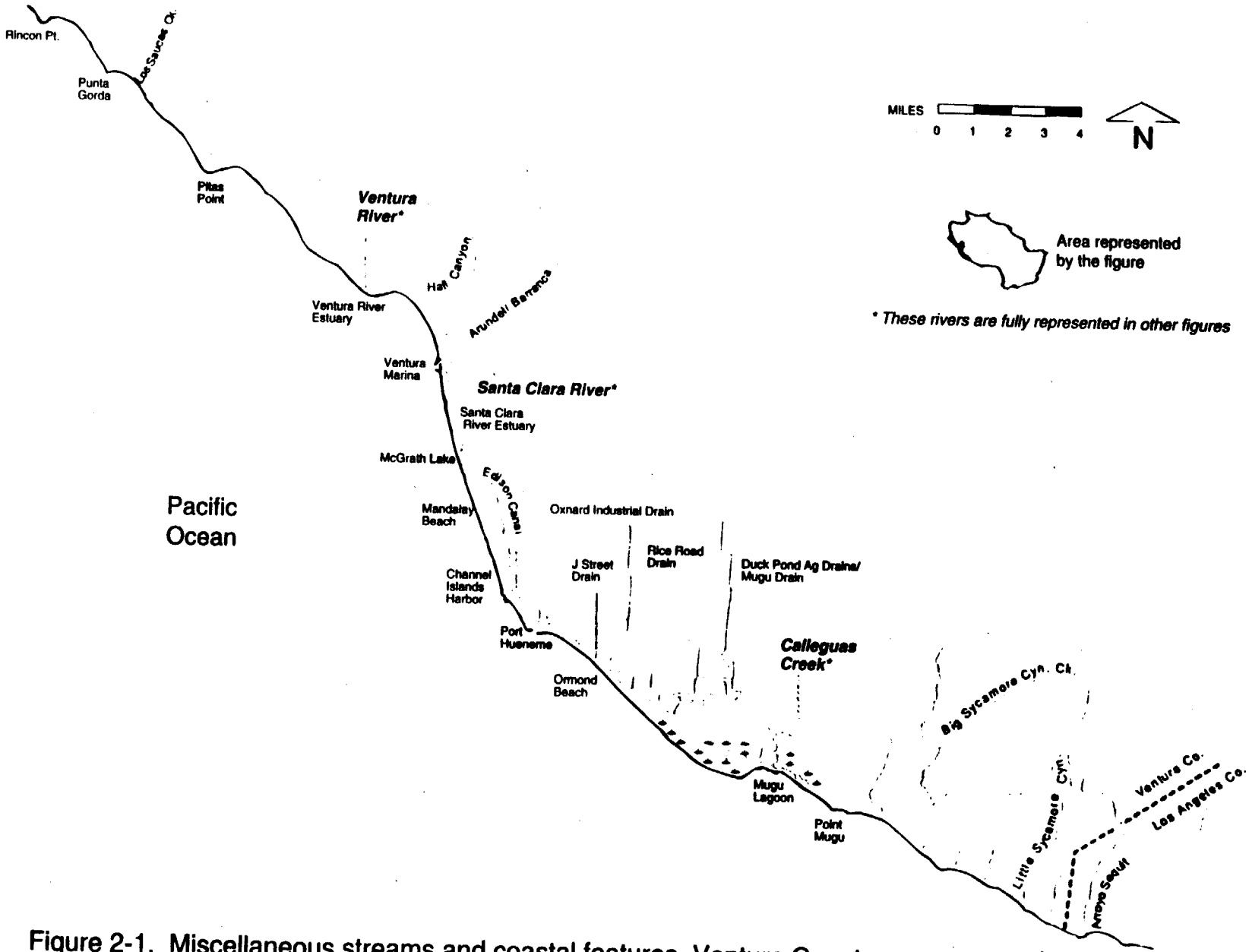


Figure 2-1. Miscellaneous streams and coastal features, Ventura County.

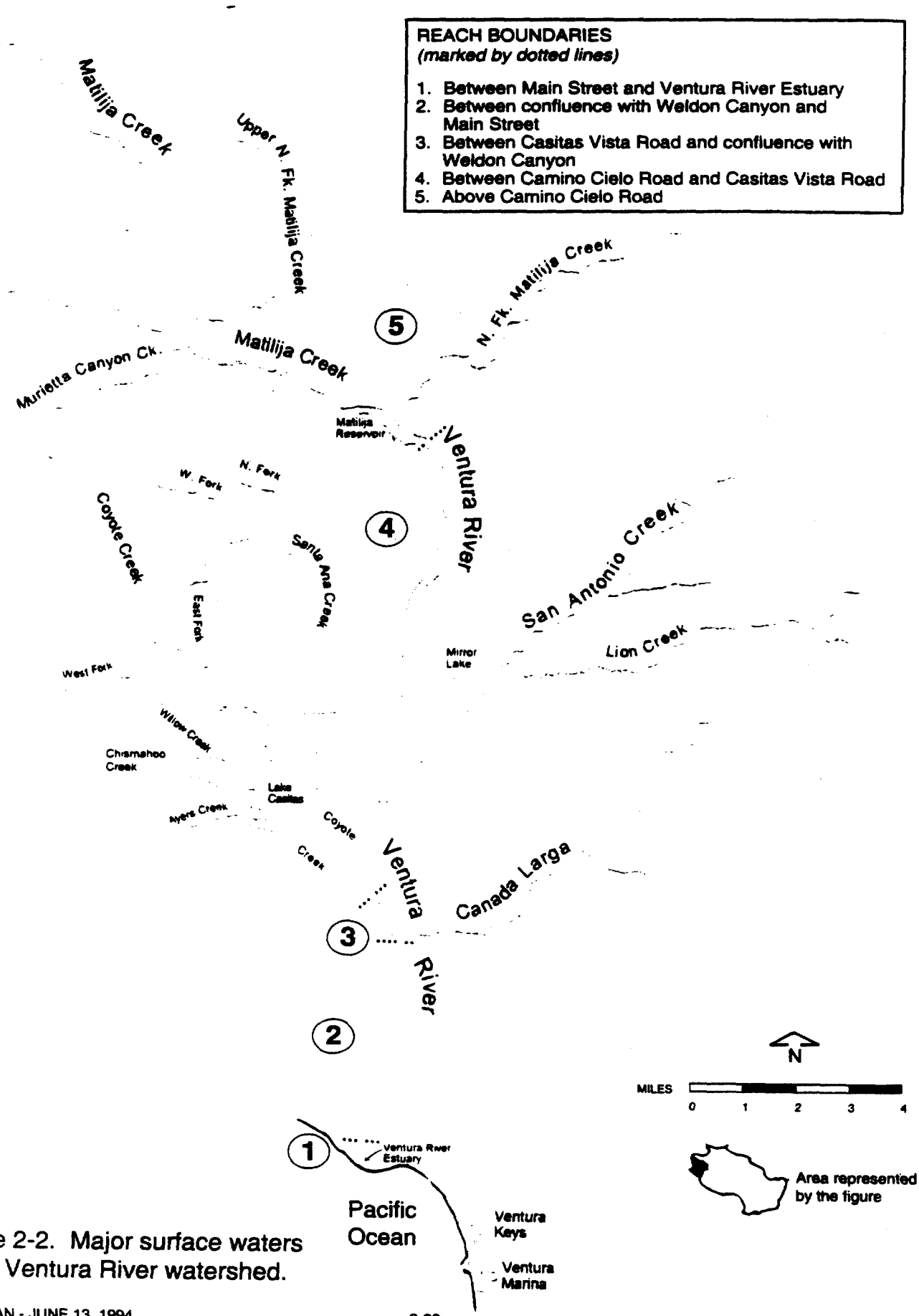


Figure 2-2. Major surface waters of the Ventura River watershed.

REACH BOUNDARIES
(marked by dotted lines)

SANTA CLARA RIVER

1. Between Highway 101 Bridge and Santa Clara River Estuary
2. Between Freeman Diversion "Dam" near Saticoy and Highway 101 Bridge
3. Between A Street, Fillmore and Freeman Diversion "Dam" near Saticoy
4. Between Blue Cut gaging station (approx. 1 mile west of LA/Ventura county line) and A Street, Fillmore
5. Between West Pier Highway 99 and Blue Cut gaging station
6. Between Bouquet Canyon Road Bridge and West Point Highway 99
7. Between Lang gaging station and Bouquet Canyon Road Bridge
8. Above Lang gaging station
9. SANTA PAULA CREEK above Santa Paula Water Works Diversion Dam
10. SESPE CREEK above gaging station, 500' downstream from Little Sespe Creek
11. PIRU CREEK above gaging station below Santa Felicia Dam

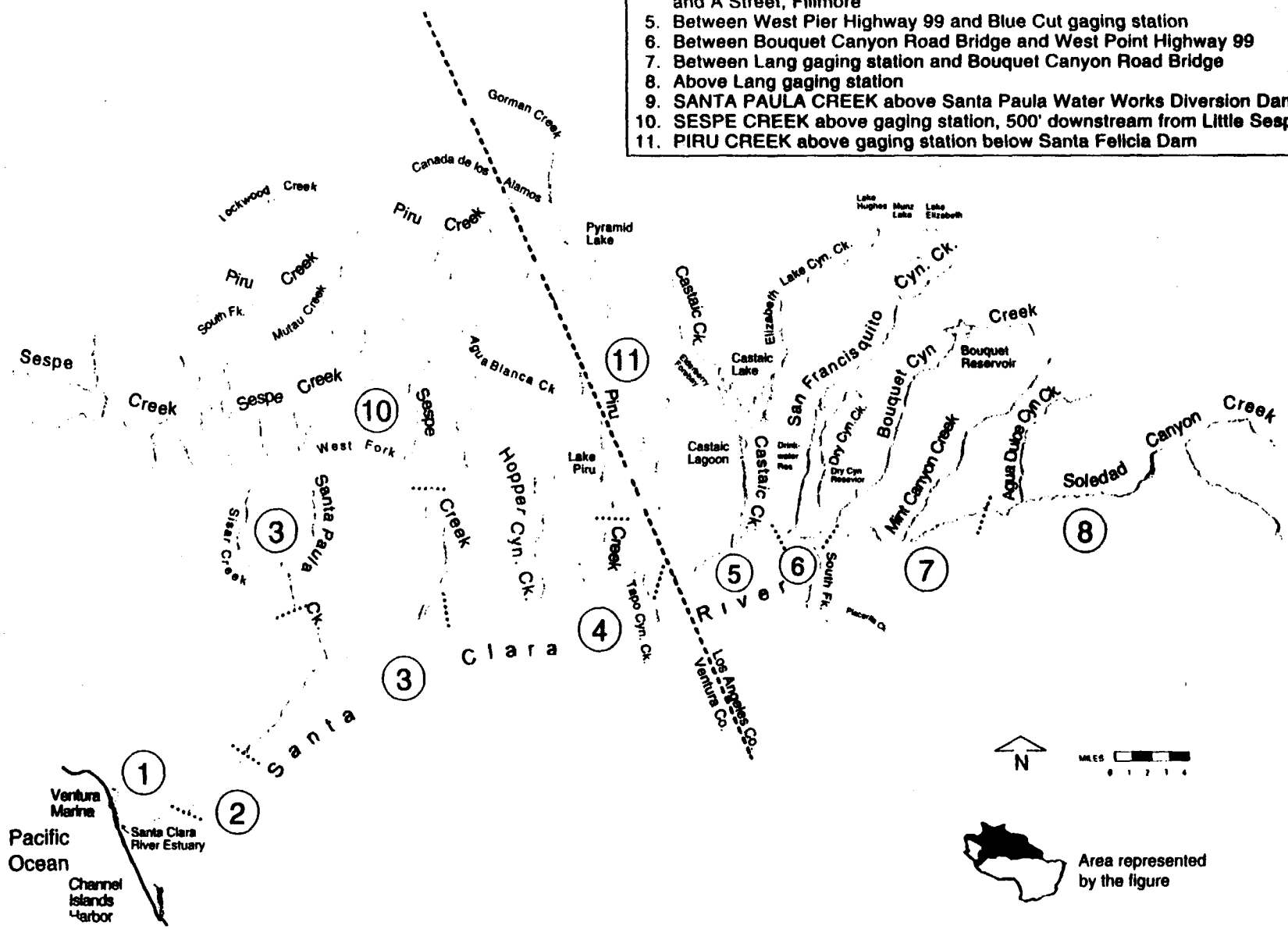


Figure 2-3. Major surface waters of the Santa Clara River watershed.

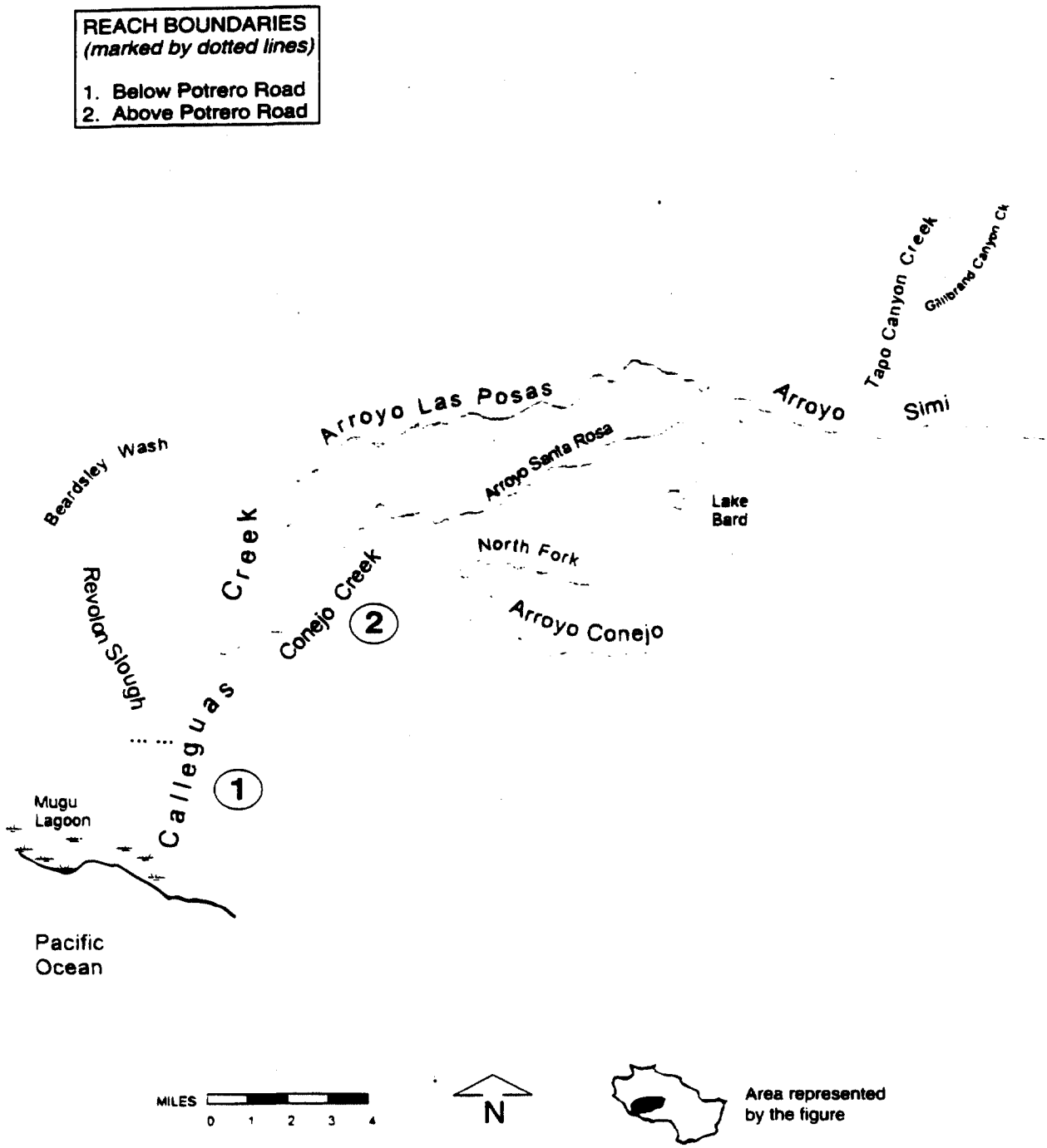


Figure 2-4. Major surface waters of the Calleguas-Conejo Creek watershed.

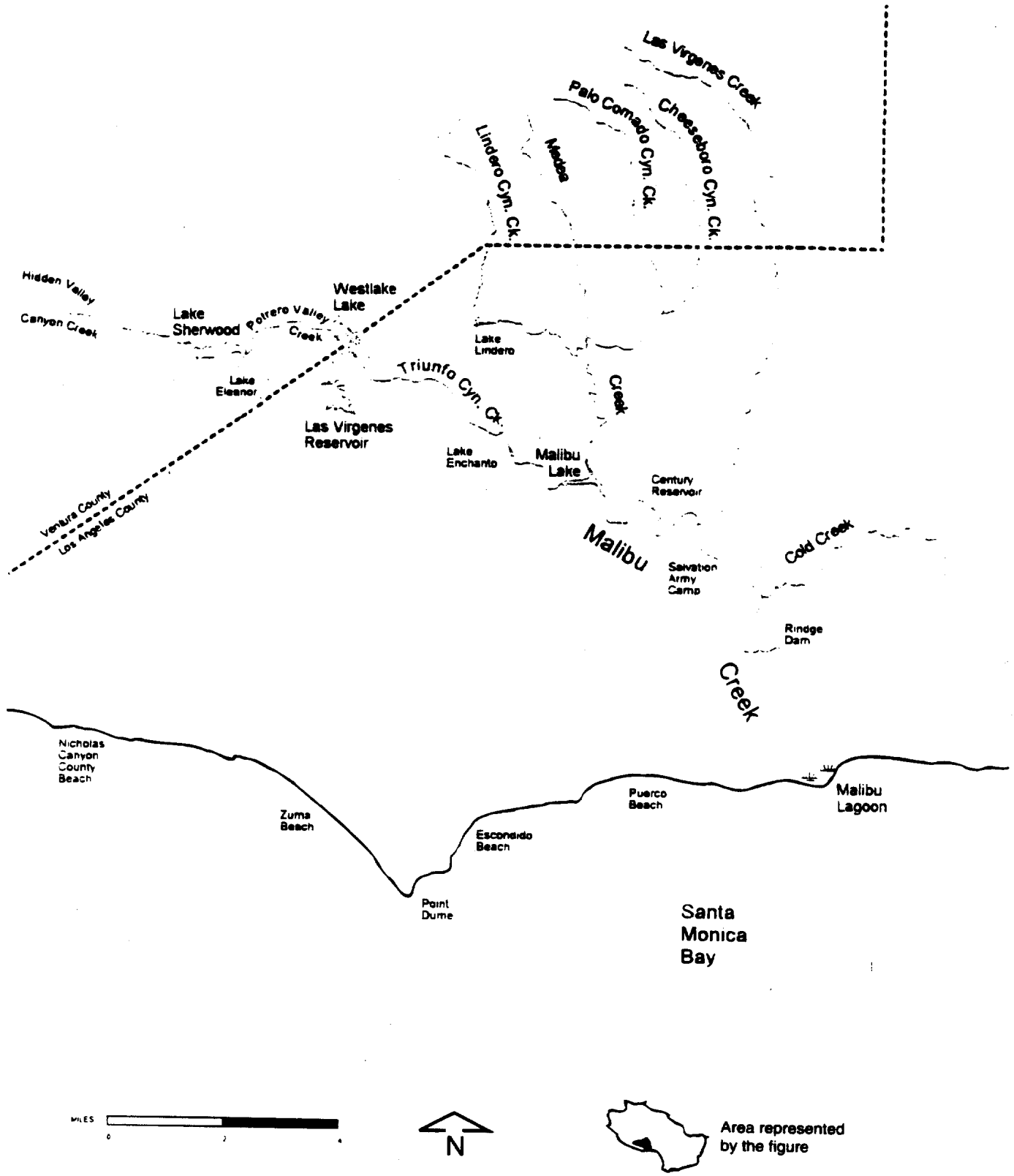
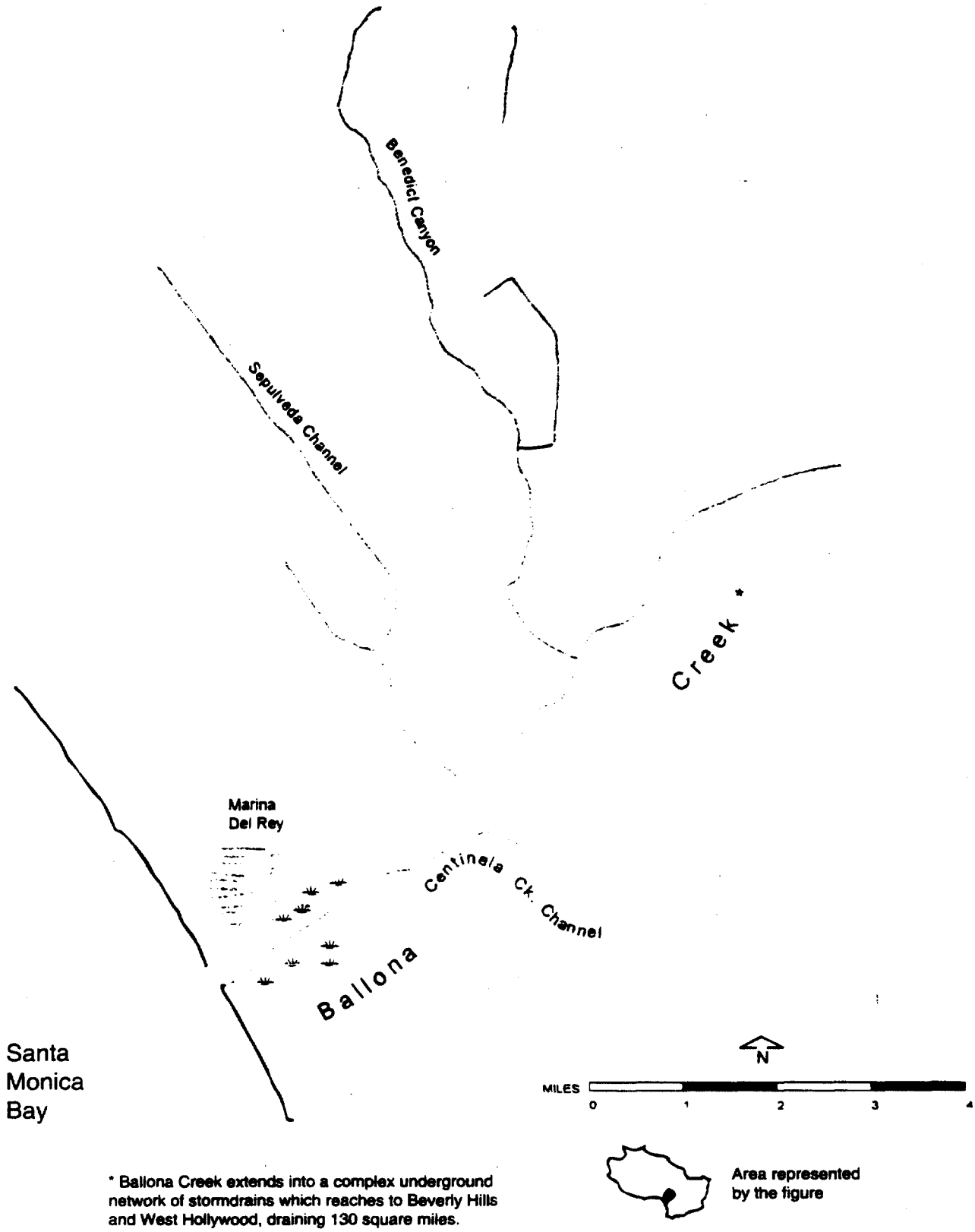


Figure 2-5. Major surface waters of the Malibu Creek watershed.



* Ballona Creek extends into a complex underground network of stormdrains which reaches to Beverly Hills and West Hollywood, draining 130 square miles.

Figure 2-6. Major surface waters of the Ballona Creek watershed.

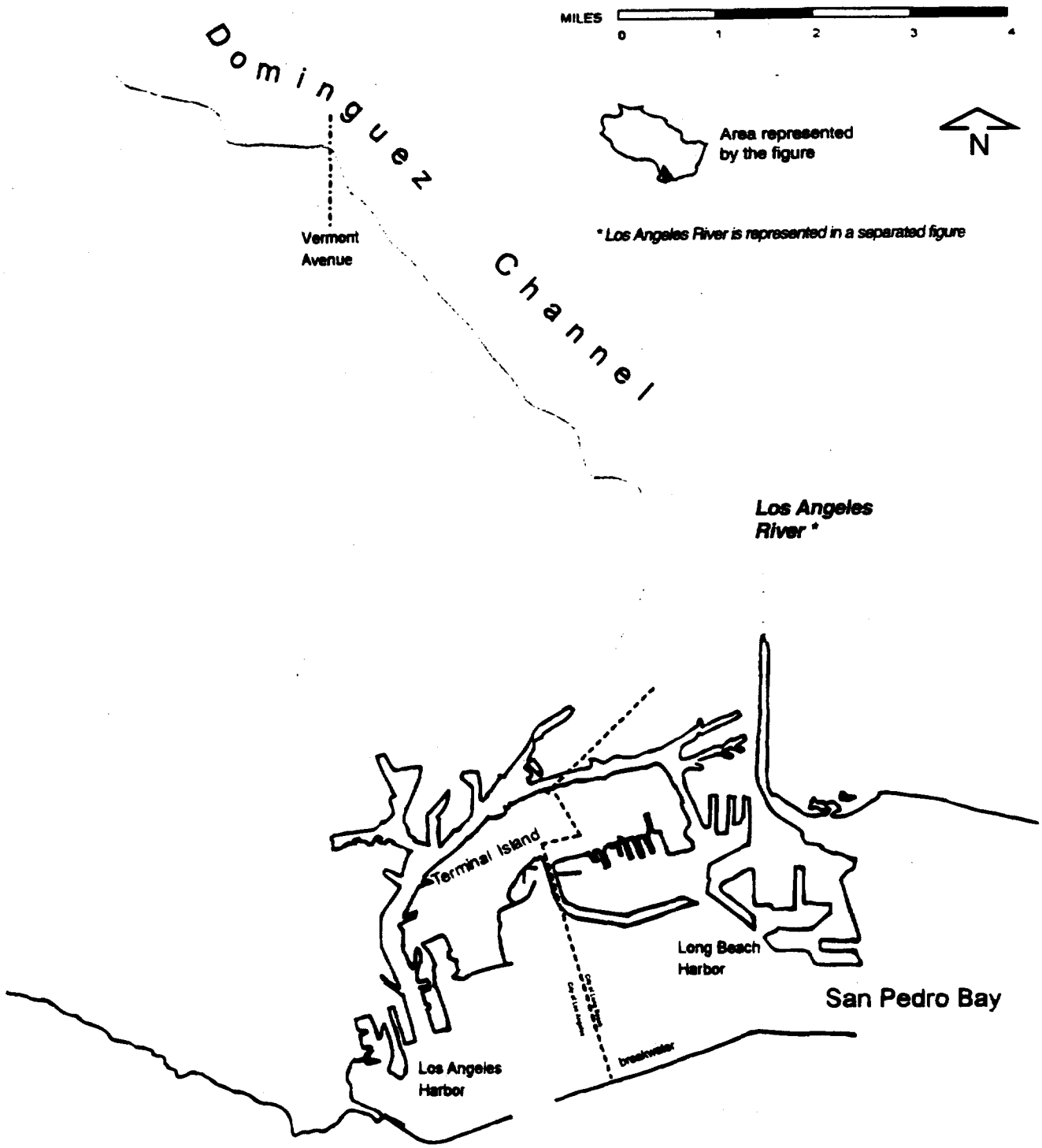


Figure 2-7. Major surface waters of the Dominguez Channel watershed.

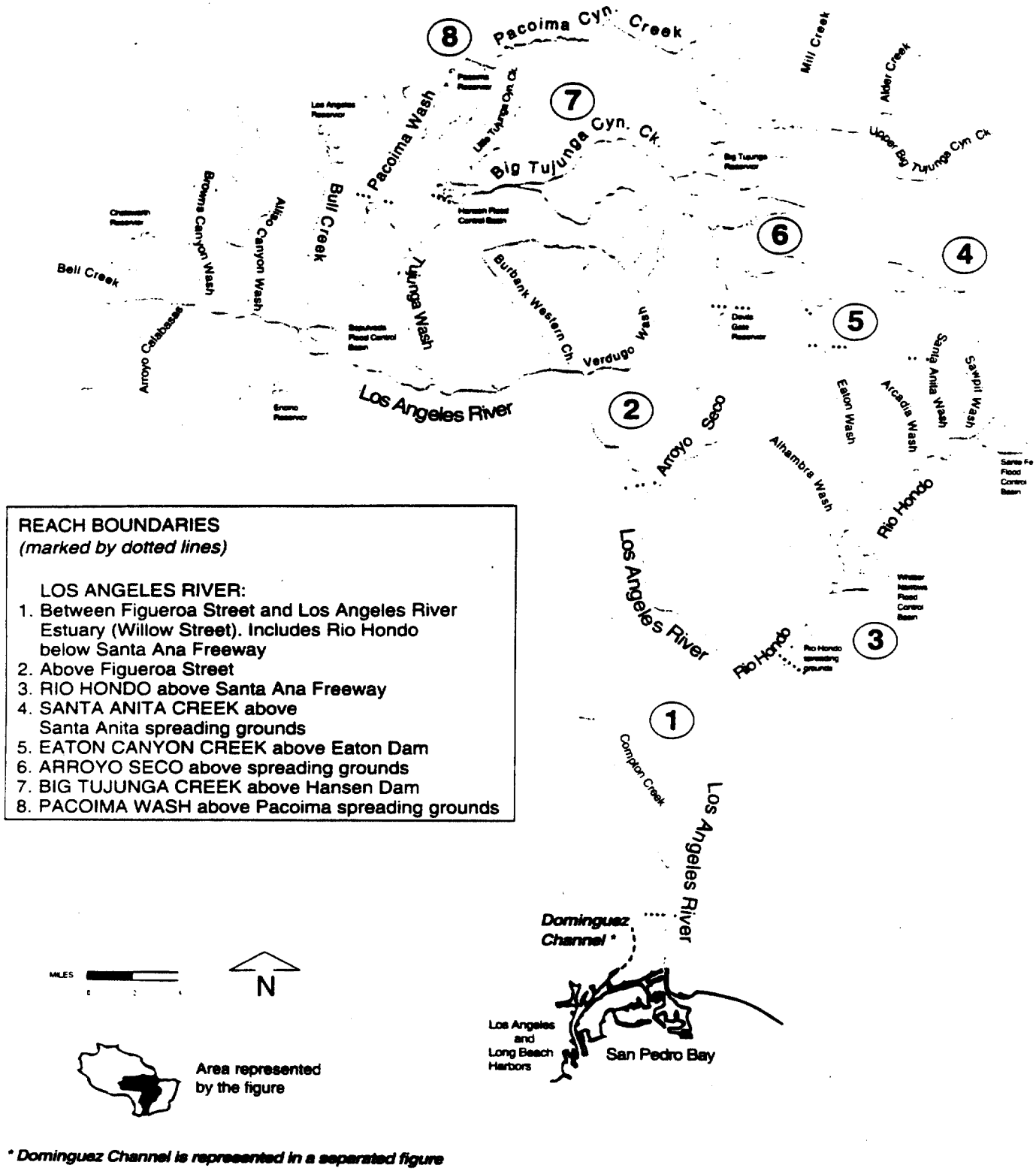


Figure 2-8. Major surface waters of the Los Angeles River watershed.

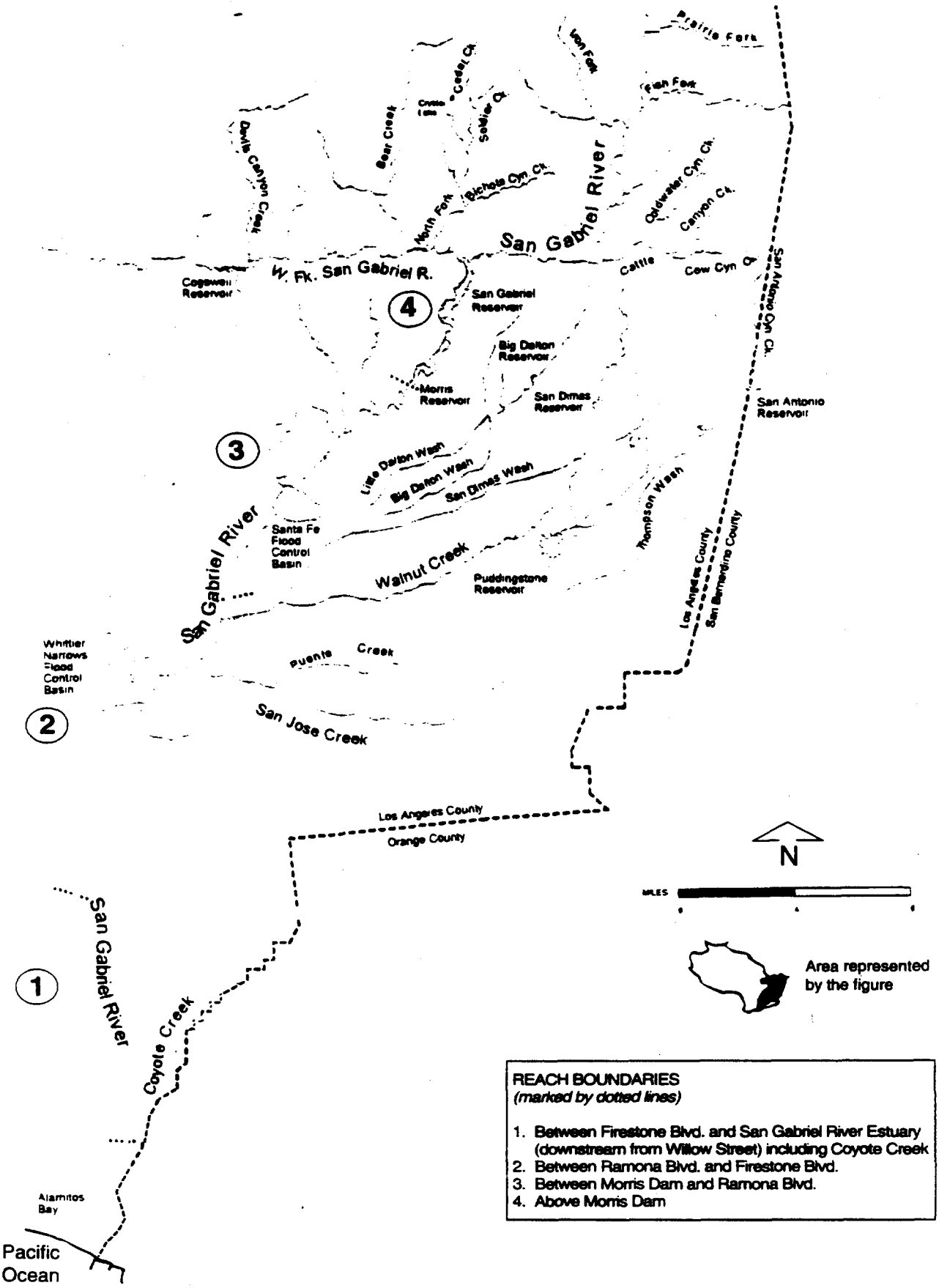


Figure 2-9. Major surface waters of the San Gabriel River watershed.

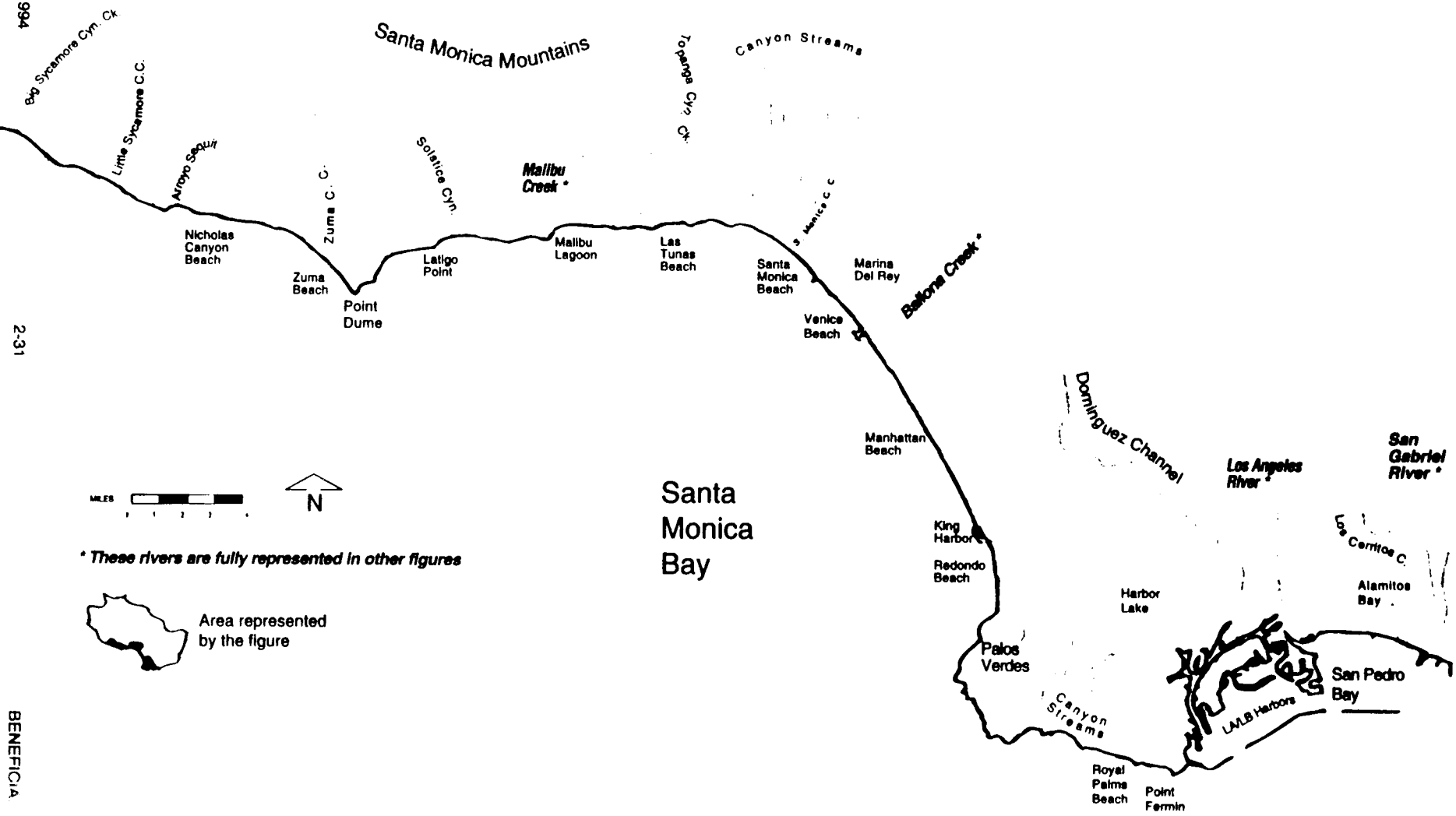


Figure 2-10. Miscellaneous streams and coastal features, Los Angeles County.

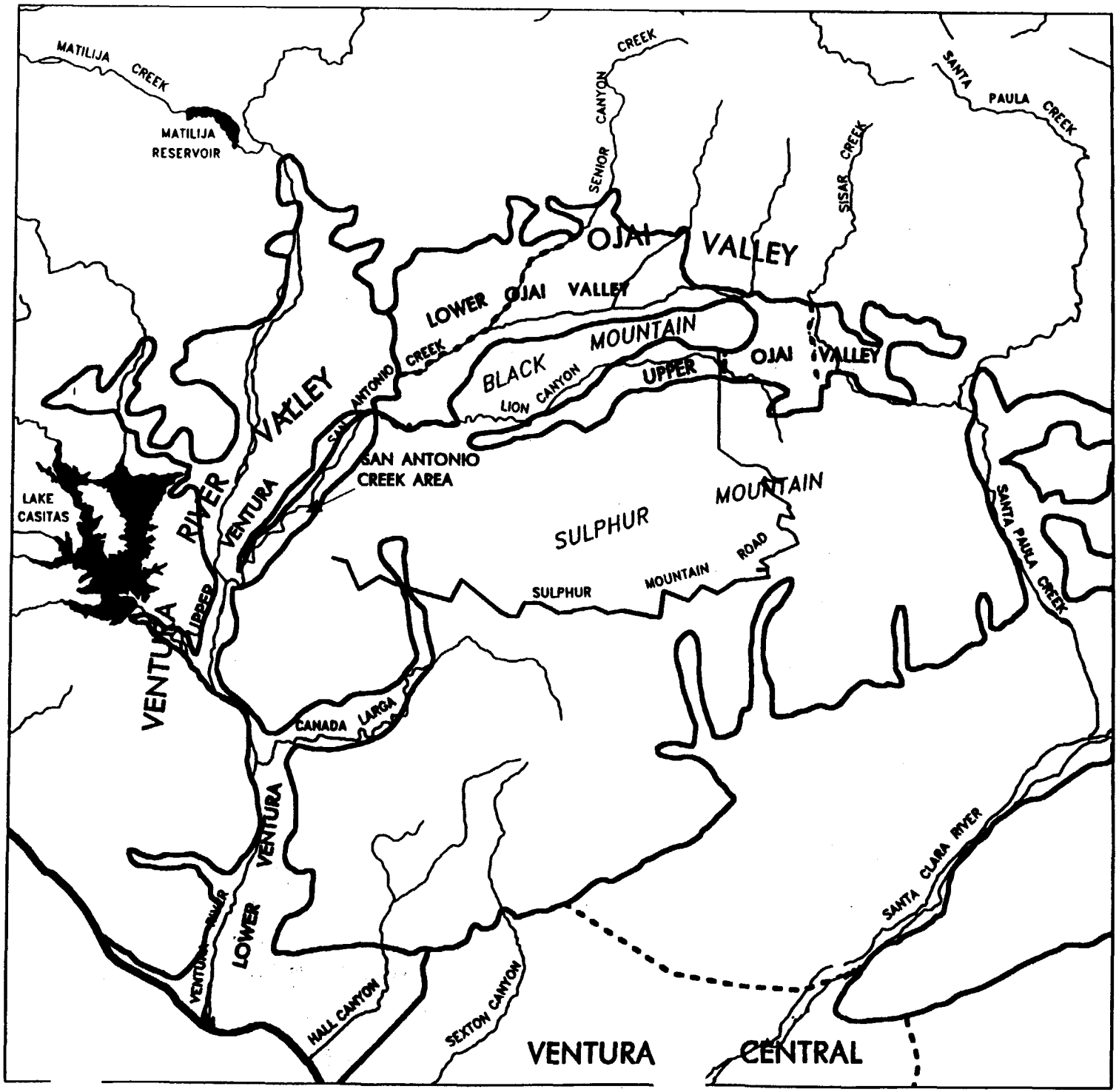


FIGURE 2-11

OJAI VALLEY AND VENTURA RIVER VALLEY GROUNDWATER BASINS

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

REGIONAL BOUNDARY

STREAMS

N

Miles

0 2 4

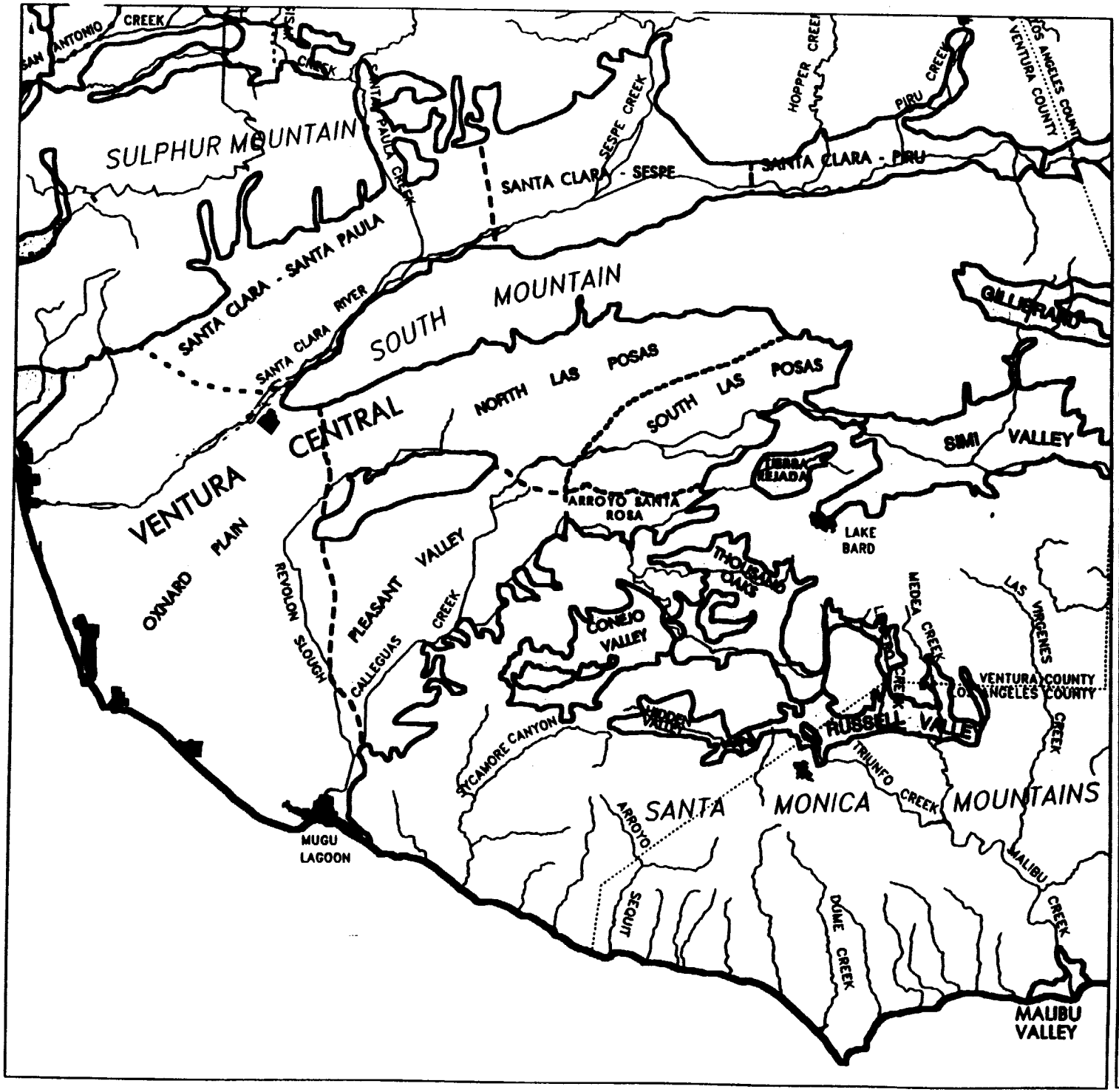


FIGURE 2-12

VENTURA CENTRAL GROUNDWATER BASINS

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION (4)

REGIONAL BOUNDARY

STREAMS

COUNTY LINE

SPREADING GROUNDS

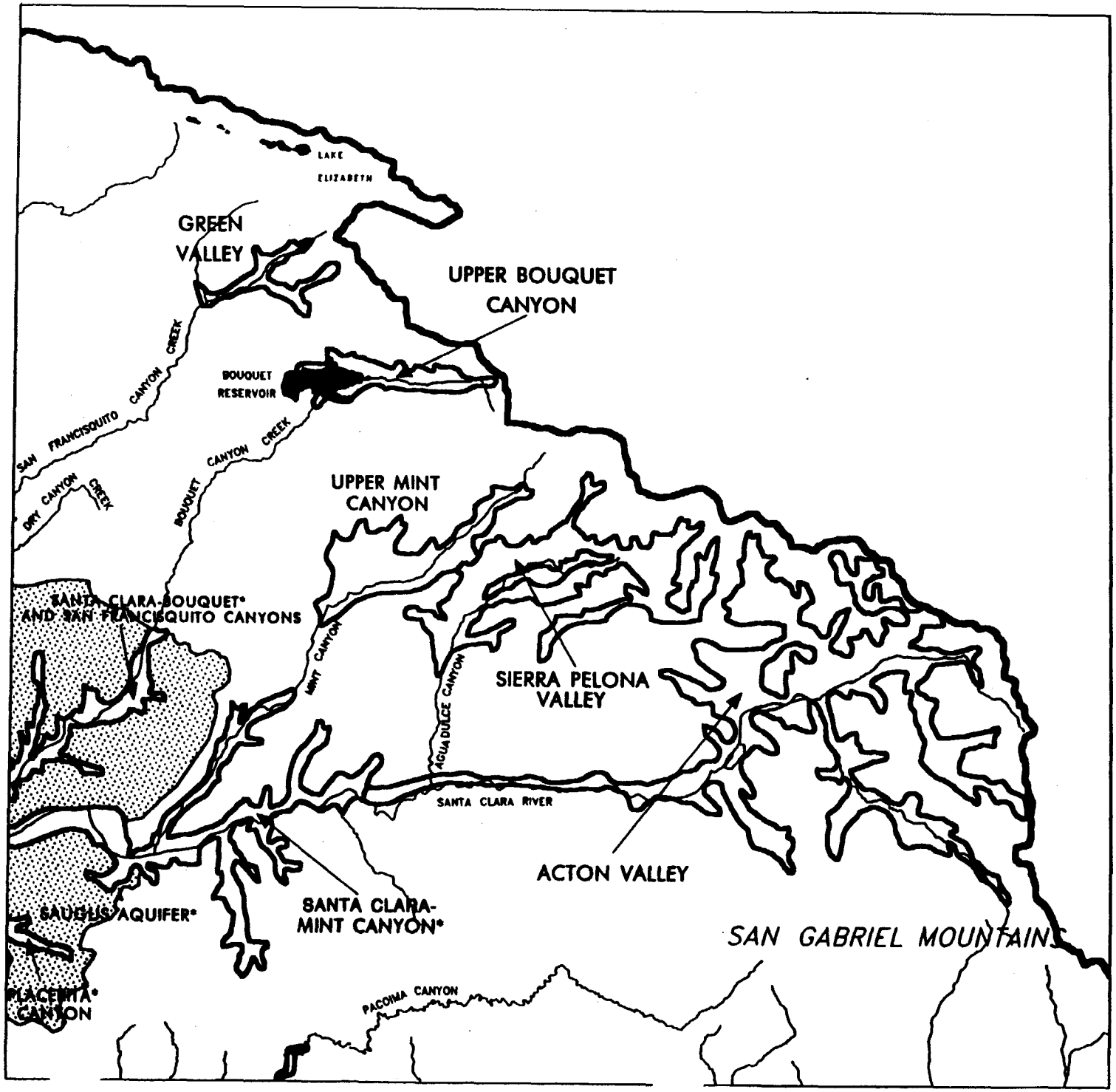


FIGURE 2-13

UPPER SANTA CLARA GROUNDWATER BASINS

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

REGIONAL BOUNDARY

STREAMS

* SAUGUS AQUIFER, SANTA CLARA-BOUQUET, SAN FRANCISQUITO, SANTA CLARA-MINT AND THE PLACERITA CANYON BELONG TO THE EASTERN SANTA CLARA GROUNDWATER BASINS

N

Miles

0 2 4

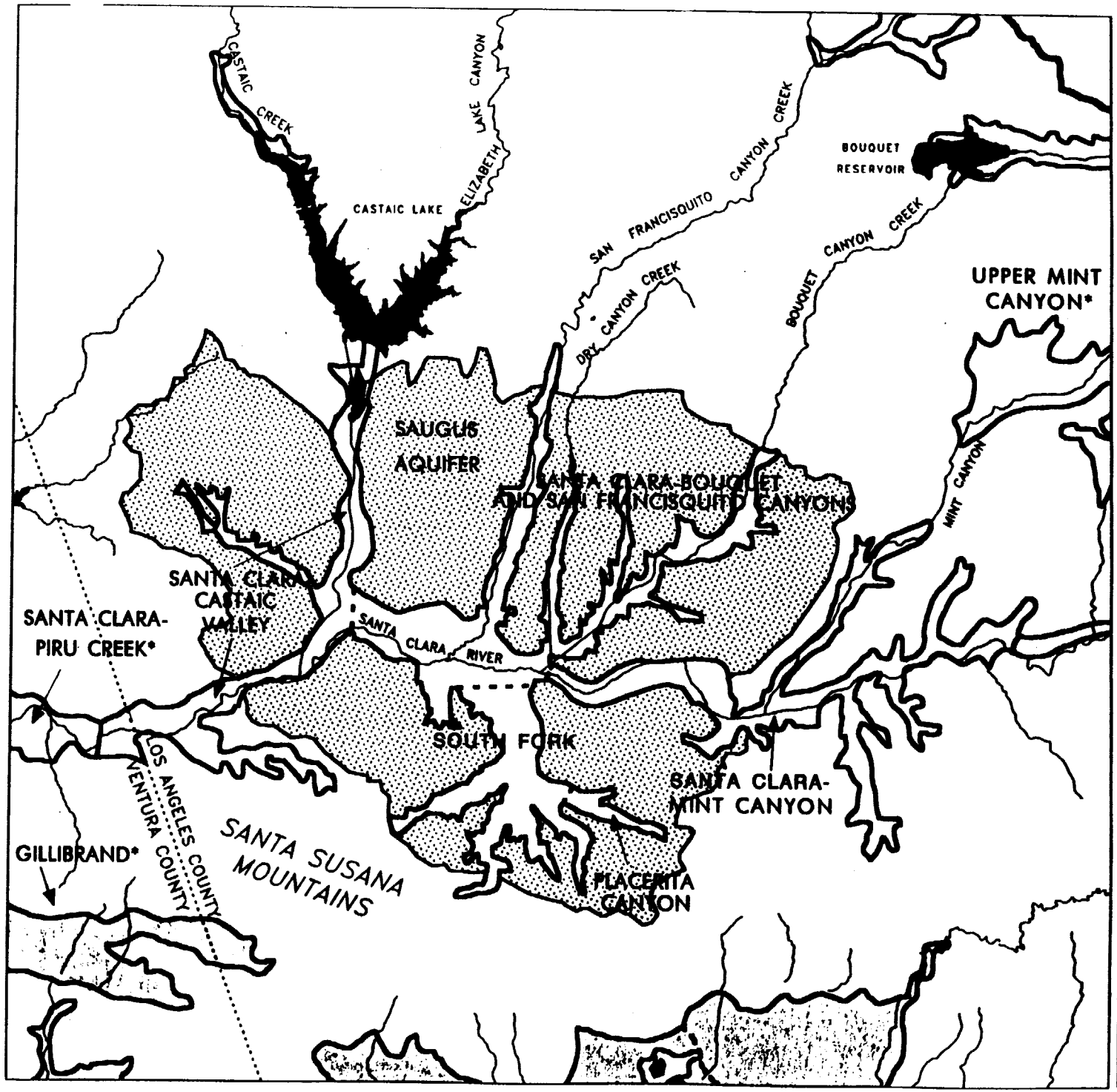


FIGURE 2-14

EASTERN SANTA CLARA GROUNDWATER BASINS

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

REGIONAL BOUNDARY

STREAMS

COUNTY LINE

* UPPER MINT CANYON IS PART OF THE UPPER SANTA CLARA BASINS.

SANTA CLARA-PIRU IS PART OF THE VENTURA CENTRAL BASINS.

GILLIBRAND IS PART OF VENTURA CENTRAL BASINS.

N

Miles

0 2 4

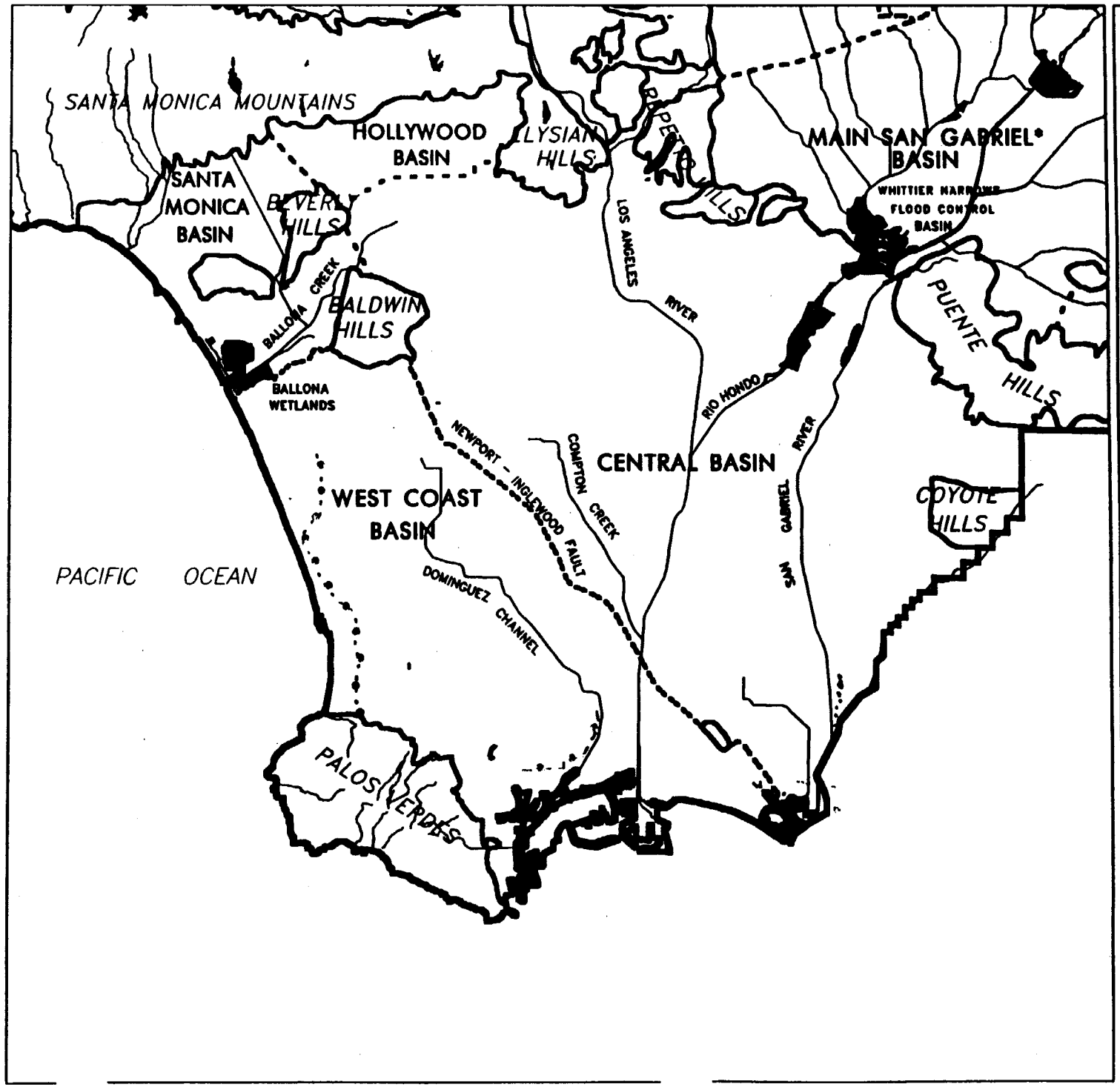


FIGURE 2-15

LOS ANGELES COASTAL GROUNDWATER BASINS

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION (4)

REGIONAL BOUNDARY

STREAMS

SPREADING GROUNDS

BARRIER INJECTION WELLS

*THE MAIN SAN GABRIEL BASIN IS A PART OF THE SAN GABRIEL VALLEY GROUNDWATER BASINS.

N

Miles

0 2 4

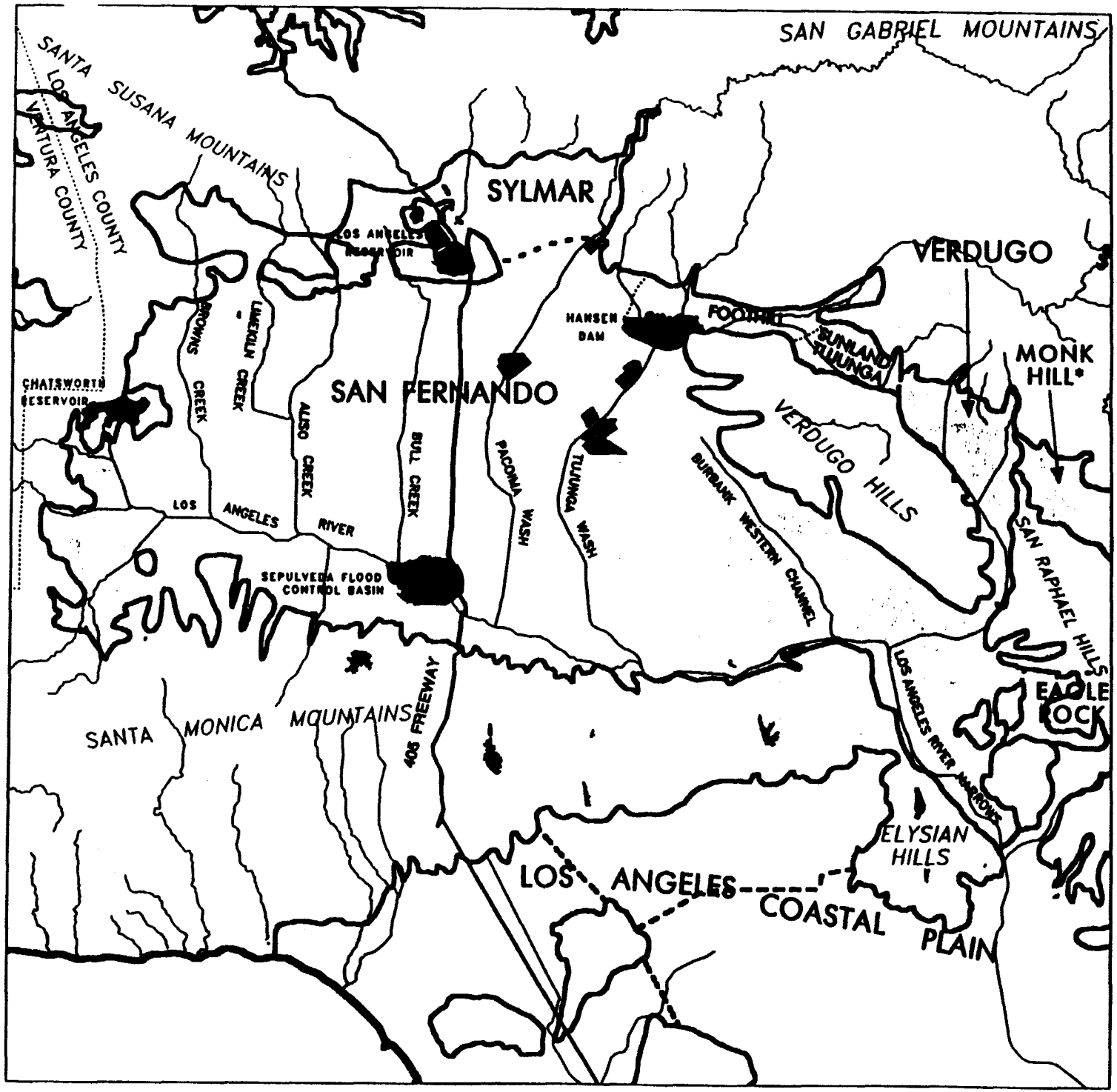


FIGURE 2-16

SAN FERNANDO VALLEY GROUNDWATER BASINS

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

REGIONAL BOUNDARY

STREAMS

COUNTY LINE

SPREADING GROUNDS

* MONK HILL IS A PART OF THE RAYMOND GROUNDWATER BASIN

N

Miles

0 2 4

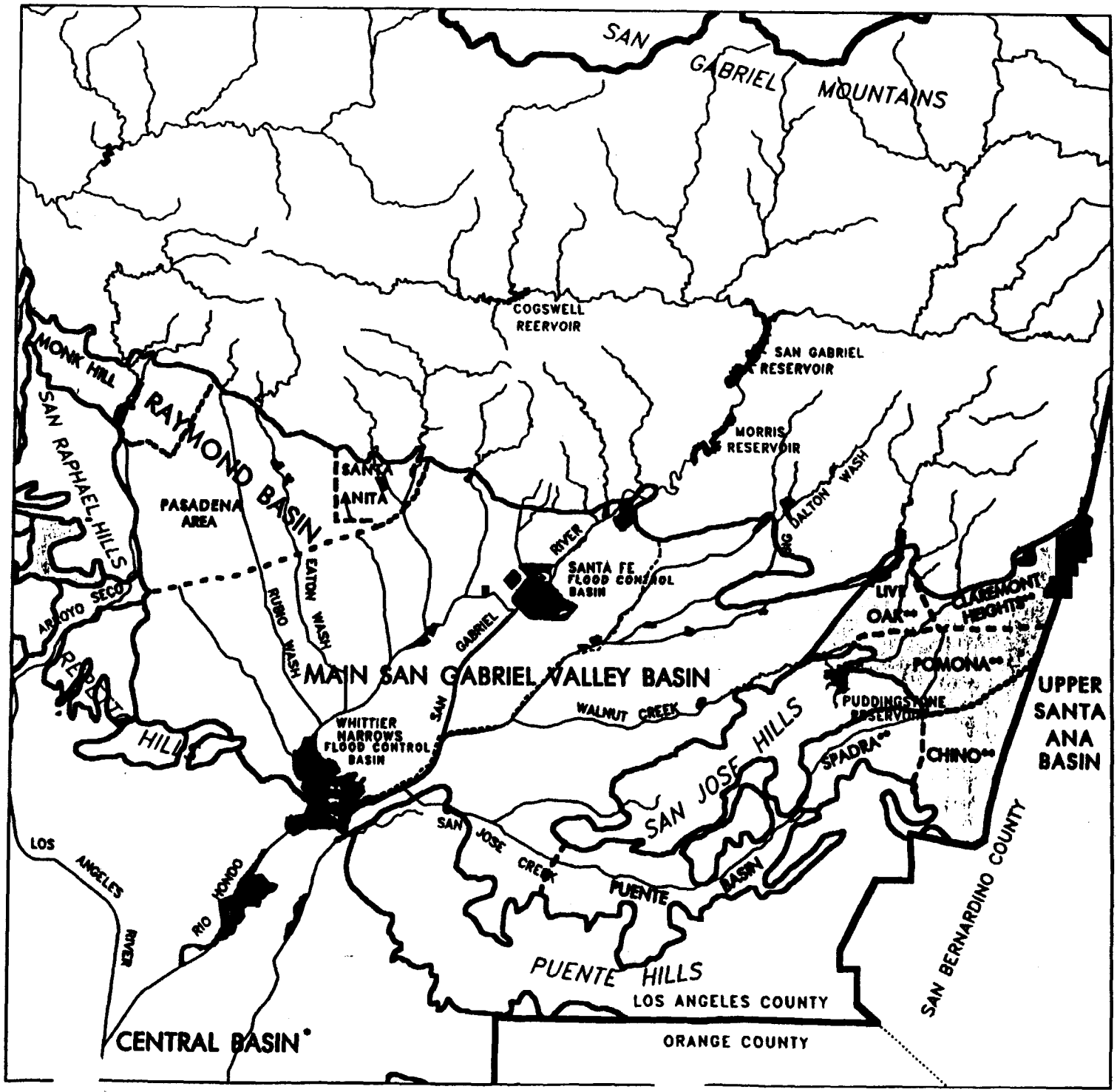


FIGURE 2-17

SAN GABRIEL VALLEY AND UPPER SANTA ANA VALLEY GROUNDWATER BASINS

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION (4)

REGIONAL BOUNDARY

STREAMS

SPREADING GROUNDS

* CENTRAL BASIN IS A PART OF THE LA COASTAL PLAIN.

** LIVE OAK, CLAREMONT HEIGHTS POMONA, SPADRA AND CHINO ARE PART OF THE UPPER SANTA ANA VALLEY GROUNDWATER BASIN

N

Miles

0 2 4

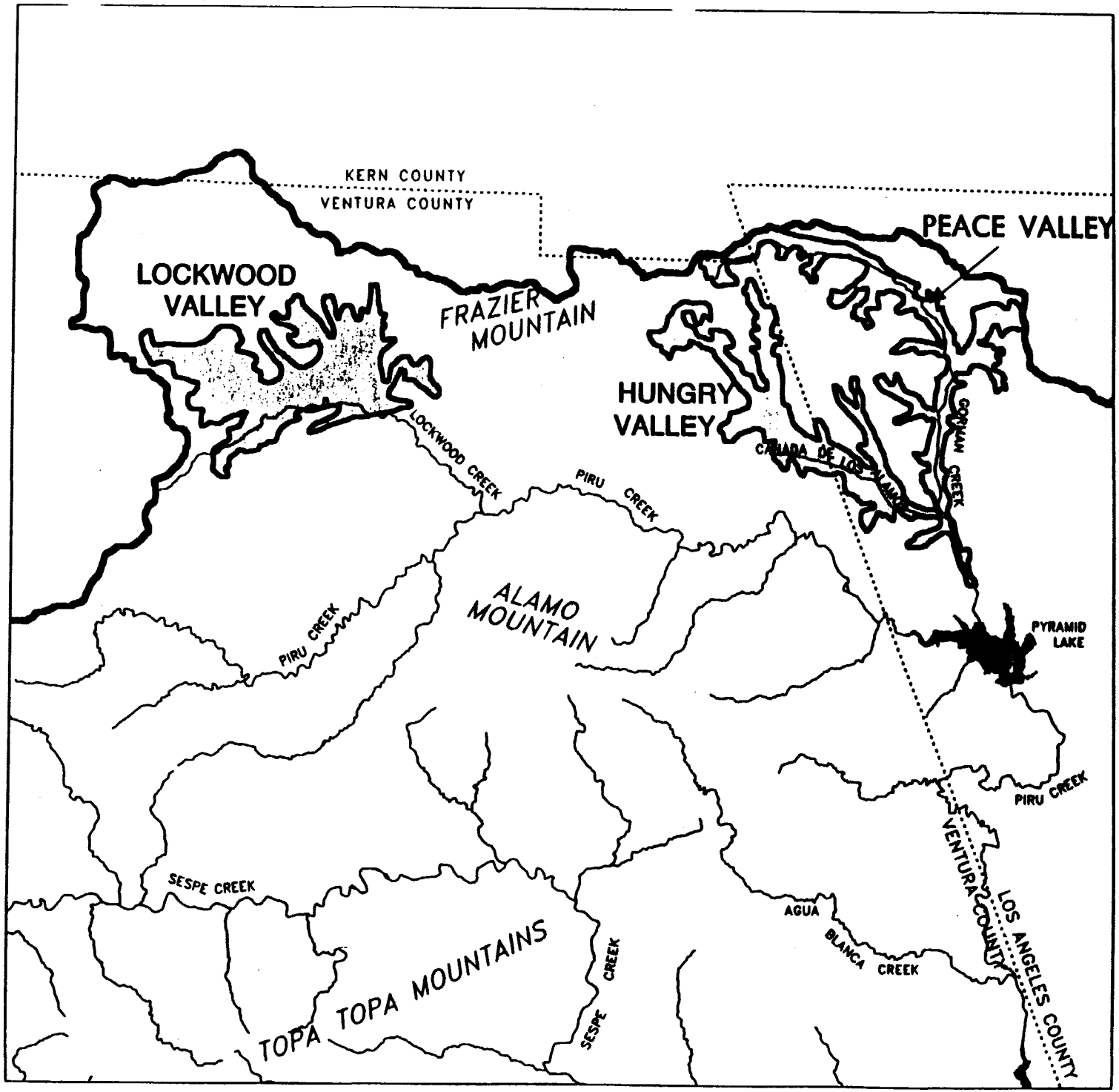


FIGURE 2-18

LOCKWOOD VALLEY
HUNGRY VALLEY
PEACE VALLEY
GROUNDWATER BASINS

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

REGIONAL BOUNDARY

STREAMS

COUNTY LINE

N

Miles

0 2 4

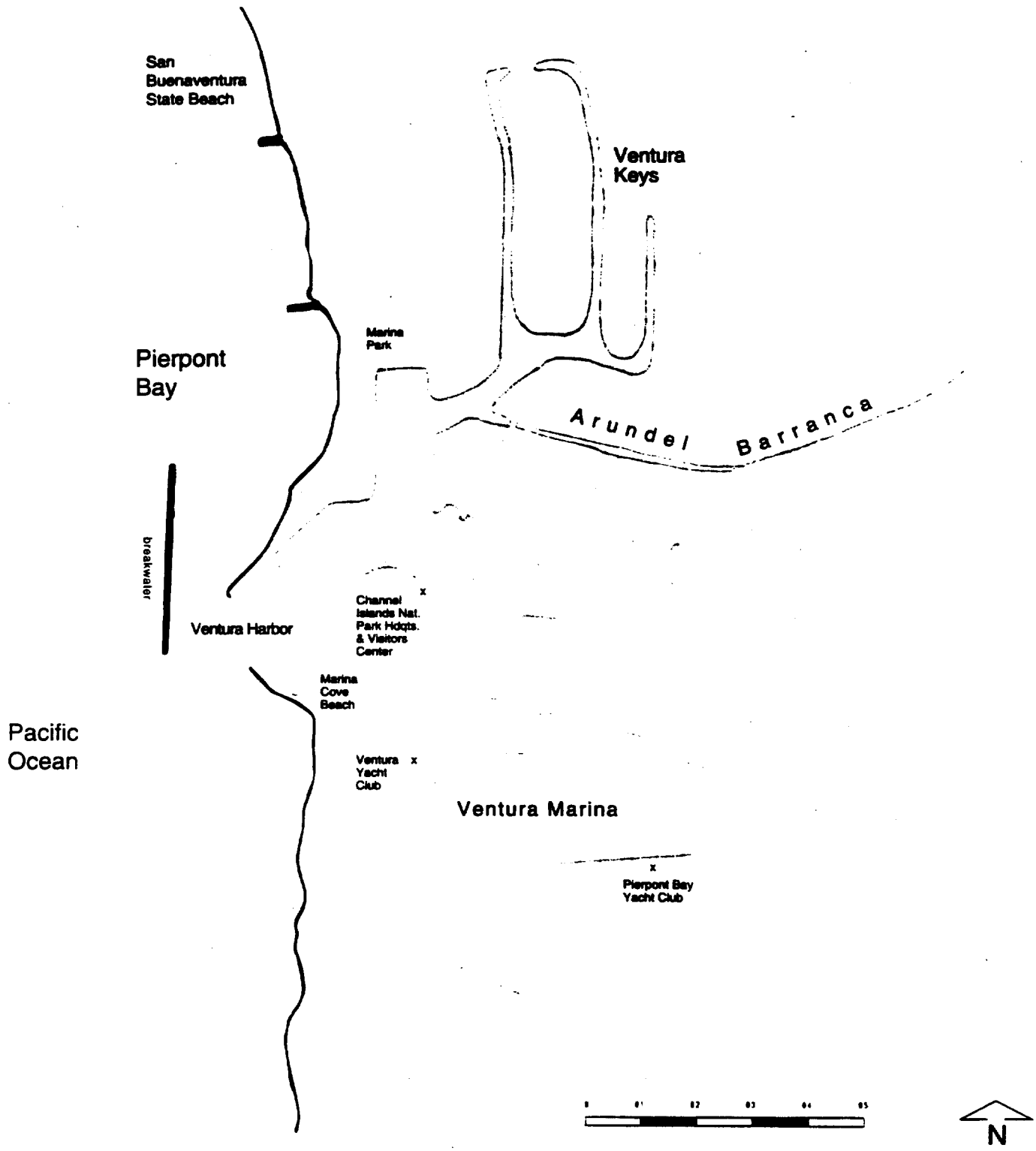


Figure 2-19. Ventura Harbor, Marina, and Keys.

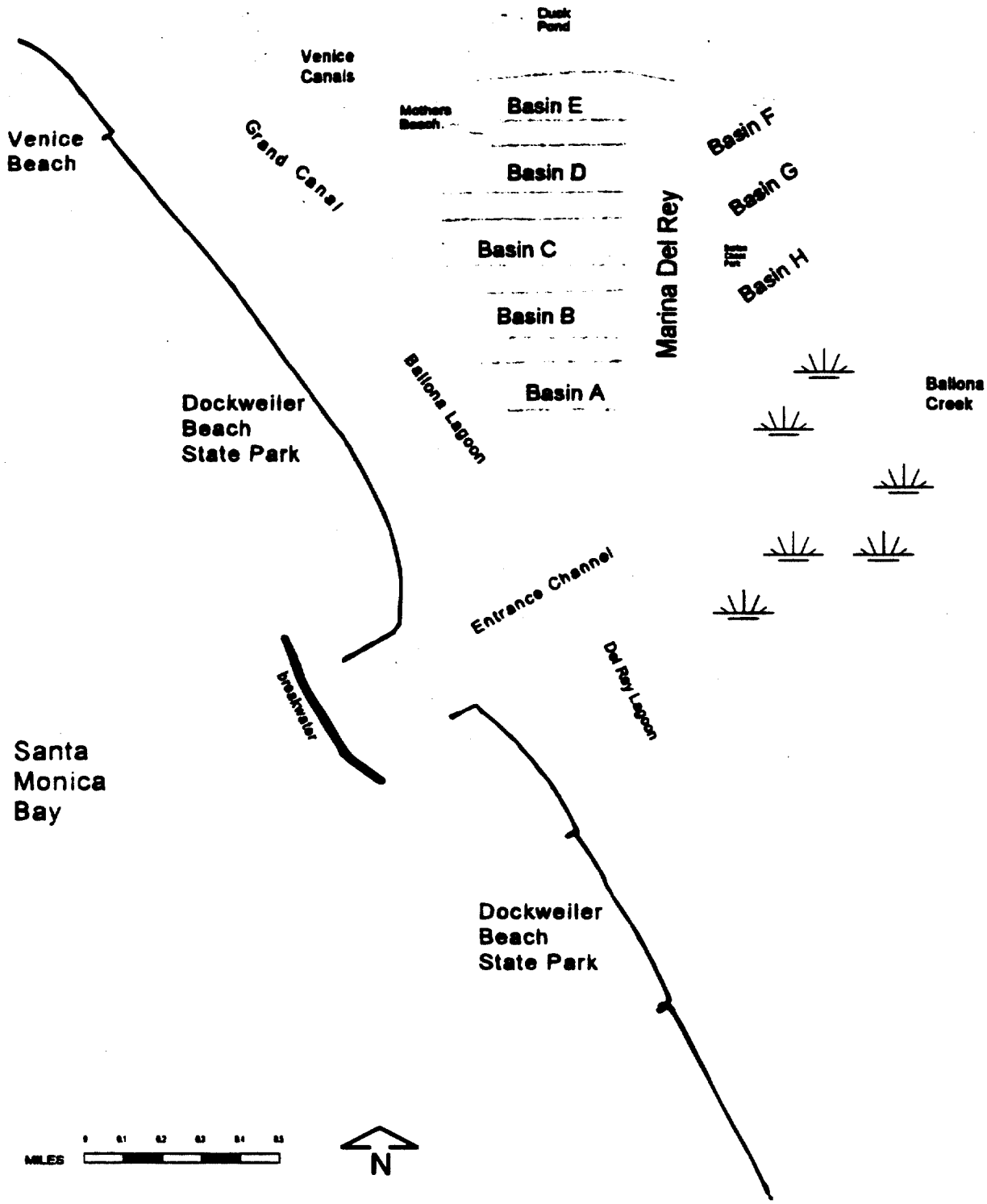
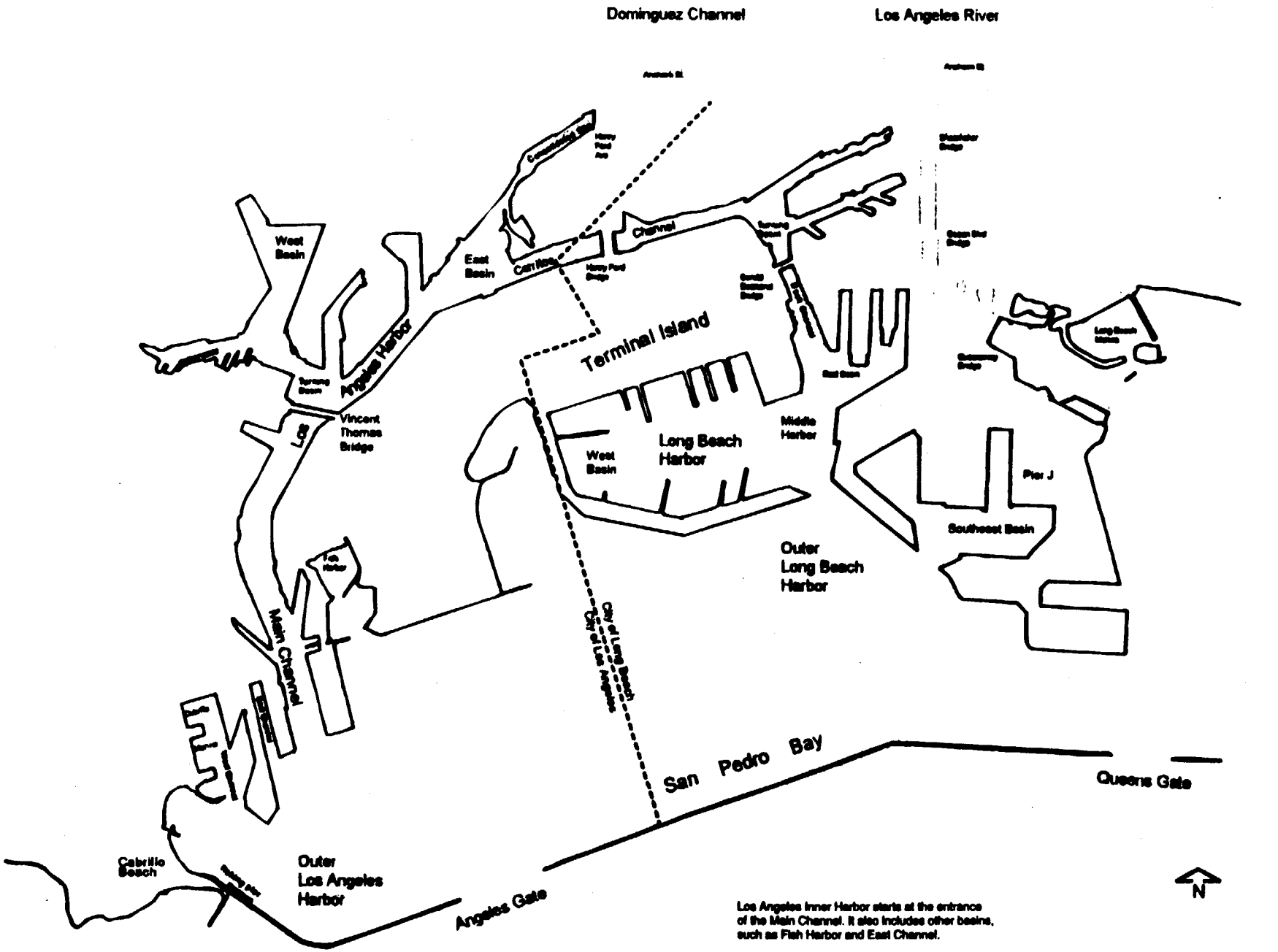


Figure 2-20. Marina Del Rey.



Los Angeles Inner Harbor starts at the entrance of the Main Channel. It also includes other basins, such as Fish Harbor and East Channel.

Long Beach Inner Harbor starts at the entrance of the Middle Harbor. It also includes other basins, such as Southeast Basin.

Figure 2-21. Los Angeles Harbor and Long Beach Harbor.

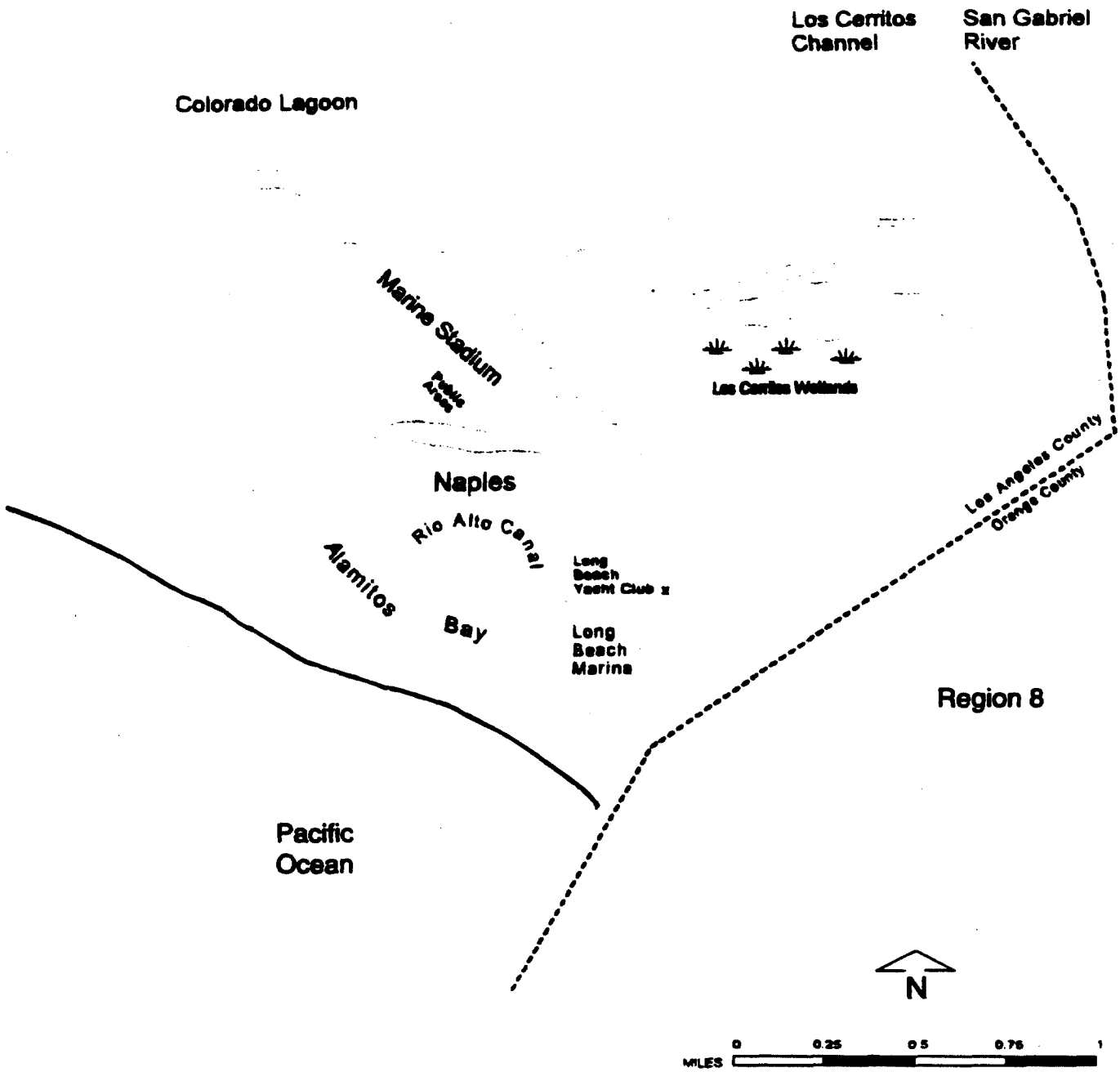


Figure 2-22. Alamitos Bay.

3

3. WATER QUALITY OBJECTIVES

Table of Contents

Introduction 3-1

Statement of Policy with Respect to Maintaining High Quality of Waters in California 3-1

Regional Objectives for Inland Surface Waters 3-3
- Ammonia 3-3
- Bacteria, Coliform 3-3
- Bioaccumulation 3-8
- Biochemical Oxygen Demand (BOD_5) 3-8
- Biostimulatory Substances 3-8
- Chemical Constituents 3-8
- Chlorine, Total Residual 3-9
- Color 3-9
- Exotic Vegetation 3-9
- Floating Material 3-9
- Methylene Blue Activated Substances (MBAS) 3-11
- Mineral Quality 3-11
- Nitrogen (Nitrate, Nitrite) 3-11
- Oil and Grease 3-11
- Oxygen, Dissolved (DO) 3-11
- Pesticides 3-15
- pH 3-15
- Polychlorinated Biphenyls (PCBs) 3-15
- Radioactive Substances 3-15
- Solid, Suspended, or Settleable Materials 3-16
- Taste and Odor 3-16
- Temperature 3-16
- Toxicity 3-16
- Turbidity 3-17

Regional Narrative Objectives for Wetlands 3-17
- Hydrology 3-17
- Habitat 3-17

Regional Objectives for Ground Waters 3-17
- Bacteria 3-18
- Chemical Constituents and Radioactivity 3-18
- Mineral Quality 3-18
- Nitrogen (Nitrate, Nitrite) 3-18
- Taste and Odor 3-18

Statewide Objectives for Ocean Waters 3-22

Site Specific Objectives 3-22

Introduction

The Clean Water Act (§303) requires states to develop water quality standards for all waters and to submit to the USEPA for approval all new or revised water quality standards which are established for inland surface and ocean waters. Water quality standards consist of a combination of beneficial uses (designated in Chapter 2) and water quality objectives (contained in this Chapter).

In addition to the federal mandate, the California Water Code (§13241) specifies that each Regional Water Quality Control Board shall establish water quality objectives. The Water Code defines water quality objectives as "the allowable limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area." Thus, water quality objectives are intended (i) to protect the public health and welfare and (ii) to maintain or enhance water quality in relation to the designated existing and potential beneficial uses of the water. Water quality objectives are achieved through Waste Discharge Requirements and other programs outlined in Chapter 4, Strategic Planning and Implementation. These objectives, when compared with future water quality data, also provide the basis for identifying trends toward degradation or enhancement of regional waters.

These water quality objectives supersede those contained in all previous Basin Plans and amendments adopted by the Los Angeles Regional Board. As new information becomes available, the Regional Board will review the objectives contained herein and develop new objectives as necessary. In addition, this Plan will be reviewed every three years (triennial review) to determine the need for modification.

Statement of Policy with Respect to Maintaining High Quality of Waters in California

A key element of California's water quality standards is the state's Antidegradation Policy. This policy, formally referred to as the *Statement of Policy with Respect to Maintaining High Quality Waters in California* (State Board Resolution No. 68-16), restricts degradation of surface or ground waters. In particular, this policy protects waterbodies where existing quality is higher than is necessary for the protection of beneficial uses.

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 68-16

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

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

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

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

NOW, THEREFORE, BE IT RESOLVED:

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

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

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

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

CERTIFICATION

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

Dated: October 28, 1968

Original signed by
Kerry W. Mulligan, Executive Officer
State Water Resources Control Board

Under the Antidegradation Policy, any actions that can adversely affect water quality in all surface and ground waters (i) must be consistent with the maximum benefit to the people of the state, (ii) must not unreasonably affect present and anticipated beneficial use of such water, and (iii) must not result in water quality less than that prescribed in water quality plans and policies. Furthermore, any actions that can adversely affect surface waters are also subject to the federal Antidegradation Policy (40 CFR 131.12), developed under the CWA. The USEPA, Region IX, has also issued detailed guidance for the implementation of federal antidegradation regulations for surface waters within its jurisdiction (USEPA, 1987).

Regional Objectives for Inland Surface Waters

Narrative or numerical water quality objectives have been developed for the following parameters (listed alphabetically) and apply to all inland surface waters and enclosed bays and estuaries (including wetlands) in the Region. *Water quality objectives are in italics.*

Ammonia

The neutral, un-ionized ammonia species (NH_3) is highly toxic to fish and other aquatic life. The ratio of toxic NH_3 to total ammonia ($NH_4^+ + NH_3$) is primarily a function of pH, but is also affected by temperature and other factors. Additional impacts can also occur as the oxidation of ammonia lowers the dissolved oxygen content of the water, further stressing aquatic organisms. Ammonia also combines with chlorine (often both are present) to form chloramines - persistent toxic compounds that extend the effects of ammonia and chlorine downstream.

Oxidation of ammonia to nitrate may lead to groundwater impacts in areas of recharge.

In order to protect aquatic life, ammonia concentrations in receiving waters shall not exceed the values listed for the corresponding instream conditions in Tables 3-1 to 3-4.

Timing of compliance with this objective will be determined on a case-by-case basis. Discharges will have up to 8 years following the adoption of this plan by the Regional Board to (i) make the necessary adjustments/improvements to meet these objectives or (ii) to conduct studies leading to an approved site-specific objective for ammonia. If it is determined that there is an immediate threat or impairment of beneficial uses due to ammonia, the objectives in Tables 3-1 to 3-4 shall apply.

In order to protect underlying groundwater basins, ammonia shall not be present at levels that when oxidized to nitrate, pose a threat to groundwater.

Bacteria, Coliform

Total and fecal coliform bacteria are used to indicate the likelihood of pathogenic bacteria in surface waters. Water quality objectives for total and fecal coliform vary with the beneficial uses of the waterbody and are described below:

In waters designated for water contact recreation (REC-1), the fecal coliform concentration shall not exceed a log mean of 200/100 ml (based on a minimum of not less than four samples for any 30-day period), nor shall more than 10 percent of total samples during any 30-day period exceed 400/100 ml.

In waters designated for non-water contact recreation (REC-2) and not designated for water contact recreation (REC-1), the fecal coliform concentration shall not exceed a log mean of 2000/100 ml (based on a minimum of not less than four samples for any 30-day period), nor shall more than 10 percent of samples collected during any 30-day period exceed 4000/100 ml.

In all waters where shellfish can be harvested for human consumption (SHELL), the median total coliform concentration throughout the water column for any 30-day period shall not exceed 70/100 ml, nor shall more than ten percent of the samples collected during any 30-day period exceed 230/100 ml for a five-tube decimal dilution test or 330/100 ml when a three-tube decimal dilution test is used.

Table 3-1. One-hour Average Concentration for Ammonia[1,2] for Waters Designated as COLD (Salmonids or Other Sensitive Coldwater Species Present).

pH	Temperature, °C						
	0	5	10	15	20	25	30
Un-ionized ammonia (mg/liter NH_3)							
6.50	0.0091	0.0129	0.0182	0.026	0.036	0.036	0.036
6.75	0.0149	0.021	0.030	0.042	0.059	0.059	0.059
7.00	0.023	0.033	0.046	0.066	0.093	0.093	0.093
7.25	0.034	0.048	0.068	0.095	0.135	0.135	0.135
7.50	0.045	0.064	0.091	0.128	0.181	0.181	0.181
7.75	0.056	0.080	0.113	0.159	0.22	0.22	0.22
8.00	0.065	0.092	0.130	0.184	0.26	0.26	0.26
8.25	0.065	0.092	0.130	0.184	0.26	0.26	0.26
8.50	0.065	0.092	0.130	0.184	0.26	0.26	0.26
8.75	0.065	0.092	0.130	0.184	0.26	0.26	0.26
9.00	0.065	0.092	0.130	0.184	0.26	0.26	0.26
Total ammonia (mg/liter NH_3)							
6.50	35	33	31	30	29	20	14.3
6.75	32	30	28	27	27	18.6	13.2
7.00	28	26	25	24	23	16.4	11.6
7.25	23	22	20	19.7	19.2	13.4	9.5
7.50	17.4	16.3	15.5	14.9	14.6	10.2	7.3
7.75	12.2	11.4	10.9	10.5	10.3	7.2	5.2
8.00	8.0	7.5	7.1	6.9	6.8	4.8	3.5
8.25	4.5	4.2	4.1	4.0	3.9	2.8	2.1
8.50	2.6	2.4	2.3	2.3	2.3	1.71	1.28
8.75	1.47	1.40	1.37	1.38	1.42	1.07	0.83
9.00	0.86	0.83	0.83	0.86	0.91	0.72	0.58

1 To convert these values to mg/liter N, multiply by 0.822

2 Source: USEPA, 1986

Table 3-2. One-hour Average Concentration for Ammonia[1,2] for Waters Designated as WARM (Salmonids or Other Sensitive Coldwater Species Absent).

pH	Temperature, -C				
	0	5	10	15	20
Un-ionized ammonia (mg/liter NH_3)					
6.50	0.0091	0.0129	0.0182	0.026	0.036
6.75	0.0149	0.021	0.030	0.042	0.059
7.00	0.023	0.033	0.046	0.066	0.093
7.25	0.034	0.048	0.068	0.095	0.135
7.50	0.045	0.064	0.091	0.128	0.181
7.75	0.056	0.080	0.113	0.159	0.22
8.00	0.065	0.092	0.130	0.184	0.26
8.25	0.065	0.092	0.130	0.184	0.26
8.50	0.065	0.092	0.130	0.184	0.26
8.75	0.065	0.092	0.130	0.184	0.26
9.00	0.065	0.092	0.130	0.184	0.26
Total ammonia (mg/liter NH_3)					
6.50	35	33	31	30	29
6.75	32	30	28	27	27
7.00	28	26	25	24	23
7.25	23	22	20	19.7	19.2
7.50	17.4	16.3	15.5	14.9	14.6
7.75	12.2	11.4	10.9	10.5	10.3
8.00	8.0	7.5	7.1	6.9	6.8
8.25	4.5	4.2	4.1	4.0	3.9
8.50	2.6	2.4	2.3	2.3	2.3
8.75	1.47	1.40	1.37	1.38	1.42
9.00	0.86	0.83	0.83	0.86	0.91

1 To convert these values to mg/liter N, multiply by 0.822

2 Source: USEPA, 1986

Table 3-3. Four-day Average Concentration for Ammonia[1,2] for Waters Designated as COLD (Salmonids or Other Sensitive Coldwater Species Present).

pH	Temperature, °C						
	0	5	10	15	20	25	30
Un-ionized ammonia (mg/liter NH_3)							
6.50	0.0008	0.0011	0.0016	0.0022	0.0022	0.0022	0.0022
6.75	0.0014	0.0020	0.0028	0.0039	0.0039	0.0039	0.0039
7.00	0.0025	0.0035	0.0049	0.0070	0.0070	0.0070	0.0070
7.25	0.0044	0.0062	0.0088	0.0124	0.0124	0.0124	0.0124
7.50	0.0078	0.0111	0.0156	0.022	0.022	0.022	0.022
7.75	0.0129	0.0182	0.026	0.036	0.036	0.036	0.036
8.00	0.0149	0.021	0.030	0.042	0.042	0.042	0.042
8.25	0.0149	0.021	0.030	0.042	0.042	0.042	0.042
8.50	0.0149	0.021	0.030	0.042	0.042	0.042	0.042
8.75	0.0149	0.021	0.030	0.042	0.042	0.042	0.042
9.00	0.0149	0.021	0.030	0.042	0.042	0.042	0.042
Total ammonia (mg/liter NH_3)							
6.50	3.0	2.8	2.7	2.5	1.76	1.23	0.87
6.75	3.0	2.8	2.7	2.6	1.76	1.23	0.87
7.00	3.0	2.8	2.7	2.6	1.76	1.23	0.87
7.25	3.0	2.8	2.7	2.6	1.77	1.24	0.88
7.50	3.0	2.8	2.7	2.6	1.78	1.25	0.89
7.75	2.8	2.6	2.5	2.4	1.66	1.17	0.84
8.00	1.82	1.70	1.62	1.57	1.10	0.78	0.56
8.25	1.03	0.97	0.93	0.90	0.64	0.46	0.33
8.50	0.58	0.55	0.53	0.53	0.38	0.28	0.21
8.75	0.34	0.32	0.31	0.31	0.23	0.173	0.135
9.00	0.195	0.189	0.189	0.195	0.148	0.116	0.094

1 To convert these values to mg/liter N, multiply by 0.822.

2 Source: USEPA, 1992

Table 3-4. Four-day Average Concentration for Ammonia[1,2] for Waters Designated as WARM (Salmonids or Other Sensitive Coldwater Species Absent).

pH	Temperature, °C						
	0	5	10	15	20	25	30
Un-ionized ammonia (mg/liter NH_3)							
6.50	0.0008	0.0011	0.0016	0.0022	0.0031	0.0031	0.0031
6.75	0.0014	0.0020	0.0028	0.0039	0.0055	0.0055	0.0055
7.00	0.0025	0.0035	0.0049	0.0070	0.0099	0.0099	0.0099
7.25	0.0044	0.0062	0.0088	0.0124	0.0175	0.0175	0.0175
7.00	0.0078	0.0111	0.0156	0.022	0.031	0031	0.031
7.75	0.0129	0.0182	0.026	0.036	0.051	0.051	0.051
8.00	0.0149	0.021	0.030	0.042	0.059	0.059	0.059
8.25	0.0149	0.021	0.030	0.042	0.059	0.059	0.059
8.50	0.0149	0.021	0.030	0.042	0.059	0.059	0.059
8.75	0.0149	0.021	0.030	0.042	0.059	0.059	0.059
9.00	0.0149	0.021	0.030	0.042	0.059	0.059	0.059
Total ammonia (mg/liter NH_3)							
6.50	3.0	2.8	2.7	2.5	2.5	1.73	1.23
6.75	3.0	2.8	2.7	2.6	2.5	1.74	1.23
7.00	3.0	2.8	2.7	2.6	2.5	1.74	1.23
7.25	3.0	2.8	2.7	2.6	2.5	1.75	1.24
7.50	3.0	2.8	2.7	2.6	2.5	1.76	1.25
7.75	2.8	2.6	2.5	2.4	2.3	1.65	1.18
8.00	1.82	1.70	1.62	1.57	1.55	1.10	0.79
8.25	1.03	0.97	0.93	0.90	0.90	0.64	0.47
8.50	0.58	0.55	0.53	0.53	0.53	0.39	0.29
8.75	0.34	0.32	0.31	0.31	0.32	0.24	0.190
9.00	0.195	0.189	0.189	0.195	0.21	0.163	0.133

1 To convert these values to mg/liter N, multiply by 0.822.

2 Source: USEPA, 1992

Bioaccumulation

Many pollutants can bioaccumulate in fish and other aquatic organisms at levels which are harmful for both the organisms as well as organisms that prey upon these species (including humans).

Toxic pollutants shall not be present at levels that will bioaccumulate in aquatic life to levels which are harmful to aquatic life or human health.

Biochemical Oxygen Demand (BOD_5)

The 5-day BOD test indirectly measures the amount of readily degradable organic material in water by measuring the residual dissolved oxygen after a period of incubation (usually 5 days at 20 °C), and is primarily used as an indicator of the efficiency of wastewater treatment processes.

Waters shall be free of substances that result in increases in the BOD which adversely affect beneficial uses.

Biostimulatory Substances

Biostimulatory substances include excess nutrients (nitrogen, phosphorus) and other compounds that stimulate aquatic growth. In addition to being aesthetical unpleasant (causing taste, odor, or color problems), this excessive growth can also cause other water quality problems.

Waters shall not contain biostimulatory substances in concentrations that promote aquatic growth to the extent that such growth causes nuisance or adversely affects beneficial uses.

Chemical Constituents

Chemical constituents in excessive amounts in drinking water are harmful to human health. Maximum levels of chemical constituents in drinking waters are listed in the California Code of Regulations and the relevant limits are described below.

Surface waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use.

Water designated for use as Domestic or Municipal Supply (MUN) shall not contain concentrations of chemical constituents in excess of the limits specified in the following provisions of Title 22 of the California Code of Regulations which are incorporated by reference into this plan: Table 64431-A of Section 64431 (Inorganic Chemicals), Table 64431-B of Section 64431 (Fluoride), and Table 64444-A of Section 64444 (Organic Chemicals). This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Tables 3-5, 3-6, and 3-7.)

Table 3-5. The Maximum Contaminant Levels: Inorganic Chemicals (for MUN beneficial use) specified in Table 64431-A of Section 64431 of Title 22 of the California Code of Regulations as of 9-8-94.

Constituent	Maximum Contaminant Level mg/L
Aluminum	1.
Antimony	0.006
Arsenic	0.05
Asbestos	7 MFL*
Barium	1.
Beryllium	0.004
Cadmium	0.005
Chromium	0.05
Cyanide	0.2
Mercury	0.002
Nickel	0.1
Nitrate (as NO_3)	45.
Nitrate + Nitrite (sum as nitrogen)	10.
Nitrite (as nitrogen)	1.
Selenium	0.05
Thallium	0.002

* MFL = million fibers per liter; MCL for fibers exceeding 10 μm in lenght

Table 3-6. The Limiting and Optimum Concentrations for Fluoride (for MUN beneficial use) specified in Table 64431-B of Section 64431 of Title 22 of the California Code of Regulations as of 9-8-94.

Annual Average of Maximum Daily Air Temperature (°F)	Fluoride Concentration (mg/L)			
	Lower	Optimum	Upper	Maximum Concentration Level
53.7 and below	0.9	1.2	1.7	2.4
53.8 to 58.3	0.8	1.1	1.5	2.2
58.4 to 63.8	0.8	1.0	1.3	2.0
63.9 to 70.6	0.7	0.9	1.2	1.8
70.7 to 79.2	0.7	0.8	1.0	1.6
79.3 to 90.5	0.6	0.7	0.8	1.4

Chlorine, Total Residual

Disinfection of wastewaters with chlorine produces a chlorine residual. Chlorine and its reaction products are toxic to aquatic life.

Chlorine residual shall not be present in surface water discharges at concentrations that exceed 0.1 mg/L and shall not persist in receiving waters at any concentration that causes impairment of beneficial uses.

Color

Color in water can result from natural conditions (e.g., from plant material or minerals) or can be introduced from commercial or industrial sources. Color is primarily an aesthetic consideration, although extremely dark colored water can limit light penetration and cause additional water quality problems. Furthermore, color can impact domestic and industrial uses by discoloring clothing or foods. The secondary drinking water standard is 15 color units (DHS, 1992).

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

Exotic Vegetation

Exotic (non-native) vegetation introduced in and around stream courses is often of little value as habitat (food and cover) for aquatic-dependent biota. Exotic plants can quickly out-compete native vegetation and cause other water quality impairments.

Exotic vegetation shall not be introduced around stream courses to the extent that such growth causes nuisance or adversely affects beneficial uses.

Floating Material

Floating materials can be an aesthetic nuisance as well as provide substrate for undesirable bacterial and algal growth and insect vectors.

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

Table 3-7. The Maximum Contaminant Levels: Organic Chemicals (for MUN beneficial use) specified in Table 64444-A of Section 64444 of Title 22 of the California Code of Regulations as of 9-8-94.

Constituent	Maximum Contaminant Level mg/L
A. Volatile Organic Chamicals (VOCs)	
Benzene	0.001
Carbon Tetrachloride	0.0005
1,2-Dichlorobenzene	0.6
1,4-Dichlorobenzene	0.005
1,1-Dichloroethane	0.005
1,2-Dichloroethane	0.0005
1,1-Dichloroethylene	0.006
cis-1,2-Dichloroethylene	0.006
trans-1,2-Dichloroethylene	0.01
Dichloromethane	0.005
1,2-Dichloropropane	0.005
1,3-Dichloropropene	0.0005
Ethylbenzene	0.7
Monochlorobenzene	0.07
Styrene	0.1
1,1,2,2-Tetrachlorethane	0.001
Tetrachloroethylene	0.005
Toluene	0.15
1,2,4-Trichlorobenzene	0.07
1,1,1-Trichloroethane	0.200
1,1,2-Trichloroethane	0.005
Trichloroethylene	0.005
Trichlorofluoromethane	0.15
1,1,2-Trichloro-1,2,2-Trifluoroethane	1.2
Vinyl Chloride	0.0005
Xylenes (single isomer or sum of isomers)	1.750
B. Non-Volatile Synthetic Organic Chemicals (SOCs)	
Alachlor	0.002
Atrazine	0.003
Bentazon	0.018

Constituent	Maximum Contaminant Level mg/L
Benzo(a)pyrene	0.0002
Carbofuran	0.018
Chlordane	0.0001
2,4-D	0.07
Dalapon	0.2
1,2-Dibromo-3-chloropropane	0.0002
Di(2-ethylhexyl)adipate	0.4
Di(2-ethylhexyl)phthalate	0.004
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylene Dibromide	0.00005
Glyphosate	0.7
Heptachlor	0.00001
Heptachlor Epoxide	0.00001
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.04
Molinate	0.02
Oxamyl	0.2
Pentachlorophenol	0.001
Picloram	0.5
Polychlorinated Biphenyls	0.0005
Simazine	0.004
Thiobencarb	0.07
Toxaphene	0.003
2,3,7,8-TCDD (Dioxin)	$3X10^{-8}$
2,4,5-TP (Silvex)	0.05

Methylene Blue Activated Substances (MBAS)

The MBAS procedure tests for the presence of anionic surfactants (detergents) in water. Positive results can indicate the presence of domestic wastewater. This test can be used to indicate impacts from septic systems. Surfactants disturb the surface tension which affects insects and can affect gills in aquatic life. The secondary drinking water standard for MBAS is 0.5 mg/L (DHS, 1992).

Waters shall not have MBAS concentrations greater than 0.5 mg/L in waters designated MUN.

Mineral Quality

Mineral quality in natural waters is largely determined by the mineral assemblage of soils and rocks and faults near the land surface. Point and nonpoint source discharges of poor quality water can degrade the mineral content of natural waters. High levels of dissolved solids renders waters useless for many beneficial uses. Elevated levels of boron affect agricultural use (especially citrus).

Numerical mineral quality objectives for individual inland surface waters are contained in Table 3-8.

Nitrogen (Nitrate, Nitrite)

High nitrate levels in drinking water can cause health problems in humans. Infants are particularly sensitive and can develop methemoglobinemia (blue-baby syndrome). Excess nitrogen in surface waters also leads to excess aquatic growth and can contribute to elevated levels of NO_3 in ground water as well. The primary drinking water standard for nitrate (as NO_3) is 45 mg/L (DHS, 1992).

Waters shall not exceed 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen (NO_3-N + NO_2-N), 45 mg/L as nitrate (NO_3), 10 mg/L as nitrate-nitrogen (NO_3-N), or 1 mg/L as nitrite-nitrogen (NO_2-N) or as otherwise designated in Table 3-8.

Oil and Grease

Oil and grease are not readily soluble in water and form a film on the water surface. Oily films can coat birds and aquatic organisms, impacting respiration and thermal regulation, and causing death. Oil and grease can also cause nuisance conditions (odors and taste), are aesthetically unpleasant, and can restrict a wide variety of beneficial uses.

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

Oxygen, Dissolved (DO)

Adequate dissolved oxygen levels are required to support aquatic life. Depression of dissolved oxygen can lead to anaerobic conditions resulting in odors or, in extreme cases, in fish kills. Dissolved oxygen requirements are dependent on the beneficial uses of the waterbody.

*At a minimum (see specifics below), the **mean** annual dissolved oxygen concentration of **all** waters shall be greater than 7 mg/L, and no single determination shall be less than 5.0 mg/L, except when natural conditions cause lesser concentrations.*

The dissolved oxygen content of all surface waters designated as WARM shall not be depressed below 5 mg/L as a result of waste discharges.

The dissolved oxygen content of all surface waters designated as COLD shall not be depressed below 6 mg/L as a result of waste discharges.

The dissolved oxygen content of all surface waters designated as both COLD and SPWN shall not be depressed below 7 mg/L as a result of waste discharges.

For that area known as the Outer Harbor area of Los Angeles-Long Beach Harbors, the mean annual dissolved oxygen concentrations shall be 6.0 mg/L or greater, provided that no single determination shall be less than 5.0 mg/L.

Table 3-8. Water Quality Objectives for Selected Constituents in Inland Surface Waters[a].

Reaches are in upstream to downstream order.

WATERSHED/STREAM REACH[b]	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron[c] (mg/L)	Nitrogen[d] (mg/L)	SAR[e] (mg/L)
Miscellaneous Ventura Coastal Streams	*no waterbody specific objectives [f]*					
Ventura River Watershed:						
Above Camino Cielo Road	700	300	50	1.0	5	5
Between Camino Cielo Road and Casitas Vista Road	800	300	60	1.0	5	5
Between Casitas Vista Road and confluence with Weldon Canyon	1000	300	60	1.0	5	5
Between confluence with Weldon Canyon and Main Street	1500	500	300	1.5	10	5
Between Main St. and Ventura River Estuary	*no waterbody specific objectives [f]*					
Santa Clara River Watershed:						
Above Lang gaging station	500	100	50	0.5	5	5
Between Lang gaging station and Bouquet Canyon Road Bridge	800	150	100	1.0	5	5
Between Bouquet Canyon Road Bridge and West Pier Highway 99	1000	300	100	1.5	10	5
Between West Pier Highway 99 and Blue Cut gaging station	1000	400	100	1.5	5	10
Between Blue Cut gaging station and A Street, Fillmore	1300	600	100	1.5	5	5
Between A Street, Fillmore and Freeman Diversion "Dam" near Saticoy	1300	650	80	1.5	5	5
Between Freeman Diversion "Dam" near Saticoy and Highway 101 Bridge	1200	600	150	1.5	-	-
Between Highway 101 Bridge and Santa Clara River Estuary	*no waterbody specific objectives [f]*					
Santa Paula Creek above Santa Paula Water Works Diversion Dam	600	250	45	1.0	5	5
Sespe Creek above gaging station, 500' downstream from Little Sespe Creek	800	320	60	1.5	5	5
Piru Creek above gaging station below Santa Felicia Dam	800	400	60	1.0	5	5
Calleguas Creek Watershed:						
Above Potrero Road	850	250	150	1.0	10	f
Below Potrero Road	*no waterbody specific objectives [f]*					

Table 3-8. Water Quality Objectives for Selected Constituents in Inland Surface Waters[a] (cont.)

Reaches are in upstream to downstream order.

WATERSHED/STREAM REACH[b]	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron[c] (mg/L)	Nitrogen[d] (mg/L)	SAR[e] (mg/L)
Miscellaneous Los Angeles County Coastal Streams	*no waterbody specific objectives [f]*					
Malibu Creek Watershed	*2000*	*500*	*500*	*2.0*	*10*	-
Ballona Creek Watershed	*no waterbody specific objectives [f]*					
Dominguez Channel Watershed	*no waterbody specific objectives [f]*					
Los Angeles River Watershed:						
Above Figueroa Street	950	300	150	g	8	g
Between Figueroa Street and Los Angeles River Estuary (Willow Street). Includes Rio Hondo below Santa Ana Freeway	1500	350	150	g	8	g
Rio Hondo above Santa Ana Freeway [h]	750	300	150	g	8	g
Santa Anita Creek above Santa Anita spreading grounds	250	30	10	g	f	g
Eaton Canyon Creek above Eaton Dam	250	30	10	g	f	g
Arroyo Seco above spreading grounds	300	40	15	g	f	g
Big Tujunga Creek above Hansen Dam	350	50	20	g	f	g
Pacoima Wash above Pacoima spreading grounds	250	30	10	g	f	g
San Gabriel River Watershed:						
Above Morris Dam	250	30	10	0.6	2	2
Between Morris Dam and Ramona Blvd.	*450*	*100*	*100*	*0.5*	8	g
Between Ramona Blvd. and Firestone Blvd.	750	300	150	*1.0*	8	g
Between Firestone Blvd. and San Gabriel River Estuary (downstream from Willow Street) including Coyote Creek	*no waterbody specific objectives [f]*					
All other minor San Gabriel Mountain streams tributary to San Gabriel Valley [i]	300	40	15	g	f	g
Island Watercourses:						
Anacapa Island	*no waterbody specific objectives [f]*					
San Nicolas Island	*no waterbody specific objectives [f]*					
Santa Barbara Island	*no waterbody specific objectives [f]*					
Santa Catalina Island	*no waterbody specific objectives [f]*					
San Clemente Island	*no waterbody specific objectives [f]*					

Table 3-8. Water Quality Objectives for Selected Constituents in Inland Surface Waters[a] (cont.)

Reaches are in upstream to downstream order.

WATERSHED/STREAM REACH[b]	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron[c] (mg/L)	Nitrogen[d] (mg/L)	SAR[e] (mg/L)
Other Watercourses:						
San Antonio Creek[j]	225	25	6	–	–	–
Chino Creek[j]	–	–	–	–	–	–

a. As part of the State's continuing planning process, data will continue to be collected to support the development of numerical water quality objectives for waterbodies and constituents where sufficient information is presently unavailable. Any new recommendations for water quality objectives will be brought before the Regional Board in the future.

b. All references to watersheds, streams and reaches include all tributaries. Water quality objectives are applied to all waters tributary to those specifically listed in the table. See Figures 2-1 to 2-10 for locations.

c. Where naturally occurring boron results in concentrations higher than the stated objective, a site-specific objective may be determined on a case-by-case basis.

d. Nitrate-nitrogen plus nitrite-nitrogen (NO3-N + NO2-N). The lack of adequate nitrogen data for all streams precluded the establishment of numerical objectives for all streams.

e. Sodium adsorption ratio (SAR) predicts the degree to which irrigation water tends to enter into cation-exchange reactions in so:

$$SAR = Na^{+}/((Ca^{++} + Mg^{++})/2)^{1/2}$$

f. Site-specific objectives have not been determined for these reaches at this time. These areas are often impaired (by high levels of minerals) and there is not sufficient historic data to designate objectives based on natural background conditions. The following table illustrates the mineral or nutrient quality necessary to protect different categories of beneficial uses and will be used as a guideline for establishing effluent limits in these cases. Protection of the most sensitive beneficial use(s) would be the determinin- criteria for the selection of effluent limits.

Recommended objective (mg/L)	Beneficial Use Categories				
	MUN (Drinking Water Standards) [1]	PROC	AGR	AQ LIFE*(Frshwtr)	GWR
TDS	500 (USEPA secondary MCL)	50-1500 [2,7,8]	450-2000 [2,3,6]		Limits based on appropriate groundwater basin objectives and/or beneficial uses
Chloride	250 (USEPA secondary MCL)	20-1000 [2,8]	100-355 [2,3,6]	230 (4 day ave. continuous conc) [4]	
Sulfate	400-500 (USEPA proposed MCL)	20-300 [2,8]	350-600 [2,6]		
Boron			0.5-4.0 [2,5,6]		
Nitrogen	10 (USEPA MCL)				

References: 1) USEPA CFR § 141 et seq., 2) McKee and Wolf, 1963, 3) Ayers and Westcot, 1985, 4) USEPA, 1988, 5) Water Pollution Control Federation, 1989, 6) USEPA, 1973, 7) USEPA 1980, 8) Ayers, 1977.

* Aquatic life includes a variety of Beneficial Uses including WARM, COLD, SPWN, MIGR and RARE.

g. Agricultural supply is not a beneficial use of the surface water in the specified reach.

h. Rio Hondo spreading grounds are located above the Santa Ana Freeway

i. The stated objectives apply to all other surface streams originating within the San Gabriel Mountains and extend from their headwaters to the canyon mouth.

j. These watercourses are primarily located in the Santa Ana Region. The water quality objectives for these streams have been established by Santa Ana Region. Dashed lines indicate that numerical objectives have not been established, however, narrative objectives shall apply. Refer to the Santa Ana Region Basin Plan for more details.

Pesticides

Pesticides are used ubiquitously for a variety of purposes; however, their release into the environment presents a hazard to aquatic organisms and plants not targeted for their use. The extent of risk to aquatic life depends on many factors including the physical and chemical properties of the pesticide. Those of greatest concern are those that persist for long periods and accumulate in aquatic life and sediments.

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

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of pesticides in excess of the limiting concentrations specified in Table 64444-A of Section 64444 (Organic Chemicals) of Title 22 of the California Code of Regulations which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-7.)

pH

The hydrogen ion activity of water (pH) is measured on a logarithmic scale, ranging from 0 to 14. While the pH of "pure" water at 25 °C is 7.0, the pH of natural waters is usually slightly basic due to the solubility of carbon dioxide from the atmosphere. Minor changes from natural conditions can harm aquatic life.

The pH of inland surface waters shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges. Ambient pH levels shall not be changed more than 0.5 units from natural conditions as a result of waste discharge.

The pH of bays or estuaries shall not be depressed below 6.5 or raised above 8.5 as a result of waste discharges. Ambient pH levels shall not be changed more than 0.2 units from natural conditions as a result of waste discharge.

Polychlorinated Biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) are a highly toxic and persistent group of organic chemicals that have been historically released into the environment. Many historic discharges still exist as sources in the environment.

The purposeful discharge of PCBs (the sum of chlorinated biphenyls whose analytical characteristics resemble those of Aroclor-1016, Aroclor-1221, Aroclor-1232, Aroclor-1242, Aroclor-1248, Aroclor-1254, and Aroclor-1260) to waters of the Region, or at locations where the waste can subsequently reach waters of the Region, is prohibited.

Pass-through or uncontrollable discharges to waters of the Region, or at locations where the waste can subsequently reach water of the Region, are limited to 70 pg/L (30 day average) for protection of human health and 14 ng/L and 30 ng/L (daily average) to protect aquatic life in inland fresh waters and estuarine waters respectively.

Radioactive Substances

Radioactive substances are generally present in natural waters in extremely low concentrations. Mining or industrial activities increase the amount of radioactive substances in waters to levels that are harmful to aquatic life, wildlife or humans.

Radionuclides shall not be present in concentrations that are deleterious to human, plant, animal, or aquatic life or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

Waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the limits specified in Table 4 of Section 64443 (Radioactivity) of Title 22 of the California Code of Regulations which is incorporated by reference into this plan. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Table 3-9.)

Table 3-9. The Maximum Contaminant Levels: Radioactivity (for MUN beneficial use) specified in Table 4 of Section 64443 of Title 22 of the California Code of Regulations as of 12-22-88.

MCL Radioactivity	Maximum Contaminant Level pCi/L
Combined Radium-226 and Radium-228	5
Gross Alpha particle activity (including Radium-226 but excluding Radon and Uranium)	15
Tritium	20,000
Strontium-90	8
Gross Beta particle activity	50
Uranium	20

(pCi/L = picocuries = curies x 10^{-12})

Solid, Suspended, or Settleable Materials

Surface waters carry various amounts of suspended and settleable materials from both natural and human sources. Suspended sediments limit the passage of sunlight into waters, which in turn inhibits the growth of aquatic plants. Excessive deposition of sediments can destroy spawning habitat, blanket benthic (bottom dwelling) organisms, and abrade the gills of larval fish.

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

Taste and Odor

Undesirable tastes and odors in water are an aesthetic nuisance, can impact recreational and other uses, and can indicate the presence of other pollutants.

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

Temperature

Discharges of wastewaters can cause unnatural and/or rapid changes in the temperature of receivin waters which can adversely affect aquatic life.

The natural receiving water temperature of all regional waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Board that such alteration in temperature does not adversely affect beneficial uses. Alterations that are allowed must meet the requirements below.

For waters designated WARM, water temperature shall not be altered by more than 5 °F above the natural temperature. At no time shall these WARM-designated waters be raised above 80 °F as a result of waste discharges.

For waters designated COLD, water temperature shall not be altered by more than 5 °F above the natural temperature.

Temperature objectives for enclosed bays and estuaries are specified in the "Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays of California" (Thermal Plan), including any revisions thereto. See Chapter 5 for a description of the Thermal Plan.

Toxicity

Toxicity is the adverse response of organisms to chemical or physical agents. When the adverse response is mortality, the result is termed acute toxicity. When the adverse response is not mortality but instead reduced growth in larval organisms or reduced reproduction in adult organisms (or other appropriate measurements), a critical life stage effect (chronic toxicity) has occurred. The use of aquatic bioassays (toxicity tests) is widely accepted as a valid approach to evaluating toxicity of waste and receiving waters.

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

The survival of aquatic life in surface waters, subjected to a waste discharge or other controllable water quality factors, shall not be less than that for the same waterbody in areas unaffected by the waste discharge or, when necessary, other control water.

There shall be no acute toxicity in ambient waters, including mixing zones. The acute toxicity objective for discharges dictates that the average survival in undiluted effluent for any three consecutive 96-hour static or continuous flow bioassay tests shall be at least 90%, with no single test having less than 70% survival when using an established USEPA, State Board, or other protocol authorized by the Regional Board.

There shall be no chronic toxicity in ambient waters outside mixing zones. To determine compliance with this objective, critical life stage tests for at least three species with approved testing protocols shall be used to screen for the most sensitive species. The test species used for screening shall include a vertebrate, an invertebrate, and an aquatic plant. The most sensitive species shall then be used for routine monitoring. Typical endpoints for chronic toxicity tests include hatchability, gross morphological abnormalities, survival, growth, and reproduction.

Effluent limits for specific toxicants can be established by the Regional Board to control toxicity identified under Toxicity Identification Evaluations (TIEs).

Turbidity

Turbidity is an expression of the optical property that causes light to be scattered in water due to particulate matter such as clay, silt, organic matter, and microscopic organisms. Turbidity can result in a variety of water quality impairments. The secondary drinking water standard for turbidity is 5 NTU (nephelometric turbidity units).

Waters shall be free of changes in turbidity that cause nuisance or adversely affect beneficial uses. Increases in natural turbidity attributable to controllable water quality factors shall not exceed the following limits:

Where natural turbidity is between 0 and 50 NTU, increases shall not exceed 20%.

Where natural turbidity is greater than 50 NTU, increases shall not exceed 10%.

Allowable zones of dilution within which higher concentrations may be tolerated may be defined for each discharge in specific Waste Discharge Requirements.

Regional Narrative Objectives for Wetlands

In addition to the regional objectives for inland surface waters (including wetlands), the following narrative objectives apply for the protection of wetlands in the Region.

Hydrology

Natural hydrologic conditions necessary to support the physical, chemical, and biological characteristics present in wetlands shall be protected to prevent significant adverse effects on:

- *natural temperature, pH, dissolved oxygen, and other natural physical/chemical conditions,*
- *movement of aquatic fauna,*
- *survival and reproduction of aquatic flora and fauna, and*
- *water levels.*

Habitat

Existing habitats and associated populations of wetlands fauna and flora shall be maintained by:

- *maintaining substrate characteristics necessary to support flora and fauna which would be present naturally,*
- *protecting food supplies for fish and wildlife,*
- *protecting reproductive and nursery areas, and*
- *protecting wildlife corridors.*

Regional Objectives for Ground Waters

The following objectives apply to all ground waters of the Region:

Bacteria

Total and fecal coliform bacteria are used to indicate the likelihood of pathogenic bacteria in waters.

In ground waters used for domestic or municipal supply (MUN) the concentration of coliform organisms over any seven day period shall be less than 1.1/100 ml.

Chemical Constituents and Radioactivity

Chemical constituents in excessive amounts in drinking water are harmful to human health. Maximum levels of chemical constituents in drinking waters are listed in the California Code of Regulations and the relevant limits are described below.

Ground waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents and radionuclides in excess of the limits specified in the following provisions of Title 22 of the California Code of Regulations which are incorporated by reference into this plan: Table 64431-A of section 64431 (Inorganic chemicals), Table 64431-B of Section 64431 (Fluoride), Table 64444-A of Section 64444 (Organic Chemicals), and Table 4 of Section 64443 (Radioactivity). This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. (See Tables 3-5, 3-6, 3-7, and 3-9.)

Ground waters shall not contain concentrations of chemical constituents in amounts that adversely affect any designated beneficial use.

Mineral Quality

Inorganic constituents in ground waters are largely influenced by thermodynamic reactions that occur as ground water comes into contact with various rock and soil types. For example, ground water that flows through beds of gypsum ($CaSO_4 \cdot 2H_2O$) typically has relatively high levels of calcium cations and sulfate anions. Ground water flowing through limestone ($CaCO_3$) also has relatively high levels of calcium cations, but coupled with bicarbonate anions instead of sulfate. Ground waters with these ions at levels greater than 120 mg/L (expressed as $CaCO_3$) are considered hard waters (Hem, 1989).

Human activities and land use practices can influence inorganic constituents in ground waters. Surface waters carrying abnormally high levels of salts (e.g., irrigation return flows) can degrade the ground waters that they recharge. Abnormally high levels of inorganic constituents can impair and preclude beneficial uses. For example, high levels of boron preclude agricultural use (especially for citrus crops) of ground waters. Hard waters present nuisance problems and may require softening prior to industrial use.

Numerical mineral quality objectives for individual groundwater basins are contained in Table 3-10.

Nitrogen (Nitrate, Nitrite)

High nitrate levels in drinking water can cause health problems in humans. Infants are particularly sensitive and can develop methemoglobinemia (blue-baby syndrome). The primary drinking water standard for nitrate (as NO_3) is 45 mg/L (DHS, 1992).

Human activities and land use practices can also influence nitrogen concentration in ground waters. For example, effluents from wastewater treatment plants, septic tanks and confined animal facilities can add high levels of nitrogen compounds to the ground water that they recharge. Irrigation water containing fertilizers can add high levels of nitrogen to ground water.

Ground waters shall not exceed 10 mg/L nitrogen as nitrate-nitrogen plus nitrite-nitrogen (NO_3-N + NO_2-N), 45 mg/L as nitrate (NO_3), 10 mg/L as nitrate-nitrogen (NO_3-N), or 1 mg/L as nitrite-nitrogen (NO_2-N).

Taste and Odor

Undesirable tastes and odors in water are an aesthetic nuisance and can indicate the presence of other pollutants.

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

Table 3-10. Water Quality Objectives for Selected Constituents in Regional Ground Waters[a].

DWR Basin No.[b]	BASIN	OBJECTIVES (mg/L)			
		TDS	Sulfate	Chloride	Boron
	Pitas Point Area [c]	None specified			
	Ojai Valley				
4-1	Upper Ojai Valley				
	West of Sulfur Mountain Road	1,000	300	200	1.0
	Central area	700	50	100	1.0
	Sisar area	700	250	100	0.5
4-2	Lower Ojai Valley				0.5
	West of San Antonio–Senior Canyon Creeks	1,000	300	200	0.5
	East of San Antonio–Senior Canyon Creeks	700	200	50	
4-3	**Ventura River Valley**				
	Upper Ventura	800	300	100	0.5
	San Antonio Creek area	1,000	300	100	1.0
	Lower Ventura	1,500	500	300	1.5
	Ventura Central [d]				
4-4	Santa Clara–Piru Creek area				
	Upper area (above Lake Piru)	1,100	400	200	2.0
	Lower area east of Piru Creek	2,500	1,200	200	1.5
	Lower area west of Piru Creek	1,200	600	100	1.5
	Santa Clara–Sespe Creek area				
	Topa Topa (upper Sespe) area	900	350	30	2.0
	Fillmore area				
	Pole Creek Fan area	2,000	800	100	1.0
	South side of Santa Clara River	1,500	800	100	1.1
	Remaining Fillmore area	1,000	400	50	0.7
	Santa Clara–Santa Paula area				
	East of Peck Road	1,200	600	100	1.0
	West of Peck Road	2,000	800	110	1.0
	Oxnard Plain				
	Oxnard Forebay	1,200	600	150	1.0
	Confined aquifers	1,200	600	150	1.0
	Unconfined and perched aquifers	3,000	1,000	500	–
4-6	Pleasant Valley				
	Confined aquifers	700	300	150	1.0
	Unconfined and perched aquifers	–	–	–	–
4-7	Arroyo Santa Rosa	900	300	150	1.0
4-8	Las Posas Valley				
	South Las Posas area				
	NW of Grimes Cyn Rd & LA Ave & Somis Rd	700	300	100	0.5
	E of Grimes Cyn Rd and Hitch Blvd	2,500	1,200	400	3.0
	S of LA Ave between Somis Rd & Hitch Blvd	1,500	700	250	1.0
	Grimes Canyon Rd & Broadway area	250	30	30	0.2
	North Las Posas area	500	250	150	1.0
4-5	**Upper Santa Clara**				
	Acton Valley	550	150	100	1.0
	Sierra Pelona Valley (Agua Dulce)	600	100	100	0.5
	Upper Mint Canyon	700	150	100	0.5
	Upper Bouquet Canyon	400	50	30	0.5
	Green Valley	400	50	25	–
	Lake Elizabeth–Lake Hughes area	500	100	50	0.5

Table 3-10. Water Quality Objectives for Selected Constituents in Regional Ground Waters[a] (cont.)

DWR Basin No.[b]	BASIN	OBJECTIVES (mg/L)			
		TDS	Sulfate	Chloride	Boron
4-4.07	**Eastern Santa Clara**				
	Santa Clara--Mint Canyon	800	150	150	1.0
	South Fork	700	200	100	0.5
	Placerita Canyon	700	150	100	0.5
	Santa Clara--Bouquet & San Francisquito Canyons	700	250	100	1.0
	Castaic Valley	1,000	350	150	1.0
	Saugus Aquifer	–	–	–	–
4-9	**Simi Valley**				
	Simi Valley Basin				
	Confined aquifers	1,200	600	150	1.0
	Unconfined aquifers	–	–	–	–
	Gillibrand Basin	900	350	50	1.0
4-10	**Conejo Valley**	800	250	150	1.0
4-11	**Los Angeles Coastal Plain**				
	Central Basin	700	250	150	1.0
	West Coast Basin	800	250	250	1.5
	Hollywood Basin	750	100	100	1.0
	Santa Monica Basin	1,000	250	200	0.5
4-12	**San Fernando Valley**				
	Sylmar Basin	600	150	100	0.5
	Verdugo Basin	600	150	100	0.5
	San Fernando Basin				
	West of Highway 405	800	300	100	1.5
	East of Highway 405 (overall)	700	300	100	1.5
	Sunland-Tugunga area [e]	400	50	50	0.5
	Foothill area [e]	400	100	50	1.0
	Area encompassing RT-Tujunga-Erwin-N. Hollywood-Whithall-LA/Verdugo-Crystal Springs-Headworks-Glendale/Burbank Well Fields	600	250	100	1.5
	Narrows area (below confluence of Verdugo Wash with the LA River)	900	300	150	1.5
	Eagle Rock Basin	800	150	100	0.5
4-13	**San Gabriel Valley**				
	Raymond Basin				
	Monk Hill sub-basin	450	100	100	0.5
	Santa Anita area	450	100	100	0.5
	Pasadena area	450	100	100	0.5
	Main San Gabriel Basin				
	Western area [f]	450	100	100	0.5
	Eastern area [f]	600	100	100	0.5
	Puente Basin	1,000	300	150	1.0
4-14 8-2 [g]	**Upper Santa Ana Valley**				
	Live Oak area	450	150	100	0.5
	Claremont Heights area	450	100	50	–
	Pomona area	300	100	50	0.5
	Chino area	450	20	15	–
	Spadra area	550	200	120	1.0
4-15	**Tierra Rejada**	700	250	100	0.5
4-16	**Hidden Valley**	1,000	250	250	1.0
4-17	**Lockwood Valley**	1,000	300	20	2.0
4-18	**Hungry Valley and Peace Valley**	500	150	50	1.0

Table 3-10. Water Quality Objectives for Selected Constituents in Regional Ground Waters[a] (cont.)

DWR Basin No.[b]	BASIN	OBJECTIVES (mg/L)			
		TDS	Sulfate	Chloride	Boron
4-19	Thousand Oaks area	1,400	700	150	1.0
4-20	Russell Valley				
	Russell Valley	1,500	500	250	1.0
	Triunfo Canyon area	2,000	500	500	2.0
	Lindero Canyon area	2,000	500	500	2.0
	Las Virgenes Canyon area	2,000	500	500	2.0
4-21	Conejo-Tierra Rejada Volcanic area [h]	–	–	–	–
4-22	Santa Monica Mountains–southern slopes [i]				
	Camarillo area	1,000	250	250	1.0
	Point Dume area	1,000	250	250	1.0
	Malibu Valley	2,000	500	500	2.0
	Topanga Canyon area	2,000	500	500	2.0
	San Pedro Channel Islands [j]				
	Anacapa Island	–	–	–	–
	San Nicolas Island	1,100	150	350	–
	Santa Catalina Island	1,000	100	250	1.0
	San Clemente Island	–	–	–	–
	Santa Barbara Island	–	–	–	–

a. Objectives for ground waters outside of the major basins listed on this table and outlined in Figure 1-9 have not been specifically listed. However, ground waters outside of the major basins are, in many cases, significant sources of water. Furthermore, ground waters outside of the major basins are either potential or existing sources of water for downgradient basins and, as such, objectives in the downgradient basins shall apply to these areas.

b. Basins are numbered according to Bulletin 118-80 (Department of Water Resources, 1980).

c. Ground waters in the Pitas Point area (between the lower Ventura River and Rincon Point) are not considered to comprise a major basin, and accordingly have not been designated a basin number by the California Department of Water Resources (DWR) or outlined on Figure 1-9.

d. The Santa Clara River Valley (4-4), Pleasant Valley (4-6), Arroyo Santa Rosa Valley (4-7) and Las Posas Valley (4-8) Ground Water Basins have been combined and designated as the Ventura Central Basin (DWR, 1980).

e. The category for the Foothill Wells area in previous Basin Plan incorrectly groups ground water in the Foothill area with ground water in the Sunland-Tujunga area. Accordingly, the new categories, Foothill area and Sunland-Tujunga area, replace the old Foothill Wells area.

f. All of the ground water in the Main San Gabriel Basin is covered by the objectives listed under Main San Gabriel Basin – Eastern area and Western area. Walnut Creek, Big Dalton Wash, and Little Dalton Wash separate the Eastern area from the Western area (see dashed line on Figure 2-17). Any ground water upgradient of these areas is subject to downgradient beneficial uses and objectives, as explained in Footnote a.

g. The border between Regions 4 and 8 crosses the Upper Santa Ana Valley Ground Water Basin.

h. Ground water in the Conejo-Tierra Rejada Volcanic Area occurs primarily in fractured volcanic rocks in the western Santa Monica Mountains and Conejo Mountain areas. These areas have not been delineated on Figure 1-9.

i. With the exception of ground water in Malibu Valley (DWR Basin No. 4-22), ground waters along the southern slopes of the Santa Monica Mountains are not considered to comprise a major basin and accordingly have not been designated a basin number by the California Department of Water Resources (DWR) or outlined on Figure 1-9.

j. DWR has not designated basins for ground waters on the San Pedro Channel Islands.

Statewide Objectives for Ocean Waters

The State Board's *Water Quality Control Plan for Ocean Waters of California* (Ocean Plan) and the *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California* (Thermal Plan) and any revision thereto, shall also apply to all ocean waters of the Region. These plans are described in Chapter 5, Plans and Policies. Copies of these plans can be obtained at the Office of Legislative and Public Affairs (OLPA) in Sacramento or at the Regional Board office.

Site Specific Objectives

While many pollutants are regulated under federal, state or regionally applied water quality standards, the Regional Board supports the idea of developing site-specific objectives (SSOs) in appropriate circumstances. Site-specific, or reach-specific, objectives are already in place for some parameters (i.e., mineral quality). These were established to protect a specific beneficial use or were based on antidegradation policies. The development of site-specific objectives requires complex and resource intensive studies; resources will limit the number of studies that will be performed in any given year. In addition, a Use Attainability Analysis (UAA) study will be necessary if the attainment of designated aquatic life or recreational beneficial uses is in question. UAAs include waterbody surveys and assessments which define existing uses, determine appropriateness of the existing and designated uses, and project potential uses by examining the waterbody's physical, chemical, and biological characteristics. Under certain conditions, a designated use may be changed if attaining that use would result in substantial and widespread economic and social impacts. Uses that have been attained can not be removed under a UAA analysis. If a UAA study is necessary, that study must be completed before a SSO can be determined. Early planning and coordination with Regional Board staff will be critical to the development of a successful plan for developing SSOs.

Site-specific objectives must be based on sound scientific data in order to assure protection of beneficial uses. There may be several acceptable methods for developing site-specific objectives. A detailed workplan will be developed with Regional Board staff and other agencies (if appropriate) based on the specific pollutant and site involved. State Board staff and the USEPA will participate in the development of the studies so that there is agreement on the process from the beginning of the study.

Although each study will be unique, there are several elements that should be addressed in order to justify the need for a site-specific objective. These may include, but are not limited to:

- Demonstration that the site in question has different beneficial uses (e.g., more or less sensitive species) as demonstrated in a UAA or that the site has physical or chemical characteristics that may alter the biological availability or toxicity of the chemical.
- Provide a thorough review of current technology and technology-based limits which can be achieved at the facility(ies) on the study reach.
- Provide a thorough review of historical limits and compliance with these limits at all facilities in the study reach.
- Conduct a detailed economic analysis of compliance with existing, proposed objectives.
- Conduct an analysis of compliance and consistency with all federal, state, and regional plans and policies.

Once it is agreed that a site-specific objective is needed, the studies are performed, and an objective is developed, the following criteria must be addressed in the proposal for the new objective.

- Assurance that aquatic life and terrestrial predators are not currently threatened or impaired from bioaccumulation of the specific pollutant <u>and</u> that the biota will not be threatened or impaired by the proposed site-specific level of this pollutant. Safe tissue concentrations will be determined from the literature and from consultation with the California Department of Fish and Game and the U.S. Fish and Wildlife Service.

  For terrestrial predators, the presence, absence, or threat of harmful bioaccumulated pollutants will be determined through consultation with the

California Department of Fish and Game and the U.S. Fish and Wildlife Service.

- Assurance that human consumers of fish and shellfish are currently protected from bioaccumulation of the study pollutant, and will not be affected from bioaccumulation of this pollutant under the proposed site-specific objective.

- Assurance that aquatic life is currently, and will be protected from chronic toxicity from the proposed site-specific objective.

- Assurance that the integrity of the aquatic ecosystem will be protected under the proposed site-specific objective.

- Assurance that no other beneficial uses will be threatened or impaired by the proposed site-specific objective.

4

4. STRATEGIC PLANNING AND IMPLEMENTATION

Table of Contents

Introduction 4-1

Control of Point Source Pollutants 4-3
- Introduction – General Information about Regional Board Permitting Programs 4-3
- Waste Discharge Requirements (WDRs) 4-4
  - Land Disposal 4-5
    - Landfills 4-10
    - Sludge Use and Disposal 4-16
    - Soil and Hazardous Waste Disposal 4-17
    - Dredging Requirements 4-17
  - Septic Systems 4-17
  - Waivers from WDRs 4-17
- Water Reclamation Requirements (WRRs) 4-18
- National Pollutant Discharge Elimination System Program (NPDES) 4-18
  - Pretreatment 4-21
  - Storm Water Permits 4-21
- Criteria for WDRs, WRRs, and NPDES Permit Limit and Provisions 4-25
  - Municipal Effluent Limits (NPDES) 4-25
  - Specific Criteria for Site-specific Determination of Effluent Limits 4-25
  - Standard Provisions in WDRs and NPDES Permits 4-31
- Self Monitoring, Compliance Monitoring and Inspections 4-32
- Enforcement 4-32

Control of Nonpoint Source Pollutants 4-33
- Introduction 4-33
- Early Nonpoint Source Pollution Planning Efforts 4-34
- Development of the State Nonpoint Source Program 4-34
- Nonpoint Source Funding 4-36
- Nonpoint Source Categories 4-37
  - Agriculture 4-37
  - Confined Animal Operations 4-39
  - Urban Runoff 4-39
    - Comprehensive Control Program 4-41
    - Highway Runoff Control Program 4-42
    - Industrial Activity Control Program 4-43
    - Construction Activity Control Program 4-43
  - Hydrologic Modification 4-43
    - 401 Certification Program 4-44
    - Streambed Alteration Agreements 4-46
  - Recreational Impacts 4-46
  - Septic Systems 4-46
  - Seawater Intrusion 4-47
  - Resource Extraction 4-48
    - Mines 4-48
    - Oil and Gas Extraction 4-49
  - Silviculture 4-52
- Coastal Nonpoint Source Pollution Program 4-54
- Future Direction: Watershed-Based Water Quality Control 4-54
- Remediation of Pollution 4-57
  - Underground Storage Tanks 4-57
  - Well Investigations 4-59
  - Spills, Leaks, Investigation and Cleanup (SLIC) 4-60
  - Department of Defense and Department of Energy 4-60
  - Aboveground Petroleum Storage Tanks 4-63
  - Resource Conservation and Recovery Act 4-63
  - Toxic Pits Cleanup Act 4-63
  - Bay Protection and Toxic Cleanup Program 4-63
  - The Santa Monica Bay Restoration Project 4-64
    - Introduction 4-64
    - Assessment of Problems in Santa Monica Bay 4-64
      - Environmental Issues 4-64
      - Management Issues 4-65
    - Recommended Actions 4-65

Introduction

The Regional Board's mission is to achieve and maintain water quality objectives that are necessary to protect all beneficial uses of the waters in the Region. Depending on the nature of the water quality problem, several different strategies, as outlined below, are employed to accomplish this mission.

- ***Control of Point Source Pollutants:*** Pollutants from point sources are transported to waterbodies in controlled flows at well-defined locations. Examples of point sources include discharges from municipal and industrial wastewater treatment facilities.

  Programs that protect water quality from point source pollutants are primarily regulatory in nature. Permitting programs such as California's Waste Discharge Requirements (established in the 1950s) and the federal National Pollutant Discharge Elimination System (established in the 1970s) are examples of key regulatory programs. Significant progress toward the control of point source pollutants has been made through these permitting programs.

- ***Control of Nonpoint Source Pollutants:*** Pollutants from nonpoint sources are diffuse, both in terms of their origin and mode of transport to surface and ground waters. Unlike pollutants from point sources, pollutants from nonpoint sources often enter waters in sudden

pulses and large quantities as rain, irrigation, and other types of runoff that mobilize and transport contaminants into surface and ground waters. Nationwide, pollutants from nonpoint sources represent the greatest threat to water quality. Examples of nonpoint sources in southern California include lawn and garden chemicals that are transported by storm water or water from lawn sprinklers; household and automotive care products that are dumped or drained on streets and into storm drains; fertilizers and pesticides that are washed from agricultural fields by rain or irrigation waters; sediment that erodes from construction sites; and various pollutants deposited by atmospheric deposition.

Nonpoint source pollutants are more difficult to control than point source pollutants, and different control strategies are required. For example, traditional permitting programs are neither a practical nor effective means of protecting water quality from lawn and garden chemicals. Accordingly, the Regional Board is integrating non-regulatory programs with regulatory programs in order to control pollutants from nonpoint sources. Emphasis is placed on pollution prevention through careful management of resources, as opposed to "cleaning up" the waterbody after the fact. Through public outreach – an example of a non-regulatory program – residents are informed of threats to the quality of the waters in their communities and are encouraged to voluntarily implement Best Management Practices (BMPs) that will eliminate or reduce nonpoint sources of pollution. When necessary, local governments are encouraged to develop and implement ordinances that supplement the Regional Board's public outreach efforts. This flexible

Table 4-1. "Threat to Water Quality" and "Complexity" Definitions.

Category	Definition	Example
THREAT TO WATER QUALITY		
Category I (Major threat)	Those discharges which could cause the long-term loss of a designated beneficial use of the receiving water, render unusable a ground water or surface water resource used as a significant drinking water supply, require closure of an area used for contact recreation, result in long-term deleterious effects on shellfish spawning or growth areas of aquatic resources, or directly expose the public to toxic substances.	Loss of a drinking water supply
Category II (Moderate threat)	Those discharges of waste which could impair the designated beneficial uses of the receiving water, cause short-term violations of water quality objective, cause secondary drinking water standards to be violated, or cause a nuisance. The discharge could have a major adverse impact on receiving biota, cause aesthetic impairment to a significant human population, or render unusable a potential domestic or municipal water supply.	Aesthetic impairment from nuisance from a waste treatment facility.
Category III (Minor threat)	Those discharges of waste which could degrade water quality without violating water quality objectives, or cause a minor impairment of designated beneficial uses compared with Category I and Category II.	Small pulses of water from low volume cooling water discharges.
COMPLEXITY		
Category "a"	Any major NPDES discharger; any discharge of toxic wastes; any small volume discharge containing toxic waste or having numerous discharge points or ground water monitoring; any Class I waste management unit.	Small volume complex discharger with numerous discharge points, leak detection systems or ground water monitoring wells.
Category "b"	Any discharger not included above which has a physical, chemical, or biological treatment systems (except for septic systems with subsurface disposal), or any Class II or Class III waste management units.	Marinas with petroleum products, solid wastes or sewage pump-out facilities.
Category "c"	Any discharger for whom waste discharge requirements have been or would be prescribed pursuant to Section 13263 of the Water Code not included as a Category "a" or Category "b" as described above.	Discharges having no waste treatment systems or that must comply with best management practices, discharges having passive treatment and disposal systems, or dischargers having waste storage system with land disposal such as dairy waste ponds.
NPDES Major or Minor		
Major	Publicly owned treatment works with a yearly average flow of over 0.5 million gallons per day (MGD) or an industrial source with a yearly average flow of over 0.1 MGD and those with lesser flows but with acute or potential adverse environmental impacts.	
Minor	All other dischargers that are not categorized as a Major.	

approach can be an effective means of controlling pollutants from many nonpoint sources.

- ***Remediation of Pollution:*** The Regional Board oversees remediation of both ground and surface waters through the investigation of polluted ground water and enforcement of corrective actions needed to restore water quality. These activities are managed through eight programs, namely: Underground Storage Tanks; Well Investigations; Spills, Leaks, Investigations and Cleanups (SLIC); Aboveground Petroleum Storage Tanks; U.S. Department of Defense (DOD) and Department of Energy (DOE) Sites; Resource Conservation and Recovery Act (RCRA); Toxic Pits Cleanup Act; and Bay Protection and Toxic Cleanup.

These programs are designed to return polluted sites to productive use by identifying and eliminating the sources of pollutants, preventing the spread of pollution, and restoring water quality.

Control of Point Source Pollutants

Introduction – General Information about Regional Board Permitting Programs

All wastewater discharges in the Region – whether to surface or ground waters – are subject to Waste Discharge Requirements (WDRs). Likewise, all reuses of treated wastewaters are subject to Water Reclamation Requirements (WRRs). In addition, because the USEPA has delegated responsibility to the State and Regional Boards for implementation of the federal National Pollutant Discharge Elimination System (NPDES) program, WDRs for discharges to surface waters also serve as NPDES permits. These programs are the legal means to regulate controllable discharges. It is illegal to discharge wastes into any waters of the State and to reuse treated wastewaters without obtaining appropriate WDRs, WRRs, or NPDES permits (all of which are hereinafter referred to as Requirements).

Any facility or person who discharges, or proposes to discharge, wastes or makes a material change to the character, location, or volume of waste discharges to waters in the Los Angeles Region (other than into a community sewer system) must describe the quantity and nature of the proposed discharge in a report of waste discharge (ROWD) or an NPDES application. Upon review of the ROWD or NPDES application and all other pertinent information (including comments received at a public hearing), the Regional Board will consider the issuance of Requirements that incorporate appropriate measures and limitations to protect public health and water quality. The basic components of the Requirements include:

- discharge limitations (including, if required, effluent and receiving water limits);
- standard requirements and provisions outlining the discharger's general discharge requirements and monitoring and reporting responsibilities; and
- a monitoring program in which the discharger is required to collect and analyze samples and submit monitoring reports to the Regional Board on a prescribed schedule.

Discharges are categorized according to their threat to water quality and operational complexity (Table 4-1). In addition, discharges to surface waters are categorized as major or minor discharges. Filing and annual fees are based on these categories. WDRs or WRRs usually do not have an expiration date but are reviewed periodically on a schedule based on the level of threat to water quality. NPDES permits are adopted for a five-year period.

Most Requirements are tailored to specific waste discharges. In some cases, however, discharges can be regulated under general Requirements (Table 4-2), which simplify the permit process for certain types of discharges. These general Requirements are issued administratively to the discharger after a completed ROWD or NPDES application has been filed and the Executive Officer has determined that the discharge meets the conditions specified in the general Requirements.

Point source discharges include wastewaters from municipal sewage treatment plants, industrial and manufacturing facilities, shipyards and power generation stations (see examples in Table 4-3). The Regional Board currently administers approximately 1,200 Requirements for these discharges, including 37 sewage treatment facilities with design flows of over 100,000 gallons per day (Table 4-4; Figure 4-1). Major or significant

Table 4-2. Summary of General WDRs* and NPDES Permits Issued by the State Board and the Regional Board.

General WDRs and NPDES Permits	Examples of eligible dischargers
General WDR for land treatment of petroleum hydrocarbon contaminated soil in Los Angeles and Santa Clara River Basins (Order No. 90-148).	Refineries, leaking underground and above ground tanks, and leaking pipelines.
General NPDES permit and WDR for discharges of ground water to surface waters in Los Angeles River and Santa Clara River Basins (Order No. 91-92).	Construction de-watering discharges and well test waters.
General WDR for discharge of non-hazardous contaminated soils and other wastes in Los Angeles River and Santa Clara River Basins (Order No. 91-93).	Petroleum-contaminated soil, excavation soils.
General WDR for private subsurface sewage disposal systems in areas where ground water is used or may be used for domestic purposes (Order No. 91-94).	New residential developments.
General NPDES permit and WDR for discharges of hydrostatic test water to surface waters in Los Angeles River and Santa Clara River Basins (Order No. 91-111).	Waste waters from hydrostatic testing of pipe(s), tanks(s), in any storage vessels.
General NPDES permit and WDR for discharges of storm water associated with industrial activities excluding construction activities (Order No. 91-13-DWQ).**	Surface runoff discharges from industrial sites or facilities.
General NPDES permit and WDR for discharges of storm water runoff associated with construction activity (Order No. 92-08-DWQ).**	Surface runoff from construction sites.
General NPDES permit and WDR for discharge of ground water from investigation and/or clean up of petroleum fuel pollution to surface waters in the Los Angeles and Santa Clara River Basins (Order No. 92-91).	Treated ground water to cleanup waters polluted with petroleum fuel, ground water extracted during pump tests, and well development and purging.
General WDR for specified discharges to ground water in Santa Clara River and Los Angeles River Basins (Order No. 93-10).	Hydrostatic testing of tanks, pipes, and storage vessels; construction dewatering; dust control application; water irrigation storage systems; subterranean seepage dewatering; well development and test pumping; aquifer testing; and monitoring well construction.

* General WDRs can be issued by the Executive Officer without formal Board Action.
** State Board Order.

dischargers of the Region, as of February 1994, fall into the categories shown in Table 4-5.

Waste Discharge Requirements (WDRs)

All discharges, whether to land or water, are subject to the California Water Code (§13263) and will be issued WDRs by the Regional Board. Furthermore, discharges to land are also subject to Title 23, California Code of Regulations, either under Chapter 15 (e.g., mining operations and landfills) or under other chapters (e.g., wastewater treatment, erosion control projects, and certain septic systems).

WDRs usually do not have an expiration date (with the exception of dredging WDRs and some Chapter 15 WDRs).

Land and groundwater-related WDRs (i.e., "Non-NPDES" WDRs) are described in this section. WDRs for discharges to surface waters, that also serve as NPDES permits, are described in the National Pollutant Discharge Elimination System Program section. In general, "Non-NPDES" WDRs regulate discharges of privately or publicly treated domestic wastewater, cooling tower bleed off, process and wash-down wastewater, and oil field brines. These WDRs usually protect the beneficial uses of groundwater basins but some WDRs are

Table 4-3. Examples of Industrial and Municipal Point Source Discharges to Surface Waters.

Discrete Discharge	Examples of pollutants*	Examples of Affected Waterbodies
Oil refinery wastewaters	Oil, chemical additives, dissolved mineral salts, VOCs (BTEX**), BOD, suspended solids, metals, temperature	Santa Monica Bay, Dominguez Channel, Long Beach and Los Angeles Harbors
Oil field drilling brine disposal *Regulated by the California Department of Conservation, Division of Oil and Gas*	BOD, COD, TDS, chloride, settleable solids, suspended solids, oil and grease, sulfur, heavy metals	Re-injection in groundwater basins
Zoo wastewaters	Suspended solids, BOD, bacteria	Los Angeles River
Municipal wastewater treatment plants (See Table 4-4 for more information)	BOD, COD, TDS, chloride, sulfate, nutrients, NH3, residual chlorine, metals, organic chemicals	Most inland waters, Pacific Ocean
Cooling tower water (contact and non-contact), boiler blowdown	Suspended solids, oil and grease, dissolved minerals, settleable solids, chemical additives, temperature	Most inland rivers and streams
Power generation plants	Temperature, chemical additives, minerals	Los Angeles River, Los Cerritos Channel, Santa Monica Bay, Los Angeles Harbor, San Gabriel River Estuary, Pacific Ocean
Ground water from remediation or from construction de-watering	TDS, chloride, sulfate, VOC's, (BTEX), and other petroleum hydrocarbons	Region-wide
Manufacturing (process/wash) waste water	Temperature, residual chlorine	Most inland rivers and streams
Aquaculture wastewater	Suspended solids and nutrients	Pacific Ocean
Shipyard, boatyard wastes	Oil and grease, metals (Pb, Cr), suspended solids, settleable solids, TBT, temperature, chemical additives	Long Beach Harbor, Los Angeles Harbor, Pacific Ocean

* These examples are possible pollutants. Actual presence in all discharges is not implied.
** BTEX is benzene-toluene-ethylbenzene-xylene

issued to protect surface waters in areas where ground water is known to exfiltrate from groundwater basins to surface waters.

Types of waste discharge that require WDRs under these laws and regulations include:

- On-site disposal systems (septic systems)
- Holding/equalization tanks
- Evaporation ponds
- Percolation ponds and leachfields
- Landfills
- Land treatment units (bioremediation)
- Dredging
- Oil field brines

Land Disposal

The Regional Board issues WDRs for wastewaters originating from landfills, surface impoundments, waste piles and land treatment units, mines, and confined animal feedlots. These WDRs can be issued in cooperation with other state agencies (Table 4-6). The Regional Board also administers the Solid Waste Assessment Test (SWAT) Program to identify any landfills that have "leaked" wastes.

The Regional Board can also direct responsible parties to abate any condition of nuisance or pollution from closed, illegal, or abandoned disposal sites.

Table 4-4. Sewage Treatment Facilites with Design Flow Greater than 100,000 Gallons per Day.

Facility Name	1993 Average flow/Peak flow-MGD	Design flow 1993/ Projected 2000-MGD	Receiving waterbody	Reclamation/ percolation ponds	Treatment level	Future plans
Avalon, City of: Avalon Wastewater Treatment Facility	0.65/ 2.00	1.2/ 2.0	Pacific Ocean		Secondary	Plant expansion plan (1994) with biological secondary treatment
Burbank, City of: Burbank Water Reclamation Plant	7.37/ 16.00	9/ 15	Burbank Western Channel	Plans to increase sales for irrigation	Tertiary	Plant expansion plan (1994-1996)
Camarillo Sanitation District: Water Reclamation Plant	3.9/ 7.0	6.75/ same	Conejo Creek	Future plans	Secondary	Plan to construct phase II by 2004 with possible filtration
County Sanitation Districts of Los Angeles County: Joint Water Pollution Control Plant	340/ 460 * (200 secondary)	385 advanced primary (200 secondary)/ same	Pacific Ocean	N/A	Advanced primary/ secondary	Plan for full secondary
County Sanitation Districts of Los Angeles County: La Canada Water Reclamation Plant	0.124/ NA	0.2/ same	none	Irrigation	Secondary	Plan to connect to District's Joint Outfall
County Sanitation Districts of Los Angeles County: Long Beach Water Reclamation Plant	17.3/ 24.9 *	25/ same	Coyote Creek	Plans to increase reclaimed use by ground water injection and other by 1995	Tertiary	Plan to expand capacity by 2010
County Sanitation Districts of Los Angeles County: Los Coyotes Water Reclamation Plant	37.8/ 45.0 *	37.5/ same	San Gabriel River	Reclaimed use	Tertiary	Plan for increased volume
County Sanitation Districts of Los Angeles County: Pomona Water Reclamation Plant	13.2/ 21.3 *	15/ same	San Jose Creek	Industrial, agriculturdal and irrigation use	Tertiary	Plan for increased volume
County Sanitation Districts of Los Angeles County: San Jose Creek Water Reclamation Plant	71.7/ 116.1 *	100/ same	San Gabriel River and San Jose Creek	Groundwater recharge and irrigation	Tertiary	Plan for increased volume
County Sanitation Districts of Los Angeles County: Saugus Water Reclamation Plant	6.3/ 10.5 * (excess is diverted to Valencia)	5.6/ 7.0	Santa Clara River	Plans for reclaimed use	Tertiary	Plan for increased volume
County Sanitation Districts of Los Angeles County: Valencia Water Reclamation Plant	8.8/ 14.6 *	7.5/ 13.5	Santa Clara River	Plans for reclaimed use	Tertiary	Plan for expansion
County Sanitation Districts of Los Angeles County: Whittier Narrows Water Reclamation Plant	12.5/ 18.0 *	15.0/ same	San Gabriel River and Rio Hondo	Groundwater recharge and plans for other reuse	Tertiary	Plan for increased volume

Table 4-4. Sewage Treatment Facilites with Design Flow Greater than 100,000 Gallons per Day (continued).

Facility Name	1993 Average flow/Peak flow-MGD	Design flow 1993/ Projected 2000-MGD	Receiving waterbody	Reclamation/ percolation ponds	Treatment level	Future plans
Las Virgenes Municipal Water District: Tapia Water Reclamation Facility	8/ 13	16/ same	Malibu Creek	Plans increased sales of reclaimed water (Current: 90% of effluent from June-Sept.)	Tertiary	Anaerobic sludge digestion, centrifuge dewatering, in-vessel composting and beneficial reuse
Los Angeles, City of, Department of Public Works: Donald C. Tillman Water Reclamation Plant	75/ 100	80/ same	Los Angeles River	Japanese garden, Wildlife Lake, Lake Balboa. Irrigation. Future groundwater recharge.	Tertiary	Possible increase in capacity
Los Angeles, City of, Department of Public Works: Hyperion Treatment Plant	350/ 476	420/ 450	Santa Monica Bay	West Basin Municipal District plans to reclaim 70 MGD by 1995 at new facility. Other reuse.	Primary/ secondary	Upgrade (1998) to full secondary pure oxygen, two stage anaerobic digestion
Los Angeles, City of, Department of Public Works: Los Angeles-Glendale Water Reclamation Plant	20/ 27	20/ 50	Los Angeles River	Plans to increase reclaimed water sales. Industrial use.	Tertiary	Plan expansion project
Los Angeles, City of, Department of Public Works: Terminal Island Treatment Plant	18/ 26 (dry) 40 (wet)	30/ same	Los Angeles Harbor	Plans for reclaimed use (5 MGD) in 1996	Secondary	Full effluent filtration
Los Angeles, City of, Department of Recreation and Parks: LA Zoo Wastewater Treatment Plant	4.0/ 0.5	2.5/ 8.0	Los Angeles River (over flow) otherwise City sanitary sewer	N/A	Primary/chlorinated	New facility under construction
Los Angeles, County of, Department of Public Works: Malibu Mesa Wastewater Treatment Plant	0.175/ 0.20	0.20/ same	Winter and Marie Canyons	Landscape spray irrigation	Tertiary	No changes anticipated
Los Angeles, County of, Department of Public Works: Trancas Sewage Treatment Plant	0.058/ 0.15	0.12/ same	N/A	Leaching fields	Tertiary	No changes anticipated
Los Angeles, County of, Mech Dept.: Acton Rehabilitation Center	0.026/ ?	0.15/	N/A	N/A	Secondary	No changes anticipated
Ojai Valley Sanitary District: Ojai Valley Wastewater Treatment Plant	2.26/ 3.24	3.0/ same	Ventura River	Plans for reclaimed water	Secondary	New facility plan (1996) for Tertiary treatment
Oxnard, City of, Department of Public Works: Oxnard Wastewater Treatment Plant	18/ 25	37.1/ same	Pacific Ocean	Plans for reclaimed water	Secondary	Plan for tertiary treatment
San Buenaventura, City of: Ventura Water Reclamation Plant	7.6/ 15.0	14/ 16	Santa Clara River Tidal Prism	Plan to increase use of reclaimed water	Tertiary	Plan to update electrical systems.
Simi Valley County Sanitation District: Simi Valley Water Quality Control Plant	9.0/ 22.5	12.5/ same	Arroyo Simi	?	Tertiary	Depends on outcome of study

Table 4-4. Sewage Treatment Facilites with Design Flow Greater than 100,000 Gallons per Day (continued).

Facility Name	1993 Average flow/Peak flow-MGD	Design flow 1993/ Projected 2000-MGD	Receiving waterbody	Reclamation/ percolation ponds	Treatment level	Future plans
Thousand Oaks, City of, Utility Department: Hill Canyon Wastewater Treatment Plant	8.6/ 18.0	10.8/ 14.0	Arroyo Conejo	Future irrigation plans	Tertiary	Advanced treatment using nitrification/denitrification processes
Thousand Oaks, City of, Utility Department: Olsen Road Water Reclamation Plant	0.175/ 0.225	0.75/ same**	Arroyo Conejo	Future irrigation plans	Secondary	Tertiary treatment by filtration
US Navy: NALF San Clemente Island	0.015/ 0.029	0.030/ same	Pacific Ocean	Plan to use reclaimed water for dust control	Secondary	Additional flow equalization capacity, increased drying bed, change to new chemical treatment and aeration
Ventura, County of, Water Works District: Moorpark Wastewater Treatment Plant	1.92/ 2.12	3.0/ 3.5	Calleguas Creek	Reclaimed use and percolation ponds	Tertiary/ Secondary	New tertiary facility. Plans to construct a reclaimed distribution system
Ventura, County of, Water Works District: Nyeland Acres Wastewater Treatment Plant	0.107/ 0.128	0.22/ same	Revolon Slough	no	Secondary	Conversion of STEP system to a gravity collection system
Ventura, County of, Water Works District: Piru Treatment Facility	0.12/ 0.147	0.20/ same	Santa Clara River	Percolation ponds	Secondary	No changes anticipated
Ventura Regional Sanitation District and Camrosa CWD: Camrosa Wastewater Treatment Plant	1.2/ 1.4	1.5/ same	Calleguas Creek	Reclamation reservoir and irrigation	Secondary	Plans to upgrade plant
Ventura Regional Sanitation District: City of Fillmore Wastewater Treatment Plant	1.0/ 1.3	1.3/ 1.6	Santa Clara River	Percolation ponds	Secondary	Currently under expansion
Ventura Regional Sanitation District: Liquid Waste Treatment Fac. #1, sludge treatment	0.04/ 0.06	0.15/ same	N/A	No	Primary	No changes anticipated
Ventura Regional Sanitation District: Montalvo Treatment Plant	0.25/ 0.35	0.36/ same	N/A	Percolation Ponds	Secondary	No changes anticipated
Ventura Regional Sanitation District: Santa Paula Wastewater Treatment Plant	2.04/ 2.6	2.5/ same	Santa Clara River	Groundwater recharge	Tertiary	No changes anticipated
Ventura Regional Sanitation District: Saticoy Sanitation District	0.12/ 0.32	0.30/ same	N/A	Percolation ponds	Primary	No changes anticipated

* Partial 1993 data (first 4 to 6 months).
** The actual flow is not expected to exceed 0.3 MGD

FIGURE 4-1

PUBLICLY OWNED TREATMENT WORKS (POTW'S)

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

REGIONAL BOUNDARY

POTW

N

Miles

0 10 20

Table 4-5. Major or Significant NPDES and WDR Discharge Categories, Numbers of Permits and Total Design Flow[#].

Category	Number of permits (Major or Significant Dischargers)	Total design flow from facilities [†] (MGD approximate)
Domestic sewage	13	35.5
Domestic sewage mixed with industrial waste	26	1255.9
Solid Waste	25	1.0 *
Wash water (industrial/ manufacturing)	1	0.03
Contact & non-contact cooling waters and process waste (industrial/ manufacturing)**	16	6700.4
Storm water runoff ***	14	361
Miscellaneous ****	5	21.1

[#] Numbers as of February 1994.
[†] Total design flow numbers includes secondary discharges (other categories) from some facilities. The Requirements listed include multiple permits for some major dischargers, particularly municipal sewage treatment plants.
* All landfills are permitted for "no discharge;" not including storm runoff. The 1.0 MGD shown on table is for a sludge farm.
** Includes powerplants.
*** These numbers indicate some process or other wastes.
**** Includes refineries, shipyards, aquaculture, and others.

Landfills

There are over 700 landfills in the Los Angeles Region, of which approximately 30 are active; the remainder are inactive or closed. The Regional Board issues WDRs to landfills that accept at least one of the following types of waste (Table 4-7): hazardous waste (Class I), designated waste (Class II), non-hazardous solid waste (Class III) and inert solid waste (Unclassified). One significant issue in the regulation of solid waste disposal is the definition of designated wastes. Many wastes which are classified as non-hazardous contain constituents of water quality concern that could become soluble in a non-hazardous solid waste landfill. Because of the need for greater containment requirements for this type of designated waste, disposal in a Class III landfill can pose a threat to the beneficial uses of State waters and therefore a more secure site (Class II) is necessary.

Landfill applicants must demonstrate to the Regional Board that the proposed disposal will be in a manner and setting such that wastes will not adversely affect any waters. Criteria for evaluating waste disposal sites include:

- Geologic features of site area
- Liners
- Leachate collection and removal systems
- Subsurface barriers

WDRs for active landfills include mandatory detection and evaluation monitoring programs and prescribed corrective actions for leakages. Landfills that close must be monitored for 30 years (40 CFR Parts 257 and 258) or longer if wastes pose a threat to water quality (Title 23, California Code of Regulations, Chapter 15, §2580).

The Regional Board has regulated landfills since the 1950s. Many of the small older sites have been closed and waste is now being handled at large regional landfills (see Table 4-8 for status of all landfills with ongoing groundwater monitoring programs; Figure 4-2 for locations). The Regional Board reviews and revises WDRs for active Class III sites (there are no active Class I or Class II sites in the Region) to ensure consistency with revised State requirements (Title 23, California Code of Regulations, Chapter 15), requires upgrading of groundwater monitoring systems in order to identify water quality degradation, and reviews and oversees the development and implementation of proper closure plans. Article 5 of Chapter 15, adopted in 1991, specifies new guidelines for the siting of groundwater monitoring wells around all active landfills. In addition, USEPA promulgated regulations (40 CFR Parts 257 and 258, "Subtitle D" [Solid Waste Disposal Facility Criteria]) in 1991, that uniformly apply additional requirements to dischargers of municipal solid waste. The Regional Board adopted Order No. 93-062 (September 27, 1993) which requires that all applicable regional landfills comply with these federal regulations.

Class III landfills in the Los Angeles Region are listed in Table 4-9. Former active Class I landfills include Calabasas, BKK, Palos Verdes, and Simi Valley. There are approximately 15 active inert

Table 4-6. Cooperating Agencies for the Land Disposal Programs.

Waste Disposal Category	Cooperating Agency
Mining Waste (Article 7 of Chapter 15)	California Division of Mines and Geology
Nonhazardous solid waste landfills (also regulated by the Federal Resource Conservation and Recovery Act [RCRA], Subtitle D)	California Integrated Waste Management Board
Hazardous Wastes (also regulated by the Federal Resource Conservation and Recovery Act [RCRA], Subtitle C)	California Department of Toxic Substances Control

Table 4-7. Landfill Classifications.

Disposal Site classification	Definitions of Waste Types (California Code of Regulations, Title 23, Division 3, Chapter 15, Sections 2521 et seq.)	Examples
Class I - Hazardous Waste	a) Hazardous waste is any waste which, under Section 66300 of Title 22, is required to be managed according to Chapter 30 of Division 4 of Title 22. b) Hazardous waste shall be discharged only at Class I waste management units which comply with the applicable provisions unless wastes qualify for a variance under Section 66310 of Title 22. c) Waste which have been designated as restricted wastes by California Department of Health Services (DHS) pursuant to Section 66900, of Title 22 shall not be discharged to waste management units after the restriction dates established by Section 66905 of Title 23 unless: 1) such discharge is for retrievable storage, and 2) DHS has determined that processes to treat or recycle substantially all of the waste are not available, or 3) DHS has granted a variance from restrictions against land disposal of the waste under Section 66930 of Title 22.	Materials that contain high concentrations of pesticides, certain solvents, and PCBs are examples of hazardous wastes.
Class II - Designated Waste	a) Designated waste is defined as: 1) nonhazardous waste which consists of or contains pollutants which, under ambient environmental conditions at the waste management unit, could be released at concentrations in excess of applicable water quality objectives, or which could cause degradation of waters of the State. 2) hazardous waste which has been granted a variance from hazardous waste management requirements pursuant to Section 66310 of Title 22. b) Wastes in this category shall be discharged only at Class I waste management units or at Class II waste management units which comply with the applicable provisions of Chapter 15 and have been approved for containment of the particular kind of waste to be discharged. Decomposable wastes in this category may be discharged to Class I or II land treatment waste management units.	Materials with high concentrations of BOD, hardness, or chloride. Inorganic salts and heavy metals are "manageable" hazardous wastes.
Class III-Nonhazardous Solid Waste	a) Nonhazardous solid waste means all putrescible and nonputrescible solid, semi-solid, and liquid wastes, including garbage, trash, refuse, paper, rubbish, ashes, industrial wastes, demolition and construction wastes, abandoned vehicles and parts thereof, discarded home and industrial appliances, manure, vegetable or animal solid and semi-solid wastes and other discarded solid or semi-solid waste; provided that such wastes do not contain wastes which must be managed as hazardous wastes, or wastes which contain soluble pollutants in concentrations which exceed applicable water quality objectives, or could cause degradation of waters of the State (i.e., designated waste). b) Except as provided in Subsection 2520(d) of Chapter 15, nonhazardous solid waste may be discharged at any classified landfill which is authorized to accept such waste, provided that: 1) the discharger shall demonstrate that co-disposal of nonhazardous solid waste with other waste shall not create conditions which could impair the integrity of containment features and shall not render designated waste hazardous (e.g., by mobilizing hazardous constituents); 2) a periodic load-checking program approved by DHS and regional boards shall be implemented to ensure that hazardous materials are not discharged at Class III landfills. c) Dewatered sewage or water treatment sludge may be discharged at a Class III landfill under the following conditions, unless DHS determines that the waste must be managed as hazardous waste: 1) The landfill is equipped with a leachate collection and removal system; 2) The sludge contains at least 20 percent solids by weight if primary sludge, or at least 15 percent solids if secondary sludge, mixtures of primary and secondary sludges, or water treatment sludge; and 3) A minimum solids-to-liquid ratio of 5:1 by weight shall be maintained to ensure that the co-disposal will not exceed the initial moisture-holding capacity of the nonhazardous solid waste. The actual ratio required by the regional board shall be based on site-specific conditions. d) Incinerator ash may be discharged at a Class III landfill unless DHS determines that the waste must be managed as hazardous waste.	Garbage, trash, refuse, paper, demolition and construction wastes, manure, vegetable or animal solid and semisolid wastes.
Unclassified/Inert	a) Inert waste does not contain hazardous waste or soluble pollutants at concentrations in excess of applicable water quality objectives. It does not contain significant quantities of decomposable waste. b) Inert wastes do not need to be discharged to classified management units. c) Regional boards may prescribe individual or general waste discharge requirements for discharges of inert wastes.	Concrete, rock, plaster, brick, uncontaminated soils.

Table 4-8. Status of Landfills (Active and Inactive) in Region that have Ongoing Groundwater Monitoring Programs.

Landfill	Constituents detected in monitoring wells	Current activities
Azusa Landfill (Azusa Land Reclamation Co., Inc.)	Volatile organic compounds (VOCs)	Ongoing continuous detection monitoring includes gas control.
Bailard Landfill (Ventura Regional Sanitation District)	Vinyl chloride	Increased gas extraction wells as well as groundwater extraction wells at Bailard and one well at a coastal site are reducing vinyl chloride exceedances.
BKK Landfill West Covina* (BKK Corporation)	Class I area: VOCs, heavy metals, semi-VOCs, general minerals Class III area: no detectable contaminants	The groundwater monitoring system surrounding the landfill consists of over 200 wells. Offsite well clusters are currently being installed to determine the extent of the contaminant plume from the landfill. Corrective action program ongoing.
Bradley Landfill (Valley Reclamation Co.)	VOCs	Site undergoing evaluation monitoring.
Brand Park Disposal Site (City of Glendale)	No detected contamination	Inert landfill. Site undergoing detection monitoring.
Calabasas Landfill* (Sanitation Districts of Los Angeles County)	Heavy metals, VOCs, semi-VOCs	Site undergoing evaluation monitoring.
Calmat Sun Valley (Calmat Properties Co.)	No detected contamination	Inert landfill. Site undergoing detection monitoring.
Chandler Sand and Gravel (Chandler's Sand and Gravel)	General minerals	Inert landfill. Site undergoing detection monitoring.
Chiquita Canyon Landfill (Laidlaw Waste System Chiquita)	VOCs, inorganic compounds	Corrective action program will be implemented.
Coastal Landfill (Ventura Regional Sanitation District) [closed]	VOCs	Increased gas extraction wells as well as groundwater extraction wells at Bailard and one well at coastal site are reducing VOCs exceedances.
Getty Oil Site (Texaco Producing, Inc.)	No detected contamination	Site undergoing detection monitoring.
Irwindale Dike Build-up (Livingston-Graham Inc.)	No detected contamination	Inert landfill. Site undergoing detection monitoring.
Lopez Canyon Landfill (City of Los Angeles Department of Public Works)	No detected contamination	Additional up and down gradient wells installed as part of required program. Site undergoing detection monitoring.
Manning Pit South [Former] (Los Angeles County DPW WMD)	No detected contamination	Inert landfill. Site undergoing detection monitoring.
Manning Pit North (City of Irwindale)	No detected contamination	Inert landfill. Site undergoing detection monitoring.
Montebello Land and Water (Montebello Land and Water Co.)	No detected contamination	Inert landfill. Site undergoing detection monitoring.
Nu-Way Owl Rock Landfill	No detected contamination	Inert landfill. Site undergoing detection monitoring.
Nu-Way Industries Landfill [closed]	Detectable VOCs up- and down-gradient	No statistically significant exceedences.

Table 4-8. Status of Landfills (Active and Inactive) in Region that have Ongoing Groundwater Monitoring Programs (continued).

Landfill	Constituents detected in monitoring wells	Current activities
Operating Industries Landfill*** (Operating Industries, Inc.) [closed-Superfund site]	VOCs, semi-VOCs, metals, inorganic compounds	A leachate treatment plant has been constructed for on-site treatment, with a remedial investigation ongoing.
Owl Rock Quarry Site (Nu-Way Industries, Inc.)	No detected contamination	Inert landfill. Site undergoing detection monitoring.
Palos Verdes** (Sanitation Districts of Los Angeles County) [closed]	VOCs	Department of Toxic Substances Control is lead agency. Districts have submitted remedial investigation report.
Puente Hills Landfill (Sanitation Districts of Los Angeles County)	VOCs, metals	In August 1993, the Districts installed a replacement barrier and additional gas wells to control landfill gas, the probable source of the VOC's. Site undergoing detection monitoring.
San Marino City Dump (City of San Marino)	No detected contamination	Inert landfill. Site undergoing detection monitoring.
Santa Clara Disposal Site, Oxnard (Ventura Regional Sanitation District) [closed]	VOCs	Increased gas extraction wells and groundwater extraction wells at Bailard and one well at a coastal site are reducing VOCs exceedances.
Savage Canyon Disposal Site (City of Whittier)	No detected contamination	Site undergoing detection monitoring.
Scholl Canyon Landfill (Sanitation Districts of Los Angeles County)	VOCs, chloride	Site undergoing evaluation monitoring.
Simi Valley Landfill* (Waste Management of California)	VOCs	Site undergoing evaluation monitoring.
Spadra Landfill (Sanitation Districts of Los Angeles County)	VOCs	An evaluation monitoring program will be implemented.
Stough Park Landfill (City of Burbank)	VOCs	An evaluation monitoring program will be implemented.
Strathern (LA By-Products Co.)	No detected contamination	Inert landfill. Site undergoing detection monitoring.
Sunshine Canyon Landfill - City of Los Angeles portion (Browning-Ferris Industries, Inc.) [closed]	Chloride above Water Quality Protection Standard	The operator has been asked to do additional background/site characterization to determine sources of elevated chloride levels downgradient of the landfill.
Toland Road Disposal Site (Ventura Regional Sanitation District)	No detected contamination	Additional downgradient well to be installed. Site undergoing detection monitoring.
Toyon Canyon Landfill (City of Los Angeles Department of Public Works) [closed]	Organic and inorganic constituents	A monitoring and reporting program was revised in December 1991. An evaluation monitoring program has also been submitted.

* Former Class I landfill that is now an operating Class III landfill and has an ongoing ground water monitoring program.
** Former Class I landfill that is now closed and has an ongoing ground water monitoring program.
*** Former Class II landfill that is now closed but has an ongoing ground water monitoring program.

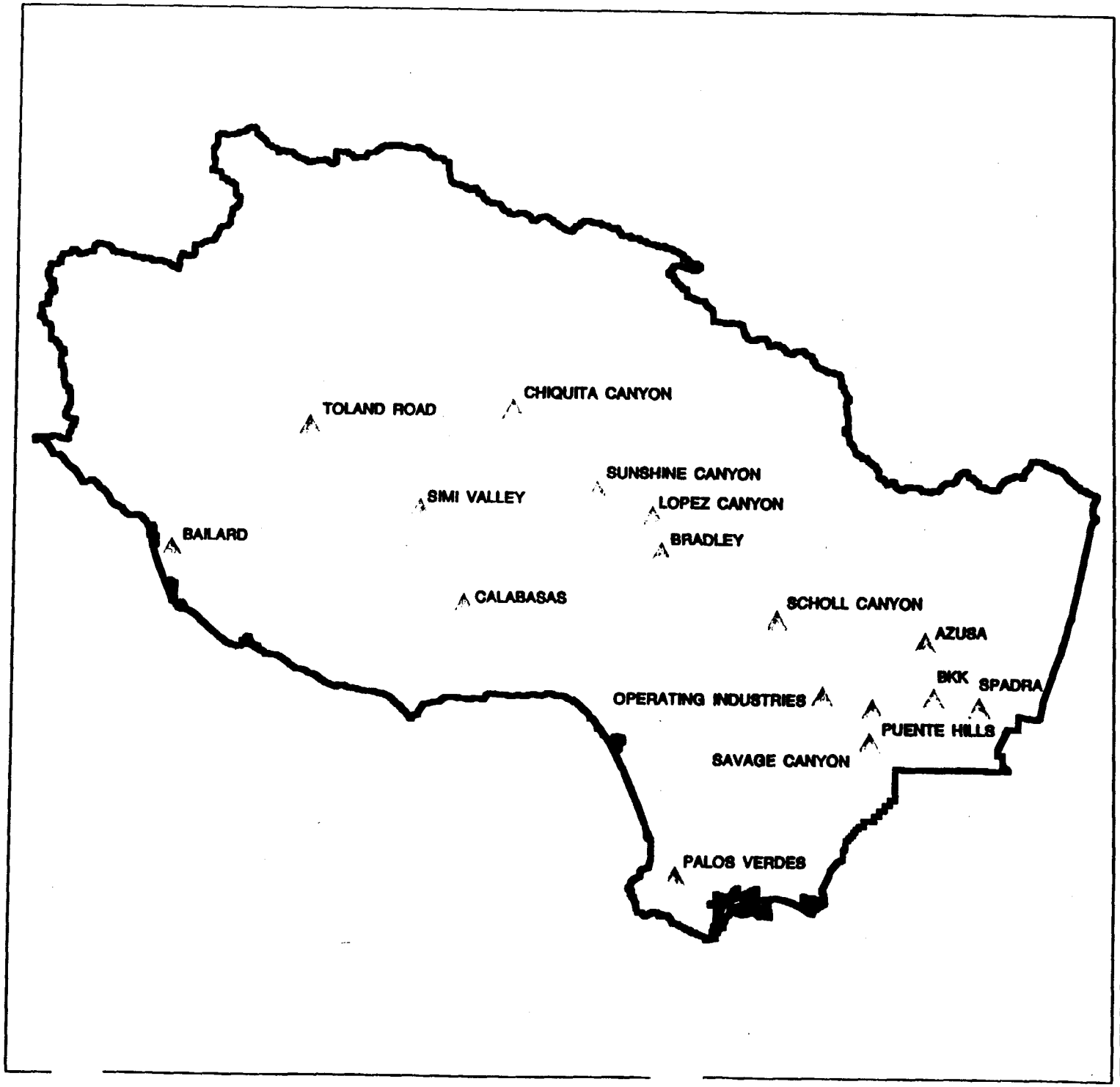


FIGURE 4-2

MAJOR LANDFILLS

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

REGIONAL BOUNDARY

LANDFILL

N

Miles

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Table 4-9. Active Regional Class III Landfills.

County	Agency/Owner	Landfills
Ventura County	Ventura Regional Sanitation District	Bailard Toland Road
	Waste Management Disposal Services of California, Inc.	Simi Valley
Los Angeles County	Azusa Land Reclamation/BFI *	Azusa
	BFI	Sunshine Canyon
	BKK	BKK-West Covina
	City of Burbank	Stough Park
	Laidlaw Waste System	Chiquita Canyon
	City of Los Angeles Department of Public Works	Lopez Canyon
	Sanitation Districts of Los Angeles County	Calabasas Puente Hills Scholl Canyon Spadra
	Valley Reclamation Company/Waste Management Disposal Services of California, Inc.	Bradley
	City of Whittier	Savage Canyon
	Consolidated Disposal	Pebbly Beach
	Doug Bombard Enterprises	Two Harbors

* The Azusa Landfill Reclamation site is currently accepting inert wastes. A ruling from State Board will determine whether the original 80-acre portion of the site will continue to operate as a Class III landfill pursuant to Regional Board Order WQ 86-59 and State Board Order 91-01.

landfills; see Table 4-10 for Regional Board procedures for siting inert landfills. In addition, there are several hundred inactive landfills in the Region, for which information about the nature of wastes and possible impacts to ground water are unknown at this time.

The Regional Board also administers the Solid Waste Water Quality Assessment Test (SWAT) Program in the Region, pursuant to the California Water Code (§13273). Section 13273, added in 1985, requires owners of active or inactive non-hazardous landfills to evaluate the possible migration of hazardous wastes or leachate from their landfill.

In addition to requiring site evaluations, the SWAT Program also:

- provides deadlines for implementation of water quality monitoring systems at active solid waste disposal sites;
- requires water quality monitoring systems at many closed solid waste disposal sites which previously had none; and
- requires identification of leaking solid waste disposal sites for verification monitoring and/or remedial actions to be taken under the Chapter 15 Program.

In 1986, the Regional Board began to require that landfill operator/owners prepare SWAT proposals to show how they would meet the requirements of Section 13273. Upon approval of proposals by the Regional Board, the operators must collect groundwater monitoring data during four consecutive quarters and submit the combined data in a SWAT report. To date, the Regional Board has received approximately 75 reports. Several of the landfills that detected problems underwent, or are undergoing, verification monitoring. SWAT reports submitted by owner/operators must include an analysis of the surface and ground water on, under, and within one mile of the solid waste disposal site in order to provide a reliable indication of whether there is any leakage of hazardous waste. Reports must also contain a chemical characterization of the soil-pore liquid of those areas which are likely to be affected if the solid waste disposal site is leaking and compare that area to geologically similar areas near the solid waste disposal site which have not been affected by the leakage of waste.

Table 4-10. Procedures for Siting Inert Landfills.

Regional Board procedures for siting inert landfills
A monitoring program approved by the Executive Officer must be in place and operating prior to disposal of any inert waste. This will include ground water monitoring and waste disposal reporting. In the event that possible leakage from the landfill is observed during routine detection monitoring, an evaluation monitoring, and if necessary, a corrective action program similar to those included in Chapter 15 will be implemented.
Disposal must be restricted to inert wastes. Organic material is allowed only in insignificant quantities, with the exception of a maximum of 5% by volume of organic material from debris basins. Friable asbestos, asphaltic material*, and rubber tires are specifically prohibited unless allowed by Waste Discharge Requirements from the Regional Water Quality Control Board.
A waste load checking program similar to those approved for Class III landfills must be carried out.
Installation of precipitation and drainage controls is required to accommodate runon and runoff.
Inspection of facility by Regional Board staff should be conducted at least once per year.
Submittal of a closure plan is required for review and approval by the Executive Officer. Such plan to include ground water monitoring for a minimum period of five years.

* Asphaltic material that contains less than 50% solids is not allowed (i.e., asphalt). Asphaltic concrete (as defined by the Joint Cooperative Committee of the Southern California Chapter, American Public Works Association, and Southern California Districts, and Associated General contractors: *Standard Specifications for Public Works Construction*) is allowed.

Under Public Resources Code Section 45700, the State Board is required to rank all solid waste facilities throughout the State based on the threat to water quality. Other State Board reports prepared under this section detail the extent of hazardous waste at each solid waste disposal site, the potential effects these hazardous wastes can have upon the quality of waters of the State, and recommended actions needed to protect the quality of water.

Sludge Use and Disposal

Biosolids, or sludge, are residual byproducts of sewage treatment, water treatment, and certain industrial processes. Heavy metals and volatile organic chemicals tend to concentrate in sludge. For this reason, USEPA and the Regional Board do not allow the direct discharge of sludge to the ocean or any other surface waters. Discharge to land must be carefully controlled because of potential impacts on ground and surface water quality. If sludge is disposed at a landfill, it must be non-hazardous, and meet the moisture and liquid-solid ratio requirements of the receiving landfill.

Under the NPDES program, sludge disposal is regulated (40 CFR Part 503) as a self-implementing program enforced by USEPA; the state does not have delegated authority for implementing the sludge program. Sludge reporting requirements (i.e., haulage information) for sewage treatment plants are included in their NPDES permits and WDRs.

The Regional Board encourages the use of sludge or by-products thereof. Some ways that sludge can be disposed include the following:

- dehydrated sludge as fuel in gas boilers to generate electricity (ash can be recovered for use as a fluxing agent in copper smelting or in cement production);
- sludge digester methane gas as fuel in gas boilers to generate electricity;
- chemically fixated sludge as landfill daily cover: adding chemical additives which fix heavy metals, reduce pathogens, and reduce free water to form a clay-like soil for use as daily landfill cover;
- sludge as a soil amendment: composting dewatered sludge (pathogens are killed at composting temperatures);
- sludge as a nutrient source for non-edible crops: direct application to agricultural crops not meant for direct human consumption (mixing, tilling, or injecting sludge into soil);
- sludge disposal directly in certain landfills; and
- sludge disposal in-situ.

Soil and Hazardous Waste Disposal

Contaminated soil and other material must be treated or properly disposed in order to minimize threat to the quality of surface or ground waters. Dischargers are required to submit an initial analysis of the material by a State-certified laboratory. If the material is deemed hazardous, the discharger is referred to the California Department of Toxic Substances Control. For non-hazardous materials, general WDRs can be issued on a case-by-case basis. All permitted treatment or disposal includes monitoring and reporting requirements.

General WDRs (Table 4-2) for discharge of non-hazardous contaminated soils or other wastes (good for 90 days) are issued for disposal of up to 100,000 cubic yards of contaminated material. If the material contains acceptable levels of total petroleum hydrocarbons (TPH) or other contaminants, then it can be disposed in a Class III landfill at the discretion of the site operator. For discharges over 100,000 cubic yards, individual WDRs are required.

General WDRs (Table 4-2) for in-situ treatment are issued for materials that meet guidelines for land treatment of petroleum hydrocarbon-contaminated soils. Up to 100,000 cubic yards of contaminated soil can be remediated, by land treatment, to acceptable levels usually not exceeding 1000 mg/kg total petroleum hydrocarbons, within one year. For discharges over 100,000 cubic yards, individual WDRs are necessary.

Remediation treatment includes biodegradation (by a land treatment process) for hydrocarbon contaminated soil found on site and a fixation process for metals contaminated soils. In-situ disposal (without treatment) can be allowed, on a case-by-case basis, for material that is not considered to be a threat to surface or ground water.

Dredging Requirements

The Regional Board issues WDRs for dredging projects to control potential water quality impacts associated with removal and disposal of bottom sediments. In the Los Angeles Region, most dredging activities take place within the Ports of Los Angeles and Long Beach to maintain navigation channels at the proper depth or to accommodate new development. Dredging projects periodically occur in other partially or fully enclosed water bodies (e.g., marinas and lagoons), ocean waters, and inland lakes and reservoirs. Applicants must demonstrate that dredging activities will not cause adverse water quality impacts and that disposal will be managed such that beneficial uses will not be affected. Dredging requirements usually have an expiration date.

Septic Systems

The California Water Code, Chapter 4, Article 5, sets forth criteria for regulating individual disposal systems (i.e., residential septic tanks). In the past, the Regional Board placed certain types of septic tank systems under individual WDRs. The Regional Board has delegated local health or public works departments jurisdiction to permit and regulate most single-family dwellings septic tank disposal systems. However, the Regional Board retains jurisdiction over multiple-dwelling units, some non-domestic septic tank systems, and large developments in certain problem areas, as well as in any situation where septic systems are creating or have the potential to create a water quality problem.

The Regional Board has adopted general WDRs (Table 4-2) for certain private residential subsurface sewage disposal systems in areas where ground water is an important source of drinking water. These general WDRs apply to areas greater than 1 acre and less than five acres in size and in general require either a hydrogeologic study or mitigation measures. WDRs are not issued for lots less than 1 acre in size and are not required for lot sizes greater than five acres.

Waivers from WDRs

The Regional Board can waive WDRs pursuant to the California Water Code (§13269) provided that such action is not against the public interest. Discharges eligible for such waivers (see Table 4-11 for examples) must comply with all applicable Water Quality Control Plans, and:

- have minimal adverse water quality impact;
- be adequately regulated by another State or local agency; or
- be a category of discharge covered by State or Regional Board regulations, guidelines, or Best Management Practices where the Regional Board has obtained voluntary compliance.

Table 4-11. Waiver Conditions from WDRs.

Regional Board waivers
Single family dwelling subsurface sewage disposal systems which are installed and operated in compliance with local ordinances *(as modified by General Permit Order No. 91-94).*
Single family dwelling swimming pool waste disposal installations which are constructed and operated in compliance with local ordinances (Resolution No. 53-5).
The on-site disposal of uncontaminated and unpolluted rotary mud resulting from the drilling of one oil well in such a manner that it will not be dumped or allowed to drain into any waters of the State.
State Board Waivers
Temporary construction dewatering discharge when end-of-pipe treatment is not feasible and the quality of the discharge is acceptable.
Discharges from private and public recreational impoundments caused by: a) continuous addition of domestic water and no additives are used to maintain the lake quality b) wet weather conditions and herbicides are used on a seasonal basis for maintenance of the aesthetic conditions in the impoundment c) water spilled from an impoundment through the addition of new water, wind action, or rainfall, or over a spillway.

Waivers of WDRs are conditional and can be terminated at any time by the Regional Board. NPDES permits, described below, can not be waived.

Water Reclamation Requirements (WRRs)

The State and Regional Board adopted the *Policy With Respect to Water Reclamation in California.* This policy, summarized and reprinted in Chapter 5, directs the Regional Boards to encourage reclamation of wastewaters and to promote water reclamation projects that preserve, restore, or enhance in-stream beneficial uses. The Regional Board waives fees for WRRs.

Projects that reuse treated wastewaters and thereby lessen the demand for higher quality fresh waters are subject to Water Reclamation Requirements (WRRs). Title 22, California Code of Regulations, Division 4, Chapter 3, describes the applicable reclamation criteria (Table 4-12). Requirements from the California Department of Health Services are incorporated into WRRs. Treated wastewaters subject to WRRs in the Los Angeles Region are used for landscape irrigation, recreational impoundments, and to recharge ground water. WRRs are not needed for process waters that are completely recycled during plant operations.

National Pollutant Discharge Elimination System Program (NPDES)

The CWA authorized the USEPA to regulate point source pollutants to the waters of the United States under the NPDES permitting program. The goal of this program was to eliminate all discharges of pollutants to surface waters by 1985. In 1974, California became a "delegated state" for issuing NPDES permits. As noted above, the state issues NPDES permits as WDRs in accordance with a Memorandum of Agreement (MOA) between the USEPA and the State Board, and as codified in the California Water Code, Chapter 5.

A standard NPDES permit generally includes the following components:

- Findings: *official description of the facility, processes, type and quantity of wastes, existing requirements, enforcement actions, public notice and applicable Water Quality Control Plans.*
- Effluent limitations: *narrative and numerical limits for effluent; discharge prohibitions.*
- Receiving water limitations: *narrative and numerical objectives for the receiving waters.*
- Provisions: *standard provisions required by the Regional Board and by Federal law; expiration date of permit.*
- Compliance/task schedules: *time schedules and interim reporting deadlines for compliance.*
- Pretreatment requirements: *standard pretreatment requirements for municipal facilities (see below).*

Table 4-12. Reclaimed Water: Uses and California Title 22 Health Requirements.

Permitted use of reclaimed water	Summary of Title 22 (Sections 60303 et. seq.) Health Requirements
Spray irrigation of food crops	Reclaimed water used for spray irrigation of food crops shall be at all times adequately disinfected, oxidized, coagulated, clarified, filtered wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process, the median number of coliform organisms does not exceed 2.2 per 100 ml and the number of coliform organisms does not exceed 23 per 100 ml in more than one sample within any 30-day period. The median value shall be determined from the bacteriological results of the last 7 days for which analyses have been completed.
Surface irrigation of food crops	Reclaimed water used for surface irrigation of food crops shall be at all times an adequately disinfected, oxidized wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process, the median number of coliform organisms does not exceed 2.2 per 100 ml as determined from the bacteriological results of the last 7 days for which analyses have been completed. Orchards and vineyards may be surface irrigated with reclaimed water that has the quality at least equivalent to that of primary effluent provided that no fruit is harvested that has come in contact with the irrigating water or the ground. Exceptions to the quality requirements for reclaimed water used for irrigation of food crops may be considered by the State Department of Health on an individual basis where the reclaimed water is to be used to irrigate a food crop which must undergo extensive commercial, physical or chemical processing sufficient to destroy pathogenic agents before it is suitable for human consumption.
Irrigation of fodder, fiber and seed crops	Reclaimed water used for the surface or spray irrigation of fodder, fiber, and seed crops shall have a level of quality no less than that of primary effluent.
Irrigation of pasture for milking animals	Reclaimed water used for the irrigation of pasture to which milking cows or goats have access shall be at all times an adequately disinfected, oxidized wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process the median number of coliform organisms does not exceed 23 per 100 ml, as determined from the bacteriological results of the last 7 days for which analyses have been completed.
Landscape irrigation of golf courses, cemeteries, freeway landscapes and similar areas	Reclaimed water used for the irrigation of golf courses, cemeteries, freeway landscapes, and landscapes in other areas where the public has similar access or exposure shall be at all times an adequately disinfected oxidized wastewater. The wastewater shall be considered adequately disinfected if the median number of coliform organisms in the effluent does not exceed 23 per 100 ml as determined from the bacteriological results of the last 7 days for which analyses have been completed, and the number of coliform organisms does not exceed 240 per 100 ml in any two consecutive samples.

Table 4-12. Reclaimed Water: Uses and California Title 22 Health Requirements (continued).

Permitted use of reclaimed water	Summary of Title 22 (Sections 60303 et. seq.) Health Requirements
Irrigation of parks, playgrounds, schoolyards and similar areas	Reclaimed water used for the irrigation of parks, playgrounds, schoolyards, and other areas where the public has similar access or exposure shall be at all times an adequately disinfected, oxidized, coagulated, clarified, filtered wastewater or a wastewater treated by sequence of unit processes that will assure an equivalent degree of treatment and reliability. The wastewater shall be considered adequately disinfected if the medium number of coliform organisms in the effluent does not exceed 2.2 per 100 ml, as determined from the bacteriological results of the last 7 days for which analyses have been completed, and the number of coliform organisms does not exceed 23 per 100 ml in any sample.
Nonrestricted recreational impoundment (no limitations are imposed on body-contact sport activities)	Reclaimed water used as a source of supply in a nonrestricted recreational impoundment shall be at all times adequately disinfected, oxidized, coagulated, clarified, filtered wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process, the median number of coliform organisms does not exceed 2.2 per 100 ml and the number of coliform organisms does not exceed 23 per 100 ml in more than one sample within any 30-day period. The median value shall be determined from the bacteriological results of the last 7 days for which analyses have been completed.
Restricted recreation impoundment (recreation is limited to fishing, boating, and other non-body-contact water recreation activities)	Reclaimed water used as a source of supply in a restricted recreational impoundment shall be at all times an adequately disinfected, oxidized wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process the median number of coliform organisms does not exceed 2.2 per 100 ml, as determined from the bacteriological results of the last 7 days for which analyses have been completed.
Landscape impoundment (aesthetic enjoyment or other function but no body-contact is allowed)	Reclaimed water used as a source of supply in a landscape impoundment shall be at all times an adequately disinfected, oxidized wastewater. The wastewater shall be considered adequately disinfected if at some location in the treatment process the median number of coliform organisms does not exceed 23 per 100 ml, as determined from the bacteriological results of the last 7 days for which analyses have been completed.
Groundwater recharge of domestic water supply aquifers	Recharge water requirements are made on a case-by-case basis to ensure that the water is of such quality that fully protects public health at all times. Factors considered include treatment provided, effluent quality and quantity, spreading operations, soil characteristics, hydrogeology, residence time, receiving water quality and distance to withdrawal.
Other uses (toilet flush, industrial cooling water, process water, seawater intrusion barrier)	User must demonstrate that methods of treatment and reliability features will assure an equal degree of treatment and reliability.

- Sludge requirements: *sludge monitoring and control requirements, if necessary and not regulated under separate WDRs.*

- Monitoring program: *specific locations of monitoring stations and sampling frequency for all parameters limited in permit, including flow.*

Pretreatment

The 1972 amendments to the CWA established a separate regulatory program, called the National Pretreatment Program, that requires removal of toxic and other non-conventional pollutants at their sources before the wastewater enters publicly-owned treatment works (POTWs). The USEPA has developed pretreatment regulations for certain industries.

In addition, agencies operating one or more POTWs with a total design flow greater than five-million gallons per day are required to implement pretreatment programs. Smaller POTWs that have significant industrial influent, treatment process problems, or violations of effluent limitations, also can be required to pretreat influent. The pretreatment programs are designed to reduce pollutants that: interfere with biological treatment processes, contaminate sludge, and violate water quality objectives of receiving waters. POTWs are responsible for implementing and enforcing their own pretreatment programs, but are subject to USEPA and Regional Board approval and oversight.

Storm Water Permits

Storm water runoff is runoff from land surfaces that flows into storm drains or directly into natural waterbodies during rainfall. Storm water discharges include flow through pipes and channels or sheet flow over a surface. Storm water runoff was not regulated by the NPDES program until after the 1987 amendments to the CWA. Historically, many large manufacturers or industrial operators collected runoff (non-process wastewater) within their properties and discharged it to storm drains or sent it to a sewage treatment plant. However, most small industries and construction sites did not collect or monitor their runoff. The NPDES program now requires that this runoff be eliminated or regulated under a storm water permit. For more information about storm water, see the Urban Runoff in the Nonpoint Source section of this Chapter.

Table 4-13. Storm Water General NPDES Categories (General Permit Major Categories are Italic).

Industrial Facility Categories
i. Facilities subject to storm water effluent limitations guidelines, new source performance standards, or toxic pollutant effluent standards (40 CFR subchapter N)
ii. Certain manufacturing facilities
iii. Oil and Gas/Mining facilities
iv. Hazardous waste treatment, storage, or disposal facility
v. Landfills, land application sites, and open dumps that receive or have received any industrial wastes from facilities listed herein
vi. Recycling facilities, including metal scrap yards, battery reclaimers, salvage yards, and automobile junkyards
vii. Steam electric power generating facilities
viii. Transportation facilities which have vehicle maintenance shops, equipment cleaning operations, or airport deicing operations
ix. Sewage or Wastewater treatment facilities with design flows greater than 1.0 mgd or plants required to have pretreatment program
xi. Other manufacturing facilities where materials, machinery, or products are exposed to storm water
Construction Activities of five acres or more, including clearing, grading and excavation. Construction which results in soil disturbances of less than 5 acres requires a permit if the construction activity is part of a larger common plan of development.

In November 1990, USEPA published initial permit application requirements for certain categories of storm water discharges associated with industrial activity and for discharges from separate municipal storm sewer systems located in municipalities with populations of 100,000 or more (55 FR 47990). These NPDES storm water discharge permits provide a mechanism for monitoring the discharge of pollutants to "waters of the United States" and for establishing appropriate controls to the maximum extent practicable.

In cases where there are existing NPDES permits for wastewater discharges, the Regional Board incorporates storm water discharge provisions into the same permit. Currently two types of NPDES storm water permits have been promulgated by the State and Regional Boards:

- Municipal permits for separate storm sewer systems located in urban areas with populations of 100,000 or more.

- Statewide general permits (Table 4-2):

  (i) for *industrial activities*, excluding construction. This permit covers 10 of the 11 industrial classifications described in the federal storm water regulations (Table 4-13); and

  (ii) for all *construction projects* impacting five acres or more, or smaller areas that are part of a larger common plan, including excavation, demolition, grading and clearing. (USEPA is considering making this permit applicable to all construction sites as part of Phase 2 of the storm water program).

Municipal storm water runoff is covered under municipal permits for a single city, county, or groups of cities and counties. The County of Los Angeles requested and received an "early" permit in 1990, prior to the promulgation of the USEPA storm water regulations. This permit covers the drainage basins contained within Los Angeles County with cities being brought into compliance under the program in three phases (Table 4-14; Figure 4-3). The Regional Board is currently developing a similar municipal permit that will cover most of Ventura County (Table 4-15), including the cities of Oxnard, Simi Valley and Thousand Oaks which have populations of greater than 100,000. The City of Thousand Oaks will be issued a separate storm water NPDES permit for drainage areas tributary to Santa Monica Bay. Each phase of the storm water program in Los Angeles County is being implemented over three years:

- Year I: compilation of existing data on the storm drain system and identification of existing Best Management Practices.

- Year II: implementation of early action Best Management Practices for cities, and regional

Table 4-14. Drainage Areas and Associated Co-permittees of Los Angeles County Municipal Storm Water NPDES Permit

Phase or Drainage Area 1: Santa Monica Bay Drainage Basin
Agoura Hills, Beverly Hills, Calabasas, Caltrans, Culver City, El Segundo, Hermosa Beach, Inglewood, Los Angeles (City and County), Malibu, Manhattan Beach, Palos Verdes Estates, Rancho Palos Verdes, Redondo Beach, Rolling Hills, Rolling Hills Estates, Santa Monica, Torrance, Ventura County (portions of Ventura County are included within the Los Angeles permit area), West Hollywood, Westlake Village
Phase or Drainage Area 2: Upper Los Angeles River and Upper San Gabriel River Drainage Basins
Alhambra, Arcadia, Azusa, Baldwin Park, Bradbury, Burbank, Calabasas, Caltrans, Claremont, Covina, Diamond Bar, Duarte, El Monte, Glendale, Glendora, Hidden Hills, Industry, Irwindale, La Cañada Flintridge, La Habra Heights, La Puente, La Verne, Los Angeles (City and County), Monrovia, Montebello, Monterey Park, Pasadena, Pomona, Rosemead, San Dimas, San Fernando, San Gabriel, San Marino, Sierra Madre, South El Monte, South Pasadena, Temple City, Walnut, West Covina
Phase or Drainage Area 3: Lower Los Angeles River, Lower San Gabriel River and Santa Clara River Drainage Basins
Alhambra, Artesia, Bell, Bellflower, Bell Gardens, Caltrans, Carson, Cerritos, Commerce, Compton, Cudahy, Downey, El Segundo, Gardena, Glendale, Hawaiian Gardens, Hawthorne, Huntington Park, Inglewood, La Cañada Flintridge, La Habra Heights, Lakewood, La Mirada, Lawndale, Lomita, Long Beach, Los Angeles (City and County), Lynwood, Maywood, Montebello, Norwalk, Palos Verdes Estates, Paramount, Pasadena, Pico Rivera, Rancho Palos Verdes, Redondo Beach, Rolling Hills, Rolling Hills Estates, Santa Clarita, Santa Fe Springs, Signal Hill, South Gate, South Pasadena, Torrance, Vernon, Whittier

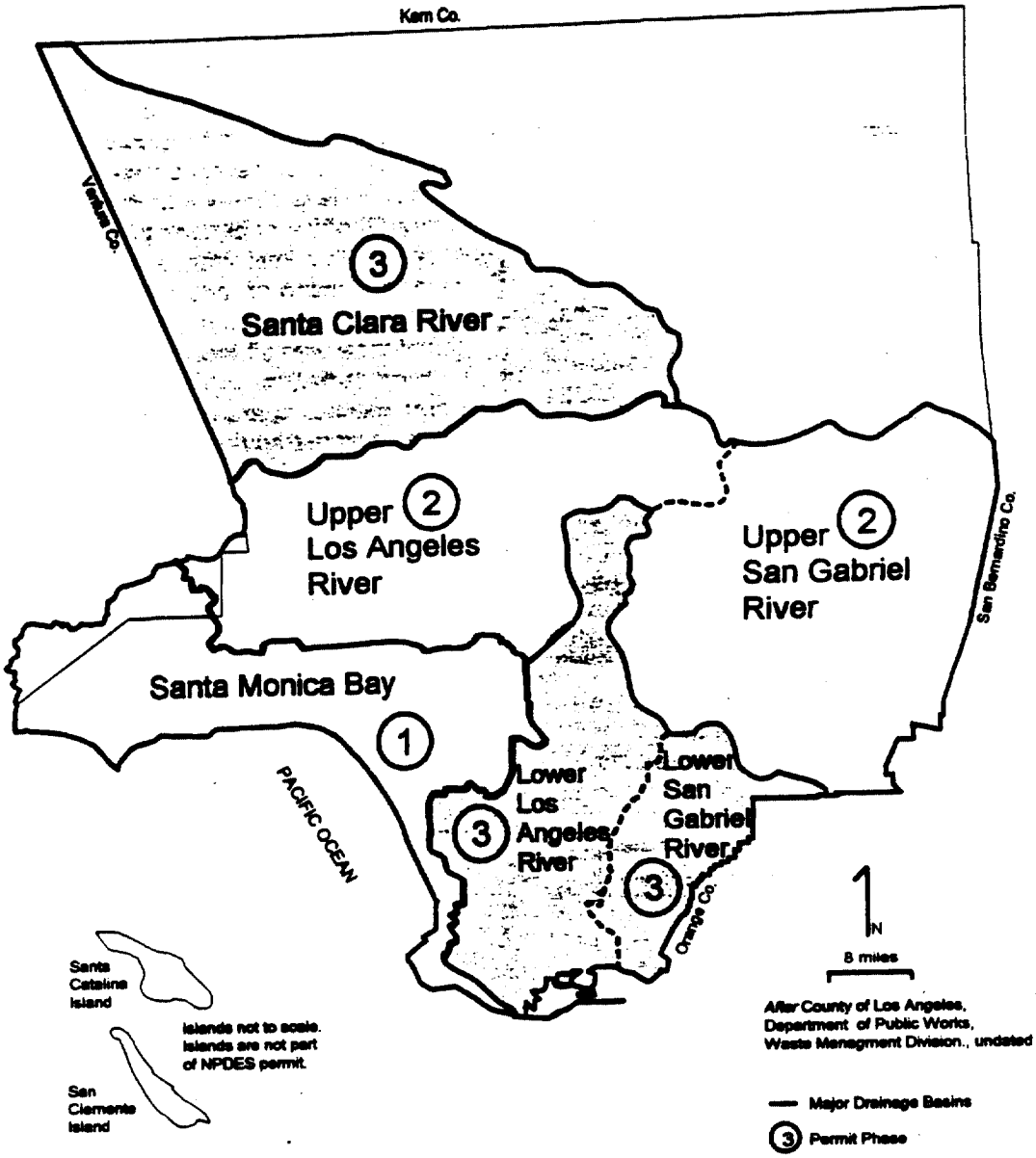

Figure 4-3. Drainage basins and phases of the Los Angeles County Municipal storm water NPDES permit.

monitoring programs for nonpoint source pollutants.

- Year III: implementation of additional Best Management Practices that are city-specific based on existing land use patterns and local concerns.

Industrial general storm water NPDES permits require that any owner/operator of a site that falls into one of the regulated categories and that discharges storm water to waters of the United States file a Notice of Intent (NOI) with the State Board. As detailed in the general permit, these dischargers are required to eliminate most non-storm water discharges, including illicit connections, to storm water drainage systems.

An industrial owner/operator must prepare a *Storm Water Pollution Prevention Plan* and a *Monitoring and Reporting Program* if storm water leaves, or has the potential to leave, an industrial site. Industries can monitor individually, or apply for a "group monitoring" program for like industries. Group monitoring is based on the assumption that similar industries have similar types of discharges. Industries under this program must sample a minimum of 20% or a minimum number of four, whichever is higher, of the facilities covered under an approved group program.

Table 4-15. Drainage Areas and Co-permittee Cities and Agencies of the Ventura County Municipal Storm Water NPDES Permit.

Drainage Area 1: Ventura River Drainage Basin
Ojai, San Buenaventura, Unincorporated Ventura County
Drainage Area 2: Santa Clara River Drainage Basin
Fillmore, Oxnard, San Buena Ventura, Santa Paula, Unincorporated Ventura County
Drainage Area 3: Calleguas Creek Drainage Basin
Camarillo, Moorpark, Simi Valley, Thousand Oaks, Unincorporated Ventura County
Drainage Area 4: Malibu Creek
Thousand Oaks, Unincorporated Ventura County
Drainage Area 5: Bays/Estuaries
Oxnard, Port Hueneme, San Buenaventura

The Regional Board's permitting strategy for industrial facilities is based on four-tiers of priorities: baseline permitting, watershed permitting, industry-specific permitting and facility-specific permitting (Table 4-16). General permits for industrial facilities will not be less stringent than individual permits. Rather, the use of general permits is intended to alleviate the administrative burden of issuing storm water permits to all industrial facilities. All permits, whether general or individual, will also require compliance with all local agency requirements. In addition, industrial facilities must eliminate all non-storm water discharges from storm drain systems unless they are authorized by an NPDES permit or determined not to be a source of pollutants and thus do not need an NPDES permit for discharge. General permits for other classes of non-storm water discharges will be considered as the need arises. Other industrial facilities not regulated at this time are expected to identify "hot areas" at their facilities where runoff can contact pollutants or activities can release pollutants to runoff. Examples of potential "hot areas" are storage areas for raw materials, sites used for the storage and maintenance of equipment, and shipping and receiving areas. In addition, industrial facilities are expected to segregate storm water discharges from these "hot areas;" and identify and implement control measures in these and other areas at the facility consistent with local agency comprehensive storm water control programs.

Dischargers are required to control pollutant discharges through use of best available technology economically achievable (BAT) and best conventional pollutant control technology (BCT) to reduce pollutants and to use more stringent controls, if necessary, to meet water quality standards. To date, the USEPA has established technology-based numerical effluent limitations for storm water discharges from ten industrial activities (40 CFR Subchapter N, examples in Table 4-17).

For construction activities, landowners are required to develop and implement a *Storm Water Pollution Prevention Plan* and assess the effectiveness of their pollution prevention measures (control practices). The NPDES permit establishes requirements for the Notice of Intent (NOI) and the

Table 4-16. Four-tier Priority Strategy for Permitting Industrial Storm Water Dischargers.

Tier 1 - Baseline Permitting: The State Board issued a general permit in November 1991 for storm water discharges associated with industrial activities. The majority of storm water discharges associated with industrial activities in the Region will be allowed coverage under this State Board general permit. Requirements for the Notification of Intent to be covered under the general permit and the schedule for submittal and compliance are established in the permit.
Tier II - Watershed Permitting: Facilities within watersheds determined to be affected by industrial storm water discharges will be targeted for individual or watershed-specific general permits. The Regional Board will consider watershed-specific permits, on an as needed basis, for high resource or water-quality impaired watersheds in the Region.
Tier III - Industry-Specific Permitting: Specific industrial categories will be targeted for individual or industry-specific general permits. Storm water discharges from primary-metal industries, automobile salvage yards, boat yards, U.S. Department of Defense facilities in the Region may be significant sources of pollutants, and as such, the Regional Board will consider issuing general permit(s) or individual permit(s) specific to these facilities.
Tier IV - Facility-Specific Permitting: The targeting of individual facilities for facility-specific permitting will be dependent on several factors including special characteristics, complexity of operations, pollution threat, and others. Such facilities will also include those that have been found to be unsuitable for the other three tiers of permitting. In general, facility-specific permits are intended to be more restrictive than other tiers of permitting.

schedule for submittal and compliance. Discharges addressed by the permit include (i) pollutant discharges that occur during construction activities, (ii) discharges of construction waste material, and (iii) pollutant discharges in runoff after construction is completed. Permit conditions must be consistent with local agency ordinances and regulatory programs; the intent of the permit is not to supersede local programs, but rather to complement them. Under the municipal permits described above, local agencies are required to effectively address construction activities through their early planning and CEQA processes, as well as implement and develop control measures as part of their comprehensive control programs.

Criteria for WDRs, WRRs, and NPDES Permit Limit and Provisions

The Regional Board refers to several guidance documents or policies in developing effluent limits, including: USEPA's *Quality Criteria for Water* (USEPA, 1986) and a series of industry-specific USEPA Effluent Guideline Volumes (*Development Documents for Effluent Limitations Guidelines and Standards*). Site-specific effluent and receiving water limits are developed to comply with narrative and numerical objectives in the *California Ocean Plan* (1990), the *California Thermal Plan* (1975), the objectives and beneficial uses in this *Regional Water Quality Control Plan*, and other State and Regional Board plans and policies. Other nearby waste discharges, and the need to prevent nuisance, are also considered. In addition, all discharges must comply with Federal and State anti-degradation (see Chapters 3 and 5) and anti-backsliding (CWA §404) policies.

Municipal Effluent Limits (NPDES)

Effluent limitations for municipal NPDES permits require (i) at least secondary treatment, (ii) non-ocean disposal or recycling of sludge, (iii) compliance with health standards for coliform and fecal bacteria, and (iv) conformance with water contact or fish habitat standards, if necessary. Since 1977, all ocean dischargers have been required by USEPA to have secondary treatment. Some dischargers are not yet fully in compliance with this requirement; however, USEPA has denied all applications from POTWs in the Los Angeles Region for federal 301(h) waivers which would allow modified water quality criteria for ocean discharges. Those POTWs that submitted applications are now in the process of constructing secondary treatment facilities.

Specific Criteria for Site-specific Determination of Effluent Limits

The Regional Board prescribes effluent limits after assessing the nature of the waste, treatment level,

Table 4-17. Selected Point Source Categories Subject to Storm Water Effluent Limitation Guidelines (see 40 CFR 411-443).

BAT is Best Available Technology Economically Achievable.
BPT is Best Practicable Control Technology Currently Available.

Category	Legal Standard	Design storm	Parameter	Concentration (mg/L unless noted)	
				Max for any 1 day	30-day average
Cement manufacturing	BPT	10 yr. 24 hr.	TSS pH	< 50 6.0-9.0	
Feedlots (all subcategories except ducks)	BPT	10 yr. 24 hr.		No discharge of process wastewater pollutants	
	BAT	25 yr. 24 hr.		No discharge	
Feedlots (Ducks)	BPT	*	BOD5	1.66	0.91
			fecal coliform (kg/1000 ducks)	< 400/100 mpn/ml	
Fertilizer Manufacturing (Phosphate)	BPT	*	Total phosphorus Fluoride	105 75	35 25
Fertilizer Manufacturing (Ammonia)	BPT	*	Ammonia	0.1875	0.0625
			pH (kg/1000kg of product)	6.0-9.0	
Fertilizer Manufacturing (Ammonium sulfate production)	BPT	*		No discharge	
Fertilizer Manufacturing (Urea produced as a solution)	BPT	*	Ammonia Organic Nitrogen (kg/1000kg of product)	0.95 0.61	0.48 0.33
	BAT	*	Ammonia Organic Nitrogen (kg/1000kg of product)	0.53 0.45	0.27 0.24
Fertilizer Manufacturing (Urea grilled or granulated)	BPT	*	Ammonia Organic Nitrogen (kg/1000kg of product)	1.18 1.48	0.59 0.80
	BAT	*	Ammonia Organic Nitrogen (kg/1000kg of product)	0.53 0.86	0.27 0.46
Fertilizer Manufacturing (Ammonium Nitrate)	BPT	*	Ammonia Nitrate (kg/1000kg of product)	0.73 0.67	0.39 0.37
	BAT	*	Ammonia Nitrate (kg/1000kg of product)	0.08 0.12	0.04 0.07
Petroleum Refining (For discharges composed entirely of contaminated *runoff*)	BPT	*	Oil and Grease TOC	15 110	

Table 4-17. Selected Point Source Categories Subject to Storm Water Effluent Limitation Guidelines (see 40 CFR 411-443) (continued).

BAT is Best Available Technology Economically Achievable.
BPT is Best Practicable Control Technology Currently Available.

Category	Legal Standard	Design storm	Parameter	Concentration (mg/L unless noted)	
				Max for any 1 day	30-day average
Petroleum Refining (For discharges of a) contaminated runoff that is commingled or treated with process wastewater or b) wastewater consisting solely of contaminated runoff which exceeds 15 mg/L oil and grease or 110 mg/L TOC and is not commingled or treated with any other type of wastewater) *Multiply the flow of contaminated runoff (as determined by the permit writer) by the concentrations listed.*	BPT	*	BOD5 TSS COD Oil & grease Phenolic compounds (4AAP) Total chromium Hexavalent chromium	48 33 360 15 0.35 0.73 0.062	26 21 180 8 0.17 0.43 0.028
			pH (kg/1000m³ of flow)	6.0-9.5	
	BAT	*	Phenolic compounds (4AAP) Total chromium Hexavalent chromium COD (kg/1000m³ of flow)	0.35 0.60 0.062 360	0.17 0.21 0.028 180
Phosphate Manufacturing (Defluorinated phosphate rock and defluorinated phosphoric acid)	BPT	*	Total phosphorus Fluoride	105 75	35 25
			pH	6.0 -9.5	
Phosphate Manufacturing (Sodium phosphates)	BPT	*	TSS Total phosphorus Fluoride	0.50 0.80 0.30	0.25 0.40 0.15
			pH (kg/1000kg of product)	6.0-9.5	
Steam Electric Power Generating (Runoff from coal piles)	BPT	10 yr. 24 hr.	TSS pH PCBs	50 (max at any time) 6.0-9.0 No discharge	
Mineral Mining (Crushed stone and construction sand and gravel)	BPT	10 yr. 24 hr.	pH	6.0-9.0***	
Mineral Mining (Industrial sand: Discharge of process-generated wastewater from facilities that recycle waste except from those employing HF flotation)	BPT	10 yr. 24 hr.	TSS	45	25
			pH	6.0-9.0***	
Mineral Mining (Industrial sand: Discharges of process generated wastewater from facilities that recycle wastewater and employ HF flotation)	BPT	10 yr. 24 hr.	TSS Total fluoride	0.046 0.006	0.023 0.003
			pH (kg/1000kg final product)	6.0-9.0***	
Mineral Mining (Industrial sand: All other discharges of process generated wastewater)	BPT	10 yr. 24 hr.		No discharge	

Table 4-17. Selected Point Source Categories Subject to Storm Water Effluent Limitation Guidelines (see 40 CFR 411-443) (continued).

BAT is Best Available Technology Economically Achievable.
BPT is Best Practicable Control Technology Currently Available.

Category	Legal Standard	Design storm	Parameter	Concentration (mg/L unless noted)	
				Max for any 1 day	30-day average
Mineral Mining (Industrial sand: Mine dewatering discharges)	BPT	10 yr. 24 hr.	TSS	45	25
			pH	6.0-9.0***	
Mineral Mining (Gypsum, asphaltic mineral, asbestos and wollastonite, borax, potash, sodium sulfate, frasch sulfur, magnesite, diatomite, jade, novaculite, barite, fluorspar, salines from brine lakes, bentonite, and tripoli)	BPT	10 yr. 24 hr.		No discharge	
Ore mining and dressing (Iron ore: runoff from the drainage area of facility)	BPT	10 yr. 24 hr.	TSS	30	20
			Iron (dissolved)	2.0	1.0
			pH	6.0-9.0	
Ore Mining and Dressing (Copper, lead, zinc, gold, silver, and molybdenum ores: runoff from the drainage area of facility)	BPT	10 yr. 24 hr.	TSS	30	20
			Copper	0.30	0.15
			Zinc	1.5	0.75
			Lead	0.6	0.3
			Mercury	0.002	0.001
			pH	6.0-9.0	
	BAT	10 yr. 24 hr.	Copper	0.30	0.15
			Zinc	1.5	0.75
			Lead	0.6	0.3
			Mercury	0.002	0.001
			Cadmium	0.10	0.05
Ore Mining and Dressing (Gold placer mine: surface runoff which has commingled with mine drainage or waters resulting from the beneficiation process)	BPT	10 yr. 24 hr.	Settleable solids	0.2 ml/L (instantaneous max)	
Ore Mining and Dressing (Titanium ore: surface water incorporated into mine drainage)	BPT	10 yr. 24 hr.	All mine drainages:		
			TSS	30	20
			Iron	2.0	1.0
			pH	6.0-9.0	
			Discharges from Mills:		
			TSS	30	20
			Zinc	1.0	0.5
			Nickel	0.2	0.1
			pH	6.0-9.0	

Table 4-17. Selected Point Source Categories Subject to Storm Water Effluent Limitation Guidelines (see 40 CFR 411-443) (continued).

BAT is Best Available Technology Economically Achievable.
BPT is Best Practicable Control Technology Currently Available.

Category	Legal Standard	Design storm	Parameter	Concentration (mg/L unless noted)	
				Max for any 1 day	30-day average
Ore Mining and Dressing (Tungsten, Nickel and Vanadium ores: surface runoff incorporated into mine drainage)	BPT	10 yr. 24 hr.	Mines producing ≥ 5000 metric tons:		
			TSS	30	20
			Cadmium	0.10	0.05
			Copper	0.3	0.15
			Zinc	1.0	0.5
			Lead	0.6	0.3
			Arsenic	1.0	0.5
			pH	6.0-9.0	
			Mills producing ≥5000 metric tons:		
			TSS	30	20
			Cadmium	0.10	0.05
			Copper	0.3	0.15
			Zinc	1.0	0.5
			Arsenic	1.0	0.5
			pH	6.0-9.0	
			Mines and Mills producing < 5000 metric tons:		
			TSS	50	30
			pH	6.0-9.0	
Paving and Roofing Materials (Asphalt emulsion)	BPT	*	Oil and grease	0.020	0.015
			pH (kg/m³ of runoff)	6.0-9.0	
	BAT	*	TSS	0.023	0.015
			oil and grease	0.015	0.010
			pH (kg/m³ of runoff)	6.0-9.0	
Paving and Roofing Materials** (Asphalt concrete)	BPT	*		No discharge	
Paving and Roofing Materials** (Asphalt roofing)	BPT	*	TSS	0.056	0.038
			pH (kg/1000kg of product)	6.0-9.0	
	BAT	*	TSS	0.028	0.019
			pH (kg/1000kg of product)	6.0-9.0	

Table 4-17. Selected Point Source Categories Subject to Storm Water Effluent Limitation Guidelines (see 40 CFR 411-443) (continued).

BAT is Best Available Technology Economically Achievable.
BPT is Best Practicable Control Technology Currently Available.

Category	Legal Standard	Design storm	Parameter	Concentration (mg/L unless noted)	
				Max for any 1 day	30-day average
Paving and Roofing Materials ** (Linoleum and printed asphalt felt)	BPT	*	TSS	0.038	0.025
			pH (kg/1000kg of product)	6.0-9.0	
	BAT	*	TSS	0.019	0.013
			pH (kg/1000kg of product)	6.0-9.0	

* not specified

** Any water which comes into direct contact with any raw material, intermediate product, by product, or product used in or resulting from production.

*** or lower but not less than 5.0 if water quality standards authorize lower pH; and if discharge, unaltered by human activity, would have a pH lower than 6.0.

dilution or mixing zone, other discharges in the area, beneficial uses and objectives for the receiving waters, and relevant State and Federal guidelines and regulations.

On a case-by-case basis, the Regional Board can allow a mixing zone for compliance with receiving water objectives. In rivers and streams an approved mixing zone can not extend more than 250 feet from the point of discharge or be located less than 500 feet from an adjacent mixing zone. Since many of the streams in the Region have minimal upstream flows, mixing zones are usually not appropriate. In lakes or reservoirs, it may not extend 25 feet in any direction from the discharge point, and the sum of mixing zones may not be more than 5% of the volume of the waterbody. As detailed in the States' *Ocean Plan*, ocean dilution zones are determined using standard models.

Water quality-based effluent limitations for discharges to inland surface waters (SWRCB, 1991a and SWRCB, 1991b) are developed in a number of ways including:

- assignment of a portion of the loading capacity of the receiving water to each of the sources of waste, point and nonpoint;
- determination of limitations based on a formula that considers the water quality objective and ambient background concentrations of each substance and allowed dilution ratio;
- determination of limitations using statistically-based calculations and information about the effluent and receiving water, where sufficient information exists to adequately characterize effluent and receiving water;
- using discharge prohibitions to implement water quality objectives for a particular area; or
- for power plant discharges, determination of limitations based on a formula that incorporates cooling water flow and combined in-plant waste streams.

Effluent limits for ocean discharges are based on objectives in the *Ocean Plan*.

Standard Provisions in WDRs and NPDES Permits

Standard provisions are included in most Non-Chapter 15 WDRs and in all NPDES permits and outline specific restrictions and requirements imposed by the Regional Board. Selected provisions which relate to prohibited discharges are listed below. A full copy of the standard provisions for either WDRs or NPDES permits can be obtained at the Regional Board office. NPDES standard provisions are different from WDRs standard provisions.

Selected Standard Provisions Applicable to Non-Chapter 15 Waste Discharge Requirements

General Prohibition: Neither the treatment nor the discharge of waste shall create pollution, contamination, or nuisance, as defined by Section 13050 of the California Water Code.

Hazardous Releases: Except for a discharge which is in compliance with waste discharge requirements, any person who, without regard to intent or negligence, causes or permits any hazardous substance or sewage to be discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, shall, as soon as (i) that person has knowledge of the discharge, (ii) notification is possible, and (iii) notification can be provided without substantially impeding cleanup or other emergency measures, immediately notify the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State Toxic Disaster Contingency Plan adopted pursuant to Article 3.7 of Chapter 7 of Division 1 of Title 2 of the Government Code, and immediately notify the State Board or the appropriate Regional Board of the discharge. This provision does not require reporting of any discharge of less than a reportable quantity as provided for under Subdivisions (f) and (g) of Section 13271 of the Water Code unless the discharger is in violation of a prohibition in the applicable Water Quality Control Plan.

Petroleum Releases: Except for a discharge which is in compliance with waste discharge requirements, any person who without regard to intent or negligence, causes or permits any oil or petroleum product to be discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, shall, as soon as (i) such person has knowledge of the discharge, (ii) notification is possible, and (iii) notification can be provided without substantially impeding cleanup or other emergency measures, immediately notify the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State Oil Spill Contingency Plan adopted pursuant to Article 3.5 (commencing with Section 8574.1) of Chapter 7 of Division 1 of Title 2 of the Government Code. This provision does not require reporting of any discharge of less than 42 gallons unless the discharge is also required to be reported pursuant to Section 311 of the Clean Water Act or the discharge is in violation of a prohibition in the applicable Water Quality Control Plan.

Selected General Requirements and Standard Provisions Applicable for NPDES Permits

- Neither the disposal nor any handling of wastes shall cause pollution or nuisance.
- Wastes discharged shall not contain any substances in concentrations toxic to human, animal, plant or aquatic life.
- Wastes discharged shall not contain visible oil or grease, and shall not cause the appearance of grease, oil or oily slick, or persistent foam in the receiving waters or on channel banks, wall, inverts or other structures.
- Wastes discharged shall not increase the natural turbidity of the receiving waters at the time of discharge.
- Wastes discharged shall not damage flood control structures or facilities.
- The temperature of wastes discharged shall not exceed 100 °F.
- The discharge of any radiological, chemical, or biological warfare agent or high level radiological waste is prohibited.
- Bypass (the intentional diversion of waste streams from any portion of a treatment facility) is prohibited (with certain exceptions).

Self Monitoring, Compliance Monitoring and Inspections

Permits and requirements issued by the Regional Board are generally self-monitored by each individual discharger, with oversight by the Regional Board. The Regional Board conducts periodic inspections and compliance monitoring and, as necessary, will take enforcement actions to ensure compliance.

Self Monitoring Program: Dischargers are required to regularly collect samples of their waste stream(s) and, in some cases, receiving waters and submit results to the Regional Board. If the discharger discovers that they are not in compliance with their Requirements, they are required to take measures, including change of operations, in order to come into compliance. The monitoring and reporting schedule is determined for each discharger on a case-by-case basis.

Compliance Monitoring and Inspections: Regional Board staff conduct unannounced inspections (including collection of samples) to determine the status of compliance with Requirements. All major dischargers are inspected at least once a year.

Enforcement

Regional Boards are authorized to implement a variety of enforcement actions to obtain compliance with Requirements. Enforcement procedures can be informal, such as a letter informing the discharger of non-compliance and requesting the discharger to comply with terms of its Requirements, or they can be more formal, such as an order prescribing needed changes and a time schedule. Generally, instances of noncompliance are first addressed by discussions at the site, via telephone, or by letter with a request to correct the problem within a given period of time.

The California Water Code (§13267) authorizes the Regional Board to require any discharger to submit technical or monitoring reports. Failure to supply the required reports is a misdemeanor. Section 13268 permits the Regional Board to levy administrative civil liabilities (e.g., fine) not exceeding five thousand dollars ($5,000) for each day that the discharger fails to comply with the Section 13267 request. Civil liability may also be imposed by the superior court in an amount that shall not exceed twenty-five thousand dollars ($25,000) for each day in which the violation occurs. If warranted, the Executive Officer will issue a *Notice of Violation* that is sent to the discharger for failure to comply with a predetermined compliance action/schedule.

Under the California Water Code, the Regional Board has several enforcement options available to compel compliance with a Board order. The following is a brief overview of the enforcement actions available to the Regional Board (statutory references are to the California Water Code).

Time Schedule Orders (§13300): Dischargers operating under Regional Board orders who are not able to meet requirements, or whose actions threaten to violate requirements prescribed by the Regional Board, can be administratively issued (by the Executive Officer) an order specifying a time schedule for the discharger to take specific actions which will correct or prevent the violation. The time schedule order may also include interim limits with which the discharger must comply during the time schedule until full compliance is achieved.

Cease and Desist Orders (§13301): The Regional Board may issue a Cease and Desist Order when a discharger:

- fails to comply with requirements or discharge prohibitions contained in an NPDES permit or in WDRs/WRRs;
- fails to comply with a time schedule set by the Board in a time schedule order; or
- fails to take preventive or remedial action in the event of a threatened violation of a Board order.

The order requires the discharger to comply with established requirements or prohibitions, to comply with a time schedule, or, if the violation is threatening, to take appropriate remedial or preventative action. The order may also restrict or prohibit the discharge of new sources of waste to a community sewer system.

Cleanup and Abatement Orders (§13304): The Regional Board may issue a cleanup and abatement order to any discharger who has discharged wastes without a valid Board order or who has caused, or threatens to cause, a condition of pollution. The order requires the discharger to clean up waste or

abate its effects or, in the case of a threatened pollution or discharge, take other necessary remedial or preventive actions. If the discharger fails to take action, the State Attorney General, at the request of the Board, may file a petition for issuance of an injunction requiring compliance. Alternatively, the Executive Officer is authorized to issue a Cleanup and Abatement Order administratively.

Administrative Civil Liability: A Civil Liability (e.g., fine) may be administratively imposed by the Regional Board against dischargers who violate §13350 or §13385 or any other Regional Board order.

Assessments imposed for §13350 violations shall not exceed five thousand dollars ($5,000), but shall not be less than five hundred dollars ($500), for each day the discharger is deemed to be in violation. Section 13350 violations include:

- failure to comply with a Cleanup and Abatement Order or a Cease and Desist Order;
- violation of any Requirements which creates a nuisance or causes pollution; and
- deposition of oil or petroleum residue in or on any State waters.

The Regional Board can impose sanctions up to ten thousand dollars ($10,000) for each day in which the discharger violates §13385. Section 13385 violations include:

- failure to furnish a report, filing a false report of waste discharge or a false technical report, or failure to pay a fee when so requested;
- discharging warfare (radiological, chemical or biological) agents into State waters;
- violating dredge and fill material permits; and
- refusing to provide technical or monitoring reports as requested by the Regional Board.

The Executive Officer is authorized to impose an Administrative Civil Liability administratively. If the discharger so requests, a hearing will be held by the Regional Board on the violation and the amount of the civil liability. Funds collected from civil penalties go directly to the State Water Pollution Cleanup and Abatement Account which is administered by the State Board. In lieu of a civil liability payment, the Regional Board may require that the violator fund a cleanup or enhancement activity within the area of the discharge violation or for other environmentally beneficial projects in the Region.

Judicial Civil Liability: The State Attorney General, upon a request from the Regional Board, may petition the superior court to seek penalties in excess of the fines that the Regional Board is authorized to impose. For §13350 violations (see criteria listed in Administrative Civil Liabilities section above), the court may impose civil liabilities up to fifteen thousand dollars ($15,000) for each day. For §13385 violations, the court-imposed fines cannot exceed twenty-five thousand dollars ($25,000) for each day of violation.

Injunctive Relief: The State Attorney General or the appropriate county or District Attorney or City Attorney may, at the request of the Regional Board, petition the Superior Court for injunctive relief for any person not complying with submittal of required reports and fees (§13360) or discharging wastes in violation of the California Water Code (§13386), or where there is evidence of irreparable damage (§13361).

Control of Nonpoint Source Pollutants

Introduction

Despite California's significant achievements in controlling point source discharges from municipal sewage treatment plants and industrial facilities, pollutants from nonpoint sources continue to degrade many of our water resources. Approximately two-thirds of California's waterbodies assessed in the State's *Water Quality Assessment Report* (1992) are threatened or impaired by nonpoint sources of pollution.

Nonpoint source (NPS) pollution, as opposed to "point source" pollution (a discharge at a specific location or pipe with the exception of irrigation return flows), generally consists of diffuse runoff of pollutant-laden water from adjacent land. These pollutants are transported to waters by precipitation, irrigation, and atmospheric deposition. Nonpoint sources have been grouped by the USEPA into categories that include agriculture, urban runoff,

construction, hydromodification, resource extraction, silviculture, and land disposal. These categories, however, are not exclusive. For example, agricultural operations contain both point (concentrated animals) and nonpoint source (irrigation return flow) categories.

Nonpoint source pollution has been studied for several decades. Many of the earlier nonpoint source planning efforts generated excellent studies and reports; unfortunately, many of the recommendations have yet to be implemented. Due to new requirements mandated as a result of the 1987 amendments to the CWA, a more focused, results-oriented approach is being implemented nationwide.

Early Nonpoint Source Pollution Planning Efforts

The CWA (§208) required State and local agencies to identify water quality problems from both point and nonpoint sources as part of their water quality planning efforts. From 1974 to 1981, federal grants under this program provided funds to states and local agencies for identification of nonpoint source problems and development of control strategies. Although many of these plans were never implemented, this early work helped establish the framework for existing state nonpoint source programs currently being implemented under the CWA (§319).

Recognizing the need to assess the water quality effects of storm water runoff, the USEPA initiated the Nationwide Urban Runoff Program (NURP) in 1978. This five-year program collected data on the quality of urban runoff and its impact on receiving waters. Objectives of NURP included the development of a national database and analytical methodologies to examine the quality characteristics of urban runoff, a determination of the extent to which urban runoff contributes to water quality problems, and an evaluation of best management practices to control pollutants from urban runoff. Data from 28 projects around the country confirmed that significant levels of pollutants such as nutrients, heavy metals, and bacteria result from urban runoff. These studies also showed that the most significant effects of urban storm water runoff on aquatic life were due to hydrologic changes related to urbanization and construction activities.

Development of the State Nonpoint Source Program

The CWA (§101(a)(7)) states:

"it is the national policy that programs for the control of nonpoint sources of pollution be developed and implemented in an expeditious manner so as to enable the goals of this Act to be met through the control of both point and nonpoint sources of pollution."

With the addition of specific nonpoint source language in the 1987 amendments to the CWA (particularly §319), new direction focusing on implementation of state nonpoint source management programs have been authorized.

Section 319 requires that states complete two documents by August 4, 1988, in order to be eligible for federal nonpoint source funding: an Assessment Report describing the state's nonpoint source water quality problems and a Management Plan describing plans to address the state's nonpoint source problems.

The State Board is responsible for implementing the requirements of §319 and reporting to the USEPA. In addition to authority under the CWA, the State Board has independent authority to implement requirements of §319 by means of Division 7 of the California Water Code, commencing with §13000.

The State Water Resources Control Board completed its *Nonpoint Source Assessment Report* and *Nonpoint Source Management Plan* in 1988. The *Assessment Report* summarizes water quality impairments due to nonpoint source and describes regional, State, and Federal programs in California that addressed nonpoint source pollution. The *Management Plan* outlines the legal and institutional framework, objectives, and implementation plan for the State's program.

The State's *Nonpoint Source Management Plan* describes a three-tiered management approach to address nonpoint source problems. Each Regional Board will decide which management option(s) will be required for individual situations. Generally, the least stringent option (in terms of regulation) that will protect or restore water quality will be employed, followed by more formal regulatory measures if timely improvements in water quality are not achieved. Regional Boards usually will not impose

effluent limits on nonpoint source dischargers who are implementing Best Management Practices in accordance with a State or Regional Board formal action. The three tiers (in order of increasing regulatory control) are outlined below:

(i) Voluntary implementation of Best Management Practices

Land managers or property owners voluntarily or cooperatively implement Best Management Practices.

(ii) Regulatory-based enforcement of Best Management Practices

The Regional Board can encourage the use of Best Management Practices by waiving WDRs on the condition that the dischargers implement effective Best Management Practices .

The Regional Board can enforce Best Management Practices indirectly by entering into Management Agency Agreements (MAAs) with other agencies that have the authority to enforce Best Management Practices .

(iii) Effluent limitations

The Regional Board can adopt and enforce WDRs on any proposed or existing waste discharge, including discharges from nonpoint sources.

Following the adoption of the *Nonpoint Source Management Plan*, the State and Regional Boards have focused on the following objectives in developing the program elements:

- Initiate and institutionalize activities for the control of nonpoint source pollution from urban runoff, agriculture, silviculture, mining, construction, hydromodification, grazing, and septic tanks.
- Encourage, develop, and manage contracts for projects funded under CWA (§319) funding.
- Develop a program to implement the requirements of the 1990 re-authorization of the Coastal Zone Management Act (CZMA) which requires the State Board and the Coastal Commission to develop and implement an enforceable nonpoint source program in the coastal zone.
- Initiate pilot watershed programs across the State.
- Implement a public outreach and educational program.

During the preparation of the California *Nonpoint Source Management Plan*, the State Board formed an Interagency Advisory Committee (IAC). IAC meetings are held quarterly and serve as a forum for discussion of Nonpoint Source Program development and direction, funding, and the exchange of new ideas in nonpoint source related activities implemented by the various agencies.

The IAC consists of State and Regional Board staff, other State agencies, the California Association of Resource Conservation Districts, federal agencies, and other interested parties. Active member agencies of the IAC are listed below:

State Agencies:

Coastal Commission
Department of Conservation
Department of Fish and Game
Department of Food and Agriculture
Department of Pesticide Regulation
Department of Transportation
Department of Water Resources
Association of Resource Conservation Districts
Water Resources Control Board
Regional Water Quality Control Boards

Federal Agencies:

Agricultural Stabilization and Conservation Service
Army Corps of Engineers
Bureau of Land Management
Bureau of Reclamation
Environmental Protection Agency
Forest Service
Fish and Wildlife Service
Soil Conservation Service

The State Board has entered into agreements with other agencies (Table 4-18) which have the authority to implement, or require the implementation of, Best Management Practices under the State's Nonpoint Source Program. These agreements capitalize on the expertise and authorities of other agencies with responsibilities related directly or indirectly to water quality. Memorandums of Understanding (MOUs) and Management Agency Agreements (MAAs) are the two types of agreements used for this purpose. The format and end-result of both agreements are

Table 4-18. Nonpoint Source-related Memorandums of Understanding (MOUs) and Management Agency Agreements (MAAs) between the State Water Resources Control Board and Other Agencies.

Effective Date	Title of Agreement
May 26, 1981	Management Agency Agreement between the State Water Resources Control Board and the Forest Service, United States Department of Agriculture.
February 3, 1988	Management Agency Agreement between the State Water Resources Control Board, the State Board of Forestry, and the State Department of Forestry and Fire Protection.
July 30, 1990	Memorandum of Understanding between the State Water Resources Control Board, the Soil Conservation Service, and U.S. Department of Agriculture for Planning and Technical Assistance Related to Water Quality Policies and Activities.
December 23, 1991	Memorandum of Understanding between the State Water Resources Control Board and the California Department of Pesticide Regulation for the Protection of Water Quality (Surface and Ground Water) from Potentially Adverse Effects of Pesticides.
February 3, 1993	Memorandum of Understanding between the California State Water Resources Control Board, the Bureau of Land Management, and U.S. Department of the Interior for Planning and Coordination of Nonpoint Source Water Quality Policies and Activities.

basically the same. These agreements outline the responsibilities of one agency, then the other, followed by the joint responsibilities of both agencies.

Nonpoint Source Funding

Because the Nonpoint Source Program is different from most other water quality programs, innovative ways of financing and implementing nonpoint source projects have been developed. Prior to the CWA 1987 amendments, states used §106 and §205(j) monies (as described below) to fund limited nonpoint source activities. The primary federal funding for current nonpoint source program development and implementation includes §205(j)(5), §319(h), §201(g)(1)(b), §603(c)(2), and §604(b) monies as described below.

Section 205(j)(5): Section 205(j)(5) established a set-aside of construction grant funds for the purposes of carrying out activities under Section 319, including program development and the preparation of state Assessment Reports and Management Plans. These funds were used for assessment and development activities for California's program through fiscal year 1989.

Section 319(h): Grant funds authorized by Section 319(h) can be used for the implementation of nonpoint source management programs but cannot be used for assessment activities. States must have a USEPA-approved Assessment and Management Plan before qualifying for these monies. This grant program funds both State and Regional Board programs and provides competitive grants for other agencies to use in implementing nonpoint source measures around the State. These grants include a "non-federal" match of 40%, illustrating the intent of Congress and USEPA to encourage states to make a substantial financial commitment to implement nonpoint source programs.

Section 201(g)(1)(b): The CWA 1987 amendments added subsection 210(g)(1)(b) that expanded the use of 201 funds to "...any purpose for which a grant can be made under Section 319(h) and (i)." These funds can be used for either nonpoint source development or implementation projects. The Regional Board has recently received funding under this program to provide resources to coordinate a multi-agency study in the Malibu Creek Watershed (see description in the Future Direction section for more detail).

Section 603(c)(2): The CWA 1987 amendments added Title VI establishing a State Water Pollution Control Revolving Fund Program (SRF). This program provides funding in the form of loans, refinancing, and bond insurance which can be used for (i) construction of publicly owned treatment works, (ii) the implementation of state nonpoint source management programs, and (iii) the

development and implementation of state estuary conservation and management plans. The State and Regional Boards encourage local agencies to apply for these low-interest loans to implement nonpoint source demonstration projects and programs in the Region.

Section 604(b): States must set aside one percent of their Title VI allotments or $100,000, whichever is greater, to carry out planning programs under 205(j) and 303(e) of the CWA. These funds can be used under 205(j) planning for nonpoint source related activities. This can become an important source of funding for nonpoint source planning and assessment tasks since these types of activities cannot be carried out under Section 319.

Nonpoint Source Categories

The following sections describe the major sources of nonpoint pollution, the extent of the problem in the Region, and the main regulatory and non-regulatory approaches available to control runoff from these nonpoint sources of pollution.

Agriculture

Agriculture is a major industry in California and will continue to be important to the State's economy. Agricultural activities, however, can generate pollutants such as sediment, pesticides, nutrients, and oxygen-demanding organic matter. Upon discharge to a receiving water, these pollutants can degrade water quality and impair beneficial uses, as explained below.

Sediment: Eroded soil materials, along with other chemicals (nutrients, pesticides, and other organic chemicals) that adsorb to the sediment particles, are transported from land surfaces into adjacent waterbodies. Excess sediment can interfere with photosynthesis by reducing light penetration, smother benthic organisms, destroy important spawning habitats, and fill in waterways hindering navigation or groundwater percolation and increasing flooding.

Pesticides: Nationwide, pesticide use has changed in recent years. Although there is now a greater number of pesticides available for use, the current trend seems to be toward a decreased use of chemicals. There is also a dramatic decrease in the use of persistent (long-lived) pesticides, many of which were banned in the late 1970s. Many currently-used chemicals, however short-lived, can be highly toxic to fish and other aquatic life (especially at critical life stages), so that even very low levels of these pesticides in runoff can be a significant environmental concern.

Nutrients: In general, runoff from agricultural lands has significantly higher nutrient concentrations than drainage waters from forested or other "covered" lands. These increased nutrient levels result from fertilizer application and animal waste. Eutrophication of lakes, streams, and coastal waters, as well as groundwater degradation, are often attributed to runoff from agricultural lands. Nutrients are necessary for plant growth in a waterbody, but excess nutrients can lead to excessive algal growth, an imbalance in natural nutrient cycles, changes in water quality (such as demand for dissolved oxygen), and a decline in the number of fish species.

Organic Material: Crop debris and animal wastes are major sources of organic matter which can be transported into streams from agricultural lands. As these materials decompose, they tend to deplete dissolved oxygen in receiving waters. Fish and other aquatic life cannot survive in waters with low levels of oxygen.

Agriculture in the Los Angeles Region is concentrated in Ventura County, which has over 95,000 acres under cultivation (Figure 4-4). Agriculture is Ventura County's largest industry and accounts for 11% of total employment in the county. Approximately 70% of the farms are between 40 and 50 acres in size, and only about 5% of the farms are greater than 500 acres. Major crops in Ventura County include fruit, nuts, vegetables, nursery stock, Christmas trees, and sod (Ventura County, 1990).

While rich soils and a mild climate have contributed to the success of Ventura County's agricultural industry, water supplies are limited. The agricultural community pumps over 270,000 acre-feet of ground water per year. This accounts for 86% of water consumption in the County (Ventura County, 1993). With groundwater pumping rates far exceeding recharge rates, some groundwater basins have been, and continue to be, overdrafted. These overdraft conditions accelerate the existing seawater intrusion problem, as discussed in the Seawater Intrusion Section below.

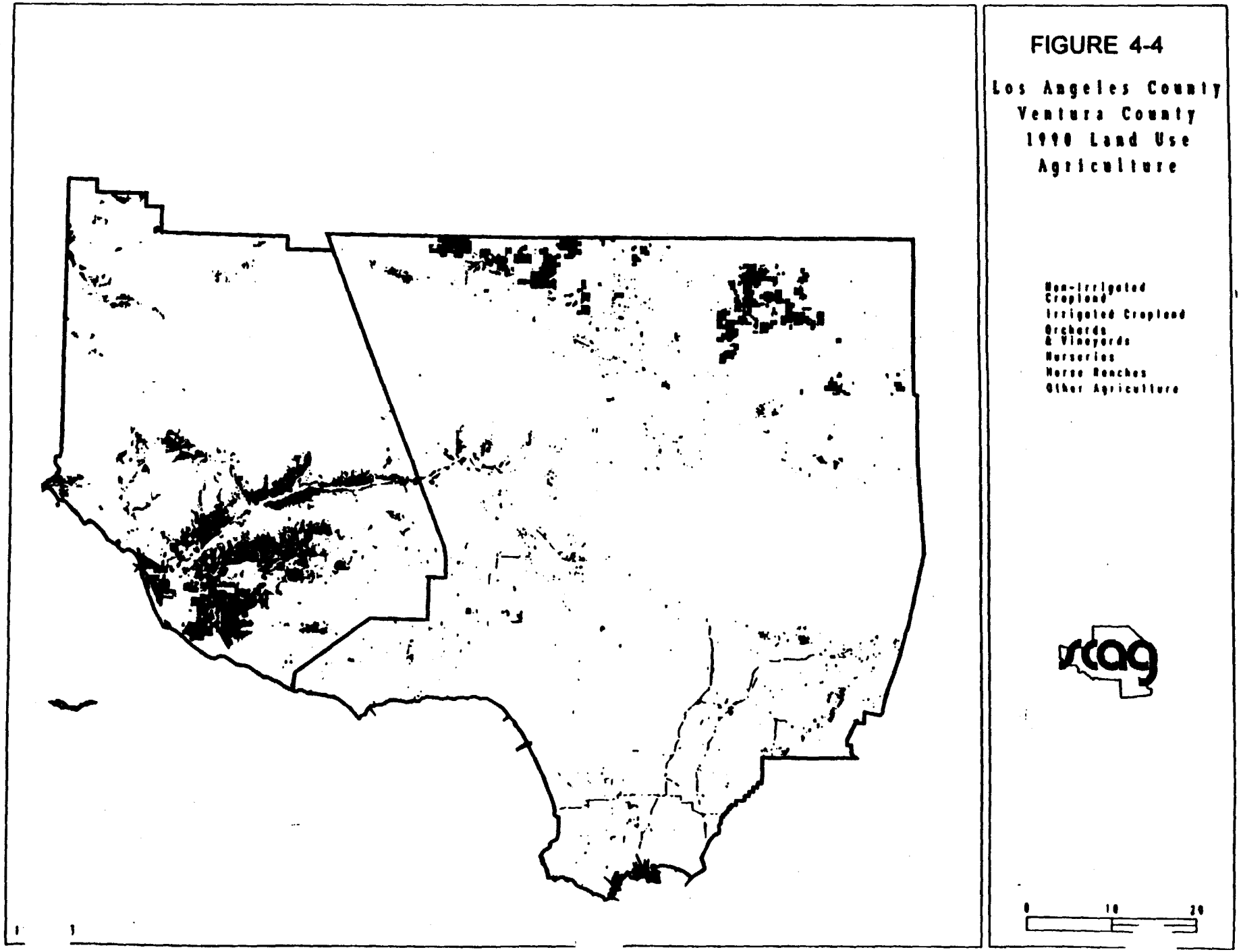
FIGURE 4-4
Los Angeles County
Ventura County
1990 Land Use
Agriculture
Non-Irrigated Cropland
Irrigated Cropland
Orchards & Vineyards
Nurseries
Horse Ranches
Other Agriculture
scag
0
10
20

The State and Regional Boards have the authority to regulate any discharge, including agriculture. Such a regulatory program could supplement the Department of Pesticide Regulation's pesticide regulatory program. To date, however, the State and Regional Boards have not chosen to control pollutants from agricultural sources through regulations such as WDRs. Rather, the Boards expect that significant improvement to water quality can be achieved through voluntary implementation of management measures (i.e., Best Management Practices) that reduce or eliminate pollutants from agricultural sources. The U.S. Department of Agriculture, Soil Conservation Service and the Resource Conservation Districts provide information on, and assistance in, implementing these types of management measures.

In addition to encouraging the implementation of Best Management Practices identified in the USEPA's *Guidance Specifying Management Measures For Sources of Nonpoint Pollution in Coastal Waters* (known as the *(g) guidance*), the Regional Board and USEPA have undertaken outreach programs. One such example is a 319(h) grant made to the Ventura County Resource Conservation District (RCD) in 1992 to fund a project that will demonstrate improved irrigation techniques to growers on the Oxnard Plain. These irrigation techniques will reduce runoff and deep percolation of pesticides, sediment, and nutrients, thereby improving water quality. Through the RCD's efforts, the Regional Board and USEPA hope to encourage other growers on the Oxnard Plain to switch to irrigation technologies and practices that will both improve water quality and conserve water.

The Regional Board is also an active participant on the Mugu Lagoon Task Force, which is comprised of local, regional, and State agencies, as well as U.S. Navy (which occupies land surrounding Mugu Lagoon). The objective of this Task Force is to foster cooperation between agencies in developing a comprehensive plan that will improve water quality in Calleguas Creek, Revolon Slough, and Mugu Lagoon, which is one of the Region's few remaining wetlands. The Task Force is focusing, in particular, on ways in which to reduce sources of sediment and pesticides.

Confined Animal Operations

Confined animals are those that are raised or sheltered in high densities. Examples of confined animal operations include kennels, horse stables, poultry ranches, dairies, stockyards, and feedlots. Wastes from such facilities can contain significant amounts of pathogens, oxygen-depleting organic matter, nitrogen compounds, and other suspended and dissolved solids. As a result, runoff of storm or wash waters from confined animal areas can degrade receiving surface waters. Furthermore, percolation of storm or wash waters into ground water can degrade the water quality. The risk of degradation increases during the rainy season when animal waste containment and treatment ponds are often overloaded.

Minimum design and management standards for the protection of water quality from confined animals are promulgated in the Title 23, California Code of Regulations, Chapter 15, Article 6. These regulations prohibit the discharge of facility wash water, animal wastes, and storm water runoff from animal confinement areas, into the waters of the State, and specify minimum design and waste management standards such as: the collection of all wastewaters; the retention of wastewaters and storm waters in manured areas during a 25-year, 24-hour storm; the use of paving or impermeable soils at manure storage areas; and the application of manures and wastewaters on land at reasonable rates for minimal percolation. The Regional Board has the authority to enforce these regulations through WDRs, described in the section of this chapter entitled Control of Point Source Contamination. In addition to the State's Title 23 regulations, many local agencies have enacted ordinances and zoning restrictions that require additional waste management practices.

While large confined animal facilities (e.g., dairies and poultry farms) sometimes threaten water quality in other Regions of the State, large confined animal facilities do not constitute a widespread threat to water quality in the Los Angeles Region, since there are only a few of such facilities in the Region. However, localized threats can result from smaller facilities, such as horse stables where runoff from manured areas can degrade the quality of receiving waterbodies. In such cases, the Regional Board has the authority to protect water quality through WDRs.

Urban Runoff

Urbanization disturbs natural land cover, alters natural drainage patterns, and increases impervious areas (e.g., rooftops, streets, parking lots) where water can not infiltrate into the ground. While

concerns about urban runoff were focussed primarily on flood control in the past, urban runoff has now been proven to be a significant source of pollutants that degrade regional waters. Pollutants in urban runoff include urban debris, suspended solids, bacteria, viruses, heavy metals, pesticides, petroleum hydrocarbons, and other organic compounds. These pollutants threaten the quality of receiving waters in numerous and varied ways. Suspended solids (such as soil particles) can, upon settling, destroy spawning grounds and other habitats. Urban debris is unsightly and can present health risks such as cuts, punctures, and disease. High levels of bacteria occasionally necessitate beach closures. Heavy metals and organic compounds contaminate sediment near harbors and other recreational areas and can bioaccumulate in aquatic organisms.

More than 1,000 miles of storm drains beneath the streets of Los Angeles collect runoff from city streets, eventually dumping this flow into streams and coastal waters. High concentrations of pollutants that have accumulated on streets and other impervious surfaces during southern California's long dry summers are flushed into the storm drains and into surface waters during major storms that typically occur in winter.

The Southern California Coastal Water Research Project (SCCWRP), the Santa Monica Bay Restoration Project (SMBRP), and the University of Southern California (USC) Institute for Ocean and Coastal Studies have evaluated the characteristics of urban runoff, including pollutant loads, impacts, and toxicity, to coastal waters. The pollutant load and toxicity of urban runoff in the Region were found to be comparable to that of sewage effluent. The USEPA performed a nationwide evaluation of the environmental hazards posed by priority pollutants in urban runoff and found that cadmium, copper, lead, and zinc exceeded freshwater acute aquatic criteria in up to 50% of the samples analyzed (USEPA, 1983). In addition, these pollutants, along with cyanide, mercury, and silver, exceeded freshwater chronic criteria in at least 10% of the samples.

The Regional Board's urban runoff management program (through both the Storm Water and nonpoint source programs) continues to assess specific urban runoff problems and control strategies to remediate those problems. Program elements include:

- Supporting research by SCCWRP, SMBRP, USC, USEPA, and others to better define regional impacts of urban runoff discharges.

- Developing cooperative investigation and control strategies utilizing the expertise and resources of point source dischargers in receiving water segments.

- Organizing local ad hoc task forces for hydrologic watersheds/sub-watersheds with representation from point source discharges, local industries, local agencies, public interest groups, the Regional Board, and the USEPA to facilitate investigations and the development of control strategies.

- Participation on the State Board Coordinating Committee and Technical Advisory Committees formed to address urban runoff management measures developed under mandates of the Coastal Zone Management Act Re-authorization Amendments (CZARA) of 1990.

- Participating on the State Board Storm Water Quality Task Force in the development and implementation of statewide urban storm water management guidance and strategies.

- Working with other agencies such as the South Coast Air Quality Management District, Southern California Association of Governments, and the Metropolitan Transit Authority to ensure that transportation related strategies and plans will reduce the impact on receiving waters from transportation system runoff discharges.

Progress to date in this program includes a survey of basic information from flood control districts, Caltrans and local agencies which own or have maintenance responsibility for storm drain systems. The survey indicated that, with few exceptions, agencies have little information on the storm drain systems that they own or manage. Flow and water quality data describing discharges from storm drain systems are very limited. Few programs existed to control urban runoff from a water quality perspective. Existing maintenance programs include cleaning storm drainage inlets, catch basins, and storm drainage lines on an annual, or as-needed basis for flood control purposes only, not for water quality improvement.

The USEPA promulgated regulations (40 CFR Parts 122, 123, and 124) for storm water discharges in

November 1990. The regulations list the types of storm water discharges for which NPDES permits are required. These include discharges from separate municipal storm drain systems serving populations of 100,000 or more, discharges associated with industrial activities, discharges from construction activities, and discharges that contribute to violations of water quality standards or are significant contributors of pollutants to the receiving waters. The regulations authorize the issuance of system-wide or jurisdiction-wide permits and effectively prohibit non-storm water discharges to storm drains. They also require designated municipalities to implement control measures to reduce pollutants to the maximum extent practicable. Industrial storm water discharges are subject to standards based on best available technology (BAT) which is economically achievable. The Regional Board can, where necessary, require storm water discharge permits for dischargers not specifically cited in the regulations but who are a significant contributor of pollutants to waters of the Region (See Point Source section above for more details about the Storm Water Regulatory Program).

Local municipalities and the County of Los Angeles are working together to implement an Urban Runoff and Storm Water Management Program. The Regional Board issued a municipal storm water NPDES permit to Los Angeles County and co-permittees (cities and agencies) in June 1990. The permit implements a program which includes the development, assignment, and implementation of control strategies to reduce pollutants in urban runoff discharges in Los Angeles County. Table 4-19 lists the minimum required Best Management Practices (BMPs) to be implemented county-wide. The County of Ventura and local municipalities in Ventura County have joined together to develop and implement a Ventura County Storm Water Management Program, and the Regional Board is considering issuance of an NPDES storm water permit to Ventura County and associated cities. The County will then be required to implement a storm water management program that will include the development and implementation of urban runoff control strategies and county-wide storm water monitoring. The program will include the cities of Oxnard, Simi Valley and Thousand Oaks which have populations greater than 100,000 and are federally mandated to implement strategies to control pollutants in urban runoff. The city of Thousand Oaks, for areas that drain into Los Angeles County, will be regulated under a separate storm water NPDES permit.

The Regional Board conducts surveillance activities and provides overall direction to oversee, verify, and ensure implementation of urban runoff control programs. Technical guidance for prevention activities, as well as the identification, assignment, and implementation of control measures, and monitoring will be developed. Numerical limitations for selected pollutants, or pollutant indicator parameters, for urban runoff discharges in high resource watersheds, or impaired stream segments, will be developed in consultation with the USEPA and the State Board.

The Regional Board's continuing strategy for urban runoff management will include: (i) a comprehensive control program, (ii) a highway runoff control program, (iii) an industrial activity control program, and (iv) a construction activity control program. These programs are described below.

Comprehensive Control Program

All cities and counties in the Region are required to develop and implement comprehensive urban runoff control programs which focus on the prevention of future water quality problems and remediation of existing problems. The requirements of the municipal control program are intended to be consistent with NPDES regulations for municipal storm water discharges. In addition to baseline elements such as implementation of Best Management Practices (Table 4-19) and monitoring of runoff, these programs will include pilot projects or other investigations which will:

- implement measures to reduce pollutants in runoff to the maximum extent practicable from commercial, residential, industrial, and roadway areas;
- implement measures to identify and eliminate illicit connections and illegal dumping into storm drain systems;
- implement measures for operating and maintaining public highways to reduce pollutants in runoff; and
- implement measures to reduce pollutants in discharges associated with the application of pesticides, herbicides, and fertilizer. These will include, as appropriate, controls such as educational activities and other measures for commercial applicators and distributors, and

Table 4-19. Los Angeles County Municipal Storm Water Permit: Minimum Required Best Management Practices (BMPs) to be Implemented County-wide.

Establish or improve an area-wide catch basin stenciling program with a universal stencil to discourage dumping, discarding, and/or discharge of pollutants, carriers, and/or debris into storm drainage systems county-wide.
Develop programs to promote, publicize and facilitate public reporting of illegal discharges and/or dumping.
Adopt a runoff control ordinance requiring the use of BMPs during and after construction and at selected commercial and industrial establishments.
Augment public education and outreach programs with regard to catch basins and storm drainage systems and their intended purpose.
Provide regular catch basin cleaning when and where needed.
Increase cleaning frequency of and number of roadside trash receptacles in areas where needed.
Increase street sweeping in areas where needed.
Discourage the improper disposal of litter, lawn/garden clippings, and pet feces into the street or area where runoff may carry these pollutants to the storm drainage system.
Implement facility inspections of auto repair shops, auto body shops, auto parts and accessory shops, gasoline stations, and restaurants as the accumulation of pollutants, garbage, and /or debris tends to concentrate in these areas.
Encourage owners and persons in control of homes or businesses to remove dirt, rubbish, and debris from their sidewalks and alleys which may contribute pollutants to urban runoff.
Encourage recycling of oil, glass, plastic, and other materials to prevent their improper disposal into the storm drainage system.
Encourage the proper disposal of Household Hazardous Wastes to prevent the improper disposal of such materials to the storm drainage system.
Encourage the proper use and conservation of water.

controls for application in public right-of-ways and at municipal facilities.

On an annual basis, each city or county is required to conduct an evaluation of the effectiveness of its Comprehensive Control Program.

Highway Runoff Control Program

An essential component of a municipal comprehensive control program is the implementation of practices for maintaining public highways that reduce impacts on receiving waters from highway runoff. However, cities and counties (permittees) do not have jurisdiction over public highways controlled by the California Department of Transportation (Caltrans). In order to ensure the effectiveness of the comprehensive control programs, Caltrans must either actively participate as an entity in the County Storm Water Program, or will be required to obtain a separate NPDES permit for storm water discharges for highways under its jurisdiction. Such a program for Caltrans shall include a *Storm Water Management Plan* which addresses the design, construction, and maintenance of highway facilities relative to reducing pollutants in highway discharges to the maximum extent practicable. The Plan shall include:

- a characterization of Caltrans highway systems, including pollutants, highway layout, and drainage control system in the area;
- a description of existing highway runoff control measures;
- a description of additional highway runoff control measures to enhance pollutant removal; and

- a plan for monitoring the effectiveness of control measures and highway runoff water quality and pollutant loads.

The Highway Runoff Management Plan shall specifically address litter control, proper pesticide/herbicide management, reduction of direct discharges, reduction of runoff velocity, landscape over-watering, use of grassed channels, curb elimination, catch basin maintenance, appropriate street cleaning, establishing and maintaining vegetation, infiltration practices, and detention/retention practices. Caltrans shall coordinate its urban runoff program with local agencies and existing programs related to the reduction of pollutants in highway runoff.

Industrial Activity Control Program

The Regional Board will require, pursuant to NPDES storm water regulations, an NPDES permit for the discharge of storm water from specified facilities associated with industrial activities. The industrial activity control program applies to any discharge from specified conveyance or engineered surface which is used for concentrating, collecting, and conveying storm water and which is directly related to manufacturing, processing, or raw material storage areas at an industrial facility. The program applies to all facilities identified by 40 CFR Part 122.26(b)(14) and include both privately and publicly (federal, state, and municipal) owned facilities (see Tables 4-13, 4-16 and 4-17).

The Regional Board considers storm water discharges from automotive operations, including gas stations, auto repair shops, auto body shops, dealerships, battery shops, wrecking yards, radiator shops and mobile car washing businesses, significant sources of pollutants in the Region. It is intended that these discharges and similar discharges from commercial establishments be addressed initially at the local level through ordinances and industrial waste inspections as part of the municipal comprehensive control program. The Regional Board will assess the success of these local programs before including such discharges in the NPDES permit program.

Construction Activity Control Program

Major construction activities include the development, or redevelopment, of residential, commercial, and industrial areas, as well as transportation facilities. The major pollutant associated with construction activities is sediment. Additional pollutants include fuel, oil, paints, glues, pesticides, fertilizers, metals, and sanitary and solid wastes. The impact of these pollutants is dependant on the activities on site, as well as the duration of construction, rainfall, topography, soil characteristics, distance to the receiving waterbody, and Best Management Practices used on the site.

The Regional Board requires, pursuant to NPDES storm water regulations, an NPDES permit for the discharge of storm water from all construction activities, including demolition, clearing and excavation, and grading. The State Board issued a general permit (Table 4-2) in August 1992, for construction activity discharges. The majority of construction activity discharges in the Los Angeles Region will be covered under the State Board general permit. This program regulates construction sites that are five acres or more; USEPA, however, is considering making this program applicable to <u>all</u> construction sites as part of phase two of the Storm Water Program.

Hydrologic Modification

In light of the extensive development that has occurred on many of the floodplains throughout the Region, flood control in the Los Angeles Region is accomplished primarily through hydrologic modification.

Hydrologic modifications are activities that are designed to control natural streamflow. These include bank stabilization, channelization, in-stream construction, dredging, dams, levees, spillways, drop structures, weirs, and impoundments. Activities such as straightening, widening, deepening, or relocating existing stream channels, and clearing or snagging operations also fall into this category. Some specific examples of hydrologic modifications are described below.

Channelization: Channelization usually involves the straightening of channels and hardening of banks (e.g, concrete and rip-rap) along waterways undertaken for the purpose of flood control, navigation, and/or drainage improvement. These hydrologic modifications can disturb vegetative cover, increase scour as a result of increased velocities, and increase water temperatures when overhanging or streamside vegetation is removed. Channel modification activities can also deprive wetlands and estuarine shorelines of enriching

sediments, change the ability of natural systems to both absorb hydraulic energy and filter pollutants from surface waters, and cause interruptions of critical life stages of aquatic organisms. Hardening of banks along waterways results in permanent elimination of habitat, decreased quantities of organic matter entering aquatic systems and increased movement of nonpoint source pollutants from the upper reaches of watersheds into coastal waters. Channel modification projects undertaken in streams or rivers usually require regularly-scheduled maintenance activities to preserve and maintain completed projects. These frequently result in a continual disturbance of in-stream and riparian habitats.

Dredging: Dredging is the removal of sediment buildup from stream channels or other waterbodies. Dredging is often needed to remove excess silt and coarse sediments which diminish some recreational and other beneficial uses. This can result in improved circulation and long-term improvements; however, many short-term impacts occur during and after dredging occurs. Dredging destroys aquatic habitats and associated organisms. Dredging can also introduce pollutant loadings to the waterbody by disturbing sediments that have accumulated contaminants over an extended period of time. This disturbance often re-suspends and redissolves pollutants back into the aquatic environment.

Impoundments and Reservoirs: Impoundments range from small dams constructed for soil and water conservation purposes to large drinking water reservoirs with volumes in excess of several hundred thousand acre feet. Impoundments cause problems during and after the construction phase. Some of the impacts during construction include high erosion rates, washings from the preparation of the dam structure, and clearing operations of the area to be inundated. Long-term problems due to the impoundment itself can affect habitats in the reservoir and impact downstream river quality by diverting waters needed in downstream areas to support the localized aquatic life. Periodic maintenance of sediment buildup in reservoirs (which involves draining, dredging, or sluicing), termed "cleanout," has the potential to degrade downstream water quality and limits groundwater recharge capabilities. Sediment removal in reservoirs must be carefully managed so as not to transport sediment loads downstream which can impair beneficial uses (i.e., sealing spreading grounds and smothering aquatic habitat and organisms). The Regional Board strongly opposes sluicing of sediment from reservoirs for maintenance purposes when this activity has the potential to impair downstream uses. Cleanout is currently a controversial issue with respect to the reservoirs in the Upper San Gabriel River watershed.

The Los Angeles County Department of Public Works maintains a series of debris basins in canyon mouths and upstream stabilization structures in selected watersheds to trap debris flows from canyons. There are currently 114 debris basins in the watershed of the Los Angeles and San Gabriel River systems. In addition, the County maintains 225 stabilization structures in 47 major watersheds, which serve as erosion control structures.

The Los Angeles County Department of Public Works also operates 14 dams as part of their Flood Control Program (refer to Figure 1-3 for the locations of major lakes and reservoirs). Table 4-20 lists the major reservoirs in the Region, their function and capacity, and the agencies that operate and maintain them.

401 Certification Program

The most effective tool the State has for regulating hydrologic modification projects is the 401 Certification Program.

The CWA (§401(a)(1)) gives states the authority to issue, deny, or waive water quality 401 certifications to applicants applying for federal permits or licenses for activities that can result in discharge to any water of the United States. The issuance of a 401 certification ensures that the project will comply with the State's Water Quality Standards as designated in the Basin Plan. The 401 certification process is commonly used by the Regional Board when reviewing projects from applicants who are requesting a Section 404 permit from the U.S. Army Corps of Engineers. The State Board can provide 401 certification upon the recommendation of the Regional Board and Executive Officer.

The CWA (§404) establishes a permit program, administered by the Secretary of the Army, acting through the Corps of Engineers, to regulate the discharge of fill or dredged material into the watersof the United States. Section 404(c) gives the Administrator of the USEPA further authority to restrict or prohibit the discharge of any dredged or fill material that can cause an unacceptable adverse effect on municipal water supplies, shellfish beds, fisheries, wildlife, or recreational areas.

Table 4-20. Selected Reservoirs in the Region: Ownership, Capacity and Function.

Name of Dam/Reservoir	Function	Capacity (acre-feet)	Ownership & Maintenance
Bard	CONS	10,600†	CAMWD
Big Dalton	FC, CONS	936*	LACDPW
Big Tujunga	FC, CONS	5,319*	LACDPW
Bouquet	CONS	36,505†	CITY of LA
Castaic	CONS, REC	323,702†	DWR
Casitas	CONS, REC	254,000†	USBR/CASITAS MWD
Chatsworth	CONS	8,888†	CITY OF LA
Cogswell	FC, CONS, REC	8,871*	LACDPW
Devil's Gate	FC, CONS	2,817*	LACDPW
Eagle Rock	CONS	254†	CITY OF LA
Eaton Wash	DS, CONS	852*	LACDPW
Hollywood/Mulhulland Dam	CONS	4,038†	CITY OF LA
Los Angeles	CONS	10,000†	CITY OF LA
Live Oak	FC, CONS	2,800†	MWD
Live Oak	FC, CONS	230†	LACDPW
Matilija	CONS	1800†	VCFCD
Morris	FC, CONS	21,343*	MWD/LACDPW
Pacoima	FC, CONS	3,383*	LACDPW
Piru/Santa Felicia Dam	CONS, REC	88,300†	UWCD
Puddingstone	FC, REC	16,342*	LACDPW
Puddingstone Diversion	FC, DIV, CONS	205*	LACDPW
Pyramid	CONS, REC	171,200†	DWR
San Dimas	FC, CONS	1,058*	LACDPW
San Gabriel	FC, CONS	45,883*	LACDPW
Santa Anita	FC, CONS	905*	LACDPW
Santa Fe	FC, CONS	32,109†	COE/LACFCD
Sawpit	FC, CONS	406*	LACDPW
Silver Lake	CONS	2,020†	CITY OF LA
Stone Canyon	CONS	10,372†	CITY OF LA
Thompson Creek	FC, CONS	533*	LACDPW
Whittier Narrows	FC, CONS	67,080†	COE/LACDPW

CONS	Conservation (domestic water supply)	CAMWD	Calleguas Municipal Water District
DIV	Diversion	COE	United States Army Corps. of Engineers
DS	Debris Storage	DWR	Department of Water Resources (State of California)
FC	Flood Control	LACDPW	Los Angeles County Department of Public Works
REC	Recreation	MWD	Metropolitan Water District of Southern California
		USBR	United States Bureau of Reclamation
		UWCD	United Water Conservation District
		VCFCD	Ventura County Flood Control District

† 1994 Capacity
* 1993 Capacity

Streambed Alteration Agreements

In addition to the CWA (§401 and §404), Sections 1601-1605 of the Fish and Game Code (Chapter 6, Fish and Wildlife Protection and Conservation) apply to any governmental agency, state or local, or any public utility that proposes to divert, obstruct or change the natural flow or bed, channel or bank of any river, stream, or lake. It is unlawful for any person to engage in such a project or activity without first notifying the California Department of Fish and Game of such activity, and one can not commence such operations until the Department has found such operations will not substantially adversely affect existing fish or wildlife resources. Agencies must submit proposed plans to the Department of Fish and Game. The Department will then review the proposal, conduct field investigations, if warranted, and notify the Agency of any potentially adverse impacts to the existing fish and wildlife resource due to the proposed activity. The Department of Fish and Game can propose mitigation measures necessary to protect the fish and wildlife.

Recreational Impacts

Water contact and non-contact recreational activities range from swimming, surfing, and sunbathing at coastal beaches to hiking along some of the pristine stretches of streams in the canyons of the Transverse Mountain Ranges. With the intense residential, commercial, and industrial development throughout much of the Region, however, relatively few natural environments remain for the enjoyment of urban residents. Many of those environments that do remain are threatened by overuse as well as disregard for the sensitivity of natural ecosystems. Many of the streams and banks in the parks and campgrounds of the Region are littered with trash and debris.

Water quality impacts from recreational use are not restricted to litter. Other ways in which water quality is affected include discharges from overloaded sewage containment and septic systems and erosion of dunes and stream banks from trampling and off-road vehicles. In addition to degrading riparian, estuarine, and coastal habitats, these impacts leave sites in unsightly and unhealthy conditions, limiting future recreational opportunities. Golf courses are kept green by applications of pesticides and fertilizers. Over watering allows these chemicals to runoff into surface waters. In some cases, the extra irrigation water itself causes a disruption of the hydrologic balance of surface waters.

The Regional Board encourages mitigation of recreational impacts through planning efforts at a local level. Planning efforts should address maintenance of parks, campgrounds, beaches, and other open spaces. Public outreach and education measures, while long term, are nonetheless considered to be the most effective way of controlling this type of pollution and maintaining these resources.

Septic Systems

Many areas in the Region rely on septic systems for disposal of domestic household waste. Septic systems "treat" household wastes by first removing organic solids through settling and decomposition in the tank portion of the system. Further treatment of organic chemicals, nutrients, and bacteria occurs as the effluent released from the tank percolates through the soil. Proper construction of septic systems is imperative. Poorly designed and constructed systems will not function properly and can result in pollution of surface and/or ground waters (Figure 4-5). Septic systems used in undersized lots or unsuitable soils are also subject to malfunction and can lead to untreated or poorly treated sewage seeping into yards, roadside ditches, streams, lagoons, or into ground water – creating a public nuisance and health hazard. Even well-functioning septic systems can pollute ground water under adverse conditions (e.g., unsuitable sites.)

Nitrogen compounds, which are typically present in effluent from septic systems, are highly soluble and stable in aqueous environments. When not denitrified by bacteria or assimilated into organic growth (plants) in the unsaturated zone, these nitrogen compounds are easily transported to ground water. Examples of this problem occur in developed areas along the coast and in rural areas undergoing rapid urbanization (such as Ventura County or northern Los Angeles County).

Although there is controversy about the possible health effects of nitrate on adults, it has been shown that high levels of nitrate cause methemoglobinemia (blue-baby syndrome) in infants. The federal drinking water standard of 10 mg/L nitrate plus nitrite (expressed as nitrogen) is based on this relationship. Furthermore, high levels of nitrates have economic impacts on supplies of potable

water, requiring well closure and relocation, well deepening, wellhead treatment, or blending. In addition, new developments may be restricted due to the presence of water supply with nitrogen concentrations that exceed drinking water standards.

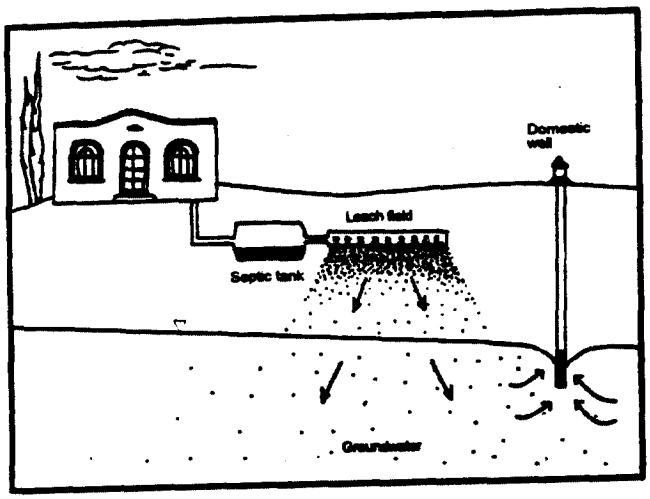

Figure 4-5. Septic System. In a properly designed septic system, pollutants in the septic tank effluent are naturally degraded in the leach field before reaching the water table. This diagram, however, illustrates how pollution of ground water can result from a septic system that is not properly located or maintained.

The Regional Board discourages the prolonged use of septic systems, except in isolated areas where connection to a wastewater collection system is not feasible and there is no threat to groundwater quality. Septic systems are not acceptable in areas where there are unsuitable soils, inadequate lot sizes, or other factors that can lead to contamination of either surface or ground water. In assessing areas of concern, high priority is given to rapidly developing areas where local ground water is the sole or primary source of drinking water. One such area is the Aqua Dulce area of the Sierra Pelona Valley in northern Los Angeles County. Ground water is the primary source of drinking water for residents in this unsewered area. High concentrations of nitrate, however, have been found in some of the wells in the area. In response, the Regional Board has contracted with the University of California at Riverside to use isotope techniques to trace the source (or sources) of nitrogen in ground water in the area.

In addition, in response to other concerns that ground water was not sufficiently protected from the effects of new developments that rely on septic systems, the Regional Board developed an Interim Policy for septic systems in areas that rely on ground water for domestic purposes. Under this Interim Policy, the Regional Board adopted *General Waste Discharge Requirements for Residential Subsurface Sewage Disposal Systems in Areas Where Ground Water is Used For Domestic Purposes* (Order No. 91-94, adopted July 22, 1991). These requirements are intended to simplify and expedite the application process and processing of requests for use of septic systems in residential areas while assuring the protection of water quality. As part of the requirements, the Regional Board requires either a hydrogeologic study or certain mitigation measures.

Recommendations for future steps for control of problems from septic systems include:

- evaluate the adequacy of existing local regulations for installation and maintenance of septic systems;
- continue to discourage or limit the use of septic systems in new developments;
- encourage alternative waste treatment systems; and
- encourage and support funding for wastewater treatment plants in outlying areas where water quality problems and/or population density require wastewater collection and treatment.

Seawater Intrusion

Ground water supplied most of the water in the Region until the 1940s. By World War II, however, increasing demands for ground water escalated to such an extent that groundwater pumping far exceeded freshwater recharge (i.e., replenishment) in many aquifers (Fossette, 1986). As a result, degradation of ground water occurred as seawater seeped inland to replace ground water in freshwater aquifers that had been overpumped. Referred to as seawater intrusion, this condition is accelerated when coastal aquifers are overdrafted (i.e., when groundwater pumping exceeds recharge).

Seawater intrusion can be controlled through pumping restrictions and artificial recharge of aquifers. Artificial recharge is especially important in urban areas where paved surfaces and buildings have eliminated natural recharge areas and drastically reduced recharge rates. Figure 4-6

illustrates two forms of artificial recharge used to combat seawater intrusion: spreading basins and injection wells. Spreading basins are constructed in permeable zones where water can seep into the subsurface. Spreading basins in the Los Angeles Region typically were created by modifying existing terrain with dikes or low head dams within, or adjacent to, stream channels. Such devices divert excess supplies of surface waters into spreading basins, thus recharging aquifers and creating a seaward gradient that will help prevent seawater intrusion. Injection wells along coastal areas create a freshwater barrier that can halt seawater intrusion, recharge aquifers, and allow groundwater pumping from elevations below sea level. In addition, artificial recharge is often supplemented through in-lieu recharge programs, wherein excess supplies of surface water (when available) are discounted and sold to groundwater pumpers. In exchange for this discounted surface water, groundwater pumpers agree that they will not exercise pumping rights on an equivalent amount of ground water.

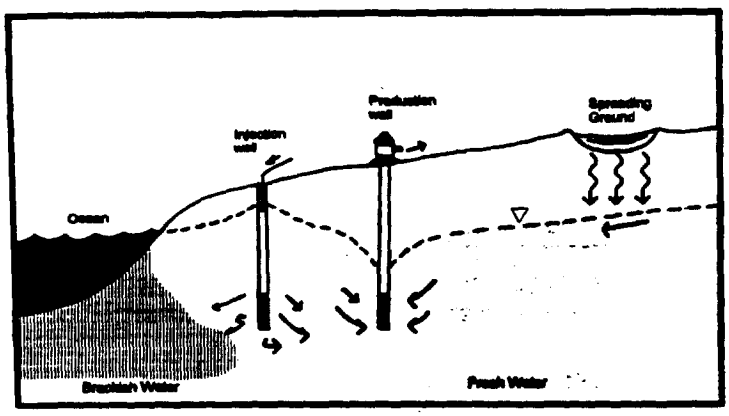

Figure 4-6. Artificial recharge through spreading grounds and injection wells. Use of artificial recharge in this coastal aquifer helps to (i) maintain groundwater levels through use of spreading grounds and (ii) prevent saltwater intrusion using injection wells. Arrows in figure indicate direction of groundwater flow. (Hatched lines indicate the water table.)

On the Los Angeles Coastal Plain, three rows of injection wells (the Alamitos Barrier along the Central Basin, and the Dominguez Gap and West Coast Barriers along the West Coast Basin) protect aquifers from seawater intrusion. In addition, spreading grounds along the San Gabriel and Rio Hondo Rivers in the northern part of the Central Basin provide further recharge of the coastal aquifers under the Los Angeles Coastal Plain. These artificial recharge projects are supplemented by an aggressive in-lieu recharge program. Finally, enforcement of adjudicated groundwater rights in these basins ensures that groundwater production will not exceed recharge.

While groundwater overdraft and seawater intrusion are under control on the Los Angeles Coastal Plain, they continue to be serious problems within the Oxnard Plain portion of the Ventura Central Groundwater Basin. Aquifers underlying the Oxnard Plain are the primary source of agricultural supply water. Although spreading grounds along the lower Santa Clara River and an in-lieu recharge program have somewhat lessened overdraft conditions, groundwater pumping continues to greatly exceed freshwater recharge.

Ground water in the San Gabriel and San Fernando Valley Basins is also artificially recharged through spreading basins. While these inland basins are not intruded by seawater, they have been overdrafted in the past. Recharge through spreading basins, coupled with court enforcement of adjudicated water rights, protects these inland basins from overdraft.

The Regional Board supports artificial recharge projects through regulatory and financial assistance programs. Water Reclamation Requirements (WRRs) – in lieu of WDRs – regulate groundwater recharge with treated wastewaters.

Resource Extraction

Resource extraction includes mining, drilling, and pumping for mineral petroleum products. Impacts to water quality can be significant, even for small operations. Surface mining operations alter the natural landscape, resulting in accelerated erosion and sedimentation. In addition, high concentrations of chemicals that are leached from exposed soils, ores, and waste rocks can pollute ground or surface waters. Oil production activities also disturb surrounding lands; brines and drilling fluids from drilling operations have a potential for degrading the environment if spilled. Water quality impacts from resource extraction are not limited to operating mines and petroleum wells (Ventura County, 1990). Water quality can be threatened by abandoned mining operations (and associated tailings) and petroleum drilling sites if not properly reclaimed.

Mines

Most active mines in the Los Angeles Region are sand and gravel operations located along the San Gabriel and Santa Clara Rivers. Gypsum, borax,

and titanium (and associated heavy minerals) mines operate in the area along with small-scale gold prospecting. In 1988-89, the number of mines in Los Angeles and Ventura Counties totaled 53, as shown below and as shown on Figure 4-7 (DMG, 1990):

Sand and gravel	41
Clay	3
Stone (including dimension, decorative)	8
Tungsten	1

There are three types of sand and gravel operations: in-stream, wet, and dry. Discharges of washwaters from all types of sand and gravel operations contain suspended sediments that can degrade downstream waters. In-stream operations divert the sand and gravel load of a stream, thereby altering natural rates of sedimentation in downstream areas. Modification of stream channels during in-stream operations results in excessive scouring and increased sedimentation during floods, possible loss of riparian vegetation due to lowering of the water table and potential loss of aquifer storage capacity. In addition, oil, grease, and turbidity from in-stream operations degrade the quality of surface waters; off channel diversion helps to minimize these problems. Wet operations, which occur below the seasonal high water table, can directly pollute ground water and otherwise degrade water quality by evaporative loss, and silting. Approximately 10% of the operations in the Region are wet. Dry sand and gravel operations, on the other hand, are conducted entirely above the water table and result in less severe impacts to water quality. Suspended sediments in runoff from dry operations, however, can degrade water quality, especially during wet weather (Division of Oil, Gas & Geothermal Resources, 1989).

Ore mining operations often generate acidic runoff (i.e., water with a pH below 6) and dissolved metals that are toxic to aquatic life in downstream surface waters. In addition, this contaminated runoff can seep into ground water. Contaminated runoff often can be neutralized with chemicals, or reduced to acceptable levels with Best Management Practices (BMPs).

Surface mining and subsequent reclamation are governed by California's Surface Mining and Reclamation Act (SMARA) of 1975 and the federal Surface Mining Control and Reclamation Act (SMCRA) of 1977 which require operations to minimize erosion and sedimentation (some operations are specifically exempted). In addition, any chemicals used in the operations must meet current discharge requirements from both their operations and stock piles. Federal mining law controls mining on Department of Defense lands, Native-American lands, Bureau of Land Management lands and Forest Service lands.

The Regional Board issues WDRs for mining operations on a case-by-case basis. Under the California Water Code (§13263.1) the Regional Board must "determine that the proposed mining waste is consistent with a waste management strategy that prevents the pollution or contamination of the waters of the State, particularly after closure of any waste management unit for mining waste." California Code of Regulations, Title 23, Chapter 15, Article 7 also applies to mining wastes. In addition, industrial storm water runoff (NPDES) permits are required for each site.

Ventura and Los Angeles Counties impose restrictions on mining operations that are consistent with Regional, State, and Federal laws. In Ventura County, stringent conditions are placed on mining operations in order to protect water quality and associated resources, preserve wildlife habitat, and enhance reclamation and aesthetics (Ventura County General Plan, 1990). In Los Angeles County, surface mining operators (including oil and gas production) are required to control slope excavations, erosion and sedimentation, runoff and flooding, etc.

Oil and Gas Extraction

Southern California has a large number of oil and gas fields (Figure 4-8). District 1 of the California Division of Oil, Gas & Geothermal Resources (DOG&G) includes Los Angeles, San Bernardino, Orange, Riverside, San Diego, and Imperial Counties; District 2 covers Ventura County. In 1991, oil production in District 1 and District 2 included 46.6 (48 active fields) and 15.8 (52 active fields) million barrels respectively. Gas production was 15.8 and 18.4 billion cubic feet, respectively. The primary method of enhanced oil recovery is waterflooding in which water is injected into oil reservoirs through injection wells. In both Districts, 102 wells had active water disposal programs totalling 20.3 million barrels of produced water (DOG&G, 1991).

While many of the discharges associated with oil and gas production (such as disposal of produced

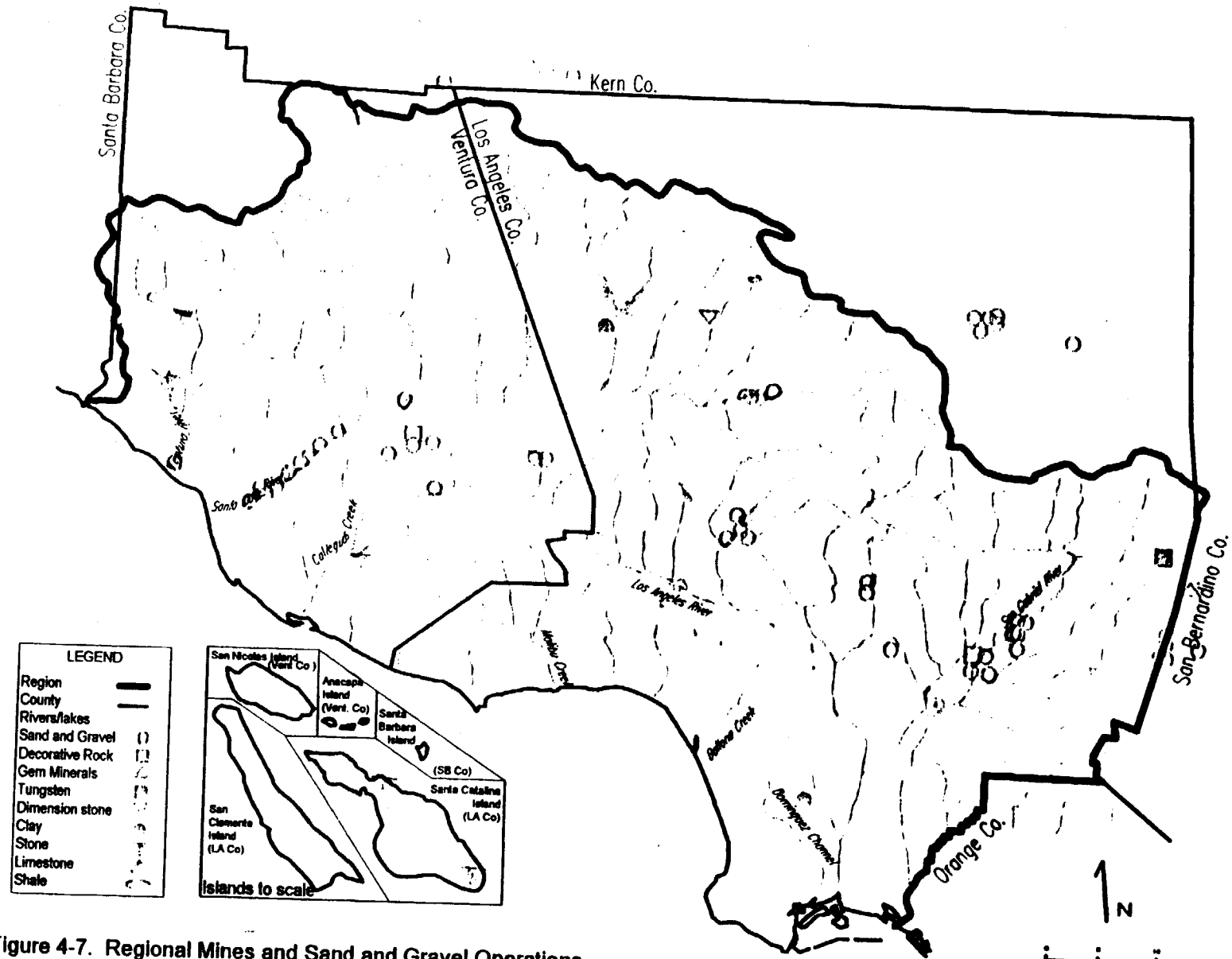

Figure 4-7. Regional Mines and Sand and Gravel Operations.

After California Division of Mines and Geology, 1990.

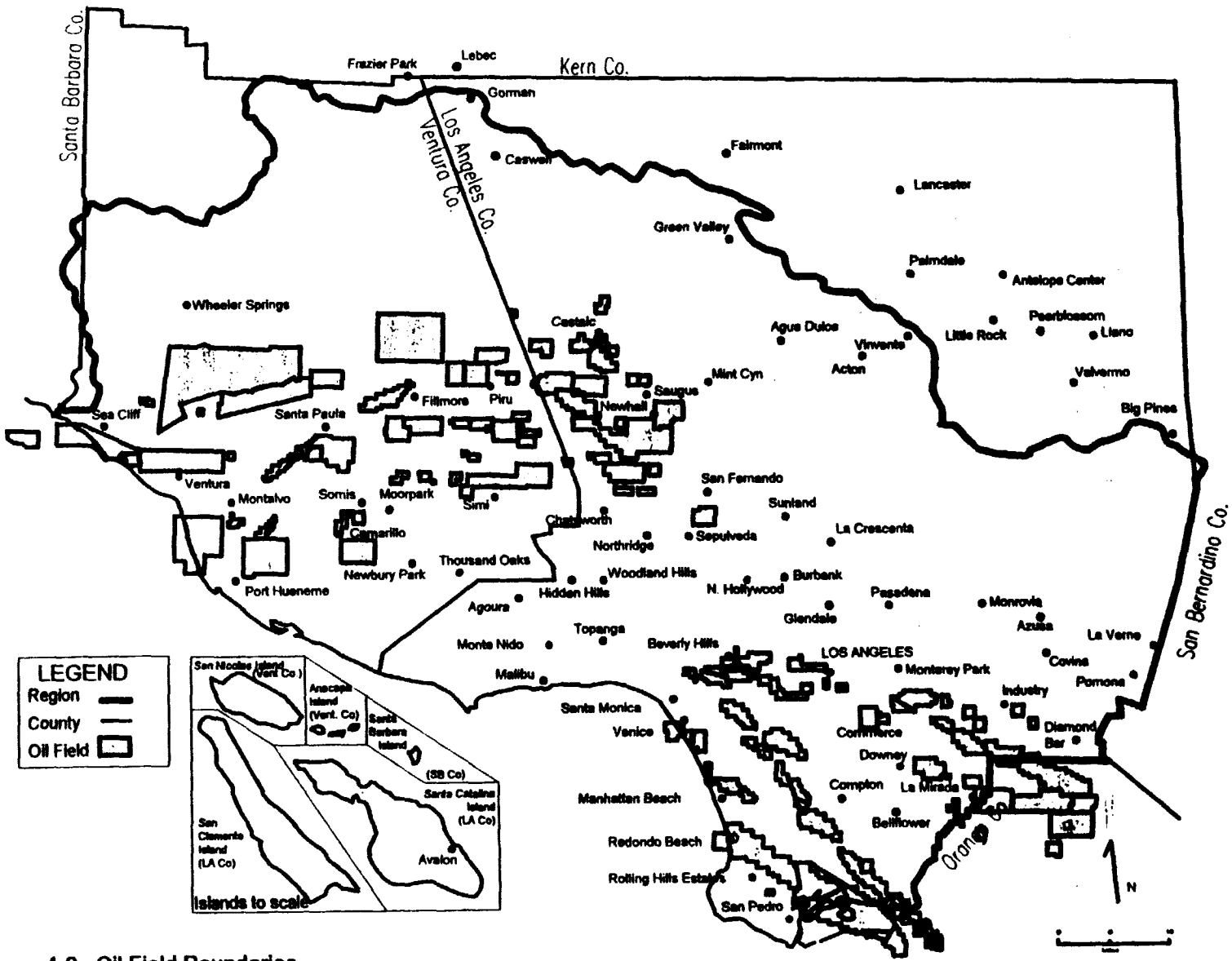

Figure 4-8. Oil Field Boundaries.

Oil field boundaries after Department of Oil and Gas, 1992 (Districts 1 and 2)

water and cuttings) are considered point sources, pollutants from nonpoint sources are also significant threats to water quality. Such nonpoint sources can include seeping and overflowing reserve pits containing drilling fluids and production pits containing hydrocarbons and radium, polluted storm water runoff from drilling and production sites, and spills during transportation. Water associated with oil, gas, or geothermal resource extraction frequently contains high levels of sodium, calcium, chloride, sulfate, carbonate, boron, and iodine, as well as trace metals and hydrocarbons. There also are significant sources of pollutants from natural oil seeps in the Region, which often surface on the ocean floor, along streams such as Santa Paula, Tapo, and Sisar Creeks in Ventura County, and in the vicinity of the La Brea Tarpits in Los Angeles County.

Oil production on federal lands, including National Forest lands, is regulated by the U.S. Bureau of Land Management. Offshore production within three miles of the coast is under state jurisdiction, while that beyond three miles is under federal jurisdiction. The California Division of Oil, Gas & Geothermal Resources conducts environmental inspections of active and inactive off shore and on shore wells, including injection wells for re-injection of produced water associated with oil wells. The Department of Toxic Substances Control regulates hazardous wastes stored, used, or generated on-site. As a result of a Memorandum of Understanding between the State Board and the Division of Oil, Gas & Geothermal Resources, the Regional Board no longer issues WDRs for brine injection wells but does issue WDRs for land disposal at oil and gas sites, including landfills and spreading operations. The USEPA issues permits for injection wells (40 CFR Chapter 1, Subchapter D); DOG&G regulates Class II brine injection wells.

The Regional Board requires NPDES storm water permits for oil production facilities.

Silviculture

Silviculture is the process of managing trees in a forest and includes activities such as site preparation, cultivation, timber harvest, and transport. Such activities are significant sources of nonpoint pollutants unless properly managed. The major type of pollution associated with silvicultural operations is increased sedimentation from the erosion of harvest sites, log landings, logging and skid trails. Other pollutants include pesticides, fertilizers, fire-retardant chemicals, organic matter, woody debris, and increased water temperature along streams where trees have been removed. Logging roads on forest lands, which normally provide access for timber management, recreation, fire protection and other activities, can impact wildlife habitat by increasing erosion and sedimentation in streams and thus destroying aquatic habitats.

In 1897, the federal Organic Administration Act first addressed the management of National Forests. In 1905, Congress transferred all forest reserves to the U.S. Department of Agriculture from the U.S. Department of Interior. This established the U.S. Forest Service as the land management agency in charge of National Forests. The National Environmental Policy Act (NEPA) of 1969 required evaluation of potential impacts on the environment before activities such as timber harvesting could occur on federal lands.

In 1973, mounting concern over forest management and its impacts led to the Z'berg-Nejedley Forest Practice Act. This Act regulates forest practices on state, county, and private lands. It encourages timber production but requires consideration of fish, wildlife and other forest resources. Similar concerns for other federally-owned lands led to the National Forest Management Act of 1976, which outlines even more precise management guidelines requiring long-range planning process and encouraging public participation.

Best Management Practices in Forest Management: The U.S. Forest Service water quality maintenance and improvement measures, or Best Management Practices (BMPs), were developed in compliance with CWA (§208). Practices developed by the Forest Service were certified by the State Water Resources Control Board and approved by the USEPA in 1979. The signing of the 1981 Management Agency Agreement (MAA) between the U.S. Forest Service and the State Board resulted in the formal designation of the Forest Service as a water quality management agency. BMPs are the measures both the State and Federal water quality regulatory agencies expect the Forest Service to implement in order to meet water quality objectives and to maintain and improve water quality. There are currently 98 certified practices being implemented. These 98 practices have been identified under 8 different resource categories (Table 4-21). Twenty-seven of the 98 practices are specifically related to

Table 4-21. Best Management Practices in Forest Management – Angeles and Los Padres National Forests.

Resource Category	Practice *
Timber	Protection of Unstable Areas
	Streamcourse Protection
	Erosion Control on Skid Trails
Road and Building Site Construction	Road Slope Stabilization
	Controlling In-channel excavation
	Water Source Development Consistent with Water Quality Protection
Mining	Administering U.S. Mining Laws
Recreation	Documentation of Water Quality Data
	Protection of Water Quality within Developed and Dispersed Recreation Areas
Vegetative Manipulation	Pesticide Application Monitoring and Evaluation
	Untreated Buffer Strips for Riparian Area and Streamside Management
Fire Suppression & Fuels Management	Protecting of Water Quality from Prescribed Burning Effects
	Repair or Stabilization of fire Suppression Related Watershed Damage
Watershed Management	Watershed Restoration
	Water Quality Monitoring
Grazing	Controlling Livestock Numbers and Season of Use
	Rangeland Improvements

* This list is not complete, but illustrates examples for each of the 8 Resource Categories.

Source: United States Department of Agriculture, 1987 and 1991

silvicultural activities. The most current reference for BMPs is a Soil and Water Conservation Handbook titled *Water Quality Management for National Forest System Lands in California* (USFS, 1986). In addition to the 98 certified practices, two additional practices are currently being reviewed prior to state and federal certification (USFS, 1987).

Within the Region, water quality management is administered in both the Angeles National Forest and the Los Padres National Forest through the continued implementation of the BMPs and through the guidance of the 1981 Management Agency Agreement between the State Board and the U.S. Forest Service. In both the Angeles and the Los Padres National Forests, management activities are limited to a broad-based "selection management," where selective cutting leads to, or maintains, a small even-aged groups of trees similar to those that occur under natural conditions.

Within the forest, wildfire poses one of the greatest threats to water quality. This is especially true of the Los Padres National Forest. Between 1912 and 1985, wildfires burned 1,844,150 acres of the forest, making it one of the most fire-prone in the National Forest System. Wildfires in the Angeles National Forest burn an average of 18,500 acres annually. In addition to the ash and debris resulting from wildfires, destruction of vegetation results in elevated levels of erosion and sedimentation in streams and increased levels of nutrients in the aquatic systems. Removal of streamside cover results in increased water temperature and reduced dissolved oxygen levels. In addition, flooding results in stream bank erosion and loss of riparian habitat.

Current vegetative management practices focus on fire prevention, suppression, and a program of fuel management. The U.S. Forest Service thins overstocked chaparral stands each year. This thinning is accomplished by hand or mechanical methods, use of silvicides, or by low-intensity prescribed burning. This greatly reduces the potential for wildfire by limiting exposure of residual stands to potential wildfires.

In the Angeles National forest, there are approximately 240 miles of perennial rivers and streams, numerous miles of intermittent streams, five natural lakes, and 14 reservoirs. The net yield in this forest is approximately 226,000 acre-feet of water. The Los Padres National Forest has 37

reservoirs and provides about 715,000 acre-feet net yield of water (USFS, 1987).

The major water quality problem in the forest lands is sedimentation and its effect on aquatic habitat and reservoir storage life. As an example, about six million tons of sediment are estimated to be produced on the Los Padres Forest each year; roughly 50% of this sedimentation results from erosion and flooding after wildfires (USFS,1987).

Coastal Nonpoint Source Pollution Program

The Coastal Zone Act Re-authorization Amendments (CZARA) of 1990 include Section 6217, "Protecting Coastal Waters," and requires states with approved coastal zone management programs to develop a Coastal Nonpoint Pollution Control Program (CNPCP). This program will be implemented through existing State coastal zone management programs (California Coastal Commission) and nonpoint source management programs (State Water Resources Control Board). At the federal level, the USEPA and the National Oceanic and Atmospheric Administration (NOAA) will jointly administer the new requirements.

The *Program Development and Approval Guidance* was released by USEPA and NOAA in January, 1993. States have 30 months (by July, 1995) to submit their Coastal Nonpoint Pollution Control Program for approval. Once the plan is approved, states have three years (until January, 1999) to implement the technology-based management measures. USEPA and NOAA will then have a two-year monitoring period (until January, 2001) to assess the effectiveness of the measures. States will then have an additional three years (until January, 2004) to implement any additional measure necessary to attain water quality standards.

Future nonpoint source funding allocations are contingent upon the completion of an approvable program. If the state does not submit an approvable program, financial penalties will be assessed in the form of progressively decreasing Section 319 grants to the state.

The *Guidance Specifying Management Measures For Sources of Nonpoint Pollution in Coastal Waters* (commonly called the *(g) guidance*) was released by the USEPA in January, 1993. This *(g) Guidance* contains management measures for five major categories of nonpoint source pollution: agriculture, forestry, urban (including septic tanks), marinas and recreational boating, and hydromodification (Table 4-22). States will be expected to implement all of the measures specified in the *(g) Guidance* with some limited exceptions. These exceptions include (i) sources that are not present, nor reasonably anticipated in an area; or (ii) sources that do not individually or cumulatively present significant adverse effects to living resources or human health. States will also have some flexibility in adopting the exact measures specified in the *(g) Guidance* or alternative measures which are demonstrated to be as effective as USEPA measures in controlling nonpoint source pollution.

The State Board and Coastal Commission have assembled a Coordinating Committee and several Technical Advisory Committees to review the *(g) Guidance* management measures and develop strategies to implement them in California. A key feature of this program is that the State must develop *enforceable* management measures. This differs from most of the State's existing nonpoint source efforts which for the most part are voluntary. There are also some components of the program that the Regional and State Boards do not usually regulate, such as issues relating to land use. Therefore, it will be critical to coordinate State and Regional Boards programs with those of the Coastal Commission and appropriate local agencies in order to develop a successful coastal nonpoint source program. This program will be closely integrated with the Regional Board's storm water permitting program and others, such as the Santa Monica Bay Restoration Project.

Future Direction: Watershed-Based Water Quality Control

The concept of comprehensive watershed level management of water resources is currently being incorporated into various elements of the State's Nonpoint Source Management Program. The watershed protection approach is an integrated strategy for more effectively protecting and restoring beneficial uses of State waters. By looking at an entire watershed, one can more clearly identify critical areas and practices which need to be targeted for pollution prevention and corrective actions. This approach not only addresses the waterbody itself, but the geographic area which drains to the watercourse. This strategy also

Table 4-22. Management Measures in the *Guidance Specifying Management Measures For Sources of Nonpoint Pollution in Coastal Waters* ["(g) Guidance"].

Categories	Subcategories
Agriculture	Erosion and sediment control Confined animal facility control Nutrient management Pesticide management Livestock grazing Irrigation water management
Forestry	Pre-harvest planning Streamside management areas Road construction/reconstruction Road management Timber harvesting Site preparation and forest regeneration Fire managment Revegetation of disturbed areas Forest chemical managment Wetlands forest managment
Urban	New development management Watershed protection/site development Construction erosion and sediment control Construction site chemical control Existing development managment New and operating onsite disposal systems (septic tanks) managment
Marinas	Siting and design Marina flushing managment Water quality assessment Habitat assessment Shoreline stabilization management Storm water runoff management Fueling station design management Sewage facility managment Marina and boat Operation and Maintenance Solid waste management Fish waste managment Liquid material managment Petroleum control managment Boat cleaning management Public education managment Maintenance of sewage facilities management Boat operation management
Hydromodification	Channelization and channel modification Physical and chemical characteristics of surface waters Instream and riparian habitat restoration management Dams Erosion and sediment control Chemical and pollutant control Protection of surface water quality and instream and riparian habitat Stream bank and shoreline erosion management
Wetlands	Protection of wetlands and riparian areas Restoration of wetlands and riparian areas Vegetated treatment systems

integrates both surface and ground waters, inland and coastal waters, and point and nonpoint sources of pollution. Point sources have received most of the regulatory attention in the past, however, significant improvements in point sources, coupled with continued water quality impairments, have necessitated the water resources community to look at a more integrated approach which considers impacts from both point and nonpoint sources of pollutants.

The Watershed Protection Approach is built on three main principles. *First,* targeted watersheds should be those where pollution poses the greatest risk to human health, ecological resources, other beneficial uses of the water, or combinations of these. *Second,* all parties with a stake in the specific local situation should participate in the analysis of the problems and the creation of solutions. *Third,* the actions undertaken should draw on the full range of methods and tools available, integrating them into a coordinated, multi-organizational effort to solve the identified problems.

Many agencies and organizations concerned with water resources have come to recognize that this type of approach can be very effective in realistically assessing cumulative impacts and formulating workable mitigation strategies. The Coastal Zone Management Act Re-authorization Amendments, USEPA guidance, and various legislative proposals clearly state the need to consider the implications of land use on water quality. The USEPA and State Board encourage the Watershed Protection Approach at all levels of government. USEPA program managers are re-thinking their approach to the allocation of resources (especially within the Nonpoint Source Program) and will be primarily funding studies that are part of a watershed planning and implementation effort. Recently, the State Board has formed a work group to investigate options for watershed management in California. The Water Quality Task Force, created by the Los Angeles Regional Water Quality Control Board in December, 1992, included a watershed management issue in the list of recommended actions to be implemented at the regional level.

The traditional approach to managing pollutant discharges into streams, lakes, and the ocean has evolved over time – often with separate programs to address various aspects of an overall water quality problem. Some of these programs can have different, overlapping, or conflicting priorities. A transition to watershed-based management can require some programs to be reoriented and integrated. Other programs can not be amenable to the watershed approach. However, this new perspective, even with a limited application, could produce more benefits than a strict program-based approach and provide improved communication and

Malibu Creek Watershed Nonpoint Source Pilot Project

The Malibu Creek watershed, a drainage area of approximately 105 square miles, has changed rapidly in recent years from a predominantly rural area to a steadily developing area. Impacts from human activities are degrading beneficial uses and potentially contributing to long-term environmental problems. The Malibu Lagoon is listed as an impaired waterbody, and sections of the Malibu Creek are listed as threatened waterbodies (WQA, 1992). For these reasons, the Malibu Creek watershed has been chosen by the Regional Board for a pilot watershed nonpoint source project which is funded by USEPA Title II grant monies. This project is being undertaken in cooperation with the United States Soil Conservation Service, the California Coastal Conservancy, the California Department of Fish and Game, the California Department of Parks and Recreation, and others.

Watershed stakeholders, including local activists, politicians, agency representatives, local residents and members of the regulated community, participated in a series of discussion and consensus building groups, dating back to 1991, that resulted in the identification of several areas of environmental concern. Pollutants of concern, many of which are contributed by nonpoint sources, include excess nutrients, sediment, and disease-causing organisms. Increased flows, due to imported water to support the growing population base, as well as channelization and urbanization, have caused an imbalance in the natural regime of dry weather low-flows in the summer.

A comprehensive management plan is being developed to restore biological and recreational resources and to prevent further environmental degradation. The Regional Board has taken the lead in coordinating a comprehensive approach to controlling the nonpoint source pollution aspects of the effort. The Regional Board provides technical assistance including:

- coordination of and participation in watershed-wide water quality monitoring efforts;
- development of a model to determine waste loads into the creek and lagoon system to determine where reductions are needed;
- development of a plan to minimize water quality impacts on Malibu Lagoon from surface discharge of current and future groundwater pollution abatement programs;
- assistance in the implementation of Best Management Practices for the Municipal Storm water NPDES permit; and
- initiation of a nonpoint source public education campaign.

coordination among all levels of government, private organizations, and citizens.

The Region has been divided into six watershed management areas (see Figure 1-5) for planning purposes.

Projects in the Los Angeles Region which are already successfully utilizing the watershed approach include the Malibu Creek Watershed Study (see description on previous page) and the Santa Monica Bay Restoration Project. Regional Board staff are also participating on the Santa Clara River Project Steering Committee and the Los Angeles River Master Plan Environmental Quality Subcommittee, both of which are developing flood plain or watershed plans for these rivers.

The Regional Board plans to implement more watershed-based projects in the future. These will increase the coordination of planning, monitoring, assessment, permitting, and enforcement elements of the various surface and groundwater programs with activities/jurisdiction in each watershed.

Remediation of Pollution

The Regional Board allocates substantial resources to the investigation of polluted waters and enforcement of corrective actions needed to restore water quality. Specific remediation programs include:

- Underground Storage Tanks
- Well Investigations
- Spills, Leaks, Investigations and Cleanups (SLIC)
- Aboveground Petroleum Storage Tanks
- U.S. Department of Defense (DOD) and Department of Energy (DOE) Sites
- Resource Conservation and Recovery Act (RCRA)
- Toxic Pits Cleanup Act
- Bay Protection and Toxic Cleanup

The relatively recent discovery of pollutants in ground water has jeopardized an important source of water for municipal, agricultural, industrial process, and industrial supply uses in the Los Angeles Region. As a result, reliance on imported supplies of water to this semiarid region has increased.

The Regional Board sets cleanup goals based on the State's *Antidegradation Policy* as set forth in State Board Resolution No. 68-16. Under the *Antidegradation Policy*, whenever the existing quality of water is better than that needed to protect present and potential beneficial uses, such existing quality will be maintained (see Chapter 5, Plans and Policies). Accordingly, the Regional Board prescribes cleanup goals that are based upon background concentrations. For those cases wherein dischargers have demonstrated that cleanup goals based on background concentrations cannot be attained due to technological and economic limitations, State Board Resolution No. 92-49 sets forth policy for cleanup and abatement based on the protection of beneficial uses. Under this policy, the Regional Board can – on a case-by-case basis – set cleanup levels as close to background as technologically and economically feasible. Such levels must, at a minimum, consider all beneficial uses of the waters. Furthermore, cleanup levels must be established in a manner consistent with California Code of Regulations, Title 23, Chapter 15, Article 5; cannot result in water quality less than that prescribed in the Basin Plans and policies adopted by the State and Regional Board; and must be consistent with maximum benefit to the people of the State.

The amended State Board Resolution No. 92-49 has been adopted by the State Board. Upon approval from the Office of Administrative Law (OAL), the amended policy will become effective.

Underground Storage Tanks

Approximately 18,000 underground storage tanks have been identified in the Region, accounting for 15% of the 120,000 underground storage tanks that have been identified throughout the State. Most of these tanks contain, or contained, gasoline and diesel fuel products. Over 4,500 sites in the Los Angeles Region are known to have leaking tanks. These leaks can result in pollution of soil, ground water, surface water, and air, and can also constitute fire or explosion hazards (Figure 4-9).

To protect ground and surface waters from petroleum hydrocarbons from leaking underground storage tanks, the State of California enacted legislation in 1983 (Health and Safety Code, Division 20, Chapter 6.7). Underground tank regulations promulgated under this legislation are designed to (i) ensure the integrity of all underground storage tanks, and (ii) detect any leaks. These regulations can be found in Title 23, California Code of Regulations, Division 3, Chapter 16.

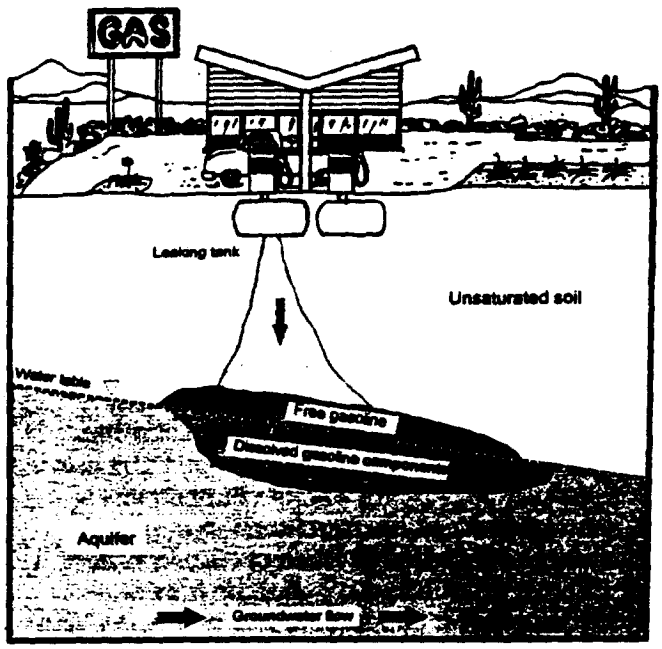

Figure 4-9. Leaking underground storage tank. This diagram illustrates how contamination of the vadose zone and pollution of ground water can result from leaks of gasoline from an underground storage tank (Adapted from Fetter, 1988).

To ensure the integrity of all underground storage tanks, the State's regulations require all counties in California to implement an underground tank permitting program. The counties have the flexibility to shift responsibility to local governments (known as Local Implementing Agencies), provided that the Local Implementing Agencies (LIAs) adopted appropriate ordinances before July, 1990 for implementing underground tank permitting programs that are at least as stringent as the Chapter 16 regulations. Under the permitting programs, a tank owner or operator must obtain an operating permit from the county or LIA in which the tank is located. Permit conditions include tank construction standards, monitoring requirements, unauthorized release reporting, initial abatement procedures, and closure requirements. Furthermore, permitting procedures undertaken by LIAs include initial assessments of sites where pollution can have occurred. LIAs within the Los Angeles Region include: the Counties of Ventura and Los Angeles, and the Cities of Burbank, Glendale, Long Beach, Los Angeles (including the City of San Fernando), Pasadena, Santa Monica, San Buenaventura, Torrance, and Vernon.

Responsibility for overseeing investigations of groundwater pollution and corrective actions rests with the Regional Board. However, given the magnitude of the problems from leaking underground storage tanks in the Los Angeles Region, the Counties of Los Angeles and Ventura joined the State Board's Local Oversight Program (LOP), through which they share regulatory responsibility with the State. (Note that, in addition to their role in the LOP program, the Counties of Los Angeles and Ventura are also LIAs.) In order to provide practical guidance to regulatory agencies overseeing site investigations and corrective actions, the State Board has issued the *Leaking Underground Fuel Tank (LUFT) Field Manual*. This manual is not a policy or regulation; rather, it establishes procedures for verifying the occurrence of a leak from an underground fuel storage tank and for assessing the impact to soil and ground water.

To expedite the permitting process for sites requiring groundwater remediation, the Regional Board has adopted a general permit for the discharge of treated ground water, *Discharge of Ground Water from Investigation and/or Cleanup of Petroleum Fuel Pollution to Surface Waters* (Table 4-2). This general permit regulates the discharge of treated ground water, from petroleum fuel contamination sites, to surface waters, provided that the discharge meets the limitations and conditions of the general permit and does not exceed water quality objectives or impair beneficial uses of the receiving waters.

Leaks from underground storage tanks are not limited to petroleum fuels. Other hazardous substances, such as solvents, also leak and pollute ground and surface waters. Although remediation of such pollution is a high priority, limited funding is available for the investigation and cleanup of such sites. Accordingly, the current scope of the Underground Storage Tank Program is somewhat restricted to pollution from petroleum fuels.

Well Investigations

By 1980, volatile organic compounds (VOCs) had been discovered in a number of public water supply wells in the San Gabriel Valley and San Fernando Valley Groundwater Basins. These discoveries, along with the discovery of dibromochloropropane (DBCP) in several hundred wells in the San Joaquin Valley and in the Riverside-San Bernardino area, prompted passage of legislation (Assembly Bill 1803) in 1983 which mandated statewide sampling for contamination in public water systems. This legislation is codified in the California Health and Safety Code, Section 4026.3.

The California Department of Health Services and county Health Departments completed sampling of public wells in 1985. Organic pollution was detected in over 640 public water supply wells in the Los Angeles Region. The Regional Board, under authority of the California Water Code (§13304) locates and abates the sources of pollutants affecting these wells and oversees the remediation of the pollution. These investigations, conducted through the Well Investigation Program (WIP), are designed to:

- identify and eliminate sources of pollutants in public water supply wells;
- identify dischargers, by establishing a cause-and-effect relationship between the discharge of a pollutant and a polluted well. When necessary, take enforcement action against dischargers in order to force them to undertake site investigations and corrective actions; and
- oversee remediation of soils and ground waters.

All WIP activities are directed to pollution of ground water in the San Gabriel Valley and San Fernando Valley Groundwater Basins. These valleys are synclinal basins at the base of the San Gabriel Mountains. The two basins, which are separated by the San Raphael Hills, are largely filled with alluvial sediments eroded from the surrounding mountains and hills. Large volumes of groundwater flow through these alluvial sediments, and both basins are important sources of water for more than one million people. In addition to meeting a large part of the demand for potable water, the San Gabriel and San Fernando Valley Groundwater Basins store large volumes of ground water that can be pumped during droughts and recharged during years of surplus surface water supplies. The discovery of significant pollution in these basins, however, has significantly reduced groundwater production as well as the potential for conjunctive use, thereby increasing dependence on imported supplies of water.

Groundwater pollution can often be traced to historic and current land uses. Primary organic pollutants in public water supply wells in the San Gabriel and San Fernando Valley Basins include tetrachloroethylene (PCE) and trichloroethylene (TCE). These compounds, both of which are volatile organic compounds (VOCs), have been widely used as solvents in manufacturing and dry cleaning processes. Soil pollution and subsequent groundwater pollution can result from inadequate handling, storage, and disposal practices of such substances at industrial facilities. In addition to volatile organic compounds, high concentrations of nitrates in the upper 160 feet of the San Fernando Valley Basin have polluted many wells. Nitrates often originate in agricultural areas where fertilizers have been excessively applied to crops, in stockyards and feedlots where nitrates from manure leaches into ground water, and in unsewered areas where nitrates from septic tank systems leach into ground water. With few continuous confining layers of less permeable sediments, groundwater recharge – and the infiltration of pollutants – can occur throughout much of the San Gabriel and San Fernando Valleys.

The Regional Board identifies sources of pollutants by inspecting facilities to check their chemical handling, storage, and disposal practices. Information from these inspections assists in identifying those responsible for releases of pollutants. Under the direction of the Regional Board, parties thus identified are required to conduct subsurface investigations of soil and ground water to confirm the presence or absence of pollutants, quantify the extent of pollution, and plan corrective actions. The Regional Board is committed to working closely with those responsible for releases of pollutants to find cost effective ways in which to investigate and remediate pollution in a timely manner. Whenever appropriate, the Regional Board promotes innovative remediation options and encourages phased, cooperative remediation plans involving multiple sites.

Additionally, in order to minimize the spread of pollution caused by groundwater pumping and recharge activities, the Regional Board oversees a

comprehensive groundwater quantity and quality management program in the San Gabriel Valley. This management program, implemented by the Main San Gabriel Basin Watermaster and about 45 private and municipal water purveyors, has the following objectives:

- Prevent public exposure to contamination.
- Maintain adequate water supply.
- Protect natural resources.
- Control the migration of pollutants.
- Remove polluted ground water.

Oversight of this management program is authorized by Regional Board Resolution No. 91-6, entitled *Amendment to the Water Quality Control Plan for the Los Angeles River Basin and Implementation Plan Concerning the Extraction of Ground Water Within the San Gabriel Valley Basin.* In the San Fernando Valley Groundwater Basin, the Watermaster for the Upper Los Angeles River Area (i.e., the San Fernando Valley Groundwater Basin) cooperates with the Regional Board to achieve similar objectives (Upper Los Angeles River Area Watermaster, 1993c).

In light of the extent of pollution in the San Gabriel Valley and San Fernando Valley Groundwater Basins (Figures 4-10 and 4-11) and the dependence on this important source of ground water, the State of California designated large areas of these basins as high priority Hazardous Substances Cleanup sites. The USEPA also designated these same areas as sites eligible for funding under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) legislation (i.e., as Superfund sites). The USEPA, as lead agency for enforcement in these areas, is responsible for strategy, case development, determination of responsible parties, and settlement negotiations. The Regional Board, on behalf of the USEPA, identifies dischargers as described above.

Spills, Leaks, Investigation and Cleanup (SLIC)

With a skilled work force, well-developed infrastructure and large-scale production capacity, the Los Angeles Region is an important industrial and manufacturing center. With 20 major refineries and hundreds of smaller facilities, the Region has the greatest concentration of petroleum production and storage facilities along the West Coast. Although these activities are an important part of the Region's economic base, they have often severely degraded the environment.

Reports of unauthorized discharges, such as spills and leaks from above-ground storage tanks, are investigated through the Regional Board's Spills, Leaks, Investigation and Cleanup (SLIC) Program. This program is not restricted to particular pollutants or environments; rather, the program covers all types of pollutants (such as solvents, petroleum fuels, and heavy metals) and all environments (including surface and water, ground water, and the vadose zone). Upon confirming that an unauthorized discharge is polluting or threatens to pollute regional waterbodies, the Regional Board oversees site investigation and corrective action. Statutory authority for the program is derived from the California Water Code, Division 7, Section 13304. Guidelines for site investigation and remediation are promulgated in State Board Resolution No. 92-49 entitled *Policies and Procedures For Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304*, described at the beginning this Chapter, in section entitled Remediation of Pollution. Pollutants in the SLIC Program are typically petroleum fuel products which, in addition to existing in liquid form as pure compounds (i.e., "free product"), can dissolve in water, adsorb to soils, and vaporize. Site investigations to delineate the extent of pollution caused by such substances are therefore very complex. Cases range from small leaks of fuel products stored in metal drums to large spills at tank farms and refineries, where tens of millions of gallons of free product are floating on the surface of ground waters in important aquifers. Over 350 cases of pollution have been investigated since 1986. Approximately 50 of these sites have been remediated and closed. State of the art remediation techniques, such as bioremediation of soils, have successfully been employed to remediate pollution. Approximately 100 cases are presently undergoing investigation or corrective action. New cases of pollution are reported at a rate of about 2 to 3 per month.

Department of Defense and Department of Energy

Decades of defense and energy activities have degraded water quality on and around federally-owned facilities. Working with other agencies, the Regional Board is involved with remedial investigation and clean up action on over 16 U.S.

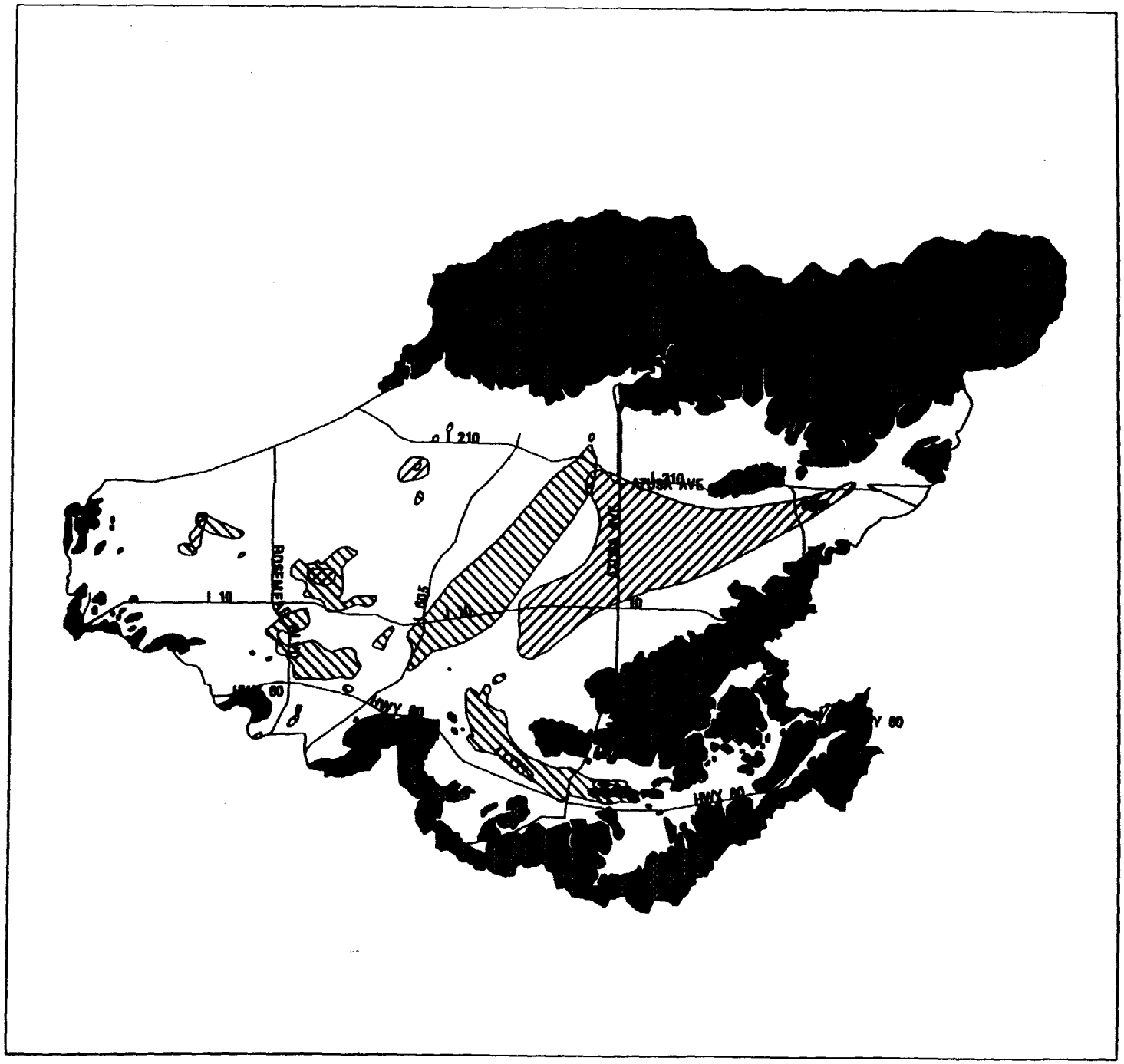

FIGURE 4-10

SAN GABRIEL VALLEY GROUNDWATER BASIN CONTAMINATION PLUMES

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION (4)

VOC'S ABOVE MCL

NITRATES ABOVE MCL

BEDROCK OUTCROP

MILES

0 1 2 3 4

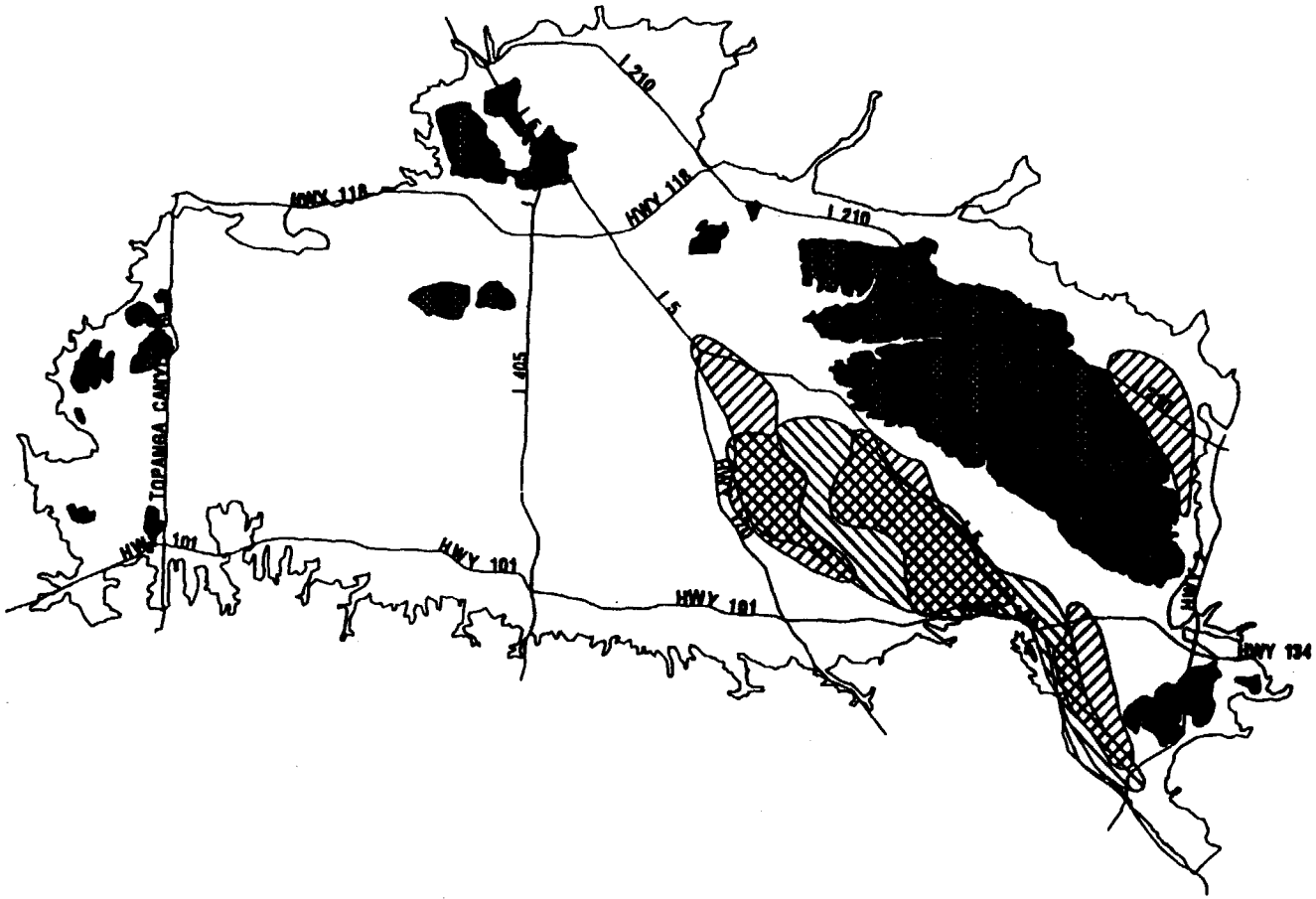

FIGURE 4-11

SAN FERNANDO VALLEY GROUNDWATER BASIN CONTAMINATION PLUMES

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION (4)

VOC'S ABOVE MCL

NITRATES ABOVE MCL

BEDROCK OUTCROP

N

MILES

0 1 2 3 4

Department of Defense (DOD) sites and one U.S. Department of Energy (DOE) site. Agreements with the DOD and DOE provide for accelerated cleanups at military bases and other Defense sites that are scheduled for closing. Site investigation and clean up procedures are consistent with State laws and regulations as well as applicable provisions of CERCLA.

Aboveground Petroleum Storage Tanks

In order to prevent unauthorized discharges from aboveground petroleum storage tanks, the State of California has enacted legislation designed to lower the risk of spills and leaks. The California Health & Safety Code (§25270 et seq.) requires owners or operators of above-ground petroleum storage tanks to file a storage statement with the State Board and implement spill prevention measures. Examples of such measures include daily visual inspections of any storage crude oil or its fractions, the installation of secondary containment for all tanks with sufficient capacity to hold the content of the largest tank at the facility plus sufficient volume for rainfall to avoid overflow, and development of a *Spill Prevention Control and Countermeasure Plan*. In the event of an unauthorized release, the owner or operator must notify State officials and undertake appropriate monitoring and corrective action. In addition, annual fees are levied on tank owners. The Regional Board uses these fees to fund aboveground petroleum tank inspections and enforcement. There are over 10,000 aboveground petroleum storage tanks in the Los Angeles Region.

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA) is federal legislation (42 U.S.C.A. 6901 et seq.) designed to ensure that hazardous substances are managed in an environmentally-sound manner. Regulations promulgated under this legislation are in 40 CFR 264 and Title 22 of the California Code of Regulations and include comprehensive requirements for hazardous waste generators, transporters, and facilities that treat, store and dispose of hazardous wastes.

The State of California Department of Toxic Substances Control (DTSC) administers the RCRA Program in California. When requested, the Regional Board reviews on water-quality issues related to RCRA sites.

Toxic Pits Cleanup Act

The State's Toxic Pits Cleanup Act of 1984 (TPCA) regulates impoundments containing liquid hazardous wastes. Regulations promulgated under the TPCA legislation are in the Health & Safety Code, Division 20, Chapter 6.5, Article 9, and are administered by the State and Regional Boards. Major provisions in these regulations include:

- Requirements that all impoundments containing liquid hazardous wastes be retrofitted with liners and laced collection systems, and performance standards for these systems.
- Groundwater monitoring in accordance with the federal Resource Conservation and Recovery Act.
- A prohibition on the discharge of liquid hazardous wastes within 1/2 mile upgradient of a drinking water well.
- A Hydrogeologic Assessment Report.

Seventeen known impoundments containing liquid hazardous waste were operating in the Los Angeles Region when TPCA legislation was enacted. The Regional Board has overseen closure of all of these impoundments.

Bay Protection and Toxic Cleanup Program

In 1989, State legislation added Sections 13390 through 13396 to the California Water Code which established the Bay Protection and Toxic Cleanup Program (BPTCP). The program has four main goals: (i) to provide protection of existing and future beneficial uses of bays and estuarine waters, (ii) to identify and characterize toxic hot spots, (iii) to plan for the cleanup or other remedial or mitigating actions, and (iv) to contribute to the development of effective strategies to control toxic pollutants and prevent creation of new hot spots or the perpetuation of existing hot spots.

The Water Code requires that each Regional Board complete a toxic hot spot cleanup plan and that the State Board prepare a consolidated cleanup plan for

submittal to the Legislature. Each cleanup plan must include a description of each toxic hot spot with its priority listing, an assessment of the most likely source(s) of pollutants, an estimate of the total costs to implement the cleanup plan, an estimate of costs which can be recoverable from responsible parties, a preliminary assessment of the actions required to remedy or restore a toxic hot spot, and a two-year expenditure schedule identifying State funds needed to implement the plan. It is required that a State-wide consolidated cleanup plan will be completed by June 30, 1999.

The Santa Monica Bay Restoration Project

Introduction

In recognition of the need to protect the Bay and associated watersheds, in May 1988, the State of California and the U.S. Environmental Protection Agency nominated and included Santa Monica Bay in the National Estuary Program (NEP). Established under the Water Quality Act of 1987 and managed by the U.S. EPA, the NEP currently includes 21 significant estuaries and coastal water bodies nationwide. The NEP was created to pioneer a broader focus for coastal protection, and to demonstrate practical, innovative approaches for protecting coastal areas and their living resources.

As an NEP, the Santa Monica Bay Restoration Project (SMBRP) is charged with assessing the Bay's pollution and degradation problems and producing a Bay Restoration Plan (BRP) to serve as a blueprint for the Bay's recovery. To fulfill its responsibility, the SMBRP convened a Management Conference. Organized into three groups (the Management, Technical Advisory, and Public Advisory Committees), the Management Conference is a unique and diverse coalition of government, environmentalists, scientists, industry, and the public committed to restoring the Bay. Over the last five years, this coalition has been successfully breaking many interagency barriers, and building consensus to solve problems.

For the purposes of the NEP, the borders of Santa Monica Bay are defined as reaching from the Ventura County line to Point Fermin on the south end of the Palos Verdes Peninsula.

Assessment of Problems in Santa Monica Bay

Santa Monica Bay is an important natural resource which provides significant environmental, recreational and economic benefits for Southern California. However, the Bay's living resources, water quality, and natural beauty have been affected by years of development and other human uses.

The creation of the SMBRP in 1988 has brought about much progress in understanding the problems facing the Bay. Above all, the SMBRP Management Conference has focused on assessing problems associated with four fundamental issues: swimming safety, seafood safety, fisheries and living resources protection, and ecosystem health.

Environmental Issues

Public concern about the safety of *swimming* in, and consuming *seafood* from Santa Monica Bay has been high for the past decade. Studies have shown that some local seafood species contain elevated concentrations of potentially toxic chemicals, primarily DDT and PCBs. As a result, responsible State agencies have published advisories to anglers regarding consumption of these species. With regard to the safety of swimming in Bay waters, some Santa Monica Bay beaches are occasionally closed due to storm water contaminated with minimally-treated sewage overflows. Studies have also found evidence of human fecal waste in dry-weather urban runoff. As a result, warning signs have been posted near outlets of flowing storm drains on beaches to discourage swimming near storm drains.

Despite the relative abundance of aquatic and terrestrial life in and around Santa Monica Bay (including several endangered species), the Bay's *habitats* have been significantly altered and degraded. For example, only about 5% of the area's historical wetlands acreage still exists. Pollution of coastal waters has led to a decline in species and a commercial fishing ban on white croaker in certain areas. In addition, although the use of DDT was banned in 1971, residues of this pesticide still bio-accumulate in the tissues of invertebrates, fish, birds, and marine mammals.

Pollutant loading has been identified as the most important contributor to the problems associated with beneficial use impairment in the Bay. The

SMBRP identified 19 pollutants of concern based on the serious impacts they have had or may have on the Bay. These 19 pollutants of concerns are: DDT, PCBs, PAHs, chlordane, TBT, cadmium, chromium, copper, lead, nickel, silver, zinc, pathogenic bacteria and viruses, total suspended solids, nutrients, trash and debris, chlorine, oxygen demands, and oil and grease.

Pollutants of concern reach Santa Monica Bay through a number of routes. Major pathways include wastewater carried by the region's sewage system and released into the Bay after treatment; urban runoff/storm water carried into the Bay through the region's storm drain system; treated wastewater directly discharged into the Bay from industrial facilities; oil and hazardous waste spilled directly into the Bay or into the storm drain system, and resuspension of contaminated sediments. Overall, sewer systems are the largest source of pollutant loading to the Bay. However, as the quality of sewage discharges from treatment plants has improved, the relative contribution of storm water and urban runoff to the total pollutant load to the Bay has increased.

The condition of the Bay and its watershed, with an emphasis on the effects of pollution on human health and the marine environment is documented in detail in the Santa Monica Bay Characterization Report published by the SMBRP in April 1993.

Management Issues

The Santa Monica Bay "watershed" is bordered on the north by the Santa Monica Mountains divide, on the east by Griffith Park, on the south by Point Fermin, and on the west by the eastern portion of Ventura County. Hydrologically, the Bay watershed is divided into 28 drainage basins, each of which has unique topographical and land use characteristics. The northern portion of the Bay watershed has steep topography and contains large undeveloped areas. The central and southern portions have a mixture of residential and industrial/commercial land use. The Palos Verdes Peninsula segment of the watershed contains residential development along with open space and a rocky shoreline.

Management of water pollution and habitat protection in Santa Monica Bay is currently based on jurisdictional rather than hydrologic or watershed boundaries. There are more than 50 Federal, State, and local agencies or jurisdictions whose management decisions directly or indirectly affect water quality, natural resources, and recreational activities in the Santa Monica Bay watershed and the near-coastal area. To make planning, forecasting, and implementation of actions more cost effective and successful, they should be coordinated on a watershed basis.

Historically, water quality management in the Santa Monica Bay area targeted the most visible pollution problems such as individual municipal and industrial "point" sources of pollution. This approach has solved the worst pollution problems, but it may have neglected the less obvious, but potentially more damaging impact of "nonpoint" pollution such as storm water/urban runoff and atmospheric deposition. There is an urgent need to address all these pathways/sources in a coordinated rather than a fragmented manner.

Currently, most of these pollutants are primarily managed by applying concentration-based water quality standards. However, such an approach may not always be appropriate to protect against impacts that result from long-term accumulation of these pollutants in marine environments. A new mass emissions approach is being considered. Under this approach, an allowable "no impact" cumulative loading of a pollutant would be determined on a watershed basis, coupled with a set of useful "end points" by which to measure the adequacy of management actions.

Recommended Actions

Supported by extensive problem research and assessment, the Bay Restoration Plan sets forth actions that need to be taken to achieve a clean and healthy Bay. The BRP not only identifies actions, but also implementors, timelines, and potential funding sources.

Described below are some of the high priority actions presented in the Draft BRP which the Los Angeles Regional Water Quality Control Board has been designated to serve as either the lead, regulatory lead, or as an important participant in their implementation.

- Improve management framework for water quality regulation and enforcement

  Specific actions to be led by the Regional Board include revising and incorporating new program

elements into the NPDES permits, especially storm water NPDES permits, as needed; ensuring adequate staffing, resources, and legal support at the Regional Board for storm water NPDES permits, other NPDES permits, and pretreatment permit compliance and enforcement; and developing new, effective enforcement tools, if necessary.

Led by EPA and the post-SMBRP organization, and with the involvement of the Regional Board, specific actions are also recommended to investigate the necessity for and feasibility of developing numeric effluent limits for storm water runoff.

- Coordinate Bay water pollution management on a watershed basis

  A key action under the leadership of the Regional Board is to develop tools for coordinating all components of the NPDES program (urban, municipal, industrial and cooling water discharges) with other permitting and regulatory functions on a watershed/sub-watershed basis. One recommended mechanism for management on a watershed basis is the adoption of a mass emissions approach, with the Regional Board serving as the lead in overseeing its development and implementation.

  In order to carry out the watershed management approach, the BRP prescribes a Malibu Creek Pilot Watershed Management Plan. It is recommended that the post-SMBRP organization, with participation of the Regional Board, use applicable elements of the Malibu Creek Pilot Plan to develop management plans for other priority watersheds.

- Implement control measures for pollutants associated with storm water/urban runoff

  Specific actions include ensuring adequate staff and training in local municipalities and agencies for storm water/urban runoff management; evaluating and developing effective processes to address small discharges of non-storm or contaminated storm runoff; developing and implementing land use tools for storm water/urban runoff management; developing and enforcing land use ordinances; developing and implementing a five-year urban runoff education strategy; implementing a set of mandatory short-term Best Management Practices (BMPs); conducting pilot projects for medium and long term BMP implementation; and promoting implementation of general good housekeeping practices by commercial and industrial facilities and construction activities.

  It is recommended that most actions in this category be implemented by co-permittees of the municipal storm water NPDES permit, led by the Los Angeles County Department of Public Works, and that the Regional Board act as regulatory lead.

- Upgrade all direct municipal discharges to Santa Monica bay to secondary treatment levels

  Two specific actions are included: (i) the City of Los Angeles should complete construction of full secondary facilities at the Hyperion treatment plant and remedy storm-related sewage overflow problems; (ii) the County of Los Angeles should install full secondary treatment facilities at the Joint Water Pollution Control Plant. It is recommended that Regional Board act as regulatory lead for implementation of these actions.

- Control pathogens in surfzone to ensure the safety of swimmers

  Specific actions include developing and conducting a sanitary survey; conducting on-site inspections and repairing malfunctioning septic tanks; developing inspection systems; conducting focused inspection of illegal and illicit sewage connections to storm drains; inspecting and correcting leaks from sewer lines and sewage treatment plants; treating and/or diverting dry-weather urban runoff if feasible

  Implementation of these actions will be carried out by various agencies/organizations including Los Angeles County Department of Public Works, Los Angeles County Department of Health Services, POTWs, and local cities, as well as the SMBRP. The Regional Board is recommended to serve as regulatory lead for implementation of these actions.

- Assess health risks associated with swimming and revise water quality standards

  The key action is to conduct an epidemiological study to assess the possible health risks of recreational exposure to storm drain runoff in

Santa Monica Bay. It is recommended that this action be led by the State Water Resources Control Board with the participation of the Regional Board and other State and local health service agencies.

- Develop and implement comprehensive monitoring program

  It is recommended that NPDES permittees as well as the Regional Board participate in a "retooled" Santa Monica Bay and watershed monitoring program focusing on compliance monitoring aspects. As part of the monitoring program, a user-friendly SMB data management system would be designed and maintained by the post-SMBRP organization with the participation of the Regional Board.

The Santa Monica Bay Restoration Plan was presented to the public in April 28, 1994. Its implementation is slated to begin in January, 1995.

5

5. PLANS AND POLICIES

Table of Contents

Introduction 5-1

State Board Plans 5-1
- Ocean Plan 5-1
- Thermal Plan 5-4
- Nonpoint Source Management Plan 5-4

State Board Policies 5-5
- The State Policy for Water Quality Control 5-5
- Statement of Policy with Respect to Maintaining High Quality Water in California (Antidegradation Policy) 5-5
- Water Quality Control Policy for the Enclosed Bays and Estuaries of California 5-6
- Water Quality Control Policy on the Use and Disposal of Inland Water Used for Powerplant Cooling 5-6
- Policy with Respect to Water Reclamation in California 5-6
- Policy on the Disposal of Shredder Waste 5-7
- Sources of Drinking Water Policy 5-7
- Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304 5-7

Regional Water Quality Advisory Task Force 5-7

Regional Board Resolutions 5-8

Introduction

The State Water Resources Control Board has adopted several statewide Water Quality Control Plans that are part of the Regional Board Basin Plans. In addition, both the State and Regional Boards have adopted policies, separate from the plans, that provide detailed direction on the implementation of certain plan provisions. In the event that inconsistencies exist among various plans and policies, the more stringent provisions apply.

This update of the Los Angeles Region's Basin Plans has been prepared to be consistent with all State and Regional Board plans and policies adopted to date. Following are summaries of the most frequently referenced plans and policies affecting the Los Angeles Region. These plans and policies can be revised periodically.

State Board Plans

Ocean Plan

The State Board adopted the *Water Quality Control Plan for Ocean Waters of California* (State Board Resolution No. 74-57) in 1974 and amended this plan in 1988 (State Board Resolution No. 88-111) and 1990 (State Board Resolution No. 90-27). This amended plan, which is referred to as the *Ocean Plan*, establishes beneficial uses and water quality objectives for waters of the Pacific Ocean adjacent to the California coast outside of enclosed bays, estuaries, and coastal lagoons. The Ocean Plan also prescribes effluent quality requirements and management principles for waste discharges and specifies certain waste discharge prohibitions. Prohibitions include discharges of specific hazardous substances and sludge, bypases of untreated waste, and discharges that impact Areas of Special Biological Significance (ASBS).

The Ocean Plan authorizes the State Board to designate ASBS and requires that wastes be discharged a sufficient distance away from these areas to protect natural water quality conditions. Waste discharges to ASBS are prohibited unless the State Board finds that there would be no adverse impact to beneficial uses. The following areas have been designated as ASBS in this Region (Figures 5-1 and 5-2):

- San Nicolas Island and Begg Rock: Waters surrounding San Nicolas Island and Begg Rock to a distance of one nautical mile offshore or to the 300-foot isobath, whichever is greater.
- Santa Barbara Island and Anacapa Island: Waters surrounding Santa Barbara Island and Anacapa Islands to a distance of one nautical mile offshore or to the 300-foot isobath, whichever is greater.
- San Clemente Island: Waters surrounding San Clemente Island to a distance of one nautical mile offshore or to the 300-foot isobath, whichever is greater.
- Mugu Lagoon to Latigo Point: Ocean water within a line originating from Laguna Point at

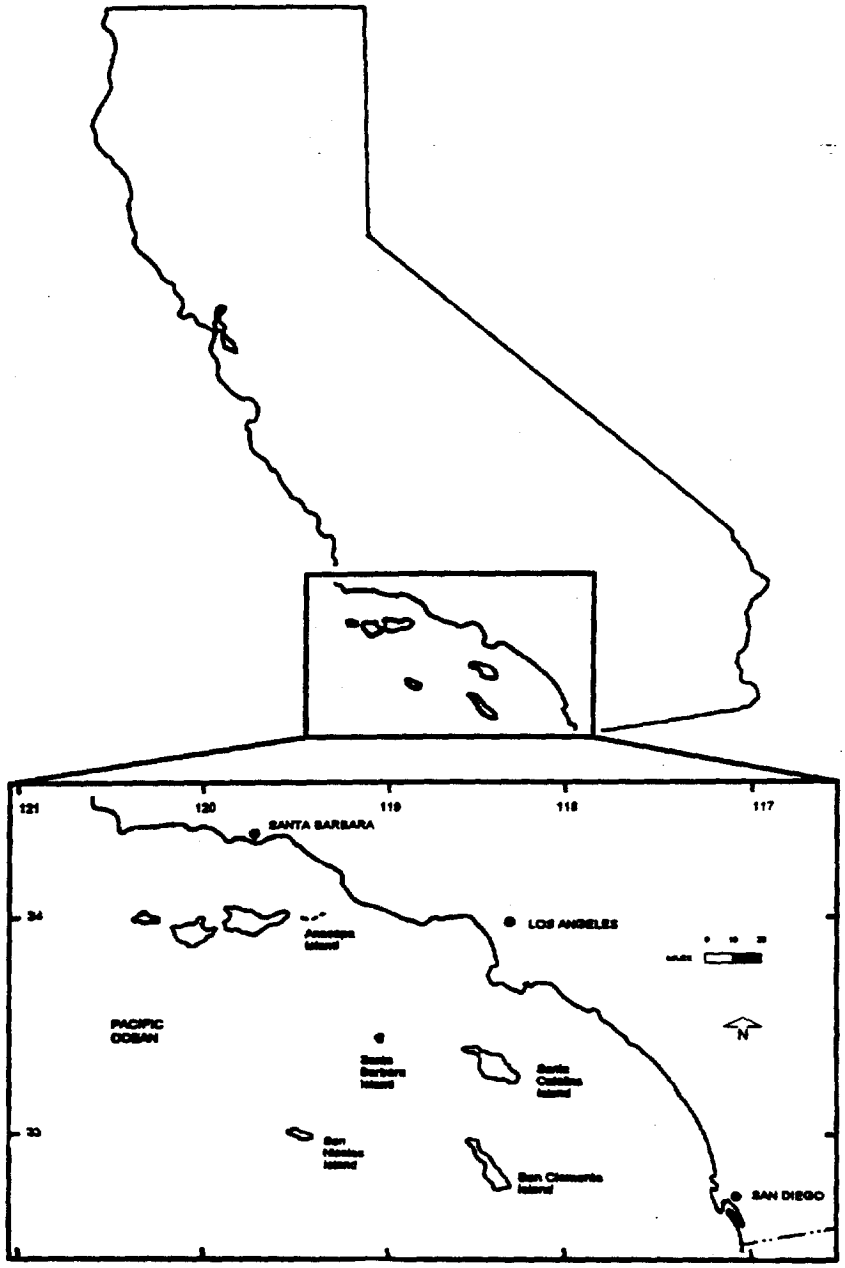

Figure 5-1. General Location of Areas of Special Biological Significance in Los Angeles Region.

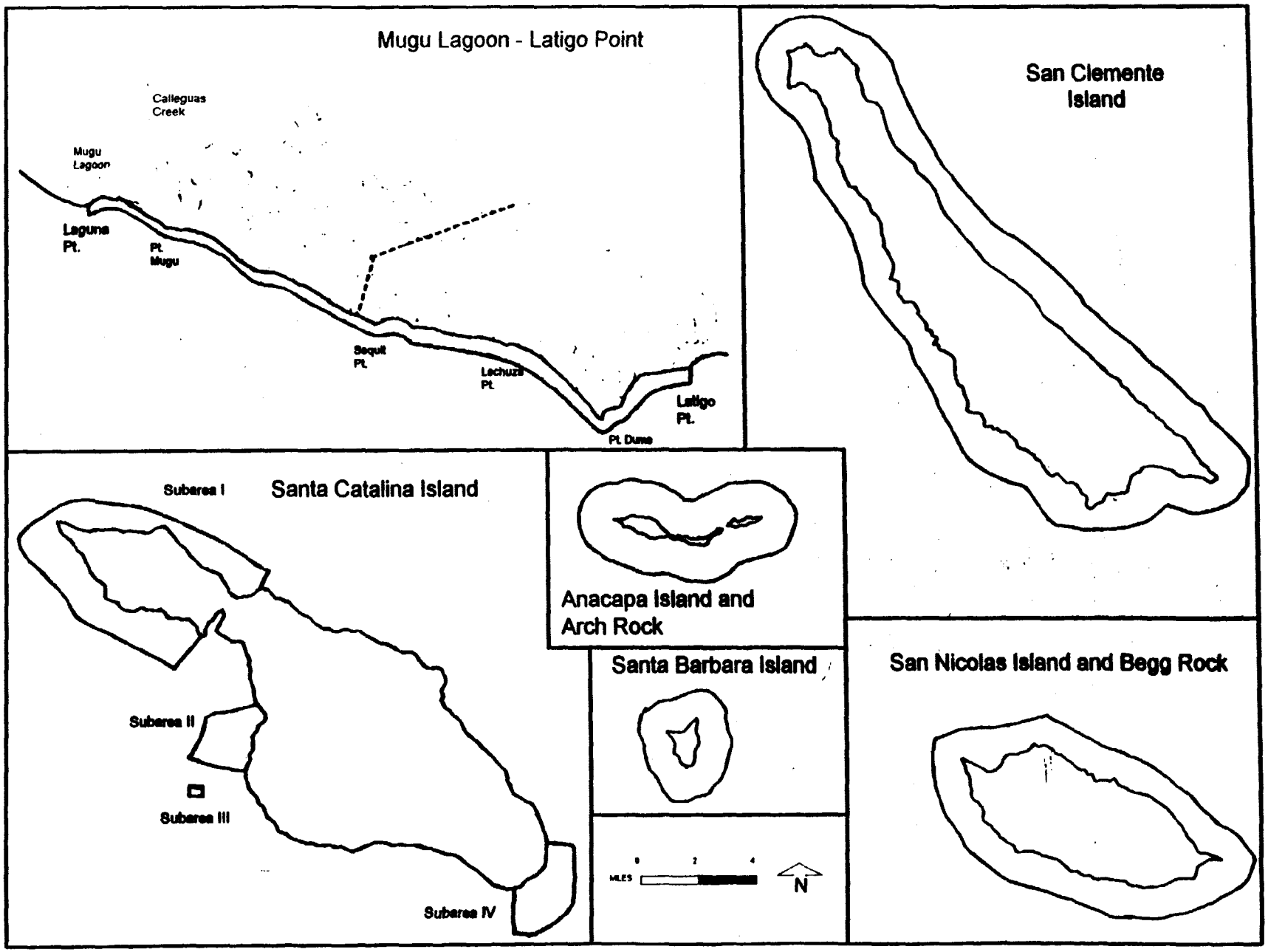

Figure 5-2. Detailed locations of Areas of Special Biological Significance in Los Angeles Region.

34° 5' 40" north, 119° 6' 30" west, thence southeasterly following the mean high tide line to a point at Latigo Point defined by the intersection of the mean high tide line and a line extending due south of Bench Mark 24; thence due south to a distance of 1000 feet offshore or to the 100-foot isobath, whichever distance is greater; thence northwesterly following the 100-foot isobath or maintaining a 1,000-foot distance from shore, whichever maintains the greater distance from shore, to a point lying due south of Laguna Point, thence due north to Laguna Point.

- Santa Catalina Island, Subarea One, Isthmus Cove to Catalina Head: From Point 1 determined by the intersection of the mean high tide line and a line extending due west from USGS Triangulation Station "Channel" on Blue Cavern Point; thence due north to the 300-foot isobath or to one nautical mile offshore, whichever distance is greater; thence northerly and westerly, following the 300-foot isobath or maintaining a distance of one nautical mile offshore, whichever is the greater distance, around the northwestern tip of the island and then southerly and easterly, maintaining the distance offshore described above, to a point due south of USGS Triangulation Station "Cone" on Catalina Head; thence due north to the intersection of the mean high tide line and a line extending due south from USGS Triangulation Station "Cone", thence returning around the northwestern tip of the Island following the mean high tide line to Point 1.

- Santa Catalina Island, Subarea Two, North End of Little Harbor to Ben Weston Point: From Point 1 determined by the intersection of the mean high tide line extending due south from USGS Triangulation Station "White Bluff"; thence due west to the 300-foot isobath or to one nautical mile offshore, whichever distance is greater; thence southerly on a meander line following the 300-foot isobath or maintaining a distance of one nautical mile offshore, whichever distance offshore is greater, to a point due west of USGS Triangulation on Station "Slip" on Ben Weston Point; thence due east to the intersection of the mean high tide line and a line extending due west from USGS Triangulation Station "Slip"; thence northerly following the mean high tide line to Point 1.

- Santa Catalina Island, Subarea Three, Farnsworth Bank Ecological Reserve: Waters within the Farnsworth Bank Ecological Reserve, which are located 1.6 nautical miles southwest of Ben Weston Point, Catalina Island, on a bearing of 240° true. The Bank is composed of sheer rocky pinnacles rising from the sandy ocean floor 250 feet deep to within 50 feet of the surface. The Bank occupies an area approximately 575 yards long by 200 yards wide.

- Santa Catalina Island, Subarea Four, Binnacle Rock to Jewfish Point: From Point 1 determined by the intersection of the mean high tide line and a line extending due north from the highest point of Binnacle Rock; thence due south to a point one nautical mile offshore or to the 300-foot isobath, whichever distance is greater; thence easterly and northerly, maintaining a distance of one nautical mile or to the 300-foot isobath, whichever distance is greater, to a point due east of the eastern-most extension of the mean high tide line at Jewfish Point; thence due west to the eastern-most extension of the mean high tide line at Jewfish Point; thence southerly and westerly following the mean high tide line to Point 1.

The State Board shall periodically revise the Ocean Plan to reflect water quality objectives that are necessary to protect beneficial uses of ocean waters and to be consistent with current technology.

Thermal Plan

The State Board adopted the *Water Quality Control Plan for the Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries in California* in May 1972, and amended this plan (State Board Resolution No. 75-89) in September 1975. This plan, which is referred to as the "Thermal Plan," was developed in order to minimize the effects of wastes on the temperature of receiving waters. The plan specifies temperature objectives, effluent limits, and discharge prohibitions related to thermal characteristics of interstate waters, enclosed bays, and estuaries.

Nonpoint Source Management Plan

The State Board adopted the *Nonpoint Source Management Plan* (State Board Resolution No. 88-123) in November 1988, pursuant to Section 319

of the CWA. This plan outlines the state's Nonpoint Source Control Program objectives, framework, and implementation program. The plan emphasizes voluntary Best Management Practices (BMPs) and the need for cooperation with local governments and other agencies to implement the BMPs.

State Board Policies

Significant State Board policies that are applicable to the Los Angeles Region are summarized below.

The State Policy for Water Quality Control

The State Board adopted the *State Policy for Water Quality Control* in July 1972. This policy, which serves as a basis for subsequent water quality policies, sets forth general principles (outlined below) that are necessary for implementation of programs that protect the quality of the waters throughout the state.

- Water rights and water quality control decisions must ensure protection of available fresh water and marine resources for maximum beneficial use.
- Municipal, agricultural, industrial wastewaters must be considered as a potential integral part of the total fresh water resource.
- Coordinated management of water supplies and wastewaters on a regional basis must be promoted to achieve efficient utilization of water.
- Efficient wastewater management is dependent upon a balanced program of source control of environmentally hazardous substances, treatment of wastewaters, reuse of reclaimed water, and proper disposal of effluent and residuals.
- Substances not amenable to removal by treatment systems presently available or planned for the immediate future must be prevented from entering sewer systems in quantities which would be harmful to the aquatic environment, adversely affect beneficial uses of water, or affect treatment plant operation. Persons responsible for the management of waste collection, treatment, and disposal systems must actively pursue the implementation of their objective of source control for environmentally hazardous substances. Such substances must be disposed of such that environmental damage does not result.
- Wastewater treatment systems must provide sufficient removal of environmentally hazardous substances which cannot be controlled at the source to ensure against adverse effects on beneficial uses and aquatic communities.
- Wastewater collection and treatment facilities must be consolidated in all cases where feasible and desirable to implement sound water quality management programs based on long-range economic and water quality benefits to an entire basin.
- Institutional and financial programs for implementation of consolidated wastewater management systems must be tailored to serve each particular area in an equitable manner.
- Wastewater reclamation and reuse systems which ensure maximum benefit from available fresh water resources shall be encouraged. Reclamation systems must be an appropriate integral part of the long-range solution to the water resources needs of an area and incorporate provisions for salinity control and disposal of non-reclaimable residues.
- Wastewater management systems must be designed and operated to achieve maximum long-term benefit from the funds expended.
- Water quality control must be based upon the latest scientific findings. Criteria must be continually refined as additional knowledge becomes available.
- Monitoring programs must be provided to determine the effects of discharges on all beneficial water uses including effects on aquatic life and its diversity and seasonal fluctuations.

Statement of Policy with Respect to Maintaining High Quality Water in California (Antidegradation Policy)

The State Board adopted the *Statement of Policy with Respect to Maintaining High Quality Water in*

California (State Board Resolution No. 68-16) on October 28, 1968. This policy, which is referred to as the "Antidegradation Policy," protects surface and ground waters from degradation. In particular, this policy protects waterbodies where existing quality is higher than that necessary for the protection of beneficial uses.

Under California's Antidegradation Policy, any actions that can adversely affect water quality in all surface and ground waters must be consistent with the maximum benefit to the people of the state, must not unreasonably affect present and anticipated beneficial use of such water, and must not result in water quality less than that prescribed in water quality plans and policies. Furthermore, any actions that can adversely affect surface waters are also subject to the federal Antidegradation Policy (40 CFR 131.12), developed under the CWA. The USEPA, Region IX, has also issued detailed guidance for the implementation of federal antidegradation regulations for surface waters within its jurisdiction (USEPA, 1987).

This resolution has been reprinted in Chapter 3.

Water Quality Control Policy for the Enclosed Bays and Estuaries of California

The State Board adopted the *Water Quality Control Policy for the Enclosed Bays and Estuaries of California* (State Board Resolution No. 74-43) in May 1974. This policy is designed to prevent water quality degradation and protect beneficial uses in enclosed bays and estuaries. In addition, the policy outlines water quality principles and guidelines to achieve these objectives. Decisions by the Regional Board must be consistent with the provisions designed to prevent water quality degradation.

The policy lists principles of management that include the State Board's desire to phase out all discharges (exclusive of cooling waters) to enclosed bays and estuaries as soon as practicable. Discharge prohibitions are placed on:

- new dischargers of municipal wastewaters and industrial process waters (exclusive of cooling water discharges) which are not consistently treated and discharged in a manner that would enhance the quality of the receiving waters;
- municipal and industrial waste sludge and untreated sludge digester supernatant, centrate, or filtrate;
- rubbish or refuse into surface waters or at any place where they would be eventually transported to enclosed bays and estuaries;
- silt, sand, soil, clay, or other earthen materials from onshore operations including mining, construction, and lumbering in quantities which unreasonably affect or threaten to affect beneficial uses;
- materials of petroleum origin in sufficient quantities to be visible or in violation of waste discharge requirements (except for scientific purposes);
- radiological, chemical, or biological warfare agent or high-level radioactive waste; and
- discharge or by-pass of untreated waste.

Water Quality Control Policy on the Use and Disposal of Inland Water Used for Powerplant Cooling

The State Board adopted the *Water Quality Control Policy on the Use and Disposal of Inland Water Used for Powerplant Cooling* (State Board Resolution No. 75-58) in June 1975. This policy outlines the State Board's positions on powerplant cooling, specifying that fresh waters should be used for cooling only when other alternatives are not feasible. The Regional Boards are responsible for enforcement of this policy.

Policy with Respect to Water Reclamation in California

The State Board adopted the *Policy with Respect to Water Reclamation in California* (State Board Resolution No. 77-1) on January 6, 1977. This resolution recognizes the shortage of water in many areas of the state and the need to conserve water for beneficial uses. In addition, the policy outlines the State and Regional Boards' support for and encouragement of water reclamation while also acknowledging the need to protect public health. As per this resolution, the State and Regional Boards encourage reclamation projects for which:

- beneficial use will be made of wastewaters that would otherwise be discharged to marine or brackish receiving waters or evaporation ponds;

- reclaimed water will replace or supplement the use of fresh water or better quality water; or

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

This resolution has been reprinted at the end of this Chapter.

Policy on the Disposal of Shredder Waste

The State Board adopted the *Policy on the Disposal of Shredder Waste* (State Board Resolution No. 87-22) on March 19, 1987. This policy permits the disposal of wastes produced by the mechanical destruction of car bodies, old appliances, and similar castoffs into certain landfills under specific conditions designated and enforced by the Regional Boards.

Sources of Drinking Water Policy

The State Board adopted the *Sources of Drinking Water Policy* (State Board Resolution No. 88-63) on May 19, 1988. This policy declares that all waters of the state, with certain exceptions, are to be protected as existing or potential sources of municipal and domestic supply. Exceptions include waters with existing high dissolved solids (i.e., waters with dissolved solids greater than 3,000 mg/L), low sustainable yield (less than 200 gallons per day for a single well), waters with contamination that cannot be treated for domestic use using best management practices or best economically achievable treatment practices, waters within particular municipal, industrial, and agricultural wastewater conveyance and holding facilities, and regulated geothermal ground waters. Where the Regional Water Board finds that one of these exceptions applies, it can remove the municipal and domestic supply beneficial use designation for the particular waterbody through a Basin Plan amendment. Basin Plan amendments are subject to approval by the State Board, the State Office of Administrative Law, and the USEPA.

This resolution has been reprinted at the end of this Chapter.

Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304

State Board Resolution No. 92-49, entitled *Policies and Procedures for Investigation and Cleanup and Abatement of Discharges under Water Code Section 13304* (the Policy) promotes attainment of the best quality of water that is reasonable.

The amended Policy establishes cleanup and abatement policies and procedures for those cases of pollution wherein it is not reasonable to restore water quality to background levels. Under this Policy, case-by-case cleanup levels for the restoration of water quality must, at minimum:

- consider all beneficial uses of the waters;

- not result in water quality less than that prescribed by in the Basin Plan and policies adopted by the State and Regional Boards;

- be consistent with maximum benefit to the people of the state; and

- be established in a manner consistent with California Code of Regulations, Title 23, Chapter 15, Article 5 (Water Quality Monitoring and Response Programs for Waste Management Units).

Regional Water Quality Advisory Task Force

In December 1992, the Regional Board created a Water Quality Task Force. The eleven member task force included representatives of governmental agencies, businesses, and environmental groups and was co-chaired by Regional Board members: Michael Keston and Larry Zarian. The goals of the group included identification of ways to reduce the costs of complying with water quality regulations without compromising water quality and public health.

Following two workshops, the Task Force developed a series of 16 recommendations (*Working Together for an Affordable Clean Water Environment*,

September 30, 1993) to be submitted to the Regional Board, State Board, Cal-EPA and the State Legislature, seeking their support, as appropriate. Regional Board staff have begun implementing many of these recommendations, and the Regional Board will submit progress reports to the Task Force on a semi-annual basis. These recommendations for the Regional Board are briefly summarized below:

- Create a Technical Review Committee to serve as a public forum to discuss existing and proposed Regional Board programs, policies and procedures.
- Prepare a Site Assessment and Clean-up Guidebook.
- Provide "trigger language" to expedite insurance claims and loan requests.
- Establish a set of clear standards for site-cleanup that are consistent across all Regional Board programs.
- Create a Business Assistance Unit.
- Review monitoring and reporting requirements and eliminate those that are unnecessary.
- Establish a "self-directed" cleanup program.
- Adopt NPDES permit process improvements including establishing a surface water quality technical review committee, assign experienced staff to all major NPDES permits and their renewals, conduct more thorough reviews of annual reports, and provide more feedback to permittees.
- Consider setting performance-based numeric goals, where appropriate, for constituents for which permit limits are more stringent than statewide Water Quality Plans.
- Take into account the mineral content of an area's water supply when setting wastewater discharge limits.
- Facilitate development and adoption of site specific objectives based upon actual or reasonably foreseeable beneficial uses.
- Incorporate a watershed management approach into the Basin Plan. Coordinate key elements of the Coastal Zone Act Re-Authorization Amendments, the Storm Water Permit Program, and other related programs.

Regional Board Resolutions

The Los Angeles Regional Board has adopted many resolutions over the years. The following are summaries of the resolutions that are most important to the Regional Board's implementation of the Basin Plan and are herein incorporated by reference:

Resolution No. 93-006. Adopted November 1, 1993.
"Accepting the Final Report of the Water Quality Advisory Task Force."

Resolution No. 92-09. Adopted October 19, 1992
"Designation of Regional Category "A" Waterbodies under the California Inland Surface Waters Plan."
The Regional Board chose not to adopt Category "A" waterbodies for the Region. The need for site-specific objectives will be determined on a case-by-case basis as each NPDES permit is renewed.

Resolution No. 92-08. Adopted June 22, 1992
"Amendment to the Water Quality Control Plans to Prohibit New or Lateral Expansion of Existing Nonhazardous Solid Waste Landfills in Sand and Gravel Mining Pits within the Los Angeles Region."
This resolution was adopted by the Regional Board but not by the State Board. The State Board will consider this issue during the next Chapter 15 review and update. This resolution, thus, is not in effect.

Resolution No. 92-06. Adopted March 9, 1992
"Approval of Regional Water Quality Assessment."
Update to include the following previous excluded waterbodies: Upper Los Angeles River, Lower Los Angeles River, Lower San Gabriel River, Lower Santa Clara River Valley, Inner Los Angeles Harbor, Inner Long Beach Harbor, Ventura Harbor, Santa Monica Bay, San Pedro Bay, Ballona Creek.

Resolution No. 92- 05 . Adopted January 27, 1992
"Approval of Regional Water Quality Assessment."
Under this resolution the Regional Board partialy adopted the 1991 Water Quality Assessment Report of the Los Angeles Region.

Resolution No. 91-06. Adopted June 3, 1991
"Amendment to the Water Quality Control Plan for the Los Angeles River Basin and Implementation Plan Concerning the Extraction of Ground Water Within the San Gabriel Valley Basin."
Under this amendment, the Regional Board oversees a comprehensive groundwater quantity and quality program in the San Gabriel Valley Groundwater Basin, designed to ensure that the extraction of ground water is conducted in a manner that will meet water supply needs and improve and protect water quality.

Resolution No. 90-11. Adopted October 22, 1990
"Adoption of Revised Water Quality Objectives and Beneficial Uses for Piru, Sespe, and Santa Paula Hydrologic Areas - Santa Clara River Basin (4A)."

Resolution No. 90-10. Adopted August 20, 1990
"Resolution of Recommendation to State Water Resources Control Board to Grant an Exception to the Ocean Plan Prohibition for Waste Discharge to an Area of Special Biological Significance - San Nicolas Island."

Resolution No. 90-08. Adopted May 21, 1990
"Requesting the State Water Resources Control Board to Accept Grant Funds from the U. S. Environmental Protection Agency (USEPA) for the Santa Monica Bay Restoration Project as Part of a Continuing Cooperative Agreement."

Resolution No. 90-07. Adopted April 23, 1990
"Requesting the State Water Resources Control Board to Apply for a Continuance of the Cooperative Agreement with the U. S. Environmental Protection Agency to Accelerate Source Investigation Activities in the San Fernando Valley."

Resolution No. 90-06. Adopted April 23, 1990
"Requesting the State Water Resources Control Board to Apply for a Continuance of the Cooperative Agreement with the U. S. Environmental Protection Agency to Accelerate Source Investigation Activities in the San Gabriel Valley."

Resolution No. 90-04. Adopted March 26, 1990
"Effects of Drought Induced Water Supply Changes and Water Conservation Measures on Compliance With Waste Discharge Requirements Within the Los Angeles Region." This policy temporarily raised chloride limitations in Waste Discharge Requirements to match chloride increases in the water supply for a period of 3 years. Specifically, chloride limitations were temporarily set at the lesser of (i) 250 mg/L or (ii) the supply concentration plus 85 mg/L.

Resolution No. 90-02. Adopted February 26, 1990
"Acceptance of the Southern California Association of Governments' Final Report on the State of Santa Monica Bay."

Resolution No. 89-10. Adopted December 4, 1989
"Adoption of Regional Water Quality Assessment Report."

Resolution No. 89-08. Adopted December 4, 1989
"Requesting the State Water Resources Control Board to Accept Grant Funds from the U. S. Environmental Protection Agency (USEPA) for the Santa Monica Bay Restoration Project as Part of a Continuing Cooperative Agreement and to Accept Action Plan Demonstration Project Funds for Early Implementation of Management Recommendations."

Resolution No. 89-03. Adopted March 27, 1989
"Incorporation of Sources of Drinking Water Policy into the Water Quality Control Plans (Basin Plans) - Santa Clara River Basin (4A)/Los Angeles River Basin (4B)."

Resolution No. 89-02. Adopted February 27, 1989
"Regional Board Acceptance of Storm Runoff Report."

Resolution No. 88-12. Adopted September 26, 1988
"Supporting Beneficial Use of Available Reclaimed Water in Lieu of Potable Water for the Same Purpose."

Resolution No. 88-11. Adopted August 22, 1988
"Directing Staff to Apply for a Cooperative Agreement With the U. S. Environmental Protection Agency to Accelerate Source Investigation Activities in the San Gabriel Valley."

Resolution No. 88-10. Adopted July 25, 1988
"Completion of the Triennial Review Public Hearing and the 1988 Triennial Review Process for the Water Quality Control Plans (Basin Plans) - Santa Clara River Basin (4A)/Los Angeles River Basin (4B)."

Resolution No. 85-09. Adopted November 25, 1985
"Designation of Class III Landfill Within the Los Angeles Region to Accept Shredder Wastes as Required by Senate Bill No. 976."

Resolution No. 85-04. Adopted March 25, 1985
"Regional Board Acceptance of Ocean Dumping Report."

Resolution No. 85-03. Adopted March 25, 1985
Rescinding Resolution No. 56-45, *"Adopting an Operating Procedure for Simplifying Filing of Reports on Disposal of Rotary Mud Resulting from Oil Well Drilling Operations."*

Resolution No. 84-05. Adopted June 25, 1984
"Triennial Review of Water Quality Control Plans - Santa Clara River Basin (4A)/Los Angeles River Basin (4B)."

Resolution No. 83-03. Adopted October 24, 1983
"Implementation of Those Elements of the Amendment to the Areawide Waste Treatment Management Plan Appropriate to its Jurisdiction."

Resolution No. 82-06. Adopted September 27, 1982
"Lowering of Lake Sherwood, Ventura County."

Resolution No. 78-13. Adopted November 27, 1978
"Revisions to Water Quality Control Plan for Los Angeles River Basin (4B)."

Resolution No. 78-12. Adopted August 28, 1978
"Regional Board Consideration of the 208 Areawide Waste Treatment Management Plan for Ventura County Adopted by the Board of Directors of the Ventura Regional County Sanitation District on June 22, 1978."

Resolution No. 78-10. Adopted July 24, 1978
"A Resolution Requesting the State Water Resources Control Board to Seek Exemption from U. S. Coast Guard Regulations for Avalon Bay Relative to Vessel Waste Discharges."

Resolution No. 78-09. Adopted July 24, 1978
"A Resolution Requesting the State Board to Seek Exemption from U. S. Coast Guard Regulations for Channel Islands Harbor Relative to Vessel Waste Discharges."

Resolution No. 78-07. Adopted June 26, 1978
"Resolution of Intent Regarding Compliance Date for Trace Element Limits in the Ocean Plan."

Resolution No. 78-02. Adopted March 27, 1978
"Revisions to Water Quality Control Plan for Santa Clara River Basin (4A)."

Resolution No. 76-01. Adopted February 27, 1976
"Supporting Adoption of the Clean Water and Water Conservation Bond Law of 1976."

Resolution No. 77-06. Adopted September 26, 1977
"Guidance for Persons Wishing to Use Reclaimed Wastewater During the Drought."

Resolution No. 77-02. Adopted April 25, 1977
"Urging Continued Irrigation of State Park Lands by Las Virgenes Municipal Water District."

Resolution No. 76-06. Adopted April 26, 1976
"Revisions to Water Quality Control Plan for Los Angeles River Basin (4B)."

Resolution No. 76-05. Adopted April 26, 1976
"Revisions to Water Quality Control Plan for Santa Clara River Basin (4A)."

Resolution No. 75-11. Adopted March 10, 1975
"Water Quality Control Plan for Los Angeles River Basin (4B)."

Resolution No. 75-10. Adopted March 3, 1975
"Water Quality Control Plan for Santa Clara River Basin (4A)."

Resolution No. 74-08. Adopted August 19, 1974
"Expressing Concern Over Possible Effects on Water Quality From Offshore Oil Drilling and Production."

Resolution No. 73-21. Adopted September 7, 1973
"Actions Affecting Water Quality by Local Agency Formation Commissions - Comments by this Agency on any Proposals within this Region to Incorporate New Cities or Form Special Districts that may Affect Water Quality."

Resolution No. 73-14. Adopted May 22, 1973
"Statement of Policy on Water Supply and Wastewater Disposal in Newly Developing Areas Within the Los Angeles Region."

Resolution No. 72-4. Adopted May 31, 1972
"Policy Statement Relative to Sewage Disposal in the Malibu Area."

Resolution No. 71-10. Adopted October 27, 1971
"Consideration of Dredging Activities Los Angeles-Long Beach Harbors."

Resolution No. 71-7. Adopted June 10, 1971
"Interim Water Quality Control Plan for Santa Clara River Basin and Los Angeles River Basin - with Project List Titled Appendix A."

Resolution No. 71-6. Adopted June 10, 1971
"Interim Water Quality Control Plan for Santa Clara River Basin and Los Angeles River Basin."

Resolution No. 70-68. Adopted November 18, 1970
"Requiring Cities and Counties to Notify the Regional Board of the Filing of Development Proposals Which Involve a Major Waste Discharge."

Resolution No. 70-18. Adopted February 11, 1970
"Well Standards in Ventura County."

Resolution No. 70-17. Adopted February 11, 1970
"Well Standards in Central, Hollywood, Santa Monica and West Coast Basins, Los Angeles County."

Resolution No. 69-53. Adopted December 3, 1969
"A Resolution Urging Close Cooperation Between the Southern California Coastal Water Research Authority and the Regional Board."

Resolution No. 69-33. Adopted July 30, 1969
"Recommending Consideration of Reclamation of Water from Sewage in the Malibu Area."

Resolution No. 54-4. Adopted January 14, 1954
"Waiving Reporting of Sewage Discharges from Family Dwellings with the City of Ojai."

Resolution No. 53-6. Adopted October 15, 1953
"Waiving Reporting of Sewage Discharges from Family Dwellings, City of South Pasadena."

Resolution No. 53-5. Adopted October 15, 1953
"Waving Reporting Of Waste Water Discharges from Family Dwelling Swimming Pools."

Resolution No. 52-4. Adopted on October 30, 1952
"Waiving Reporting of Sewage Discharges from Family Dwellings."

Resolution No. 52-3. Adopted October 16, 1952
"Prescribing Requirements for Subsurface Disposal of Sewage from Private Sewage Disposal Systems."

STATE WATER RESOURCES CONTROL BOARD

RESOLUTION NO. 77-1

POLICY WITH RESPECT TO WATER RECLAMATION IN CALIFORNIA

WHEREAS:

1. The California Constitution provides that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that waste or unreasonable use or unreasonable method of use of water be prevented, and that conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare;

2. The California Legislature has declared that the State Water Resources Control Board and each Regional Water Quality Control Board shall be the principal state agencies with primary responsibility for the coordination and control of water quality;

3. The California Legislature has declared that the people of the State have a primary interest in the development of facilities to reclaim water containing waste to supplement existing surface and underground water supplies;

4. The California Legislature has declared that the State shall undertake all possible steps to encourage the development of water reclamation facilities so that reclaimed water may be made available to help meet the growing water requirements of the State;

5. The Board has reviewed the document entitled "Policy and Action Plan for Water Reclamation in California," dated December 1976. This document recommends a variety of actions to encourage the development of water reclamation facilities and the use of reclaimed water. Some of these actions require direct implementation by the Board; others require implementation by the Executive Officer and the Regional Boards. In addition, this document recognizes that action by many other state, local, and federal agencies and the California State Legislature would also encourage construction of water reclamation facilities and the use of reclaimed water. Accordingly, the Board recommends for its consideration a number of actions intended to coordinate with the program of this Board;

6. The Board must concentrate its efforts to encourage and promote reclamation in water-short areas of the State where reclaimed water can supplement or replace other water supplies without interfering with water rights or instream beneficial uses or placing an unreasonable burden on present water supply systems; and

7. In order to coordinate the development of reclamation potential in California, the Board must develop a data collection, research, planning, and implementation Program for water reclamation and reclaimed water uses.

THEREFORE, BE IT RESOLVED:

1. That the State Board adopt the following Principles:

   I. The State Board and the Regional Boards shall encourage, and consider or recommend for funding, water reclamation projects which meet Condition 1, 2, or 3 below and which do not adversely impact vested water rights or unreasonably impair instream beneficial uses or place an unreasonable burden on present water supply systems;

      (1) Beneficial use will be made of wastewaters that would otherwise be discharged to marine or brackish receiving waters or evaporation ponds,

      (2) Reclaimed water will replace or supplement the use of fresh water or better quality water,

      (3) Reclaimed water will be used to preserve, restore, or enhance instream beneficial uses which include, but are not limited to, fish, wildlife, recreation and esthetics associated with any surface water or wetlands.

   II. The State Board and the Regional Boards shall (1) encourage reclamation and reuse of water in water-short areas of the State, (2) encourage water conservation measures which further extend the water resources of the State, and (3) encourage other agencies, in particular the Department of Water Resources, to assist in implementing this policy.

   III. The State Board and the Regional Boards recognize the need to protect the public health including potential vector problems and the environment in the implementation of reclamation projects.

IV. In implementing the foregoing Principles, the State Board or the Regional Boards, as the case may be, shall take appropriate actions, recommend legislation, and recommend actions by other agencies in the areas of (1) planning, (2) project funding, (3) water rights, (4) regulation and enforcement, (5) research and demonstration, and (6) public involvement and information.

2. That, in order to implement the foregoing Principles, the State Board:

   (a) Approves Planning Program Guidance Memorandum No. 9, "PLANNING FOR WASTEWATER RECLAMATION,"

   (b) Adopts amendments and additions to Title 23, California Administrative Code Sections 654.4, 761, 764.9, 783, 2101, 2102, 2107, 2109, 2109.1, 2109.2, 2119, 2121, 2133(b)(2), and 2133(b)(3),

   (c) Approves Grants Management Memorandum No. 9.01, "WASTEWATER RECLAMATION,"

   (d) Approves the Division of Planning and Research, Procedures and Criteria for the Selection of Wastewater Reclamation Research and Demonstration Project,

   (e) Approves "GUIDELINES FOR REGULATION OF WATER RECLAMATION,"

   (f) Approves the Plan of Action contained in Part III of the document identified in Finding Five above,

   (g) Directs the Executive Officer to establish an Interagency Water Reclamation Policy Advisory Committee. Such Committee shall examine trends, analyze implementation problems, and report annually to the Board the results of the implementation of this policy, and

   (h) Authorizes the Chairperson of the Board and directs the Executive Officer to implement the foregoing Principles and the Plan of Action contained in Part III of the document identified in Finding Five above, as appropriate.

3. That not later than July 1, 1978, the Board shall review this policy and actions taken to implement it, along with the report prepared by the Interagency Water Reclamation Policy Advisory Committee, to determine whether modifications to this policy are appropriate to more effectively encourage water reclamation in California.

4. That the Chairperson of the Board shall transmit to the California Legislature a complete copy of the "Policy and Action Plan for Water Reclamation in California."

CERTIFICATION

The undersigned, Executive Officer of the State Water Resources Control Board, does hereby certify that the foregoing is a full, true, and correct copy of a resolution duly and regularly adopted at a special meeting of the State Water Resources Control Board held on January 6, 1977.

Original signed by
Bill B. Dendy
Executive Officer
State Water Resources Control Board

STATE WATER RESOURCES CONTROL BOARD
RESOLUTION NO. 88-63

ADOPTION OF POLICY ENTITLED "SOURCES OF DRINKING WATER"

WHEREAS:

1. California Water Code Section 13140 provides that the State Board shall formulate and adopt State Policy for Water Quality Control; and,

2. California Water Code Section 13240 provides that Water Quality Control Plans "shall conform" to any State Policy for Water Quality Control; and,

3. The Regional Boards can conform the Water Quality Control Plans to this policy by amending the plans to incorporate the policy; and,

4. The State Board must approve any conforming amendments pursuant to Water Code Section 13245; and,

5. "Sources of drinking water" shall be defined in Water Quality Control Plans as those water bodies with beneficial uses designated as suitable, or potentially suitable, for municipal or domestic water supply (MUN); and,

6. The Water Quality Control Plans do not provide sufficient detail in the description of water bodies designated MUN to judge clearly what is, or is not, a source of drinking water for various purposes.

THEREFORE BE IT RESOLVED:

All surface and ground waters of the state are considered to be suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Boards [1] with the exception of:

1. Surface and ground waters where:

   a. The total dissolved solids (TDS) exceed 3,000 mg/L (5,000 uS/cm, electrical conductivity) and it is not reasonably expected by Regional Boards to supply a public water system, or

   b. There is contamination, either by natural processes or by human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or

   c. The water source does not provide sufficient water to supply a single well capable of producing an average sustained yield of 200 gallons per day.

2. Surface waters where:

   a. The water is in systems designed or modified to collect or treat municipal or industrial wastewaters, process waters, mining wastewaters, or storm water runoff, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards; or,

   b. The water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards.

3. Ground water where:

   The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 Code of Federal Regulations, Section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, Section 261.3.

4. Regional Board Authority to Amend Use Designations:

Any body of water which has a current specific designation previously assigned to it by a Regional Board in Water Quality Control Plans may retain that designation at the Regional Board's discretion. Where a body of water is not currently designated as MUN but, in the opinion of a Regional Board, is presently or potentially suitable for MUN, the Regional Board shall include MUN in the beneficial use designation.

The Regional Boards shall also assure that the beneficial uses of municipal and domestic supply are designated for protection wherever those uses are presently being attained, and assure that any changes in beneficial use designations for waters of the State are consistent with all applicable regulations adopted by the Environmental Protection Agency.

The Regional Boards shall review and revise the Water Quality Control Plans to incorporate this policy.

CERTIFICATION

The undersigned, Administrative Assistant to the Board, does hereby certify that the foregoing is a full, true, and correct copy of a policy duly and regularly adopted at a meeting of the State Water Resources Control Board held on May 19, 1988.

Original signed by
Maureen Marche
Administrative Assistant to the Board

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[1] This policy does not affect any determination of what is a potential source of drinking water for the limited purposes of maintaining a surface impoundment after June 30, 1988, pursuant to Section 25208.4 of the Health and Safety Code.

6

6. MONITORING AND ASSESSMENT

Table of Contents

Introduction 6-1

The State's Monitoring Programs 6-1
- Primary Monitoring Network 6-1
- Discharger Self-Monitoring 6-2
- Compliance Monitoring 6-2
- Complaint Investigations 6-2
- Lake Surveillance 6-2
- Bay Protection and Toxic Cleanup Program 6-3
- Quality Assurance 6-3
- Data Storage and Retrieval 6-3
- Biennial Water Quality Inventory/Water Quality Assessment Report 6-3
- Toxic Substances Monitoring and State Mussel Watch Programs 6-5

Regional Board Monitoring Programs 6-9
- Regional Board Surface Water Monitoring Network 6-9
- Intensive Surveys 6-10
- Coordination With Other Agencies 6-10
- Biological Criteria 6-10

Introduction

Monitoring and assessment are essential to the success of the Region's water quality control program. Monitoring is necessary to assess existing water quality conditions, examine long-term trends, and ensure the attainment and maintenance of beneficial uses consistent with state and federal standards. Monitoring is also necessary to assess the effectiveness of clean-up programs. This chapter contains a description of State and Regional Board programs that have been developed to meet these monitoring objectives.

The State's Monitoring Programs

The Porter-Cologne Water Quality Control Act (§13163) established the State Board as the lead agency for monitoring and assessment of water quality in California. The State Board's monitoring and assessment program is designed to meet the objectives in Table 6-1. In order to fully address these objectives, the State Board developed a comprehensive program in the mid-1970s. Monitoring activities were coordinated with the California Department of Fish and Game (DFG), California Department of Water Resources (DWR), and California Department of Health Services (DHS), and the U.S. Bureau of Reclamation, U.S. Geological Survey (USGS), and U.S. Environmental Protection Agency (USEPA). Descriptions of specific programs are outlined below. Not all of these programs are currently active in the Los Angeles Region, as many are unfunded at this time.

Table 6-1. Objectives of an Adequate State Surveillance and Monitoring Program.

Measure the achievement of water quality objectives specified in the Basin Plans.
Measure effects of water quality changes on beneficial uses.
Measure background conditions of water quality and determine long-term trends.
Locate and identify sources of water pollution that pose an acute, accumulative, and/or chronic threat to the environment.
Provide information needed to relate receiving water quality to mass emissions of pollutants by waste dischargers.
Provide data for determining discharger compliance with permit conditions.
Measure waste loads discharged to receiving waters and identify their effects in order to develop waste load allocations.
Provide the documentation necessary to support the enforcement of permit conditions and waste discharge requirements.
Provide data needed for the continuing planning process.
Measure the effects of water rights decisions on water quality, and to guide the State Board in its responsibility to regulate unappropriated water for the control of quality.
Provide a clearinghouse for water quality data gathered by other agencies and private parties cooperating in the program.
Report on water quality conditions as required by federal and state regulations or requested by others.

Primary Monitoring Network

The State Board developed a primary water quality monitoring network for California in April 1976. Participants in the network include the California

Department of Health Services, Department of Water Resources, and Department of Fish and Game, and the U.S. Bureau of Reclamation, the U.S. Geological Survey, and U.S. Environmental Protection Agency. The goal of the primary network is to provide a consistent long-term assessment of water quality across the state. This network consists of stations on high priority streams, estuaries, coastal areas, and groundwater basins throughout the state (California Water Resources Control Board, 1975).

The primary network for the Los Angeles Region originally consisted of eight freshwater sampling stations. These eight stations laid the foundation for a consistent surface water monitoring effort in the Region and were regularly monitored by the California Department of Water Resources (DWR). By 1978, DWR regularly monitored 36 stations in the Region. Currently, DWR monitors 11 of these 36 stations.

The regional network for groundwater monitoring originally consisted of seven groundwater basins selected by the State Board. While this monitoring was never fully implemented, the Regional Board as well as other agencies have undertaken several localized groundwater investigations. For example, as part of this Basin Plan Update, the Regional Board contracted with the California State University at Fullerton for an assessment of regional ground waters. The results of this study were used to review and update the groundwater sections of this Basin Plan and will be used to plan for future program development.

Discharger Self-Monitoring

Dischargers regulated under Waste Discharge Requirements (WDRs) are required to "self-monitor," that is, to collect regular samples of their effluent and receiving waters according to a prescribed schedule to determine facility performance and compliance with their requirements. Over 5,500 monitoring reports are submitted to the Regional Board annually. The Regional Board uses these data to determine compliance with requirements, issue enforcement actions, and to perform water quality assessments.

Compliance Monitoring

In addition to self-monitoring by dischargers, the Regional Board makes unannounced inspections and collects samples to determine compliance with discharge requirements and receiving water objectives and to provide data for enforcement actions. In the event of violations, the Regional Board undertakes appropriate enforcement actions as described in Chapter 4. The scope of the Regional Board's compliance monitoring depends on the number and complexity of discharges, the dischargers' history of compliance, and the Regional Board's resources. Over 550 inspections were scheduled for the fiscal year 1993-94. Major surface water dischargers are inspected at least once a year.

Complaint Investigations

The Regional Board responds to a variety of incidents, including accidental and illegal discharges of oil from offshore pipelines, oily waste discharges, and dumping in the storm drains. Complaints and reports of such incidents, that are received from citizens as well as other agencies, often require on-site inspections during which the Regional Board collects samples and obtains other evidence (e.g., photographs) to investigate and document the extent of the problem. In addition, such documentation provides a basis for enforcement of corrective action and/or assessments that are levied on responsible parties.

Lake Surveillance

The Lake Surveillance program stemmed from early requirements set forth in the CWA (§314), that required states to identify the trophic condition of all publicly-owned fresh water lakes. The State Board inventoried about 5,000 freshwater lakes in California and initiated a program to make an estimate of the lakes' trophic status.

Several lakes in the Los Angeles Region are on the federal "314 list," which designates candidates for restoration funds. This information also is included in the State Board's *Water Quality Assessment Report* (see next page). While federal grants from the USEPA have been available in the past to conduct diagnostic or feasibility studies for lake restoration, continued funding is uncertain at this time.

As part of this Basin Plan Update, the Regional Board contracted with the University of California at Riverside (Lund, 1993) for a comprehensive water quality assessment of 24 lakes in the Region.

Visual observations, aerial photographs, water quality data, and analyses of fish tissues were used in the assessments, and observations from this study were used to update this Basin Plan.

Bay Protection and Toxic Cleanup Program

In 1989, state legislation added Sections 13390 through 13396 to the California Water Code which established the Bay Protection and Toxic Cleanup Program (BPTCP). The program has four main goals:

- to provide protection of existing and future beneficial uses of bays and estuarine waters,
- to identify and characterize toxic hot spots,
- to plan for cleanup or other mitigating actions of toxic hot spots, and
- to develop effective strategies to control toxic pollutants, abate existing sources of toxicity, and prevent new sources of toxicity.

Identification and characterization of toxic hot spots involves the implementation of regional monitoring programs at each of the Regions along the coast. Sediment toxicity tests and chemical analyses are being used to classify each bay or estuarine waterbody according to its toxicity. Waterbodies are generally "pre-screened" for contamination, followed by intensive monitoring that confirms both the existence and spatial extent of contamination.

Quality Assurance

Federal regulations require that the State Board establish guidelines and standard methods for quality assurance (QA) and quality control (QC) as it relates to sample collection and analysis carried out by State and Regional Boards. To fulfill this requirement, the State Board prepared a *Quality Assurance Program Plan* (QAPP) which was approved by USEPA on April 20, 1990. This Plan was prepared in accordance with USEPA *Guidelines and Specifications for Preparing Quality Assurance Program Plans* (1980) and *Guidance for Preparation of Combined Work/Quality Assurance Project Plans for Environmental Monitoring* (1985). The QAPP outlines procedures used by the State and Regional Boards for obtaining environmental data. The Regional Board follows these procedures when collecting, transporting, and analyzing water quality samples. Each Regional Board has a QA/QC Officer who must approve all QAPPs prepared for outside studies funded under State and Regional Board Programs.

Data Storage and Retrieval

The monitoring programs implemented by the State and Regional Boards generate considerable data. Unless these data are incorporated into a "usable" form for storage and retrieval, their value is minimal. The State Board chose the USEPA STORET (Storage and Retrieval) database to store data generated under the various monitoring programs. The State Board also maintains separate databases for the Toxic Substances Monitoring and the State Mussel Watch Programs (described below).

Biennial Water Quality Inventory/Water Quality Assessment Report

The CWA (§305(b)) requires all states to prepare and submit a biennial *Water Quality Inventory Report* (commonly referred to as a *305(b) Report*). In California, this report is used by the State Board and the USEPA to prioritize funding for water quality programs. As required by the CWA, the report must contain:

- a description of the water quality of the major navigable waterbodies in the state;
- an analysis of the extent to which significant navigable waters provide for the protection and propagation of a balanced population of shellfish, fish, and wildlife and allow recreational activities in and on the water;
- an analysis of the extent to which elimination of the discharge of pollutants has been achieved;
- an estimate of the environmental impact, the economic, and social costs necessary to achieve the objective of the CWA, the economic and social benefits of the achievement, and the date of such achievement; and
- a description of the nature and extent of nonpoint sources of pollutants and recommendations as to the programs which must be taken to control them, with estimates of cost.

Table 6-2. Constituents Analyzed under the State Mussel Watch and Toxic Substances Monitoring Programs.

a) Metals Analyzed.

Aluminum[1]	Lead[3]
Arsenic[2]	Manganese[1]
Cadmium[3]	Mercury[3]
Chromium[3]	Nickel[3]
Copper[3]	Silver[3]
Lead[3]	Zinc[3]

b) Synthetic Organic Compounds Analyzed.

Aldrin	p,p'-DDMU	delta Lindane
Chlorbene	O,P,-DDT	Total Lindane[2]
alpha Chlordane	P,P'-DDT	Methoxychlor
gamma Chlordane	Total DDT	Methyl Parathion
cis Chlordane	Diazinon	Oxadiazon[2]
trans Chlordane	Dieldrin	PCB 1248
Oxychlordane	Endrin	PCB 1254
Total Chlordane	Endosulfan 1	PCB 1260
cis Nonachlor	Endosulfan 2	Total PCB
trans Nonachlor	Endosulfan Sulfate	Pentachlorophenol[1]
Chlorpyrifos	Total Endosulfan	Phenol[1]
Dacthal	Ethyl Parathion	Ronnel[1]
Dicofol[2]	Heptachlor	Tetrachlorophenol[1]
P,P'-DDE	Heptachlor Epoxide	Tetradifon[1]
O,P,-DDE	Hexachlorobenzene	Toxaphene
O,P'-DDD	alpha Lindane	Tributylin[1]
P,P'-DDD	beta Lindane	
P,P'-DDMS	gamma Lindane	

[1] These constituents only analyzed for in the State Mussel Watch program

[2] These constituents only analyzed for in the Toxic Substances Monitoring Program

[3] These constituents analyzed for in both the monitoring programs

Each Regional Board prepares a biennial *Water Quality Assessment (WQA) Report* for its Region using data collected by regional planning, permitting, surveillance, and enforcement programs. The regional reports contain inventories of the major waterbodies in the region including rivers and streams, lakes, bays, estuaries, harbors, coastal waters, wetlands, and ground water. For each waterbody, the report classifies the water quality (as "good," "intermediate," "impaired," or "unknown") and describes general problems and sources of water quality impairment. In addition, the report notes those waterbodies that are included on the federal lists. These lists, which indicate specific types of water quality impairments, are organized by CWA section (§131.11, §303(d), §304(M), §304(S), §304(L), §314, and §319).

After Regional Boards adopt their individual *WQA Reports*, they are compiled into a statewide report entitled *California Water Quality Assessment Report*. Upon adoption of this statewide report by the State Board, the information is converted to the *305(b) Report* format and submitted to the USEPA to satisfy the CWA requirements. The most recent California *Water Quality Assessment Report* was published in May 1992, and is available from the State Board office in Sacramento.

Toxic Substances Monitoring and State Mussel Watch Programs

Water column monitoring for toxic substances can be unreliable since toxic substances are often transported intermittently and can be missed with standard "grab" sampling of water. In addition, harmful levels of toxicants are often present in such low concentrations in water that make them difficult and expensive to detect. In some cases, a more realistic and cost-effective approach is to test the flesh of fish and other aquatic organisms that bioaccumulate these compounds in their tissues and concentrate toxicant through the food web.

In 1977, the State Board added two biomonitoring elements to the State Board's Monitoring Program: the Toxics Substances Monitoring (TSM) Program and the State Mussel Watch (SMW) Program. The Los Angeles Region has active Toxics Substances Monitoring and State Mussel Watch programs. These programs are implemented jointly by the State Board and the California Department of Fish and Game. The field sampling is performed by Fish and Game and Regional Board staff, while the laboratory analyses are performed by Fish and Game. The objectives of the Toxics Substances Monitoring and State Mussel Watch Program Programs are:

- to develop statewide baseline data and to demonstrate trends in the occurrence of toxic elements and organic substance in aquatic biota;
- to assess impacts of accumulated toxicant upon the usability of State waters by humans;
- to assess impacts of accumulated toxicant upon aquatic biota; and
- where problem concentrations of toxicant are detected, to attempt to identify sources of toxicant and to relate concentrations found in biota to concentrations found in water.

Tissue samples collected under the Toxics Substances Monitoring program are usually fish, but can also include benthic invertebrates. Fish and invertebrate tissues are analyzed for trace metals and synthetic organic chemicals, most of which are pesticides (Table 6-2). Toxics Substances Monitoring data have been collected in rivers and lakes throughout the Los Angeles Region since 1978 (Table 6-3). This program primarily monitors inland fresh waters.

The State Mussel Watch Program provides similar documentation of the quality of coastal marine and estuarine waters. Mussels, which are sessile (attached) bivalve invertebrates, serve as indicator organisms and provide a localized measurement of water quality, as they accumulate trace metals and synthetic organic chemicals in their tissues (Table 6-2). Mussels transported from "clean areas" of the State are primarily used, although local mussels are sometimes used. Other types of shellfish can be used at times, and occasionally, sediments are also collected as part of the program. State Mussel Watch Program data have been collected in coastal waters throughout the Region since 1977 (Table 6-4).

After more than 15 years of monitoring, the State Board has accumulated a considerable amount of data from these two programs. These data have been useful in assessing regional waters as they provide a direct measure of beneficial use impairment.

Table 6-3. Toxic Substances Monitoring Stations and Type of Samples Collected (LA Region).

Station No.	Station Name	81	82	83	84	85	86	87	88	89	90	91	92	93
402.10.02	Ventura River	–	EO	EO	O	–	–	–	–	EO	EO	EO	–	–
402.10.00	Ventura River Estuary	–	–	–	–	–	–	–	–	–	–	–	–	EO
402.20.02	Casitas Lake	–	–	–	–	–	–	–	O	–	–	–	EO	–
402.20.21	Ventura R/Ojai	–	–	–	–	–	–	–	–	–	–	–	–	EO
403.21.05	Santa Clara River/Santa Paula	EO	–	–	O	–	–	–	–	–	–	E	O	–
403.51.05	Santa Clara River/Valencia	–	–	–	–	–	–	–	–	–	–	O	EO	–
403.11.04	Revolon Slough	–	–	–	–	O	EO	EO	–	EO	EO	–	O	O
403.11.02	Rio de Santa Clara/Oxnard Drain	–	–	–	–	–	–	–	–	EO	EO	O	–	–
403.11.03	Oxnard Drainage Ditch 2	–	–	–	–	–	–	–	–	–	–	–	–	O
403.11.91	Mugu Lagoon	–	–	–	–	–	–	O	EO	EO	EO	E	EO	EO
403.12.06	Calleguas Creek	–	–	–	–	EO	EO	O	EO	EO	EO	O	O	O
403.67.04	Arroyo Simi	–	–	–	–	–	–	–	–	–	–	EO	–	–
403.64.02	Arroyo Conejo	–	–	–	–	–	–	–	–	–	EO	EO	–	–
403.64.03	Arroyo Conejo (downstream of forks)	–	–	–	–	–	–	–	–	–	–	–	–	EO
403.12.07	Conejo Creek	–	–	–	–	–	–	–	–	–	–	EO	EO	–
404.26.01	Sherwood Lake	–	–	–	–	–	–	–	–	–	–	EO	EO	–
404.26.00	Eleanor Lake	–	–	–	–	–	–	–	–	–	–	EO	–	–
404.25.01	Westlake Lake	–	–	–	–	–	–	–	–	–	–	EO	EO	–
404.23.04	Lindero Lake	–	–	–	–	–	–	–	–	–	–	EO	EO	–
404.21.00	Malibu Lagoon	–	–	–	–	–	–	–	–	–	–	–	–	EO
404.21.01	Malibu Creek	–	–	–	–	EO	–	–	EO	–	–	EO	–	–
404.21.04	Malibu Creek/Tapia Park	–	–	–	–	–	–	–	–	–	–	–	EO	–
404.21.07	Malibou Lake	–	–	–	–	–	–	–	–	–	–	EO	EO	–
405.21.03	Calabasas Lake	–	–	–	–	–	–	–	–	–	–	EO	EO	–
405.13.00	Marina del Rey	–	–	–	–	–	–	–	–	–	–	–	–	EO
405.13.01	Ballona Creek	–	–	–	–	–	–	–	–	–	–	–	–	EO
405.13.03	Ballona Wetlands	–	–	–	–	–	–	–	–	–	–	–	–	EO
405.13.02	Venice Canals/Sherman Ave.	–	–	–	–	–	EO	–	–	–	–	–	–	–
405.12.90	Harbor Park Lake	–	–	EO	EO	EO	O	O	O	EO	EO	O	EO	O
405.12.91	Simms Pond	–	–	–	–	–	–	–	–	–	–	–	–	EO
405.15.98	Hollenbeck Park Lake	–	–	–	–	–	–	–	–	–	–	EO	–	–
405.15.97	Belvedere Park Lake	–	–	–	–	–	–	–	–	–	–	EO	EO	–
405.15.99	Lincoln Park Lake	–	–	EO	–	–	–	–	–	–	–	EO	EO	–
405.15.24	Echo Park Lake	–	–	–	–	–	–	O	–	–	–	EO	EO	–
405.21.11	Hansen Dam Lake	–	–	E	–	–	–	–	–	–	–	–	–	–
405.12.03	Los Angeles River	–	–	EO	–	–	–	–	–	–	–	–	–	–
405.21.06	Los Angeles River/Los Feliz Road	–	–	–	–	–	–	–	–	–	–	–	EO	–
405.21.16	Los Angeles River/Sepulveda Basin	–	–	–	–	–	–	–	–	–	–	EO	EO	–
405.41.08	Peck Road Lake	–	–	–	–	–	EO	–	–	–	–	EO	EO	–
405.12.00	Alamitos Bay	–	–	–	–	–	–	–	–	–	–	EO	–	–
405.12.02	Dominguez Channel	–	–	–	–	–	–	–	–	–	–	–	EO	–
405.12.04	Colorado Lagoon	–	–	–	–	–	–	–	–	–	–	–	EO	–
405.15.04	San Gabriel River	–	–	EO	–	E	–	–	EO	EO	EO	E	EO	EO
–	San Gabriel River/Coyote Creek	–	–	–	–	–	–	–	–	–	–	–	EO	–
405.15.02	El Dorado Park Lake	–	–	–	–	–	–	–	–	–	–	EO	EO	–
405.41.01	Legg Lake	–	–	–	EO	–	–	–	EO	–	–	EO	EO	–
405.52.01	Puddingstone Reservoir	–	–	–	–	–	EO	O	O	–	–	EO	EO	–
405.41.11	Santa Fe Dam Park	–	–	–	–	–	–	–	–	–	–	–	EO	–

E = Trace Elements; O = Organic Chemicals; EO = Trace Elements & Organic Chemicals; – = Not Sampled;

Table 6-4. State Mussel Watch Sampling Stations and Type of Samples Collected (LA Region).

Station No.	Station Name	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
485.00	Ventura Marina	–	–	–	–	–	–	–	–	–	–	EO	–	–	–	–
485.20	Ventura River Estuary	–	–	–	–	–	–	–	–	–	–	–	–	–	–	O
487.10	Santa Clara River Estuary 1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	O
487.30	Santa Clara River Estuary 2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	O
502.00	Santa Cruz Island	EO	EO	–	–	–	–	–	–	–	–	–	–	–	–	–
503.00	Anacapa Island	EO	EO	EO	EO	–	–	–	–	–	–	–	–	–	–	–
504.00	Santa Barbara Island	EO	EO	–	–	–	–	–	–	–	–	–	–	–	–	–
505.00	Channel Island Harbor	–	–	E	EO	O	–	–	–	–	–	–	–	–	–	–
505.20	Channel Island Harbor/North	–	–	–	–	–	–	–	–	–	EO	–	–	–	–	–
506.00	Port Hueneme	–	–	EO	EO	O	–	–	–	–	–	–	–	–	–	–
506.10	Port Hueneme/Wharf B	–	–	–	–	–	–	–	–	O	O	EO	O	–	–	–
506.20	Port Hueneme/Wharf 1	–	–	–	–	–	–	–	–	O	EO	EO	O	–	–	–
506.30	Port Hueneme/Entrance	–	–	–	–	–	–	–	–	–	–	EO	–	–	–	–
507.00	Point Mugu	EO	EO	–	–	–	–	–	–	–	–	–	–	–	–	–
507.10	Mugu Lagoon/L Street	–	–	–	–	–	–	–	–	–	EO	–	–	–	O	–
507.20	Mugu Lagoon/Laguna Road	–	–	–	–	–	–	–	–	O	EO	–	–	–	O	–
507.30	Mugu Lagoon/Calleguas Creek	–	–	–	–	–	–	–	–	O	EO	–	EO	O	O	O
507.40	Ag Drain/Etting Road	–	–	–	–	–	–	–	–	–	–	–	–	–	O	–
507.60	Ag Drain/Pleasant Valley Road	–	–	–	–	–	–	–	–	–	–	–	–	–	O	–
507.70	Revolon Slough/Las Posas Road	–	–	–	–	–	–	–	–	–	–	–	–	–	O	–
507.80	Revolon Slough	–	–	–	–	–	–	–	–	–	EO	O	O	O	O	–
508.10	Mugu Drainage 1	–	–	–	–	–	–	–	–	–	–	–	–	O	–	–
508.20	Mugu Drainage 2	–	–	–	–	–	–	–	–	–	–	–	–	O	–	–
508.30	Mugu Drainage 3	–	–	–	–	–	–	–	–	–	–	–	–	O	–	–
508.40	Mugu Drainage 4	–	–	–	–	–	–	–	–	–	–	–	–	O	–	–
508.50	Mugu Drainage 5	–	–	–	–	–	–	–	–	–	–	–	–	O	–	–
508.60	Mugu Drainage 6	–	–	–	–	–	–	–	–	–	–	–	–	O	–	–
508.70	Mugu Drainage 7	–	–	–	–	–	–	–	–	–	–	–	–	O	–	–
509.00	Calleguas	–	–	–	–	–	–	–	–	–	–	–	–	O	–	–
553.00	Marina Del Rey/Entrance	–	–	–	–	–	–	–	–	–	–	–	EO	–	–	–
554.00	Marina Del Rey/Harbor Patrol Docks	–	–	–	–	–	–	–	–	EO	–	EO	EO	–	–	–
555.00	Marina Del Rey/Basin G	–	–	–	–	–	–	–	–	EO	EO	EO	EO	–	–	–
555.20	Marina Del Rey/Basin D	–	–	–	–	–	–	–	–	–	–	EO	–	–	–	–
556.00	Marina Del Rey/Basin E	–	–	–	–	–	–	–	–	EO	EO	EO	EO	–	–	–
557.00	Marina Del Rey/Ballona Creek	–	–	–	–	–	–	–	–	EO	EO	EO	EO	–	–	–
559.00	King Harbor	–	–	–	–	–	–	–	–	–	–	EO	–	–	–	–
601.00	LA Harbor/National Steel	–	–	–	–	EO	–	EO	EO	EO	EO	EO	EO	O	O	EO
602.00	LA Harbor/West Basin	–	–	–	–	EO	–	E	EO	EO	EO	EO	–	–	–	–
602.50	LA Harbor/Todd Shipyards	–	–	–	–	–	–	–	EO	EO	–	EO	EO	O	O	–
602.60	LA Harbor/Berth 50	–	–	–	–	–	–	–	–	–	–	–	–	E	–	–
602.70	LA Harbor/Pacific Ave/Storm Drain	–	–	–	–	–	–	–	–	–	–	EO	–	–	–	–
602.80	LA Harbor/Berth 49	–	–	–	–	–	–	–	–	–	EO	E	E	E	E	–
602.90	LA Harbor/Berth 51	–	–	–	–	–	–	–	–	–	–	–	–	E	–	–
603.00	LA Harbor/Berth 151	–	–	–	–	EO	–	EO	EO	EO	–	EO	O	–	–	–

Table 6-4. State Mussel Watch Sampling Stations and Type of Samples Collected (LA Region) (cont.)

Station No.	Station Name	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
603.60	LA Harbor/Slip 240	–	–	–	–	–	–	–	–	–	EO	EO	–	–	–	–
603.80	LA Harbor/West Channel	–	–	–	–	–	–	–	–	–	EO	EO	–	–	–	–
604.00	LA Harbor/GATX Terminal	–	–	–	O	EO	O	–	–	EO	–	–	–	–	–	–
604.50	LA Harbor/Berth 212	–	–	–	–	–	–	–	–	–	–	–	E	–	–	–
605.00	LA Harbor/Cabrillo Pier	–	O	O	–	EO	–	EO	–	–	–	–	EO	–	–	O
606.00	LA Harbor/Fish Harbor/Outer	–	–	–	–	EO	–	–	–	–	–	–	–	–	–	–
606.20	LA Harbor/Fish Harbor	–	–	–	–	–	–	–	–	–	EO	EO	–	–	–	–
606.30	LA Harbor/Walchom Basin	–	–	–	–	–	–	–	–	–	EO	–	–	–	–	–
607.00	LA Harbor/Terminal Island	–	–	–	O	EO	–	E	–	EO	–	–	–	–	–	–
607.40	LA/LB Harbors/Berth 214	–	–	–	–	–	–	–	–	–	EO	–	–	–	–	–
607.60	LA/LA Harbors/Channel 2	–	–	–	–	–	–	–	–	–	EO	–	–	–	–	–
607.70	LA/LB Harbors/Navy Mole Jetty	–	–	–	–	–	–	–	–	–	O	–	–	–	–	–
607.80	LA/LB Harbors/Pier J	–	–	–	–	–	–	–	–	–	EO	–	–	–	–	–
608.00	LA/LB Harbors/Navy Mole	–	–	–	–	EO	–	O	–	–	–	–	–	–	–	–
609.00	LA/LB Harbors/Tide Gauge	–	–	EO	EO	EO	O	EO	–	EO	–	O	–	–	–	–
609.40	Long Beach/Queensway Bay	–	–	–	–	–	–	–	–	–	EO	–	–	–	–	–
610.00	LA River/Mouth	–	–	–	O	–	O	–	EO	–	–	–	–	–	–	–
611.00	Long Beach Harbor/Pier F	–	–	–	–	EO	–	–	–	–	–	–	–	–	–	–
611.50	Long Beach Harbor/LAPD Ramp	–	–	–	O	–	–	–	–	–	–	–	–	–	–	–
612.00	LA/LB Harbors/Navy Channel	–	–	–	O	–	O	–	–	–	–	–	–	–	–	–
613.00	LA/LB Southern California Edison	–	–	–	–	EO	–	EO	–	EO	–	–	–	–	–	–
614.00	Long Beach/Channel 3	–	–	–	–	EO	–	–	–	–	–	–	–	–	–	–
615.00	LA Harbor/Henry Ford Bridge	–	–	–	–	–	EO	–	–	–	–	EO	EO	–	–	–
616.00	LA Harbor/Consolidate Slip	–	–	–	–	EO	O	O	EO	EO	EO	EO	EO	O	O	EO
617.00	White's Point	–	–	–	–	EO	–	–	–	–	–	–	–	–	–	–
618.00	LA Harbor/Angels Gate	–	–	–	–	–	–	–	–	–	–	–	–	–	EO	O
619.00	LA Harbor/San Pedro Breakwater	–	–	–	–	–	–	–	–	–	–	–	–	–	EO	–
620.00	LA/LB Harbor/JH Baxter 80	–	–	–	–	–	–	–	–	–	–	–	–	–	O	–
620.50	LA River/Upstream	–	–	–	–	–	–	–	–	O	–	–	–	–	–	–
621.00	LA Harbor/Berth 120	–	–	–	–	–	–	–	–	–	–	–	–	–	O	–
622.00	LA Harbor/Commer Marine	–	–	–	–	–	–	–	–	–	–	–	–	–	EO	–
625.00	Alamitos Bay/West 2nd Street	–	–	–	–	–	–	–	–	EO	–	–	–	–	–	–
626.00	Alamitos Bay/Cerritos Channel	–	–	–	–	–	–	–	–	EO	–	–	–	–	–	–
627.00	Alamitos Bay/Marine Stadium	–	–	–	–	–	–	–	–	EO	–	–	–	–	–	–
627.40	Alamitos Bay/Marine Stadium/North	–	–	–	–	–	–	–	–	–	EO	–	–	–	–	–
647.00	Point Dume	–	–	–	E	–	–	–	–	–	–	–	–	–	–	–
648.00	Malibu	–	–	–	E	–	–	–	–	–	–	–	–	–	EO	–
648.10	Malibu Lagoon/Channel A	–	–	–	–	–	–	–	–	–	–	–	–	–	–	EO
648.30	Malibu Lagoon/Channel C	–	–	–	–	–	–	–	–	–	–	–	–	–	–	EO
648.50	Malibu Lagoon/PCH	–	–	–	–	–	–	–	–	–	–	–	–	–	–	EO
649.00	Big Rock Beach	–	–	–	E	–	–	–	–	–	–	–	–	–	–	–

Table 6-4. State Mussel Watch Sampling Stations and Type of Samples Collected (LA Region) (cont.)

Station No.	Station Name	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92
650.00	Santa Monica	–	–	–	E	–	–	–	–	–	–	–	E	–	EO	–
651.00	Marina Del Rey/North docks	–	–	E	EO	–	–	–	–	–	–	–	–	–	–	–
652.00	Marina Del Rey/North Docks Jetty	–	–	E	–	–	–	–	–	–	–	–	–	–	–	–
653.00	Marina Del Rey/South Docks Jetty	–	–	–	–	EO	–	–	–	–	–	–	–	–	–	–
654.00	Playa Del Rey	–	–	–	E	–	–	–	–	–	–	–	–	–	–	–
655.00	El Segundo/Grand Avenue	–	–	–	E	–	–	–	–	–	–	–	–	–	–	–
656.00	Manhattan Beach	–	–	–	E	–	–	–	–	–	–	–	TE	–	–	–
657.00	Hermosa Beach	–	–	–	E	–	–	–	–	–	–	–	–	–	–	–
658.00	Redondo Beach	–	–	–	E	–	–	–	–	–	–	–	TE	–	–	–
659.00	Palos Verdes Point	–	–	–	E	–	–	–	–	–	–	–	–	–	–	–
660.00	Point Vincente	–	–	E	EO	–	–	–	–	–	–	–	–	–	–	–
661.00	Royal Palms/North	–	–	E	E	–	–	–	–	–	–	–	–	–	–	–
662.00	Royal Palms	–	EO	EO	EO	O	EO	EO	EO	EO	EO	EO	EO	EO	EO	EO
663.00	Royal Palms/South	–	–	–	E	–	–	–	–	–	–	–	–	–	–	–
664.00	Cabrillo Beach	–	E	O	–	–	–	–	–	–	–	–	–	–	–	O
680.00	Catalina Island/East	–	EO	E	EO	–	–	–	–	–	–	–	–	–	–	E
681.00	Catalina Island/West	EO	EO	E	E	–	–	–	–	–	–	–	–	–	–	–
682.00	Catalina Island/Ribbon Rock	–	–	–	E	–	–	–	–	–	–	–	–	–	E	–
683.00	Catalina Island/Ben Weston	–	–	–	EO	–	–	–	–	–	–	–	–	–	–	–
684.00	Catalina Island/Silver Cny.	–	–	–	E	–	–	–	–	–	–	–	–	–	–	–
685.00	Catalina Island/Church rock	–	–	–	E	–	–	–	–	–	–	–	–	–	–	–
701.00	Colorado Lagoon/West	–	–	–	–	EO	–	–	EO	EO	–	–	–	–	–	–
701.20	Colorado Lagoon/East	–	–	–	–	–	–	–	–	–	EO	–	–	–	–	–
703.00	Alamitos Bay/Pier 22	–	–	–	–	O	–	–	–	–	–	–	–	–	–	–

E = Trace Elements; O = Organic Chemicals; – = Not Sampled

Regional Board Monitoring Programs

The Regional Board conducts its own surface waters monitoring program that supplements the state monitoring programs described above (which are, for the most part, implemented by the Regional Boards).

Regional Board Surface Water Monitoring Network

Many of the State monitoring programs described above are no longer funded and thus many sampling stations have been dropped. Under these circumstances, it has been necessary for the Regional Board to develop and implement its own ambient surface water monitoring program to continue to meet state and regional monitoring and assessment objectives. This monitoring network currently consists of 60 primary stations on rivers and streams throughout the Region. Stations are placed to most effectively assess Regional waters and measure long term trends at certain historic stations developed by the Regional Board or other agencies.

Currently, each station is sampled at least once a year. In addition to water quality sampling, observations are made of existing beneficial uses, surrounding land use(s), potential sources of pollutants, and other conditions. The monitoring network is flexible and stations are added, moved, or deleted as the need arises; the Regional Board, however, maintains a core network of monitoring stations to the extent that funding is available.

Intensive Surveys

The Regional Board has started to perform Intensive Surveys to obtain detailed information on the effects of pollutant loadings from point and nonpoint sources on particular waterbodies. These surveys often involve coordination with other governmental agencies and organizations.

In addition to quantifying the effects of pollutant loadings, data from intensive surveys also augment the regional water quality database and are used for water quality assessments and basin planning updates.

Coordination With Other Agencies

Regional Board staff regularly coordinate with other agencies to share data, reduce overlap in sampling efforts, and use limited monitoring monies in the most efficient way possible.

Biological Criteria

Biological criteria are narrative (and sometimes numeric) expressions that describe the biological integrity of aquatic communities (EPA, 1991). Biological criteria supplement other water quality objectives (physical, chemical, toxicity) by providing a direct measure of aquatic communities at risk from human activities. These criteria can also provide evidence of streams with exceptional water quality. Baseline data must be collected from both reference and impacted streams in the Region. Regular monitoring of these areas can then provide a continual assessment of instream impacts. Over 30 of the 50 states have developed, or are developing, biological criteria programs. Although there is not a current biological criteria program in the Region, Regional Board staff are planning to begin conducting baseline surveys in the coming years.

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APPENDIX ONE

Inventory of Major Surface Waters and Waters to which they are Tributary

INVENTORY OF MAJOR SURFACE WATERS AND WATERS TO WHICH THEY ARE TRIBUTARY

WATERBODY	HYDROLOGIC SUBAREA (HSA)	TRIBUTARY OF
Agua Blanca Creek	403.42	Piru Creek (downstream of Pyramid Lake)
Agua Dulce Canyon Creek	403.54 403.55	Soledad Canyon Creek (HSA 403.55)
Alder Creek	403.32	Sespe Creek
Alder Creek	405.23	Big Tujunga Canyon Creek (upstream of Big Tujunga Reservoir)
Alhambra Wash	405.41	Whittier Narrows Flood Control Basin
Aliso Canyon Creek	403.55	Soledad Canyon Creek
Aliso Canyon Creek	405.21	Aliso Canyon Wash
Aliso Canyon Wash	405.21	Los Angeles River (upstream of Sepulveda Flood Control Basin)
Allison Gulch	405.43	San Gabriel River (upstream of San Gabriel Reservoir)
Arcadia Wash	405.31 405.33 405.41	Rio Hondo (downstream of Santa Fe Flood Control Basin) (HSA 405.41)
Arroyo Calabasas	405.21	Los Angeles River (upstream of Sepulveda Flood Control Basin)
Arroyo Conejo	403.64 403.68	Conejo Creek (HSA 403.64)
Arroyo Las Posas	403.12 403.62	Calleguas Creek (HSA 403.12)
Arroyo Santa Rosa	403.63 403.65	Conejo Creek (HSA 403.63)
Arroyo Seco		
Upstream of Devils Gate Reservoir	405.32	Devils Gate Reservoir
Downstream of Devils Gate Reservoir	405.15 405.31	Los Angeles River (downstream of Sepulveda Flood Control Basin) (HSA 405.15)
Arroyo Sequit	404.44	Pacific Ocean
Arroyo Simi	403.62 403.67	Arroyo Las Posas (HSA 403.62)
Arundell Barranca	403.11	Ventura Marina
Ascot Reservoir	405.15	Distribution reservoir - replace with tank
Ayers Creek	402.20	Lake Casitas

INVENTORY OF MAJOR SURFACE WATERS AND WATERS TO WHICH THEY ARE TRIBUTARY (cont.)

WATERBODY	HYDROLOGIC SUBAREA (HSA)	TRIBUTARY OF
Ballona Creek	405.13 405.15	Ballona Creek Estuary
Ballona Lagoon	405.13	Ballona Creek
Ballona Wetlands	405.13	
Bear Canyon Creek	403.32	Sespe Creek
Bear Creek	405.43	West Fork San Gabriel River (downstream of Cogswell Reservoir)
Beardsley Wash	403.11 403.61	Revolon Slough (HSA 403.11)
Beartrap Canyon Creek	403.42	Pyramid Lake
Bell Creek	405.21	Los Angeles River (upstream of Sepulveda Flood Control Basin)
Bell Canyon Creek	405.41	Big Dalton Canyon Creek
Bichota Canyon	405.43	North Fork San Gabriel River
Big Dalton Canyon Creek	405.41	Big Dalton Wash
Big Dalton Dam and Reservoir	405.41	Big Dalton Canyon Creek
Big Dalton Wash	405.41	Walnut Creek
Big Santa Anita Reservoir	405.33	Santa Anita Wash
Big Sycamore Canyon Creek	404.47	Pacific Ocean
Big Tujunga Canyon Creek		
Upstream of BigTujunga Reservoir	405.23	Big Tujunga Reservoir
Downstream of BigTujunga Reservoir	405.23	Hansen Flood Control Basin
Big Tujunga Reservoir	405.23	Big Tujunga Canyon Creek (downstream of Big Tujunga Reservoir)
Bixby Slough	405.12	
Bobcat Canyon	405.43	West Fork San Gabriel River (upstream of Cogswell Reservoir)
Bouton Lake	405.15	
Bouquet Canyon Creek		
Upstream of Bouquet Reservoir	403.51	Bouquet Reservoir
Downstream of Bouquet Reservoir	403.52	Santa Clara River
Bouquet Reservoir	403.52	Bouquet Canyon
Bradbury Canyon Creek	405.41	Santa Fe Flood Control Basin

INVENTORY OF MAJOR SURFACE WATERS AND WATERS TO WHICH THEY ARE TRIBUTARY (cont.)

WATERBODY	HYDROLOGIC SUBAREA (HSA)	TRIBUTARY OF
Browns Canyon Creek	405.21	Browns Canyon Wash
Browns Canyon Wash	405.21	Los Angeles River (upstream of Sepulveda Flood Control Basin)
Buck Creek	403.42	Piru Creek (upstream of Pyramid Lake)
Bull Creek	405.21	Sepulveda Flood Control Basin
Burbank Western Channel	405.21	Los Angeles River (downstream of Sepulveda Flood Control Basin)
Caballero Creek	405.21	Los Angeles River (upstream of Sepulveda Flood Control Basin)
Calleguas Creek	403.11 403.12	Calleguas Creek Estuary Mugu Lagoon
Canyon Streams - Palos Verdes	405.12	Coastal Streams - Palos Verdes
Cañada de los Alamos	403.43	Pyramid Lake
Cañada Larga	402.10	Ventura River
Carbon Canyon Creek	404.16	Santa Monica Bay
Castaic Creek		
Upstream of Castaic Lake	403.51	Elderberry Forebay
Downstream of Castaic Lake	403.51	Castaic Lagoon
Downstream of Castaic Lagoon	403.51	Santa Clara River
Castaic Lagoon	403.51	Castaic Creek (downstream of Castaic Lagoon)
Castaic Lake	403.51	Castaic Creek (downstream of Castaic Lake)
Cattle Canyon Creek	405.43	San Gabriel River (upstream of San Gabriel Reservoir)
Cedar Creek	405.43	Soldier Creek
Centinela Creek Channel	405.13	Ballona Creek
Century Reservoir	404.21	Malibu Creek (downstream of Century Reservoir)
Chatsworth Creek		
Upstream of Lees Lake	405.21	Lees Lake
Downstream of Lees Lake	405.21	Bell Creek
Chatsworth Reservoir	405.21	Chatsworth Creek (upstream of Lees Lake)
Chileno Canyon	405.43	West Fork San Gabriel River (downstream of Cogswell Reservoir)
Chismahoo Creek	402.20	Lake Casitas

INVENTORY OF MAJOR SURFACE WATERS AND WATERS TO WHICH THEY ARE TRIBUTARY (cont.)

WATERBODY	HYDROLOGIC SUBAREA (HSA)	TRIBUTARY OF
Clear Creek	405.23	Big Tujunga Canyon Creek (downstream of Big Tujunga Reservoir)
Coastal Streams - Palos Verdes	405.11	Santa Monica Bay
Cogswell Reservoir	405.43	West Fork San Gabriel River (downstream of Cogswell Reservoir)
Coldbrook Creek	405.43	North Fork San Gabriel River
Cold Creek	404.21	Malibu Creek (downstream of Century Reservoir)
Coldwater Canyon Creek	403.32	Sespe Creek
Coldwater Canyon Creek	405.43	Cattle Canyon Creek
Colorado Lagoon	405.12	
Compton Creek	405.15	Los Angeles River (downstream of Sepulveda Flood Control Basin)
Conejo Creek	403.12 403.63	Calleguas Creek (HSA 403.12)
Corral Canyon Creek	404.31	Santa Monica Bay
Cow Canyon Creek	405.43	Cattle Canyon Creek
Coyote Creek		
Upstream of Lake Casitas	402.20	Lake Casitas
Downstream of Lake Casitas	402.20	Ventura River
Coyote Creek	405.15	San Gabriel River (downstream of Whittier Narrows Flood Control Basin)
Crystal Lake	405.43	
Dark Canyon	405.32	Arroyo Seco Canyon
Dayton Canyon Creek	405.21	Chatsworth Creek (downstream of Lees Lake)
Deer Canyon Creek	404.46	Pacific Ocean
Del Rey Lagoon	405.13	
Devil Canyon Creek	403.41	Lake Piru
Devils Canyon Creek	405.43	Cogswell Reservoir
Devils Gate Reservoir	405.31 405.32	Arroyo Seco
Dominguez Canyon Creek	403.41	Lake Piru
Dominguez Channel	405.12	Dominguez Channel Estuary (Los Angeles Harbor)
Drinkwater Reservoir	403.51	San Franciaquito Canyon Creek

INVENTORY OF MAJOR SURFACE WATERS AND WATERS TO WHICH THEY ARE TRIBUTARY (cont.)

WATERBODY	HYDROLOGIC SUBAREA (HSA)	TRIBUTARY OF
Dry Canyon Creek	403.51	Dry Canyon Reservoir
Dry Canyon Creek	405.21	Arroyo Calabasas
Dry Canyon Reservoir	403.51	Dry Canyon Creek
Dume Creek (Zuma Canyon Creek)	404.36	Dume Lagoon, Pacific Ocean
Dunsmore Canyon Creek	405.24	Verdugo Wash
Eagle Rock Reservoir	405.25	Distribution reservoir - covered
East Fork Alder Creek	403.32	Alder Creek
East Fork Arroyo Sequit	404.44	Arroyo Sequit
East Fork Coyote Creek	402.20	Coyote Creek (upstream of Lake Casitas)
East Fork Hall Canyon Creek	402.10	Hall Canyon Creek
East Fork Santa Anita Canyon Creek	405.33	Santa Anita Canyon Creek
Eaton Canyon Creek	405.31	Eaton Dam and Reservoir
Eaton Dam and Reservoir	405.31	Eaton Wash
Eaton Wash	405.31 405.41	Rio Hondo (downstream of Santa Fe Flood Control Basin) (HSA 405.41)
Echo Lake	405.15	
Edison Canal	403.11	Channel Islands Harbor
Elderberry Forebay	403.51	Castaic Lake
El Dorado Lakes	405.15	
Elizabeth Lake Canyon Creek	403.51	Castaic Lake
Elysian Reservoir	405.15	Distribution reservoir - cover being considered
El Prieto Canyon Creek	405.32	Arroyo Seco
Emerald Creek and Wash	405.53	Live Oak Wash
Encinal Canyon Creek	404.41	Pacific Ocean
Encino Reservoir	405.21	Distribution reservoir - not tributary
Escondido Canyon Creek	404.34	Santa Monica Bay
Fall Creek	405.23	Big Tujunga Canyon Creek (upstream of Big Tujunga Reservoir)
Fish Canyon Creek	405.43	San Gabriel River (downstream of Morris Reservoir)
Fish Fork	405.43	San Gabriel River (upstream of San Gabriel Reservoir)

INVENTORY OF MAJOR SURFACE WATERS AND WATERS TO WHICH THEY ARE TRIBUTARY (cont.)

WATERBODY	HYDROLOGIC SUBAREA (HSA)	TRIBUTARY OF
Fox Creek	405.23	Big Tujunga Reservoir
Franklin Canyon Reservoir (Lower)	405.14	Distribution reservoir - covered
Frazier Creek	403.42	Piru Creek (upstream of Pyramid Lake)
Garvey Reservoir	405.41	
Gillibrand Canyon Creek	403.67	Tapo Canyon Creek
Girard Reservoir	405.21	Distribution reservoir - out of service
Gorman Creek	403.43	Cañada de los Alamos
Grand Canal	405.13	Ballona Lagoon
Haines Canyon Creek	405.23	Big Tujunga Canyon Creek (downstream of Big Tujunga Reservoir)
Hall Canyon Creek	402.10	Pacific Ocean
Halls Canyon Channel	405.24	Verdugo Wash
Hansen Flood Control Basin	405.23	Tujunga Wash
Hansen Lake	405.23	Hansen Flood Control Basin
Harbor Lake (Machado Lake)	405.12	
Hidden Valley Creek	404.26	Lake Sherwood
Hollywood Reservoir (Lower & Upper)	405.14	Distribution reservoirs
Hopper Canyon Creek	403.41	Santa Clara River
Hot Springs Canyon Creek	403.32	Sespe Creek
Howard Creek	403.32	Sespe Creek
Iron Fork	405.43	San Gabriel River (upstream of San Gabriel Reservoir)
Ivanhoe Reservoir	405.15	Silver Lake Reservoir
Javon Canyon	401.00	Pacific Ocean
Kagel Canyon Creek	405.23	Little Tujunga Canyon Creek
Lachusa Canyon Creek	404.42	Pacific Ocean
La Jolla Canyon Creek	404.48	Pacific Ocean
Lake Bard (Wood Ranch Reservoir)	403.67	Arroyo Simi
Lake Casitas	402.20	Coyote Creek (downstream of Lake Casitas)
Lake Elizabeth	403.51	Munz Lake
Lake Eleanor	404.25	Potrero Valley Creek

INVENTORY OF MAJOR SURFACE WATERS AND WATERS TO WHICH THEY ARE TRIBUTARY (cont.)

WATERBODY	HYDROLOGIC SUBAREA (HSA)	TRIBUTARY OF
Lake Eleanor Creek	404.25	Lake Eleanor
Lake Enchanto	404.24	Triunfo Creek (downstream of Lake Enchanto)
Lake Hughes	403.51	Elizabeth Lake Canyon Creek
Lake Piru	403.41	Piru Creek (downstream of Lake Piru)
Lake Sherwood	404.26	Potrero Valley Creek
Las Flores Canyon Creek	404.15	Santa Monica Bay
Las Virgenes Creek	404.21 404.22	Malibu Creek (downstream of Century Reservoir)
Las Virgenes Reservoir (Westlake Reservoir)	404.25	Westlake Lake
Latigo Canyon Creek	404.33	Santa Monica Bay
La Tuna Canyon Creek	405.21	Burbank Wester Drain
Lechier Canyon Creek	403.41	Lake Piru
Legg Lake	405.41	Whittier Narrows Flood Control Basin
Less Lake	405.21	Chatsworth Creek (downstream of Lees Lake)
Limekiln Canyon Creek	405.21	Limekiln Canyon Wash
Limekiln Canyon Wash	405.21	Aliso Canyon Wash
Lincoln Park Lake	405.15	
Lindero Creek	404.23	Medea Creek
Lion Canyon Creek	403.32	Sespe Creek
Lion Creek	402.20 402.31	San Antonio Creek (HSA 402.20)
Little Bear Canyon Creek	405.32	Arroyo Seco
Little Dalton Canyon Creek	405.41	Big Dalton Wash and Little Dalton Wash
Little Dalton Wash	405.41	Big Dalton Wash
Little Santa Anita Canyon Creek	405.33	Santa Anita Wash
Little Sycamore Canyon Creek	404.45	Pacific Ocean
Little Tujunga Canyon Creek	405.23	Hansen Flood Control Basin
Live Oak Creek	405.53	Live Oak Dam and Reservoir
Live Oak Dam and Reservoir	405.53	Live Oak Creek
Live Oak Wash	405.52 405.53	Puddingstone Dam and Reservoir

INVENTORY OF MAJOR SURFACE WATERS AND WATERS TO WHICH THEY ARE TRIBUTARY (cont.)

WATERBODY	HYDROLOGIC SUBAREA (HSA)	TRIBUTARY OF
Lockwood Creek	403.42 403.44	Piru Creek (upstream of Pyramid Lake) (HSA 403.42)
Lopez Canyon Creek	405.21 405.23	Hansen Flood Control Basin (HSA 405.23)
Los Alisos Canyon Creek	404.42	Pacific Ocean
Los Angeles River		
Upstream of Sepulveda Flood Control Basin	405.21	Sepulveda Flood Control Basin
Downstream of Sepulveda Flood Control Basin	405.12 405.15 405.21	Los Angeles River Estuary
Los Angeles Reservoir	405.21	Distribution reservoir
Los Cerritos Channel	405.15	Los Cerritos Channel Estuary
Los Cerritos Wetlands	405.15	
Los Sauces Creek	401.00	Pacific Ocean
Lost Canyon Creek	405.43	North Fork San Gabriel River
Lower Van Norman Reservoir	405.21	Bull Creek
Maddock Canyon Creek	405.43	Santa Fe Flood Control Basin
Madrona Marsh	405.12	
Malibu Creek		
Downstream of Malibou Lake	404.21	Century Reservoir
Downstream of Century Reservoir	404.21	Malibu Lagoon
Malibou Lake	404.24	Malibu Creek (downstream of Malibou Lake)
Madranio Canyon	401.00	Pacific Ocean
Mandeville Canyon Creek	405.13	Santa Monica Canyon Channel
Marshall Creek and Wash	405.41 405.53	Puddingstone Reservoir
Matilija Creek	402.20	Matilija Reservoir
Matilija Reservoir	402.20	Ventura River
May Canyon Creek	405.22	Pacoima Wash
McCoy Canyon Creek	405.21	Arroyo Calabasas
McGrath Lake	403.11	
Medea Creek	404.23 404.24	Malibu Lake (HSA 404.24)

INVENTORY OF MAJOR SURFACE WATERS AND WATERS TO WHICH THEY ARE TRIBUTARY (cont.)

WATERBODY	HYDROLOGIC SUBAREA (HSA)	TRIBUTARY OF
Middle Fork Alder Creek	405.23	Alder Creek
Middle Lake	405.23	Hansen Flood Control Basin
Millard Canyon Creek	405.32	Arroyo Seco
Mill Creek	405.23	Big Tujunga Canyon Creek (upstream of Big Tujunga Reservoir)
Mint Canyon Creek	403.51 403.53	Santa Clara River (HSA 403.51)
Mirror Lake	402.20	
Monrovia Canyon Creek	405.41	Sawpit Wash
Monteria Lake	405.21	
Morningside Park Reservoir	405.15	
Morris Reservoir	405.43	San Gabriel River (downstream of Morris Reservoir)
Mugu Lagoon	403.11	
Munz Lake	403.51	Lake Hughes
Murietta Canyon Creek	402.20	Matilija Creek
Mutau Creek	403.42	Piru Creek (upstream of Pyramid Lake)
Mystic Canyon	405.41	Big Dalton Canyon Creek
North Fork Arroyo Conejo	403.64	Arroyo Conejo
North Fork Matilija Creek	402.20	Ventura River
North Fork San Gabriel River	405.43	West Fork San Gabriel River (downstream of Cogswell Reservoir)
North Fork Santa Anita Canyon Creek	405.33	Santa Anita Canyon Creek
Ojai Wetland	402.20	
Pacoima Canyon Creek	405.22	Pacoima Reservoir
Pacoima Reservoir	405.22	Pacoima Wash
Pacoima Wash	405.21	Tujunga Wash
Pacoima Wash (south branch)	405.21	Pacoima Reservoir
Padre Juan Canyon	401.00	Pacific Ocean
Peña Canyon Creek	404.13	Santa Monica Bay
Pickens Canyon	405.24	Verdugo Wash
Piedra Blanca Creek	403.32	Sespe Creek

INVENTORY OF MAJOR SURFACE WATERS AND WATERS TO WHICH THEY ARE TRIBUTARY (cont.)

WATERBODY	HYDROLOGIC SUBAREA (HSA)	TRIBUTARY OF
Piedra Gorda Canyon Creek	404.14	Santa Monica Bay
Pine Canyon Creek	403.32	Sespe Creek
Piru Creek		
Upstream of Pyramid Lake	403.42	Pyramid Lake
Downstream of Pyramid Lake	403.42	Lake Piru
Downstream of Lake Piru	403.41	Santa Clara River
Poplar Creek	403.32	Hot Springs Canyon Creek
Potrero John Creek	403.32	Sespe Creek
Potrero Valley Creek	404.25	Westlake Lake
Poverty Canyon	401.00	Los Sauces Creek
Prairie Fork	405.43	San Gabriel River (upstream of San Gabriel Reservoir)
Puddingstone Division Dam and Reservoir	405.52	Puddingstone Wash
Puddingstone Wash	405.41	Walnut Creek
Puente Creek	405.41	San Jose Creek
Puerco Canyon Creek	404.31	Santa Monica Bay
Pyramid Lake	403.42 403.43	Piru Creek (downstream of Pyramid Lake)
Ramirez Canyon Creek	404.35	Santa Monica Bay
Redrock Creek	403.32	Tar Creek
Revees Creek	402.32	San Antonio Creek
Revolon Slough	403.61	Calleguas Creek
Rio Hondo		
Downstream of Santa Fe Flood Control Basin	405.41	Whittier Narrows Flood Control Basin
Downstream of Whittier Narrows Flood Control Basin	405.15	Los Angeles River (downstream of Sepulveda Flood Control Basin)
Roberts Canyon Creek	405.43	San Gabriel River (downstream of Morris Reservoir)
Rose Valley Creek	403.32	Sespe Creek
Rubio Canyon	405.31	Rio Hondo (downstream of Santa Fe Flood Control Basin) (HSA 405.41)
Rubio Wash	405.41	Rio Hondo (downstream of Santa Fe Flood Control Basin) (HSA 405.41)

INVENTORY OF MAJOR SURFACE WATERS AND WATERS TO WHICH THEY ARE TRIBUTARY (cont.)

WATERBODY	HYDROLOGIC SUBAREA (HSA)	TRIBUTARY OF
Runkle Reservoir (Bard Reservoir)	403.67	Arroyo Simi
Rustic Canyon Creek	405.13	Santa Monica Canyon Channel
San Antonio Canyon Creek	481.23	San Antonio Reservoir
San Antonio Creek	402.20 402.32	Ventura River (HSA 402.20)
San Antonio Dam and Reservoir	481.23	
San Dimas Canyon Creek	405.44	San Dimas Dam and Reservoir
San Dimas Dam and Reservoir	405.44	San Dimas Wash and Puddingstone Dam and Reservoir
San Dimas Wash	405.41 405.44	Big Dalton Wash
San Francisquito Canyon Creek	403.51	Santa Clara River
San Gabriel Reservoir	405.43	San Gabriel River (downstream of San Gabriel Reservoir)
San Gabriel River		
Upstream of San Gabriel Reservoir	405.43	San Gabriel Reservoir
Downstream of San Gabriel Reservoir	405.43	Morris Reservoir
Downstream of Morris Reservoir	405.41 405.42 405.43	Santa Fe Flood Control Basin
Downstream of Santa Fe Flood Control Basin	405.41	Whittier Narrow Flood Control Basin
Downstream of Whittier Narrows Flood Control Basin	405.15	San Gabriel River Estuary
San Jose Creek	405.41 405.51	San Gabriel River (downstream of Santa Fe Flood Control Basin) (HSA 405.41)
San Nicholas Canyon Creek	404.43	Pacific Ocean
Santa Ana Creek	402.20	Lake Casitas
Santa Anita Canyon Creek	405.33	Big Santa Anita Reservoir
Santa Anita Wash	405.33 405.41	Rio Hondo (downstream of Santa Fe Flood Control Basin) (HSA 405.41)
Santa Clara River	403.11 403.21 403.31 403.41 403.51	Santa Clara River Estuary

INVENTORY OF MAJOR SURFACE WATERS AND WATERS TO WHICH THEY ARE TRIBUTARY (cont.)

WATERBODY	HYDROLOGIC SUBAREA (HSA)	TRIBUTARY OF
Santa Fe Flood Control Basin	405.41	Rio Hondo and San Gabriel River (downstream of Santa Fe Flood Control Basin)
Santa Felicia Canyon Creek	403.41	Lake Piru
Santa Monica Canyon Channel	405.13	Santa Monica Bay
Santa Paula Creek	403.21	Santa Clara River
Santa Ynez Canyon	405.13	Santa Monica Bay
Santa Ynez Lake (Reservoir)	405.13	Distribution reservoir - cover being considered
Sawpit Canyon Creek	405.41	Sawpit Dam and Reservoir
Sawpit Dam and Reservoir	405.41	Sawpit Wash
Sawpit Wash	405.41	Rio Hondo (downstream of Santa Fe Flood Control Basin)
Schoolhouse Debris Basin	405.22	
Sepulveda Channel	405.13	Ballona Creek
Sepulveda Flood Control Basin	405.21	Los Angeles River (downstream of Sepulveda Flood Control Basin)
Sespe Creek	403.31 403.32	Santa Clara River (HSA 403.31)
Shields Canyon	405.24	Verdugo Wash
Silver Lake Reservoir	405.15	Distribution reservoir
Sims Pond	405.15	
Sisar Creek	403.21 403.22	Santa Paula Creek (HSA 403.21)
Snover Canyon	405.32	Halls Canyon Channel
Snowy Creek	403.42	Piru Creek (upstream of Pyramid Lake)
Solano Reservoir	405.21	Distribution reservoir - covered
Soldier Creek	405.43	North Fork San Gabriel River
Soledad Canyon Creek	403.55	Santa Clara River
Solstice Canyon Creek	404.32	Santa Monica Bay
South Fork	405.43	Iron Fork
South Fork Piru Creek	403.42	Piru Creek (upstream of Pyramid Lake)
South Fork (Santa Clara River)	403.51	Santa Clara River
South Portal Canyon Creek	403.51	San Francisquito Canyon Creek

INVENTORY OF MAJOR SURFACE WATERS AND WATERS TO WHICH THEY ARE TRIBUTARY (cont.)

WATERBODY	HYDROLOGIC SUBAREA (HSA)	TRIBUTARY OF
Spinks Canyon Creek	405.41	Santa Fe Flood Control Basin
Stetson Canyon Creek	405.22	Pacoima Wash
Stone Canyon Reservoir (Lower)	405.13	Distribution reservoir
Sullivan Canyon Creek	405.13	Santa Monica Canyon Channel
Sunset Reservoir - N	405.31	
Sunset Reservoir - S	405.31	
Tar Creek	403.32	Sespe Creek
Tapo Canyon Creek	403.66 403.67	Arroyo Simi (HSA 403.67)
Tapo Canyon Creek	403.41	Santa Clara River
Thompson Creek	405.53	Thompson Wash
Thompson Creek Dam and Reservoir	405.53	Thompson Creek
Thompson Wash	405.52 405.53	San Jose Creek
Timber Creek	403.32	Sespe Creek
Toluca Lake	405.21	
Topanga Canyon Creek	404.11	Toponga Lagoon
Trancas Canyon Creek	404.37	Pacific Ocean
Triunfo Creek		
Upstream of Lake Enchanto	404.24 404.25	Lake Enchanto
Downstream of Lake Enchanto	404.24	Malibu Lake
Trout Creek	403.32	Sespe Creek
Tujunga Wash	405.21	Los Angeles River (downstream of Sepulveda Flood Control Basin)
Tule Creek	403.32	Sespe Creek
Tumbler Canyon	405.43	Cogswell Reservoir
Tuna Canyon Creek	404.12	Santa Monica Bay
Upper Big Tujunga Canyon Creek	405.23	Big Tujunga Canyon Creek (upstream of Big Tujunga Reservoir)
Upper Franklin Canyon Reservoir	405.14	Nature preserve - not part of drinking water system
Upper North Fork Matilija Creek	402.20	Matilija Creek

INVENTORY OF MAJOR SURFACE WATERS AND WATERS TO WHICH THEY ARE TRIBUTARY (cont.)

WATERBODY	HYDROLOGIC SUBAREA (HSA)	TRIBUTARY OF
Upper Stone Canyon Reservoir	405.13	Stone Canyon Reservoir (Lower)
Van Tassel Canyon	405.43	San Gabriel River (downstream of Morris Reservoir)
Various Canyon Streams - Santa Monica	405.13	(Santa Ynez Lake)
Vasquez Creek	405.23	Big Tujunga Canyon Creek (downstream of Big Tujunga Reservoir)
Venice Canals	405.13	Grand Canal
Ventura River	402.10 402.20	Ventura River Estuary
Verdugo Wash	405.21 405.24	Los Angeles River (downstream of Sepulveda Flood Control Basin) (HSA 405.21)
Vincent Gulch	405.43	San Gabriel River (upstream of San Gabriel Reservoir)
Walnut Creek Wash	405.41	San Gabriel River (downstream of Santa Fe Flood Control Basin)
West Fork Alder Creek	405.23	Alder Creek
West Fork Bear Creek	405.43	Bear Creek
West Fork Coyote Creek	402.20	Coyote Creek (upstream of Lake Casitas)
West Fork Fox Creek	405.23	Fox Creek
West Fork San Dimas Canyon	405.44	San Dimas Canyon Creek
West Fork San Gabriel River		
Upstream of Cogswell Reservoir	405.43	Cogswell Reservoir
Downstream of Cogswell Reservoir	405.43	San Gabriel Reservoir
West Fork Santa Ana Creek	402.20	Santa Ana Creek
West Fork Sespe Creek	403.32	Sespe Creek
Westlake Lake	404.25	Triunfo Creek (upstream of Lake Enchanto)
White Oak Canyon	405.23	Big Tujunga Reservoir
Whittier Narrows Flood Control Basin	405.41	Rio Hondo and San Gabriel River (downstream of Whittier Narrows Flood Control Basin)
Wickiup Canyon	405.23	Big Tujunga Canyon Creek (upstream of Big Tujunga Reservoir)
Willow Creek	402.20	Lake Casitas

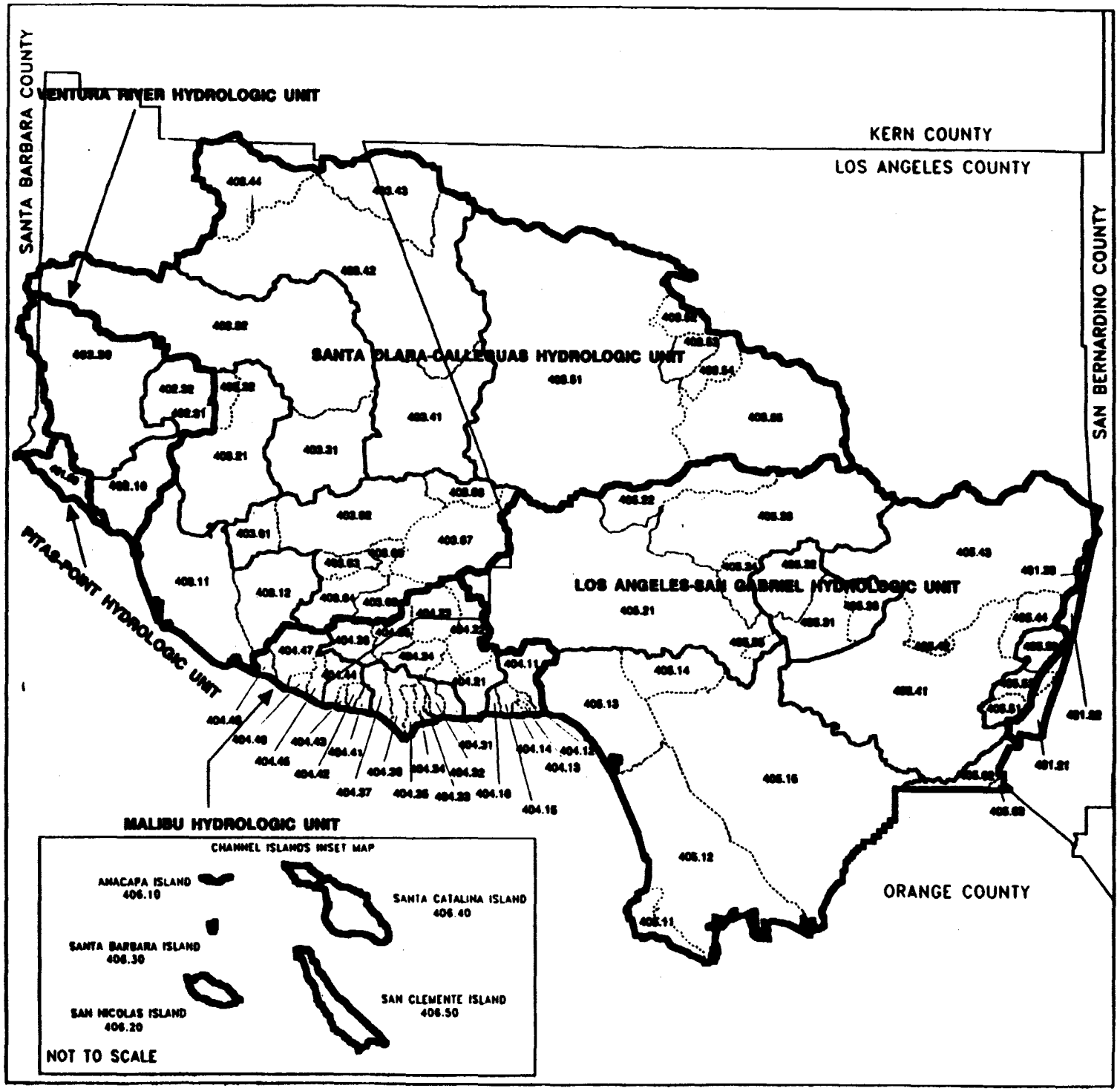
INVENTORY OF MAJOR SURFACE WATERS AND WATERS TO WHICH THEY ARE TRIBUTARY (cont.)

WATERBODY	HYDROLOGIC SUBAREA (HSA)	TRIBUTARY OF
Wilson Canyon Creek	405.22	Pacoima Wash
Winter Creek	405.33	Santa Anita Canyon Creek
Wolfskill Canyon	405.44	San Dimas Canyon Creek

APPENDIX TWO

Overlays

1. Hydrologic Units
2. Major Freeways, Highways
3. USGS 7.5 Minute Quad Boundaries



OVERLAY # 1

HYDROLOGIC UNITS

WITH AREAS AND SUBAREAS

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

HYDROLOGIC UNITS

HYDROLOGIC AREAS

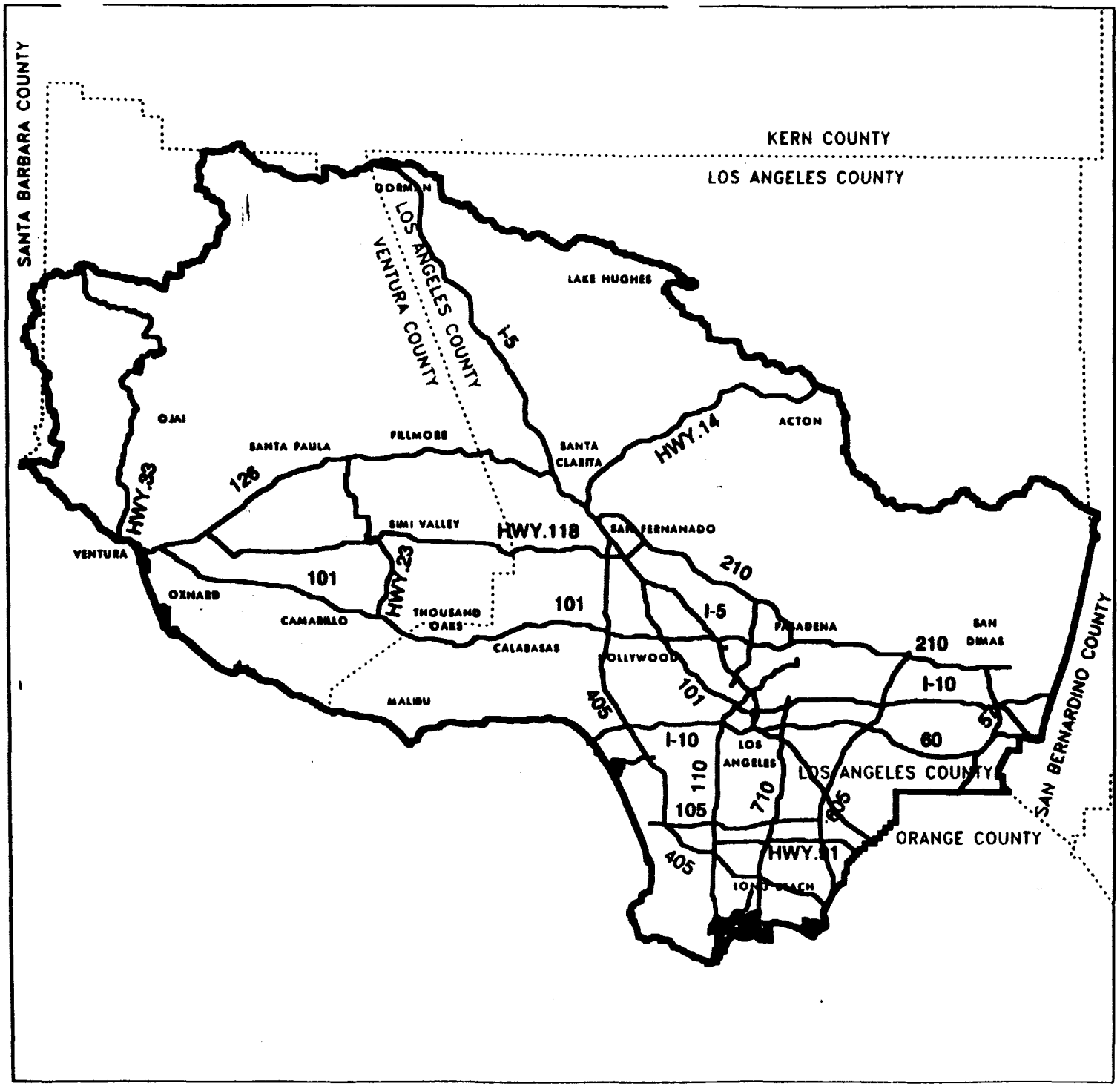
HYDROLOGIC SUB AREAS

COUNTY LINE

N

Miles

0 10 20



OVERLAY # 2

MAJOR FREEWAYS, HIGHWAYS

AND SELECTED CITIES WITH COUNTY LINES

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

REGIONAL BOUNDARY

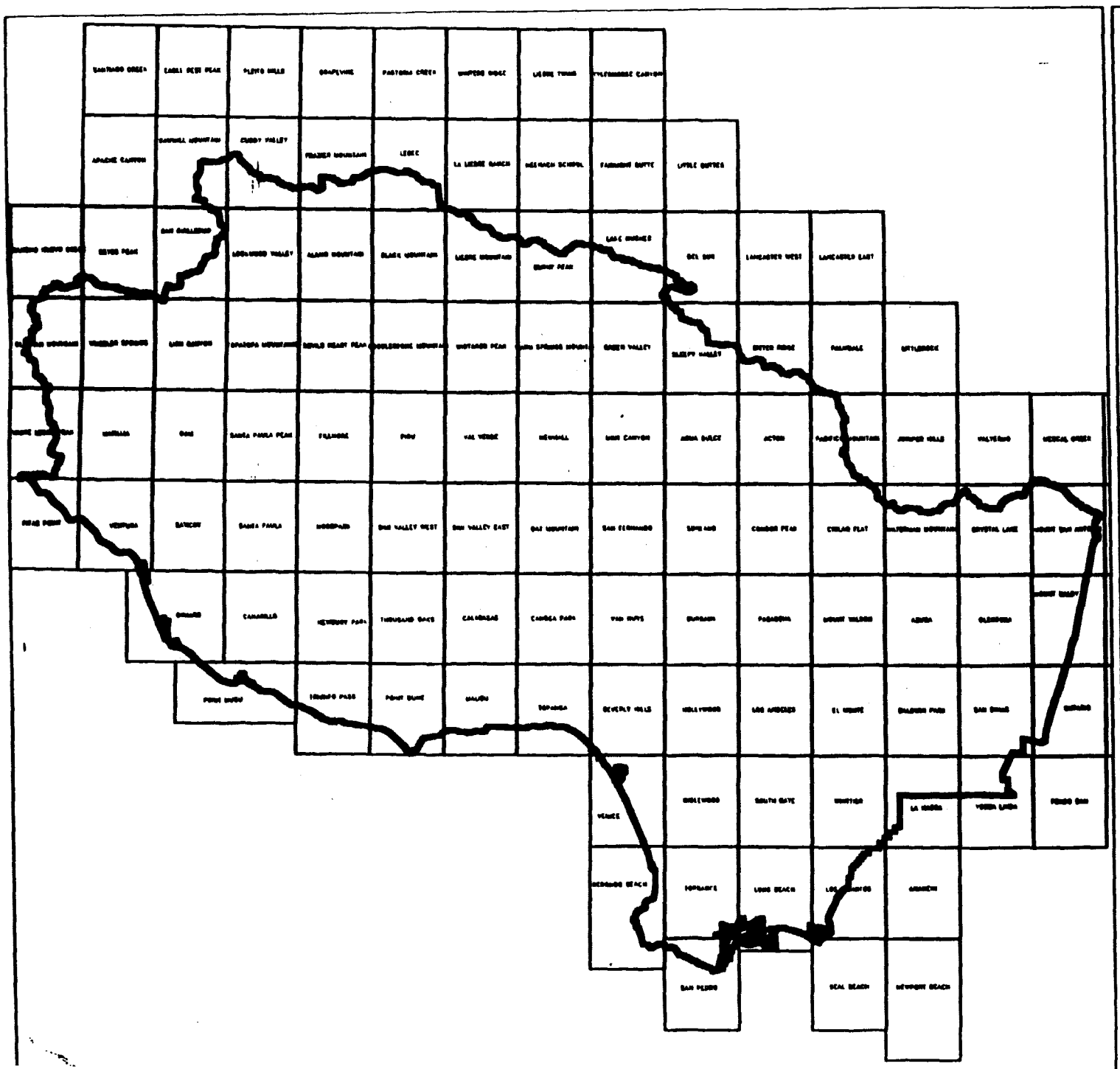
FREEWAYS/HIGHWAYS

COUNTY LINE

N

Miles

0 10 20



OVERLAY # 3

USGS

7.5 MINUTE QUAD BOUNDARIES

CALIFORNIA
REGIONAL
WATER QUALITY
CONTROL BOARD
LOS ANGELES REGION
(4)

RWQCB BOUNDARY

USGS QUADS

N

Miles

0 10 20